United States Patent

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[54] **HIGH CHAIR DOLL**
8 Claims, 10 Drawing Figs.

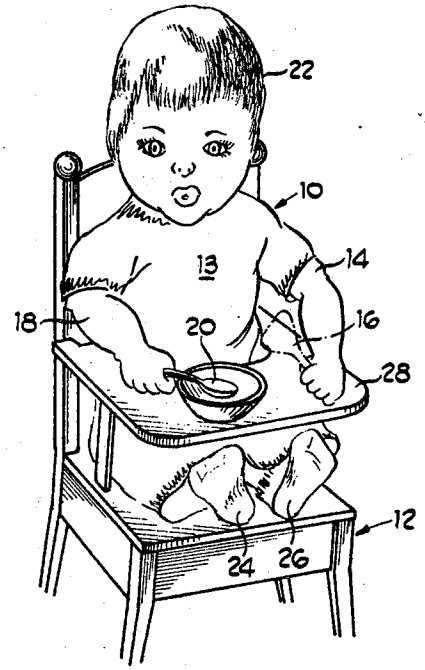
[52] **U.S. Cl.** **46/116**
[51] **Int. Cl.** **A63h 13/00**
[50] **Field of Search** 46/116, 118, 119, 120, 135, 245, 247, 141

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ABSTRACT: A doll having a number of movable body members and internal driven means operatively coupled thereto, and a high chair having a motor and associated driving means for cooperating with the doll driven means to effect animation of the various body members. The doll is seated in the high chair and by insertion of a key in any of several pairs of aligned openings in the back of the high chair and the doll various movements of the doll are provided.



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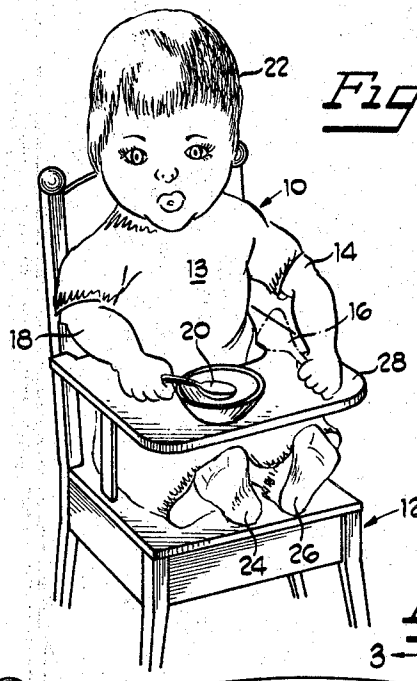


Fig 1

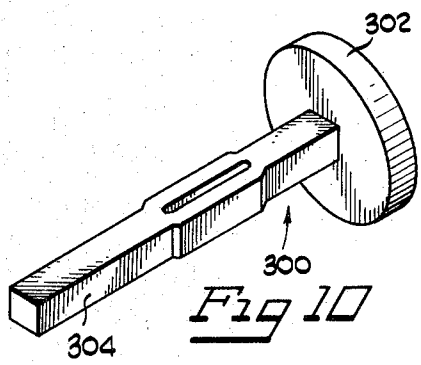
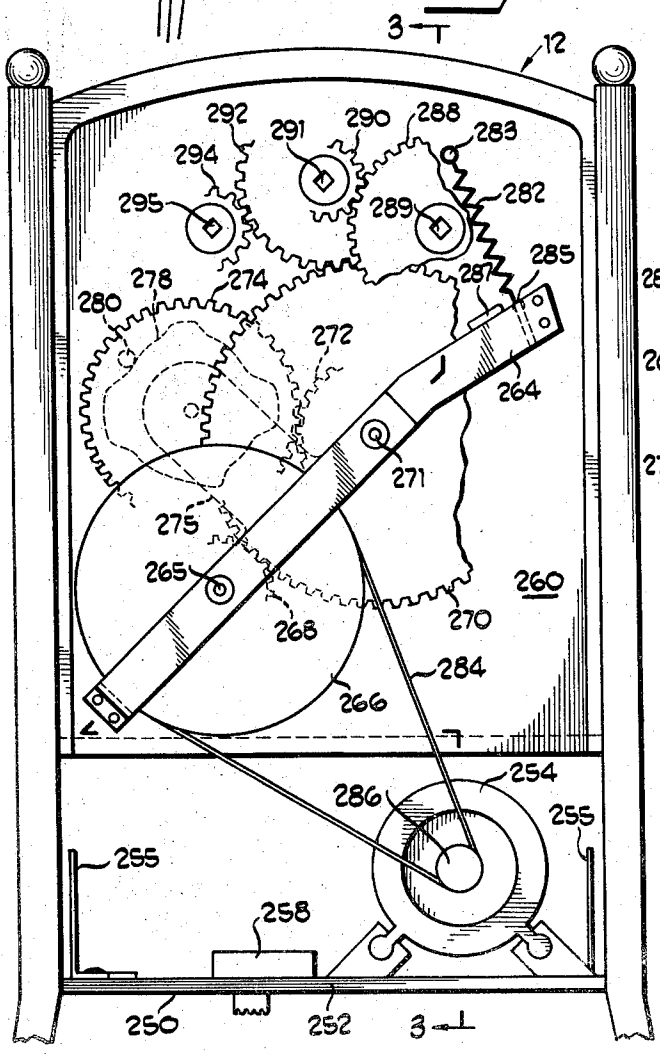


