United States Patent [19]

Franke

[11] **3,830,012**

[45] **Aug. 20, 1974**

[54] **DOLL WITH CHANGEABLE FACE AND BELLY PORTIONS**

[76] Inventor: **Günter Franke,** Veillodterstrasse 18, D-85, Nurnberg, Germany

[22] Filed: **Feb. 3, 1972**

[21] Appl. No.: **223,219**

[30] **Foreign Application Priority Data**

Feb. 3, 1971 Germany 2104899

[52] **U.S. Cl.** ..... **46/135 R,** 46/118, 46/156, 46/175 AR, 46/247, 273/155

[51] **Int. Cl.** **A63h 11/02**

[58] **Field of Search** ..... 46/135 R; 273/155

[56] **References Cited**

UNITED STATES PATENTS

247,302	9/1881	Candy	273/155 UX
1,064,576	6/1913	Washburn	46/135 R UX
1,160,080	11/1915	Ito	46/135 R
1,610,724	12/1926	Wilson	46/135 R UX
1,762,374	6/1930	Yancey	46/135 R
1,821,243	9/1931	Springer	46/135 R
2,935,814	5/1960	Freeze	273/155 X

FOREIGN PATENTS OR APPLICATIONS

422,704	1/1935	Great Britain	273/155

Primary Examiner—F. Barry Shay
Attorney, Agent, or Firm—Bacon & Thomas

[57] **ABSTRACT**

This invention relates to a convertible doll, comprising of a supporting member adapted to receive and retain a plurality of elements which represent body parts, in particular parts of the human body, the supporting member having at least one recess which may be occupied by the surface of at least one of the elements, which is constructed as a rotational member and the surface of which is provided with representations of body parts and is supported, so that different surface zones of the element may be optionally moved into the recess for the purpose of being observed. Pivoted shells are provided for varying the appearance at the upper and lower edges of the face. The rotatable changeable features may be held in various positions by detents. The doll may be of the rocking type, rocked by a motor-driven vibrator. A speaker and cassette recorder may be mounted in the doll. Detachable facial features may be provided and also electric lights, visible through translucent areas of the face.

15 Claims, 4 Drawing Figures

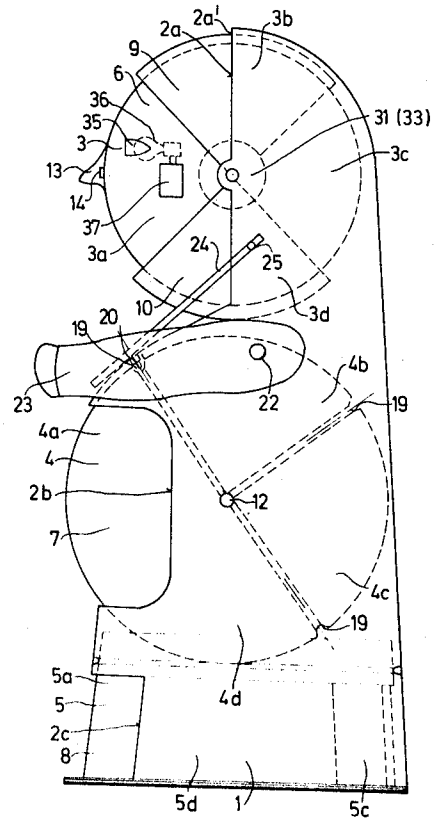
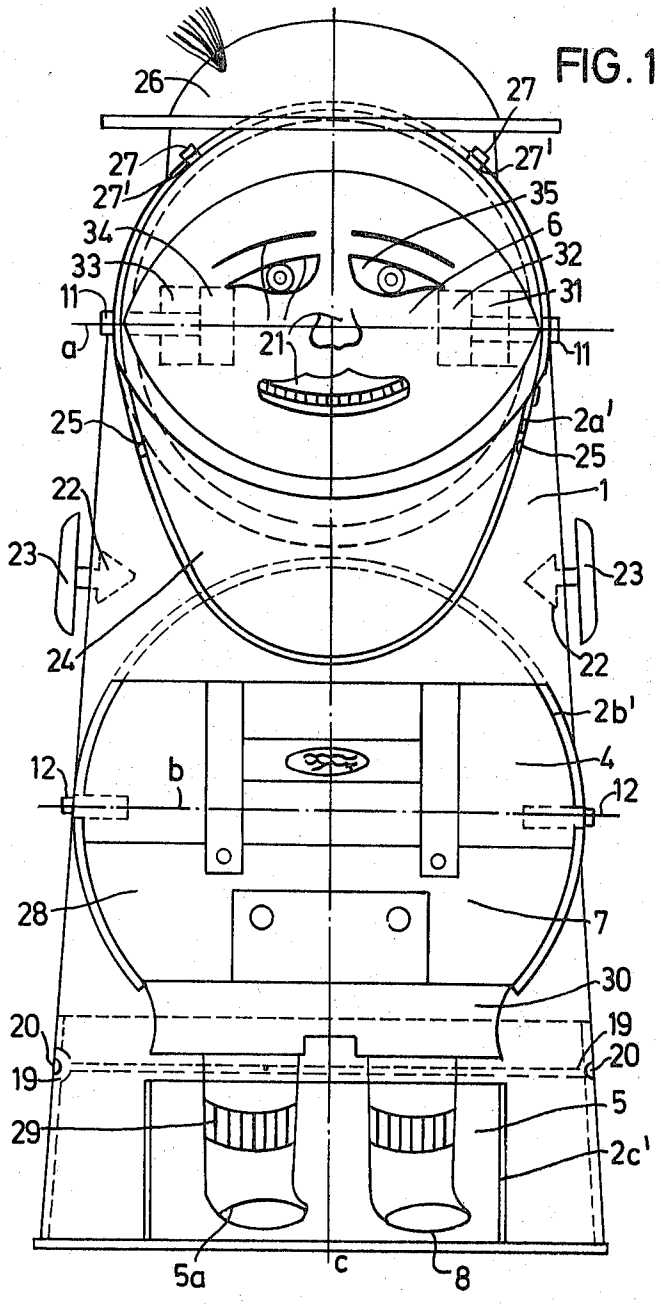


FIG. 1


26
27
27'
27
27'
35
6
34
32
33
31
11
a
21
11
25
2a'
25
22
1
23
23
24
22
2b'
12
b
4
12
28
7
30
20
19
19
20
5
29
2c'
5a
c
8

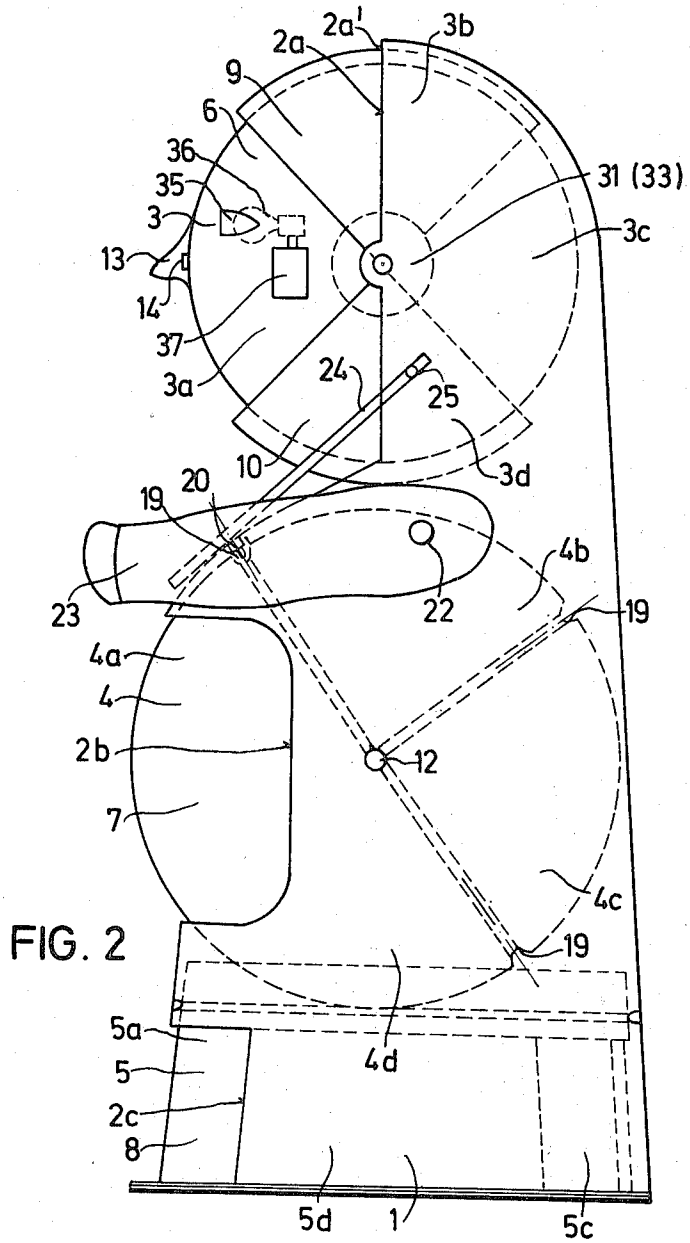

2a'
2a
3b
9
6
36
35
3
13
14
37
3a
31 (33)
3c
24
25
10
3d
19
20
4b
22
23
19
4a
4
2b
12
7
4c
19
5a
4d
5
2c
8
5d
1
5c

FIG. 2

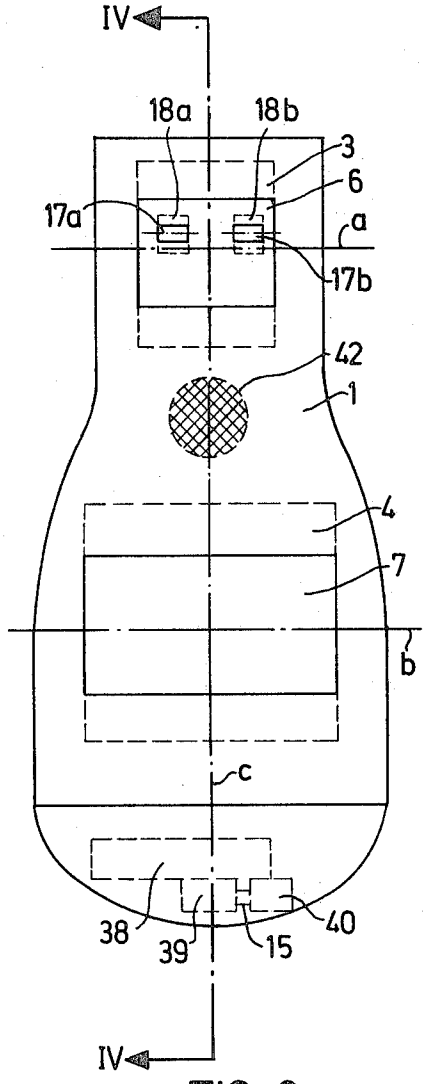

IV
18a
18b
3
6
17a
a
17b
42
1
4
7
b
c
38
39
15
40
IV

FIG. 3

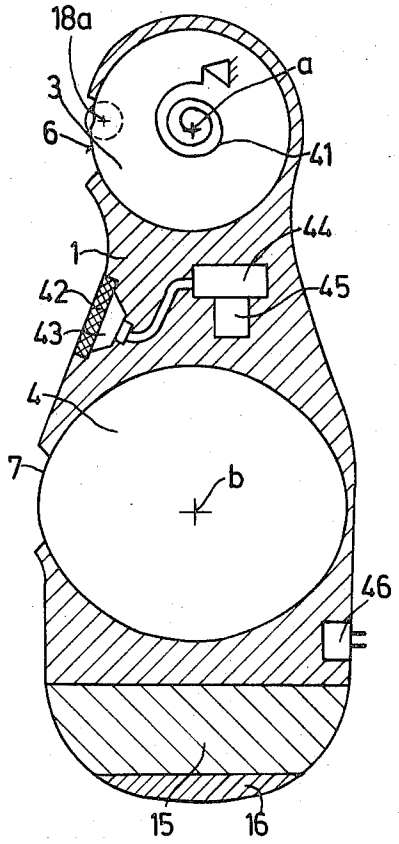

18a
3
6
a
41
44
1
42
45
43
4
7
b
46
15
16

FIG. 4

DOLL WITH CHANGEABLE FACE AND BELLY PORTIONS

The invention relates to a doll, in particular a convertible doll, having a supporting member for receiving and retaining a plurality of elements which in particular represent defined and preferably human body parts.

The prior art already discloses convertible dolls in which, for example, articles of clothing as well as hair and beard parts may be removed and exchanged. However, the body parts of such dolls cannot be changed or interchanged so that the range of variation with regard to the conversion of the doll is relatively narrow.

For reasons concerned with education and in order to encourage the playing instinct of a child, experience having shown that this contributes to the advantageous mental development of a child, it is particularly important to make available a toy or visual material which permits a wide variety of changes in simple manner. This particularly stimulates the imagination and combination ability of a child. The present invention is intended to achieve the aforementioned aims. To this end it is the object of the invention to provide a convertible doll, already containing the most diverse convertible elements within a supporting member in a moderately priced manner. It is furthermore the object of the invention to propose a doll having a plurality of convertible elements. Further objects of the invention relate to the means for providing a doll with devices permitting convertibility by a simple change of an engaged position of an element and that the converting facilities are increased by exchangeability of the individual elements.