Fig 10

Fig 2



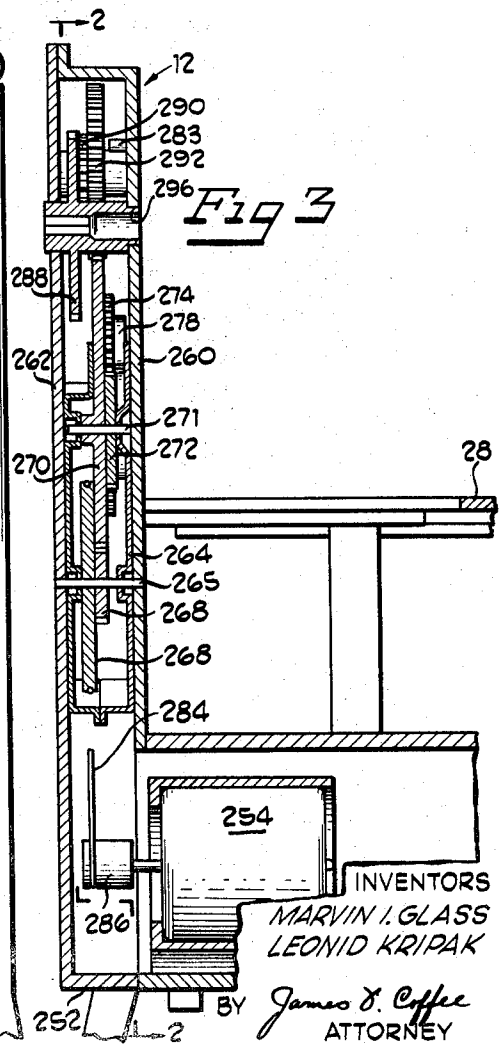


Fig 3

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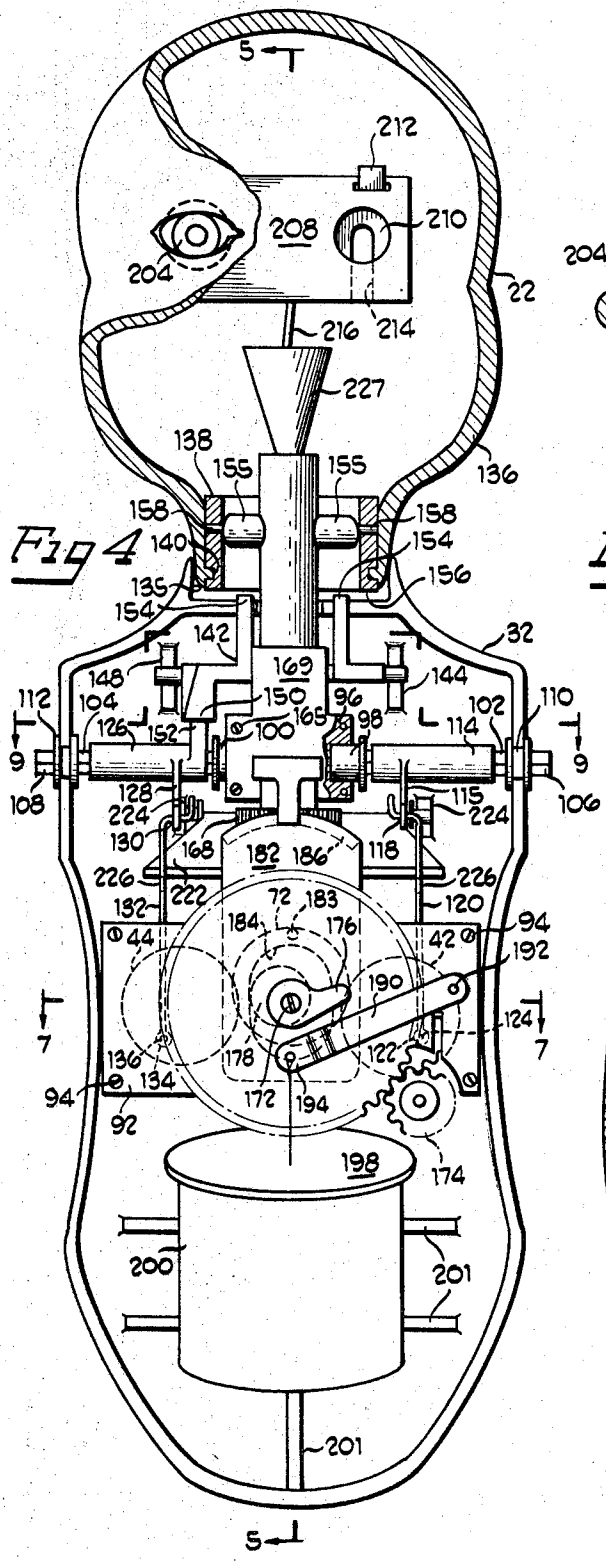


Fig 4

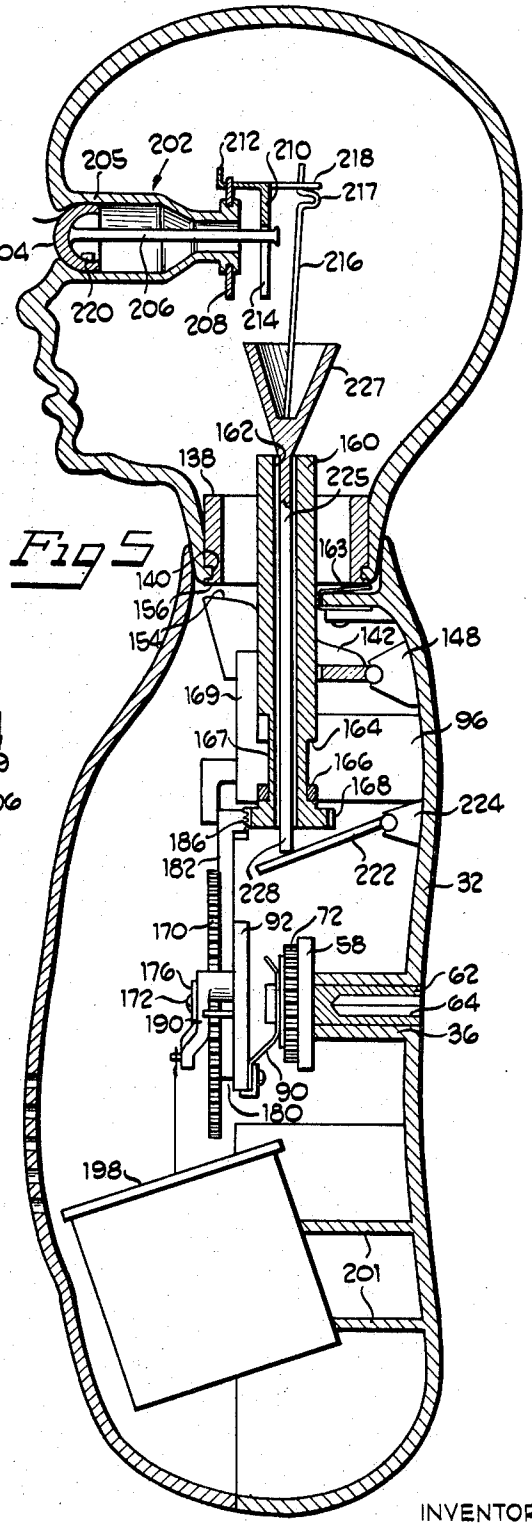


Fig 5

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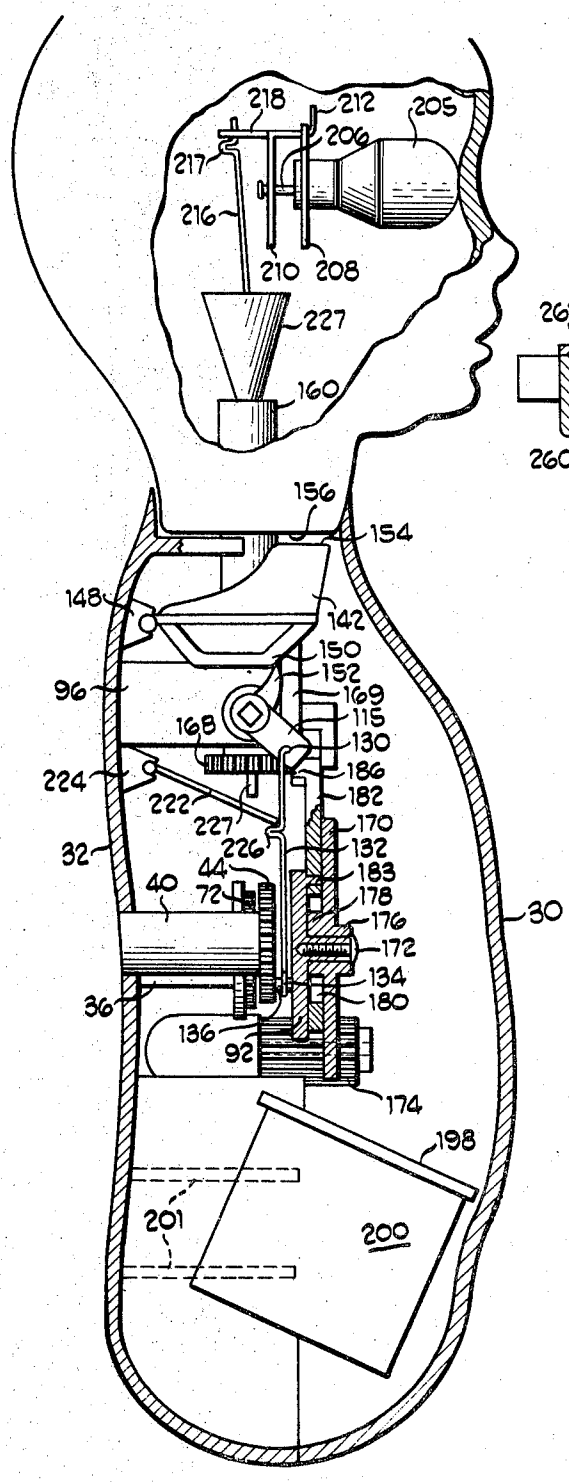