To solve this problem in a doll, in particular a convertible doll, having a supporting member for receiving and retaining a plurality of elements, in particular those representing defined and preferably human body parts, the supporting member is provided with at least one recess, filled by part of the surface of at least one element constructed as rotational member whose surface is provided with representations of body parts and is so supported that different zones of the surface of the element may be optionally moved into the recess for the purpose of being perceived. The size of the recess and the spatial shape of the edge thereof may be appropriately adapted to the size and shape of the associated rotational member so that only a defined section of the surface of the rotational member is visible to the exterior.

In this way the invention provides learning means which advantageously utilise the playing instinct of children and by means of which in particular smaller children may perceive, collect and process impressions of the ambient world and in particular vary the co-ordination of such impressions relative to each other according to their own will so that the novel experiences thus gained may be tried by the child itself who may become learningly accustomed thereto namely by adjusting the rotational member or members during play relative to the supporting member so as to provide different co-ordinations of the representations contained on the surface of rotational member relative to the shape, contour and surface embodiment of the supporting member. However, a doll according to the invention is not confined to educational applications it may also advantageously be employed for commercial publicity to draw attention or function as the support

of publicity displays to offer a variety of display variations in a moderately priced manner. The doll is also advantageously suited as means for performing doll plays or for animated films having an educational, entertaining or commercially publicising content.

The solution contained in an additional idea of the invention, and advantageously advancing the invention, provides a substantial increase in the intended number of variation possibilities which is to be as high as possible in accordance with the scope of the invention. This further idea of the invention, not obvious, is characterised in that at least one rotational member shell segment is provided which may be pivoted relative to the supporting member and/or relative to the associated rotational member. To this end it is possible for the rotational member and the rotational member shell segment to have the same axis of rotation. Furthermore, the rotational member and the rotational member shell segment may be advantageously supported by a common bearing unit, in particular with regard to low cost production and simple assembling procedure.

According to the invention it is possible for at least one pivoting axis of a rotational member to be disposed perpendicularly to the pivoting axes of the further rotational members. This is advantageous, particularly if the rotational members are not identically constructed, that is to say if for example, two rotational members constructed as spheres are used together with a rotational member constructed as a cylinder. In a construction of this kind at least two pivoting axes of different rotational members may be advantageously disposed in parallel.

The combination facilities regarding the different display elements may be advantageously and substantially extended in that the retaining means for the rotatable retention of the individual rotational members are detachably constructed. Accordingly, each individual rotational member may be exchanged for a corresponding member having another pictorial display or it may be replaced by another member. In order to construct the exchangeability or detachability of the individual rotational members as simply as possible it may be advantageous to construct the retaining device in the form of an engagable plug pin so that simple withdrawal and re-insertion of such a plug pin enables the rotational members to be exchanged even by the hand of a child. In another advantageous embodiment of this feature according to the invention it is possible for the retaining means to be constructed in the form of a press stud in such a way that the rotational member is rotationally and detachably retained.

In a particularly advantageous embodiment of the invention at least one rotational member is supported in the support member so as to be detachable and rotatable about two axes which are disposed perpendicularly to each other. However, it is also possible for at least one rotational member to be supported in the support member in universally jointed manner while being preferably detachable. This measure is particularly suitable if the doll is subjected to a change of position and in which the rotational members either retain the original position when subjected to such a change of position or assume another third position. This feature enables particularly attractive and interesting effects to be achieved as will be explained hereinbelow.

If the change of position and the effects achievable thereby play a part in one embodiment of the invention

it may be advantageous if the mass distribution in at least one of the rotational members is asymmetrically arranged. This may be appropriately achieved in that, for example in relation to the mass of the rotational member, small mass elements are detachably fixable on the rotational member with adhesive means so that the distribution of the overall mass of the rotational member becomes asymmetrical.

To this end it is possible for the mass elements to be detachably fixed on the rotational member, for example by means of an adhesive substance, or the mass elements may be advantageously and detachably fixed on the rotational member by means of magnetic force, for example by means of permanent magnets. Depending on the particular construction of the appropriate embodiment of the invention, such mass elements may be mounted within the rotational member from the beginning, but in the sense of solving the problems on which the invention is based, it has been found particularly advantageous if such mass elements for changing the overall optical impression of the doll according to the invention and in order to increase the variation possibilities for such overall impression if the mass elements, detachably affixed to the rotational member, are provided with a shape and colour adapted to the appropriate surface part of the rotational member as regards its pictorial appearance.

If the position of a doll according to the invention and having such features is changed with respect to space, this further embodiment of the invention, which is not obvious, ensures that in the event of an asymmetrical construction regarding the mass distribution of the rotational members, said members retain their original position in space. If the doll performs oscillating or vibrating motions and if the individual rotational members represent defined body elements, it is possible to achieve that the orientations of the rotational members located to a defined position in space, are retained irrespective of the vibrating motions of the supporting member.

Depending on the construction of the supporting member of the doll, the rotational members may have the most diverse volumetric shapes. In many cases it will be preferred if at least one rotational member is constructed as sphere. However, it may for example also be appropriate to construct at least one rotational member as a rotational ellipsoid which may preferably also be geodically constructed. In this shape the poles are flattened so that the equator radius is greater than the radius in the direction of the poles. However, it is also possible to select a volumetric shape for the rotational member in which the radius thereof in the direction of the poles is greater than the radius disposed perpendicularly thereto. Furthermore, according to the invention at least one further rotational member may be constructed as cylinder. Such a shape is particularly suitable for the lower part of the supporting member if the axis of the cylindrical rotational member is disposed perpendicularly and at the same time represents the axis of the supporting member. In this way it is possible for the supporting member to be constructed in a particularly stable form. The supporting member itself may be advantageously constructed in frusto-conical shape. Its upper part may appropriately terminate with a hemisphere. The said hemisphere, in the same way as the remaining parts of the support member, will have the above mentioned recesses for accommodating the rotational members.

In a further embodiment of the invention, which is not obvious, it is possible for the lower part of the supporting member to be hemispherically constructed, the lower part of the hemisphere having mass elements which, by comparison with the remaining part of the supporting member, have a greater density. In this way it is possible to perform a vibrating or oscillating motion of the entire supporting member, thus achieving the action of a so-called tumbler figurine. In a further advantageous embodiment of the invention, the hemispherical lower part of the supporting member may be constructed so as to be detachable from the frusto-conical part of the supporting member.