Fig 6

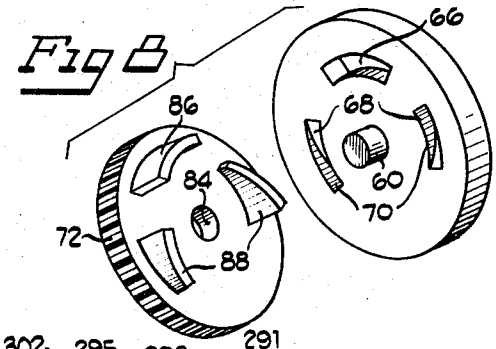


Fig 8

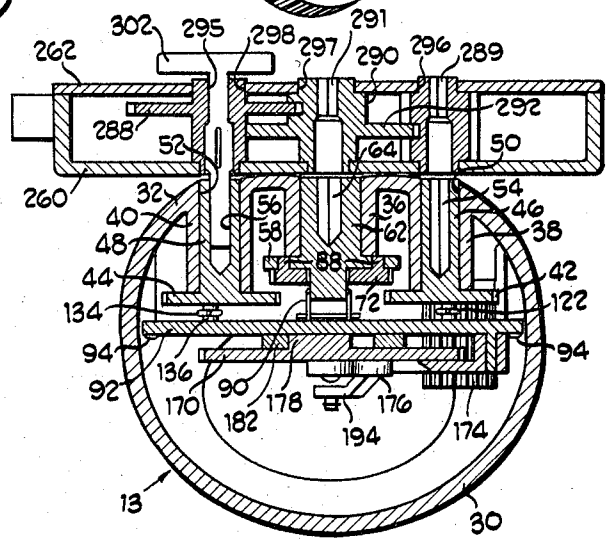


Fig 7

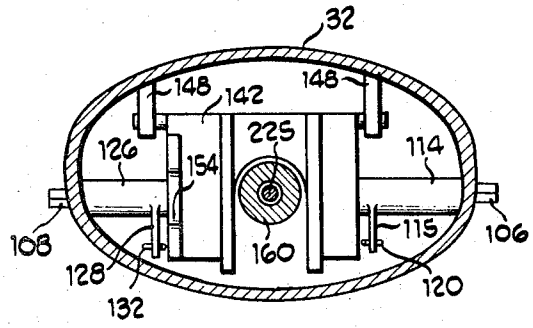


Fig 9

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HIGH CHAIR DOLL

DISCLOSURE

This invention provides an animated doll having a driven mechanism of relatively uncomplicated mechanical construction housed in the doll body. The driven mechanism does not include a drive motor or batteries, thus the doll of the invention is sufficiently light weight to be comfortably used by children and is sufficiently rugged to withstand severe abuse. The doll is adapted for use with an article of doll furniture, such as a doll high chair, which houses suitable driving means for connection with the driven mechanism of the doll. Upon seating the doll in the high chair, the shank of a key may be inserted through apertures in the high chair and into the back of the doll to transmit driving power thereto to effect animation of the body members. In the doll of the invention, the animations include synchronized arm and head movements which simulate self-feeding, eye movements, and lifting movement of the remaining arm. The various body movements may be controlled by inserting the key into different selected apertures in the high chair and the doll.

Accordingly, the primary object of this invention is to provide a novel form of animated doll. Another object of this invention is to provide an animated doll having driven means for use in combination with an article of furniture which houses driving means for effecting animation of selected doll body members.

Other objects of this invention will become apparent to those versed in the toy art upon an understanding of the following detailed description of the animated doll and its associated chair, taken in conjunction with the accompanying drawings, in which a preferred embodiment of the doll and chair is shown, and wherein:

FIG. 1 is a perspective view of a doll 10 and a doll high chair 12 of the invention;

FIG. 2 is an enlarged, rear elevational view of high chair 12 taken along line 2–2 of FIG. 3 with the rear wall of the chair removed for clarity;

FIG. 3 is a fragmentary, elevational cross-sectional view of the chair taken along offset cross section line 3–3 of FIG. 2;

FIG. 4 is an enlarged front elevational view of the body and head portions of the doll of the invention, with the front portions of the body and the face removed for clarity;

FIG. 5 is an elevational cross-sectional view of the body and head portions of the doll, taken generally along section line 5–5 of FIG. 4;

FIG. 6 is an elevational, partial cross-sectional view of the head and body portions of the doll as seen from the opposite direction with respect to the view of FIG. 5;

FIG. 7 is a top, plan cross-sectional view of the body taken along section line 7–7 of FIG. 4. FIG. 7 also includes a fragmentary portion of the chair and its driving components;

FIG. 8 is a perspective view of a gear and cam disc forming a clutch incorporated in the doll of the invention;

FIG. 9 is a top, plan, partial cross-sectional view of the body taken along offset cross section line 9–9 of FIG. 4; and

FIG. 10 is a perspective view of a key having a shank for selectively coupling the driving mechanism of the chair to the driven mechanism of the doll.

With reference to FIG. 1 of the drawings, the invention generally comprises a doll 10 having movable body members including a left arm 14 carrying a baby rattle 16, a right arm 18 holding a feeding utensil such as a spoon 20, and a body or torso 13 carrying a head member 22. The doll also includes legs 34 and 26 which may be secured to the body for manual movement and are of no importance with regard to the subject invention. Finally, the invention includes an item of furniture, such as a high chair 12 having a removable feeding tray 28 and housing and doll driving mechanism, including a motor. By positioning the doll in the high chair and coupling it to the motor, animation of the doll may be effected in accordance with the invention.

Turning now to FIG. 5, the body is fabricated of a shell comprising a front wall portion 30 and a rear wall portion 32, each of which may be molded of plastic or constructed of other suitable material. Generally, the operating components of the doll are mounted or otherwise supported on the rear wall, while the front wall merely serves as a covering shell which may be fastened to the rear wall by any suitable means.

The rear wall is formed with integral journals including a center journal 36, a left journal 38 and a right journal 40, the left and right designations applying with respect to the doll as viewed from its rear. Left and right journals 38 and 40 carry similarly sized left and right gears 42 and 44, respectively. Left gear 42 includes an integral, rearwardly extending shaft 46 which is accessible from the exterior of the doll through an opening 50 provided in the rear wall. Right gear 44 has a similar integral shaft 48 which is accessible from the exterior of the doll through an opening 52. Shafts 46 and 48 are provided with blind bores 54 and 56, respectively, each of which have a rectangular cross section for receiving a complementary shaped shank of a key in a manner which will be described in detail below.

Referring now to FIG. 8 in addition to FIG. 7, center journal 36 rotatably supports a disc-shaped member 58 having a rearwardly extending integral shaft 62 containing a blind bore 64 having an identical cross section as the cross section of bores 54 and 56. Disc 58 further includes a centrally located, forwardly extending integral stud 60 on its front surface, and three spaced apart arcuate openings 66 and 68. Openings 68–68 have interior inclined cam surfaces 70–70.

A center gear 72 defines an aperture 84 which is journaled on stud 60. Gear 72 includes arcuate projections 86 and 88–88 which are suitably spaced apart to be received by and cooperate with openings 66 and 68–68 of the disc. More particularly, arcuate projections 88–88 are received by openings 68–68 and cooperate with cam surfaces 70–70 to axially move gear 72 away from the disc responsive to driving the disc in a clockwise direction as viewed from the rear. Although gear 72 is axially moved away from disc 58, a driving connection is maintained therebetween by the engaging cooperation of projection 86 with opening 66. Axial movement of gear 72 away from the disc causes gear 72 to engage and simultaneously drive both left gear 42 and right gear 44.

A spring 90 is secured to a transverse plate 92 mounted interiorly of the doll by screw fasteners 94. Spring 90 functions to bias gear 72 rearwardly and normally out of engagement with each of the gears 42 and 44, and also frictionally retards rotational movement of gear 72 to enhance the camming action. Thus, as will be described in greater detail hereinafter, gears 42 and 44 each may be driven independently from the the exterior of the doll, or they may be driven together by center gear 72 responsive to applying a rotational driving force to disc 58.

Turning now to FIGS. 4 and 6, in addition to FIG. 7, the doll includes a support bracket 96 at approximately the chest location which may be molded integral with the back wall and extends forwardly therefrom to approximately the center of the body. Bracket 96 supports a left bearing 98 and a right bearing 100. A horizontally disposed left shaft 102 having a square cross section, and a similar but oppositely extending right shaft 104 are journaled in bearings 98 and 100, respectively. Each of the shafts extend laterally of the doll and ends 106 and 108 thereof, respectively, extend to the exterior of the body. The shafts pass through the body at bearings 110 and 112 which may be fabricated of brass or other suitable material. Left arm and right arm 14 and 18 of the doll are secured to ends 106 and 108 respectively, by suitable means, not shown. Thus, by pivoting shafts 102 or 104, either independently or together, lifting movement of either or both of the arms is effected.