According to a further embodiment of the invention, at least one rotational member may have at least one recess, filled by part of the surface of at least one further rotatably supported rotational member. According to a further advantageous embodiment of the invention, the aforementioned members may be constructed so that they may be screen-printed in order that the surfaces of the supporting members and/or of the rotational members be provided with defined displays.

It has been found particularly advantageous if the supporting member and/or rotational member is constructed of plastics material, for example polythene.

The solution of the principal problem on which the invention is based is substantially assisted, in a manner which is not obvious, by a further idea of the invention in which the variation range of the conversion facilities of the doll according to the invention may be substantially increased. According to this idea, which suitably advances the invention, the surface of at least one rotational member may be subdivided into a plurality of segments adapted to the size of the associated recess in the supporting member. The number of segments should be appropriately an even number, for example four.

In order to enable the individual rotational members to be disposed in co-ordination with the corresponding recesses in the supporting member or in rotational members supporting same or in order to dispose the individual rotational shell segments in co-ordination with the rotational members and/or the supporting member, it is possible, in a preferred further embodiment of the invention, for locking elements to be provided by means of which the parts which are rotatable relative to each other, namely supporting member and/or rotational member and/or further rotational members which are supported by the first mentioned rotational members, may be secured in the desired position. To this end, one of the parts, which are adjustable relative to each other, may preferably have a groove-shaped recess into which a locking element may be engaged which is disposed on another of the parts which are adjustable relative to each other. In an advantageous further embodiment the locking elements may have a blocking element which, due to the action of the force resulting in relative motion of the two parts, may be moved out of one recess in the other co-ordinated and relatively rotatable part in order to release the locking action. To this end the blocking element may be constructed as a ratchet pin which may be slid in the axially parallel direction due to the action of a spring. A preferred embodiment of the invention however is characterised in that the blocking element is constructed as an

extension of the material, which may be flexed due to the action of the intrinsic elasticity of the material.

Furthermore, the displays on the parts which are rotatable relative to each other may be flat or in relief. The displays are preferably so constructed that the display co-ordinated to one of the parts, which are rotatable relative to each other, complements the display co-ordinated to the other of the aforementioned parts. Furthermore, such displays on the parts which are rotatable relative to each other may represent body parts associated with human and/or animals and/or fictional beings. For example, four pictorial displays, for example of a male adult and a female adult person and of a male and a female child may be represented on the upper rotational member constructed as sphere, there being also facilities for affixing these displays as loose parts. Pictorial displays of garments and/or objects related to trade or profession may also be represented or disposed on the surface or on parts of the surface of at least one of the rotational members. The pictorial displays or parts thereof may be advantageously and detachably combined, according to the invention, with the surface of the rotational member. Retaining means for the movable and/or detachable affixing of limbs and/or of garments and/or objects and/or parts thereof may also be disposed on the supporting member. These retaining pins may advantageously have plug pins and/or press studs. An embodiment in which the retaining means have elements which may be brought into detachable adhesive connection under the action of magnetic force, has also been found advantageous.

Apart from its use as toy doll, one construction of the convertible doll may also find another special application according to a further idea of the invention which is not obvious. A doll according to this idea of the invention is characterised in that it is constructed as a figure for a Punch and Judy theatre by virtue of the fact that the individual parts which are rotatable relative to each other have actuating means associated therewith, for example linkages, joined to the rotational members and/or rotational member shell segments, with or without ratchet means to perform any desired relative rotationa by actuating defined fingers of a hand inserted from below into the supporting member.

According to a further inventive embodiment, the convertible doll according to the invention may also advantageously meet the requirements of another task or kind of application in that it is constructed as a figure for a dolls' theatre, namely by the individual parts which are rotatable relative to each other having actuating means such as cords or linkages co-ordinated therewith and by means of which the desired relative rotations may be initiated and performed in the manner in which marionettes are actuated.

It is clear that the doll according to the invention may be employed for a variety of purposes. An important field of application is the toy sector. To this end the rotational member disposed in the upper part may be constructed as a head, having for example four faces of different people, namely, a Caucasian, a Negro, a Chinese and an Indian. As already mentioned, the individual parts of the face such as noses, may be detachably mounted on the rotational member so that combination games may be performed which are educationally interesting and important for the mental development of a child. The further rotational member disposed therebelow and constructed, for example, as belly part, may have pictorial representations displaying a defined relationship to the faces of the different races displayed in the upper rotational member. In similar manner different sexes for example the member of a family with father, mother, son and daughter or different trades such as chimney sweep, postman, painter and baker may be represented in place of the different races. Corresponding remarks apply to the further rotational member disposed in the lower part and constructed as cylinder or truncated cone which may have pictorial representations of leg and foot parts related in defined manner to the human types represented in the upper rotational members. Since the individual rotational members are detachably mounted on the supporting member it is possible for the first mentioned members to be substituted for others. In this way it is possible for any desired number of combinations to be obtained so that a doll of this kind may also be used as teaching and/or learning aid for use in schools or kindergartens in a particularly low-cost manner and with a wide range of application facilities and thus with a wide range of teaching impressions which may be conveyed in this manner.

In addition to the toy sector and including the further application facilities already described as figure for a punch and judy theatre or a dolls' theatre, another preferred field of application relates to shop window decoration or exhibition applications. In all cases it may be found particularly advantageous, if, in a further embodiment of the invention, the parts of the doll, rotatable relative to each other, are so constructed and a drive and associated energy source are provided so that the corresponding relative motions may be automatically initiated and performed. An embodiment of this kind will be particularly advantageously employed in the field of publicity, both by way of shop window decoration as well as by way of exhibition display since it is generally known that exhibits of this kind which perform motions of any desired kind draw the attention of the viewers. In such a case it is particularly advantageous if the corresponding relative motions may be initiated and performed not manually but automatically. It has been found particularly advantageous, for a doll according to the invention employed for this field of application if a control system is provided preferably responding to electric control signals and by means of which the relative motions may be remotely controlled.