Shaft 102 carries a collar 114 having a length approximately equal to the distance between bearings 98 and 100. Collar 114 has a square internal bore, not shown, which is complementary to the cross section of shaft 102 and includes a radially ex-

tending arm 115 having an opening 118 adjacent its distal end. Opening 118 receives a left vertical link 120 having a loop 122 formed at its lower end which is positioned on a stud 124 carried on the front surface of left gear 42, adjacent its periphery. Thus, rotation of gear 42 transmits up and down motion to link 120 which causes collar 114 and shaft 102 to pivot back and forth through an arc of approximately 80°.

Similarly, a collar 126 is carried on shaft 104 which also has a short radial arm 128 and an aperture 130 receiving a vertical link 132 which may be designated as the right link. Right link 132 has a loop 134 formed at its lower end which is received by a stud 136 provided on the surface of right gear 44, adjacent its periphery. Thus, rotation of gear 44 effects up and down movement of right link 132 which causes back and forth pivotal movement of collar 126 through an arc of approximately 80° to effect up and down movement of right arm 18.

Head member 22 of the doll is positioned in a circular depression 135 provided at the neck portion of the doll. The head includes a pliable outer portion 136 bearing the facial features of the doll and a rigid insert 138 which may be rabetted as at 140 to receive the pliable outer portion and provide a solid support for the head. The rigid insert and the head are secured to the doll body by being journaled on pins 158 carried on cross arms 155 of a vertical tube 160 which extends downwardly into the body and is captivated by bracket 96 in a manner to be described below. The journaled connection of the head on pins 158 provides for forward and rearward nodding movements thereof.

An irregularly shaped member 142 (FIGS. 4, 5, 6 and 9) is pivotally journaled to back wall 32 at 144 and 148. The underside of member 142 includes a cam surface 150 which is positioned for cooperation with an upwardly extending tang 152 carried by collar 126 adjacent its bearing 100. As seen in FIG. 6, counterclockwise movement of collar 126 by right link 132 responsive to rotation of right gear 44 provides counterclockwise pivotal movement of member 142 through a small arc of approximately 15°.

Upper surface 154 of member 142 cooperates with a lower edge 156 at the front of insert 138 to pivot the head about an axis defined by pins 158–158, thereby simulating a rearward nod. A U-shaped return spring 162, best seen in FIG. 5, is secured in underlying relation to the rear section of the neck and is positioned so that an upper leg of the spring continuously biases the head forwardly to return it to a normally level position as tang 152 releases cam surface 150. Thus, the tang and spring provide nodding movement of the head simultaneous with movement of the right arm. Simulated feeding action of the doll may be effected by synchronizing movement of the head and right arm such that as the head nods to a level or slightly forward position, the right arm is elevated to a position whereat spoon 20 held in the right hand is disposed adjacent the mouth of the doll.

Vertical tube 160 which supports the head, extends downwardly through the body to a point just below bracket 96. The lower exterior of the tube is undercut at 164 to cooperate with a complementary circular bearing portion 166 provided on bracket 96, and a bearing portion 167 formed on a cover plate 169 secured to the front of the bracket as by fasteners 165. Undercut 164 cooperates with the bearings to vertically retain tube 160 in the doll body and thus vertically retain the head in a fixed position relative to the body.

Tube 160 includes a central bore 162 and the lower end of the tube carries an integral gear 168 which may be driven back and forth to provide side-to-side turning movement of the head.

A large gear 170 is journaled to the front side of transverse plate 92, on a fastener 172, and is driven by gear 42 through a long pinion 174 journaled on the back wall. Gear 170 carries a short cam arm 176 on its front surface and has an integral eccentric cam 178, on its rear surface. The depth of cam 178 functions as a spacer to provide a gap 180 between the back surface of the gear 170 and the front surface of plate 92.

A generally rectangular, vertically oriented gear plate 182 is positioned in gap 180 between large gear 170 and transverse plate 92. The gear plate is pivoted on a stub 183 fixed to and extending forwardly from transverse plate 92. A generally elliptical opening 184 is formed in gear plate 180 below its pivot point on stud 183. Opening 184 receives and cooperates with eccentric cam 178 to effect a back-and-forth rocking movement of the plate about stud 183 responsive to rotation of gear 170.

Gear teeth 186 are provided on the back surface at the upper edge of gear plate 182 to form a crown gear which engages gear 168 to effect back-and-forth rotational movement thereof responsive to rocking movement of the plate thereby causing side-to-side turning movement of head 22. Thus, as left gear 42 is driven, movement is transmitted through pinion 174, large gear 170, eccentric cam 178, gear plate 182 and its gear 168 to tube 160 to provide the side-to-side turning movement of the head. Coincident with turning movement of the head, left gear 42 also causes lifting movement of left arm 14. Also, it will be recalled that gears 42 and 44 may be driven at the same time by center driven gear 72, to effect simultaneous movement of both arms in addition to side-to-side and nodding movements of head 22.