In accordance with a further suitable embodiment of the invention and to achieve particular effects of light and colour, it is possible for at least partial zones of the parts which are rotatable relative to each other to be constructed in translucent manner and for a light emitting device with an associated energy source to be provided by means of which the partial zones are illuminated from the interior of the doll. It may be especially advantageous, particularly for dolls according to the invention which are to be employed in the publicity sector if a drive with associated energy source is provided to impose on the supporting member predefined reciprocating motions relative to the ambient zone. To this end the drive may be advantageously provided with an oscillating system by means of which oscillating and/or pivoting motions may be imposed on the supporting member. An embodiment of the invention of this kind may perform oscillating motion by virtue of the aforementioned drive with oscillating system (vibratory drive) an embodiment with a hemispherical lower sup-

porting member part or extension piece associated with the supporting member in the manner of a tumbler figurine being particularly suitable for such an application but by no means necessarily so. In a further suitable embodiment at least one of the parts which is movable relative to the supporting member may be supported and/or biasable by an associated power accumulator so that it performs corresponding matching motions to the reciprocating motions of the supporting member. The part which is movable relative to the supporting member may appropriately be supported thereon so that it retains its position relative to the ambient zone of the doll irrespective of the motions of the supporting member. This may be achieved, for example by a universally jointed suspension of the rotational member. In an embodiment of the invention of this kind it means that the members, suspended by universal joint means may be so constructed that they perform corresponding matching motions to the imposed oscillations of the supporting member. For example, if the upper rotational member, having a defined face representation on its surface, is fixed relative to a defined position in the exhibition space, it will retain this position due to its suitable suspension irrespective of the oscillating motions of the supporting member which symbolises the doll's body. Successful and effective publicity effects, in particular in co-operation with dynamic motions thereof and where appropriate with light effects may be achieved by an appropriate decorative construction of the doll.

Particularly simple, weight- and space-saving installation conditions and savings of manufacturing costs may be achieved if the drives for the motions of the individual parts relative to each other and/or the drive for the oscillating motion of the supporting member is constructed as electromotor or electromotors.

For publicity purposes but also for toy dolls it may be particularly advantageous if the doll according to the invention in a further embodiment thereof is provided with means, disposed in the interior and preferably supported relative to the supporting member, for reproduction of preserved sounds contained on audio media. This may be achieved for example by the installation of a small cassette recorder for audio media of conventional kind in ribbon form, supplied with electrical energy through a suitable connection and so arranged that a doll according to the invention, for example employed as publicity medium delivers publicity slogans, announcements or the like in accordance with a time programme contained in the audio medium.

A further inventive embodiment, which is not obvious, and which is to be preferred, particularly in the field of publicity displays, is characterised in that in this embodiment of a doll according to the invention it is provided with a control device by means of which an in relation to a programme transmitter the drive for the automatic introduction and performance of the relative motions of the parts which are rotatable relative to each other and/or the light transmission device and/or the drive for the reciprocating motions and/or the device for reproducing preserved sound may be brought into action in a predefined timed relationship. To this end the control device may be advantageously provided with switching elements, actuable relative to the programme transmitter for releasing or blocking pulse conductor connections for the actuating pulses between the appropriate working unit and its associated energy source.

For economical reasons it has been found particularly advantageous if a common energy source is associated with the drive for the automatic initiation and performance of the relative motions of the parts which are rotatable relative to each other and/or for the light transmission device and/or for the drive associated with the reciprocating motions and/or for the device for reproducing preserved sound. To this end the energy source may be appropriately constructed as an electrochemically operating battery. However, the operating energy for the individual operating devices may also be supplied in the form of electrical energy from an electrical energy supply mains network which is external relative to the doll. An embodiment of the invention in which the various devices to be supplied with electrical energy are constructed in switchable form for optional connection to an accumulator battery or the like disposed in the interior of the doll at a suitable position thereof and an electric supply mains, stable relative to the ambient zone, has been found particularly advantageous because it renders the use of a doll according to the invention practically independent of the appropriate local conditions.

Embodiments of the invention will now be described in purely exemplary form by reference to the accompanying drawings in which:

FIG. 1 is a schematic drawing of a front view of one embodiment of the invention in which the supporting member is constructed for placing on a flat base;

FIG. 2 shows the embodiment according to FIG. 1 as a side view with the hat removed;

FIG. 3 is a diagrammatic drawing of another embodiment of the invention in which the supporting member is shown as a tumbler figurine with an oscillating drive and

FIG. 4 is a sectional view along the line IV — IV of FIG. 3 but in which the hemispherically constructed underpart of the supporting member has an asymmetrical mass distribution in place of an oscillating drive.

Corresponding parts are always referenced with the same reference numerals.

Three recesses 2*a*, 2*b* and 2*c* are provided in the slightly tapered, hollow supporting member 1 with the spherical upper end portion in the embodiment according to FIGS. 1 and 2. Member 1 is in the form of a casing having a head portion, a belly portion, and a leg portion, each with an open cavity or recess therein. The opening 2*a* provided in the head portion has an approximately circular contour while the opening 2*b* in the belly part has approximately the shape of an intersection between a straight block with the frusto-conical supporting member, having lateral defining edges extending in a plane parallel to the middle axis *c* of the supporting member 1 and the recess 2*c* has approximately the shape of an intersection of an oblique block with the frusto-conical supporting member 1 having lateral defining lines extending in a plane parallel to the intersected external line of the said supporting member 1. Rotational members are pivotably supported in the recesses 2*a*, 2*b* and 2*c* by means of retaining and bearing devices. The spherical rotational member 3 is associated with the recess 2*a* on the head part side, the said rotational member being pivotably retained on the supporting member 1 by means of the retaining and bearing device 11, for example constructed as plug pins. A

two-part rotational member shell segment 10 is supported by means of the same retaining and bearing device 11 between the rotational member 3 forming the face part and the upper part of the supporting member 1, forming the rear of the head so that it is able to perform pivoting motions relative to the rotational member 3 as well as relative to the supporting member 1 about the axis *a* independently of any pivoting of the rotational member 3 relative to the supporting member 1.

A further rotational member 4, constructed as sphere, is supported, also by a retaining and bearing device 12, constructed as plug pins, in the belly side zone of the supporting member 1 so that the said rotational member projects from the interior of the doll into the recess 2*b* to fill same. The said rotational member 4 may be pivoted about the axis *b* relative to the supporting member 1.

A further rotational member 5, constructed in frusto-conical form and adapted to pivot about the middle axis *c* of the supporting member is supported in the interior of the supporting member 1 so that it projects into the recess 2*c* into the foot part of the supporting member 1 and fills same.

The size of the recesses 2*a* or 2*b* or 2*c* respectively and the spatial shape of the respective edges 2*a'* or 2*b'* or 2*c'* respectively thereof are adapted to the size and shape of the associated rotational members 3 or 4 or 5 respectively so that only a defined section 6 or 7 or 8 respectively of the surface of the appropriate rotational member 3 or 4 or 5 respectively is visible from the outside. The rotational member 3 and the two rotational member shell segments 9, 10 have the same pivoting axis *a*, the pivoting axis *b* of the rotational member 4 being disposed in parallel to the pivoting axis *a* while the axis of rotation *c* of the rotational member 5 extends perpendicularly to the axes *a* and *b*. The retaining means 11 or 12 respectively for the pivotable retention of the rotational members 3 or 4 respectively are constructed in the form of an engagable plug pin and are therefore easily detachable. Instead of this construction of the retaining means it is also possible to provide another retaining device in the form of press studs which permit a rotating motion.

Each of the rotational members 3 or 4 or 5 respectively have four zones 3*a*, 3*b*, 3*c*, 3*d* or 4*a*, 4*b*, 4*c*, 4*d* or 5*a*, 5*b*, 5*c*, 5*d* respectively, the surface of each of which is provided with representations of body parts. In FIGS. 1 and 2, the zone 3*a* of the rotational member 3 is disposed in the head side field of view formed by the recess 2*a*. The representation of a human face is indicated in particular in FIG. 1 and designated with the numeral 1. This face may for example be the face of a man. The zones 3*b*, 3*c* and 3*d* of the rotational member 3 have representations of faces, but these representations differ from those of the zone 3*a*, being for example the faces of an adult woman, a boy and a girl. To this end the representations may be superficial or they may be in relief. At the position at which the nose is to be disposed in the face which is to be represented it is possible for a small mass element 13, formed in accordance with a nose, to be additionally and easily detachably secured by means of a permanent magnet to complete the relief effect. An adhesive substance, for example a self-adhesive film may also be employed in place of a permanent magnet. Each of the rotational shell segments 9 and 10 are divided into two zones of which each has a different pictorial representation on its surface. For example, the part of the rotational member shell segment 9 according to FIG. 2 disposed outside the contour 2*a'* of the recess 2*a* of the supporting member 1 may have a representation of brown hair while the adjacent zone of the rotational member shell segment 9 disposed in the interior of the supporting member may support a representation of a necktie. In the same way, the zone of the rotational member shell segment 10 disposed outside the contour 2*a'* of the recess 2*a* may have a beard represented on its surface while the zone disposed in the interior of the supporting member 1 and being concealed in the view shown in accordance with FIG. 2 may have the representation of blond hair or the like. The representations in the individual zones of the rotational member 3 and of the rotational shell segments 9 and 10 are matched relative to each other and to the representations on the visible external surface of the head zones of the supporting member 1 that an overall impression of a complete representation is always obtained irrespective of which zone of the rotational member 3 or the rotational member shell segment 9 or 10 respectively is visible outside the defining contour 2*a'* of the supporting member recess 2*a*. The remarks made above and relating to representation of faces on the rotational members 3 and the rotational member shell segments 9, 10 as regards a family may also apply for example to representations of the faces of a Caucasian, a Negro, a Chinese or an Indian or to any other combinations, for example the typical faces of tradesmen, fairy-story figures or the like.

The zones 4*a*, 4*b*, 4*c*, 4*d* of the rotational member 4 is similarly provided with different representations. The zone 4*a* visible in FIG. 1 in the recess 2*b* has a representation of the belly zone of a Tyrolean. The representation 28 of lederhosen is indicated in FIG. 1. The other zones 4*b*, 4*c*, 4*d* of the said rotational member may have other representations, namely of other trousers or of dresses. As may also be recognised by reference to FIG. 1, the representation 28 of the zone 4*a* of the rotational member 4 merges in complementary manner into the representation 30 on the external surface of the downwardly adjoining zone of the supporting member 1, where the lower end of short trousers may be recognised with the zones of two legs.

The zones 5*a*, 5*b*, 5*c*, 5*d* of the rotational member 5 are provided in similar manner with different representation of body parts. The representation of the lower zones of the legs with shoes and knee sockets for the Tyrolean in the illustrated combination showing the coordination of the individual rotational member zones may be recognised in the window cut-out 2*c* in the foot zone of the supporting member 1. The representations 29 in the zones 5*a* to 5*d* of the rotational member 5 also complement the adjacent zones of the supporting member 1 in this case and therefore also complement the representations of the perceivable zones of the other rotational members to form a desired overall impression.

Many different representation combinations may be obtained by relative adjustment of the individual rotational members and rotational member shell segments with respect to each other and with respect to the supporting member. The number of combination corresponds to the product of the number of zones of the rotational members and rotational member shell seg-

ments. The variety of expression facilities can be increased still further if, as shown in exemplified form for the face part **3**, individual additional mass elements **13** are secured in suitable manner, for example by means of permanent magnets **14**, on the surface of the rotational members or rotational member shell segments respectively (where appropriate also on the rotational members **4** and **5**). The expressive facility of the doll according to the invention may be multiplied still further by individual additional mounting parts. For example, in FIGS. **1** and **2**, a collar part **24** is easily detachably secured on the supporting member by means of two plug pins **25**, engaging in corresponding recesses in the supporting member **1**, it being also possible for said plug pins to be constructed as extensions of the collar material which snap into supporting member recesses by virtue of their own material elasticity. To this end, the supplementary part **24** may be provided on its top with the representation of a long beard and on its underside with the representation of a bib or the like.

Furthermore, FIG. **1** shows a supplementary part **26**, constructed as hat, which may be secured in easily detachable manner on the top of the supporting member **1** by means of permanent magnets **27** which co-operate with iron parts **27'**, disposed in the material of the supporting member **1**. In similar manner it is possible for other supplementary parts to be disposed at a suitable position of the supporting member and/or of the rotational member and/or of the rotational member shell segments, for example individual representations of tools or garments relating to a trade.

Furthermore, by suitable shaping it is possible for the supporting member **1** to have other body parts, not shown on the rotational members or the rotational member shell segments respectively, for example arms and/or hands. For example, an arm may be represented as a corresponding convex protuberance of the supporting member **1**. In the embodiment illustrated in FIGS. **1** and **2** one pair of arms **23** is additionally detachably and movably secured on the supporting member **1** in that correspondingly constructed supplementary parts are engaged in correspondingly provided apertures in the supporting member by means of snap pins **22**, shown merely schematically in FIG. **1**. In this way a further variation facility is obtained in that the different arm configurations may be employed with corresponding representations of garments depending on requirements.

The rotational members **3, 4, 5** and/or the rotational member shell segments **9, 10** may be reasily removed from the supporting member **1** and may be exhanged for corresponding rotational members having other representations disposed thereon.

Furthermore, in the embodiment according to FIGS. **1** and **2**, means are provided for the precise locking of the appropriate co-ordinate position to facilitate the co-ordination of the individual representations of the parts which are pivotable relative to each other, namely supporting members and/or rotational members and/or rotational member shell segments. This may be achieved by means of the locking elements **19, 20** as shown in FIGS. **1** and **2** with respect to the rotational members **4** and **5**. Suitable parts of the rotational members **4** and **5** may be provided with a groove-shaped recess **19** into which a blocking element **20** may be engaged, said blocking element being disposed on the supporting member. The co-ordination of the recess **19** and the blocking element **20** may however also be conversely arranged so that the blocking element is provided on the rotational member. The blocking element **20** may be constructed in the form of a ratchet pin, adapted for sliding axially in parallel under the action of a spring. However, in the embodiment according to FIGS. **1** and **2** the blocking element is constructed as an extension of the material which is resiliently flexible under the action of the intrinsic material elasticity. In this way, simple and low-cost means enable the locking elements **19, 20** to be forcibly engaged and disengaged under the action of the force causing the relative motion of both parts **1, 3** or **1, 4** or **1, 5** or **1, 9** or **1, 10**, or **3, 9** or **3, 10** with respect to each other.