The doll includes a lever 190 which is pivotally secured to plate 92 at 192 and includes an offset end 194 positioned for cooperation with cam arm 176 responsive to rotation of large gear 170. As the large gear and the cam arm are rotated counterclockwise (as viewed in FIG. 4), the cam arm engages and elevates end 194 of the lever arm. A cork is secured to end 194 and it extends downwardly through a cover 198 of a cylindrical enclosure 200 which is secured to back wall 32 of the body by a number of ribs 201. The enclosure houses a noisemaker, not shown, which may include a compression spring for forcing a piston attached to the string downwardly, upon release of arm end 194. The piston may force compressed air through a conventional reed type noisemaker to simulate the crying sound of a baby.

As best seen in FIGS. 4, 5 and 6, the doll includes eye members 202 having simulated eyeballs 204 which may be moved between their open and closed positions. The eyeballs are carried in sockets 205 and are actuated by horizontal rods 206 extending rearwardly of the eyes. The eyes weighted at 220 so as to be normally open, and are closed by moving actuating rod 206 rearwardly.

The rear of the sockets includes a vertical bracket 208 swingably carrying a second bracket 210 which is loosely pivoted thereon at bent tabs 212. Each of the brackets 208 and 210 span the distance between the two eyes. The back ends of rods 206 are enlarged and captivated in slots 214 provided through the vertical plate 210. Swinging movement of the plate is established by a vertical eye link 216 having a reverse bend 217 forming a tab which cooperates with a horizontal extension 218 at the top of plate 210. Upward movement of eye link 216 causes plate 210 to swing outwardly and causes the eyes to close. The eyes are returned to their normally open positions by the weight 220.

Movement is imparted to bracket 210 by a pivotally mounted shelf 222 which is journaled to rear wall 32 at 224–224. The forward edge of shelf 222 cooperates with a rearward tab 226 (FIGS. 4 and 6) formed on each of the vertical links 120 and 132. As either of links 120 or 132 are elevated, tabs 226 cause shelf 122 to pivot upwardly.

A push rod 225 is provided interior of bore 162 of tube 160. A lower end 228 of the push rod is supported on an upper surface of shelf 222, while the upper end of the push rod carries a funnel-shaped member 227 which receives the bottom end of eye link 216. Thus, movement of the shelf through its cooperation with links 120 and 132 causes up and down movement of the push rod, funnel and eye link, to provide opening and closing eye movements coincident with movement of each of the arms 14 and 18. When both of the doll's arms are operating, depending upon the synchronization of links 120 and 132, the number of eye movements in a given

time period may vary although in all instances both eyes open and close simultaneously.

Turning now to FIGS. 2, 3 and 7, high chair 12 includes a frame 250 having a bottom wall 252 supporting a battery powered motor 254, a pair of brackets 255 for accommodating several dry cell batteries, not shown, and an appropriately connected on-off switch 258. The back of the chair comprises spaced apart walls 260 and 262 which may be designated as the front and back chair walls, respectively. The space defined between the walls houses a member of drive components for transmitting power to the doll mechanism, and generally includes drive gears and a cam mechanism for randomly coupling motor 254 with the gears.

More particularly, a U-shaped gear frame 264 is pivotally journaled on a shaft 265 carried by walls 260 and 262. Shaft 265 also journals a pulley 266 having a corotatable small gear 268 which engages an intermediate gear 270 suitably journaled in the frame at 271. A small gear 272 secured to large gear 270 cooperates with a slow moving gear 274 which is journaled to an extension 275 of the gear frame at 276. The cam gear has an irregularly shaped cam member 278 which cooperates with a stud 280 fixed to chair wall 260.

As noted above, gear frame 264 is pivotally carried between chair walls 260—262 at 265. A power transmission belt 284 is trained around a motor pulley 286 and pulley 266 to rotate each of the described gears and cam 278, responsive to energization of the motor. A coil spring 282 extends between a stud 283 and an end 285 of the frame for biasing the frame counterclockwise so that cam member 278 engages stud 280. As the cam member is driven, it cooperates with the studs to cause pivoted movement of frame 264 and large gear 270 about frame pivot 265 to intermittently disengage large gear 270 from a gear 268 described below. A stop tab 287 limits counterclockwise movement of the gear frame.

A center driving gear 292 is journaled between the chair walls and is positioned for intermittent engagement with the intermediate gear 270. Center driving gear 292 includes a corotatable small pinion gear 290 which engages a right driving gear 288, also journaled between the chair walls. Gear 292 engages a small gear 294, which may be designated as the left driving gear, and which is also journaled between the chair walls.