The rotational members may also have a shape different from that described in conjunction with the embodiment according to FIGS. **1** and **2**. For example, they may be constructed as a rotational ellipsoid or as an egg-shaped member or in geodical form. In the embodiment according to FIGS. **3** and **4** all rotational members are constructed as cylinders. In this embodiment the supporting member is also designated with the numeral **1** and its two rotational members with the numeral **3** (face part) and **4** (belly part). Both rotational members **3** and **4** are supported in suitable manner to pivot about the axes *a* or *b* respectively which are disposed perpendicularly to the middle axis *c* of the supporting member and are provided in a manner similar to that already described in conjunction with the embodiment according to FIGS. **1** and **2** with a plurality of segments or zones having different representations of the appropriate identical body zone of a human being, animal or fictional being or the like. The rotational member **3** of the embodiment according to FIGS. **3** and **4** has a special feature relative to the embodiment shown in FIGS. **1** and **2**. In its zones **6**, visible in the recess of the supporting member **1**, it is provided with two window recesses **17***a*, **17***b*, disposed horizontally and adjacently to each other, each being filled by a zone not designated and associated with a further cylindrical or roller-shaped rotational member **18***a*, or **18***b* respectively, supported by the rotational member **3** from the interior thereof. In a manner similar to that of the rotational member **3**, the rotational members **18***a*, **18***b* are provided on their surface with different zones provided with different representations of body parts, in the present case with different representations of eyes, namely different human eye characteristics associated with race or different make-up configurations of female eyes. The additional rotational members **18***a*, **18***b*, supported by the rotational member **3** are pivotably supported in a manner similar to that of the rotational member **3** so that a suitable eye representation may be brought into the field of view depending upon requirements.

FIG. **4** shows only the further rotational member **18***a*, associated for the representational zone of the rotational member **3** which is then disposed in the field of view **6**, but each further representational zone of the rotational member **3**, not referenced in detail, should appropriately also be provided with a similar pair of eyes constructed in the manner of a rotational member.

By contrast to the embodiment illustrated in FIGS. **1** and **2**, the embodiment illustrated in FIG. **4**, is provided with a special feature in that it has an approximately hemispherically constructed foot part **15** which may be

preferably detachably joined to the supporting member 1. Owing to the fact that the aforementioned hemispherical foot part 15 has an irregular mass distribution, namely for example a mass accumulation at the lowest centre of gravity as indicated at 16, the doll according to FIG. 4 will function as a tumbler figurine. An embodiment of this kind is particularly suitable for publicity displays. However, it is also suitable as a toy for children.

If rotational members, approximately of the kind of the head part according to FIG. 1 are inserted instead of the rotational members as illustrated in FIGS. 3 and 4 in an embodiment of the invention constructed as tumbler fingurine, it may be appropriate, particularly in such an embodiment, if at least one rotational member, preferably the rotational member 3 forming the head part, is supported in the supporting member 1 so as to be pivotable about two axes *a* and *c* which are disposed perpendicularly relative to each other. This may be achieved, for example by a known universal joint bearing system which is not shown. To this end, the appropriate rotational member may appropriately have an asymmetrical mass distribution so that a predefined coordination of the visible surface of the rotational member relative to a position in space outside the doll is retained independently of the appropriate motion of the tumbler figurine supporting member. The action of such spatial fixation independently of the motion of the supporting member is particularly effective if the rotational member is suspended by universal joint means, but such action is not confined to this kind of suspension. For example, the rotational members 18*a*, 18*b* according to FIGS. 3 and 4, representing eyes, may be disposed so as to be pivotable within defined pivoting ranges and have an irregular or asymmetrical mass distribution so that the effect of eye rolling is obtained due to motion of the supporting member 1.

In the embodiment illustrated in FIGS. 1 and 2, defined zones 35 of the rotational member 3 are constructed in translucent form. These are preferably the zones representing the eyes. A light transmitting device 36 with an associated energy source 37 is provided on the interior of the rotational member 3, so that part zones 35 may be illuminated from the interior of the doll. In this way it is possible for special colour and light effects to be achieved which may be utilised advantageously for dolls according to the invention employed for publicity purposes. The energy source in this case may for example comprise of a small pocket lamp battery of the commercial kind.

Furthermore, two drives 31 or 33 respectively are provided in FIG. 1 and by means of which the relative motions of the rotational member 3 and the rotational member shell segment 9 or 10 respectively relative to each other and to the supporting member 1 may be automatically intitated and performed. For example, a small electric motor 31 may be provided which is fed from an energy source 32, constructed for example as a pocket lamp battery, and adapted to adjust the rotational member 3 relative to the supporting member 1 through a drive mechanism, not shown because it is known, depending on control pulses supplied thereto (electric switches not shown but provided at a suitable position). The drive 33 is similarly constructed and traverses the rotational member shell segments 9, 10 relative to the rotational member 3 and/or to the supporting member 1 by means of a transmission mechanism, also not shown, in accordance with the energy supplied thereto, also from an energy source 34 which may be constructed for example as pocket lamp battery. Similar drives may also be provided for adjusting the other rotational members relative to the supporting member. Furthermore, a control system, adapted to respond to electric control signals, but not shown, may be provided and by means of which the relative motions may be remotely controlled.

A drive 38, 39, with an associated energy source 40, which may also be constructed as a pocket lamp battery, for imparting to the supporting member defined reciprocating motions relative to the ambient zone, may be provided in the hemispherically constructed foot part 15 of the supporting member 1, which may be constructed so as to be detachable from the foot part in the embodiment of the invention illustrated in FIG. 1. The said drive incorporates a vibrator system 38, for example in the form of a suitable unbalance disc 38 by means of which oscillating or rotationally oscillating motions may be imparted on to the supporting member 1. A doll according to the invention constructed in the manner described hereinabove may perform tipping motions to the front or to the side or circulating motions depending on the rotational speed and kind of unbalance. Pure rotational vibrations about the middle axis *c* of the supporting member may be obtained with a correspondingly different construction of the drive.