As noted in FIG. 7, each of the driving gears 288, 292 and 294 include central apertures 289, 291 and 295, respectively. Each aperture exhibits a square cross section similar to that provided in each of the blind bores 52 and 54 of the driven gears and bore 64 of the disc. Openings 296, 297 and 298 (FIG. 7) are formed through the back walls of the chair for journaling gears 288, 292 and 294. The openings are positioned in alignment with the openings through back wall 32 of the doll so that when the doll is seated in the high chair, opening 289 through right driving gear 288 is aligned with bore 52 of driving gear 44, so that opening 295 through left driving gear 294 is aligned with bore 54 of left driven gear 42, and so that opening 291 through center driving gear 292 is aligned with bore 64 of disc 58.

Turning now to FIG. 10, the toy finally includes a key 300 having a knob 302 and a shank 304 having a square cross section which is complementary to the cross sections of each of the driving gear apertures 289, 291 and 295 and each of the driven gear and disc bores 54, 56 and 64. Shank 304 may be selectively inserted through any of the driving gear apertures, from the back to the front thereof, and into an aligned opening of the doll and a corresponding bore 52, 54 or 64 of the driven gears and disc to provide different driving connections from the high chair to the doll mechanism.

By selectively positioning the key in the different openings, different movements of the doll may be affected. For example, by positioning the key in the left gear opening, up and down movement of the left arm as well as side-to-side turning movement of the head, blinking of both eyes and operation of the noisemaker will be affected. By inserting the key into the right opening, up and down movement of the right arm, nodding movement of the head and blinking movement of both eyes is affected. Finally, by inserting the key into the center opening, all of the above described body movements are affected and the noisemaker is rendered operational.

What has been described is an animated toy doll having internal operating components and a doll high chair carrying motor means wherein animation of the doll may be affected by selectively coupling the motor means to different animating components of the doll through use of a key member inserted through the chair and into the doll.

It is obvious that upon study by those skilled in the toy art the disclosed invention may be altered or modified both in its physical appearance and construction without departing from its inventive concept.

We claim:

1. In combination: a doll chair having driving means; and a doll suitable for occupying said chair comprising: a body carrying movable body members, driven means within said body accessible from the exterior thereof and operatively coupled to said body members, and drive coupling means for selectively coupling the chair driving means to the doll driven means, thereby effecting animated movement of said body members.

2. The combination as set forth in claim 1 wherein said driving means include motor means drivingly connected to a drive member journaled on a wall of said chair and defining a keyed opening, said doll driven means including a driven member journaled interiorly of said body defining a keyed opening; said driven member opening being positioned for alignment with said driving member opening when the doll is seated in the chair, and wherein said coupling means comprise a shank exhibiting a cross section complementary to the member openings and receivable thereby to provide a driving connection from the chair to the doll.

3. The combination as set forth in claim 2 wherein said chair driving means comprise a number of driving gears each defining keyed openings, wherein said doll driven means comprise a number of driven gears, wherein different driven means associated with each of said driving gears effects different movements of said body members, and wherein said key is selectively receivable by any of said driving gears and a corresponding driven gear to effect said different animated movements.

4. The combination as set forth in claim 3 wherein said driven gears include two spaced apart driven gears each having keyed openings, and a third driven gear adapted to selectively simultaneously engage each of said spaced apart gears for effecting simultaneous animation of all of the movable body members.

5. The combination as set forth in claim 4 wherein said driving means include cam means operable for periodically disengaging said motor from said driving gears to effect random movement of the body members.

6. The combination as set forth in claim 1 wherein said driven means include means interconnecting said first arm and the head of said doll to provide simultaneous lifting movement of the first arm towards the head and forward nodding movement of the head to simulate self-feeding, and include means operatively connected to a second arm to provide lifting movement thereof, and wherein said doll includes movable eyes operatively connected for movement with either of said arms.

7. The combination as set forth in claim 1 wherein said body members include a pair of arms independently secured to a pair of arm shafts journaled in said body, and a head secured to said body by a depending vertical member defining a central bore and carrying a gear at its lower end; wherein said driven means include two gears journaled in said body and two links for coupling each of said two gears to a respective one of said arm shafts.

8. A doll comprising a body; a number of body members mounted on said body for movement relative thereto; first driven means operatively interconnecting at least two of said body members; second driven means operatively connected to

another of said body members; and driving means including a motor exterior of said doll for selectively driving said first driving gear means to effect movement of said interconnected body members, or for driving said second driven means to effect movement of said other body members; wherein said first and second driven means include first and second driven gears individually journaled interiorly of said body; each of said gears defining a central keyed opening accessible from the exterior of the doll body; and wherein said driving means comprise a doll chair carrying said motor and having gear means carried by the chair back including two driving gears each having a central keyed opening alignable with the openings of said driven gears; and key means comprising a shank complementary to each of said keyed gear openings which is selectively insertable between either of said driving gears and an aligned driven gear.