In the case of dolls according to the invention employed in particular for publicity purposes it may be advantageous if one or more of the rotational members perform counter-motions corresponding to the reciprocating motions of the supporting member 1. To this end a power accumulator 41, for example constructed as a spiral spring, is provided in the embodiment according to FIG. 4. To this end, the rotational member 3 (FIG. 4) is supported on the supporting member 1 so that, irrespective of the motions thereof, it retains its position relative to the ambient zone of the doll.

The embodiments according to FIGS. 3 and 4 are also provided in their interior with devices 42 to 44, preferably supported relative to the supporting member 1 and intended for reproducing preserved sound contained on audio media. The numeral 42 refers to a diaphragm covered recess for a loudspeaker 43 which is electrically connected to a small cassette recorder 44 (or to a tape recorder or the like) which may be fed from an energy source 45, constructed, for example, as pocket lamp battery.

A common energy source may be provided in place of the individual pocket lamp batteries shown in the individual embodiments described hereinabove for all devices which are to be supplied with driving energy for the automatic performance of their individual functions. For example, an electrochemically operating battery, feeding the light transmitting device 36 (FIG. 2), the indexing drives 31 and 33 for the rotational member 3 or the rotational member shell segments 9, 10 (FIG. 1), the sound transmitting device 42 to 45 (FIG. 4) as well as the vibratory drive 38 to 40 (FIG. 3) may be provided at a suitable position in the supporting member 1. However, it has been found especially appropriate in particular for dolls according to the invention intended for publicity purposes if at least as an alternative to battery operation but preferably additionally thereto provision is also made for mains operation. To this end the embodiment according to FIG. 4 is pro-

vided with an electric connecting coupling **46** for connecting the individual devices to be provided with electrical energy to an electrical supply mains disposed outside the doll. Suitable change-over switching devices are provided (not shown) which permit the change-over from battery operation to mains operation and/or switching on of the individual functions of the devices to be supplied with electrical energy in accordance with requirements.

Furthermore, a control system not shown, may also be provided, in particular for dolls intended for publicity or exhibition purposes and by means of which said control system operating relative to a programme controller, also not shown, the drive for the automatic initiation and performance of the relative motions of the parts **1, 3** or **1, 4** or **1, 5** or **1, 9** or **1, 10,** or **3, 9** or **3, 10** respectively which are pivotable relative to each other and/or the light transmission device **36** and/or the drive **38, 39** for the reciprocating motions and/or the device **42** to **44** for reproducing preserved sound may be brought into action in predefined timed co-ordination with each other. To this end, the said control system may have circuit elements, adapted for actuation relative to the programme transmitter and being of any desired kind of commercial construction for releasing or blocking the impulse conductor connections for the actuating pulses between the appropriate working means and the energy source co-ordinated therewith, there being also provision for said circuit elements to be adapted for remote control or remote actuation.

Since the external surfaces of the supporting member **1** and the rotational members **3, 4, 5** have pictorial representations, said surfaces should be of paint-receiving material. To permit low-cost production in large numbers, at least the surfaces of the supporting member **1** and/or the rotational members **3** or **4** or **5** or **18***a*, **18***b* respectively are constructed so that they may be provided with screen printing since screen printing is particularly suitable as a rapid, accurate but low-cost printing method. In the interests of weight-saving and to ensure simple machining as well as low material and machining costs and in particular to provide good corrosion resistance, the supporting members **1** and/or the rotational members **3** or **4** or **5** or **18***a*, **18***b* respectively are constructed of plastics material. Polythene may preferably be employed to this end because it is a plastics material which is particularly suited for scree printing.

Although the invention is described merely by reference to some preferred embodiments, it is not confined thereto. Many different possibilities are open to the expert for adapting the invention to the individual requirements of the appropriate application and the appropriate structural conditions by adopting other combinations of the individual features of the invention or by substituting equally acting means without departing from the scope of the invention.

What we claim is:

1. A convertible doll or similar figure comprising in combination:

a doll casing having an exterior configuration defining at least a major portion of the shape of the figure, the doll casing including a head portion, a belly portion and a leg portion;

a head cavity in the head portion of the doll casing; a rotatable head member received within the head cavity; and a face opening in the head portion exposing a surface portion of the rotatable head member to the ouside;

a belly cavity in the belly portion of the doll casing; a rotatable belly member received within the belly cavity; and a belly opening in the belly portion exposing a surface portion of the rotatable belly member to the same side as the face opening;

a plurality of different faces on the surface of the head member, each face occupying a different rotational segment thereof so that only one entire face is visible in the face opening;

a plurality of different clothes designs on the belly member, each clothes design occupying a different rotational segment thereof so that only one particular clothes design is visible in the belly opening;

first rotational supporting means and positioning means for adjustably mounting said head member to said casing;

second rotational supporting means and positioning means for adjustably mounting said belly member to said casing, permitting conversion of the doll to a variety of different combinations of faces and clothes designs;

at least one shell segment interposed between the wall of the head cavity and the head member; and

means mounting said shell segment to said casing for rotation independently of said head member and casing, whereby said shell segment may be, selectively, either concealed or visible at the end of said face opening.

2. A doll as defined in claim **1,** wherein:

the exterior configuration of the doll casing approximates a frustum of a cone.

3. A doll as defined in claim **2,** wherein:

the head portion of the doll casing is in the form of a hollow hemisphere.

4. A doll as defined in claim **1,** wherein:

at least one of the two rotatable members is of spherical shape.

5. A doll as defined in claim **1,** wherein:

at least one of the rotatable members is of ellipsoid shape.

6. A doll as defined in claim **1,** wherein:

at least one of the rotatable members is of cylindrical shape.

7. A doll as defined in claim **1,** wherein:

the head member and the belly member are both rotatable about parallel horizontal axes relative to which their respective cavity openings are oriented radially.

8. A doll as defined in claim **1,** wherein:

the head member and the shell segment have a common horizontal rotational axis relative to which the face opening is radially oriented.

9. A doll as defined in claim **8,** wherein:

each shell segment includes two circumferentially adjacent outer surface portions, one of said shell surface portions carrying a hair design or other forehead covering which is exposed when the shell segment is in a position in which only said one shell surface portion protrudes from the upper margin of the face opening, the other shell surface portion carrying a beard design or other throat covering which is exposed when the shell segment is in a position in which only said other shell surface portion

protrudes from the lower margin of the face opening.

10. A doll as defined in claim **1,** wherein:

the rotational positioning means for the rotatable members includes, in each case, a detent connection between the doll casing and the rotational member which operates in each of the several positions of the rotatable member in which a face or clothes design, respectively, is in alignment with the corresponding opening.

11. A doll as defined in claim **10,** wherein:

the detent connection is in the form of a depression in the rotatable member and a corresponding inwardly biased protrusion on the doll casing.

12. A doll as defined in claim **11,** wherein:

the inwardly biased protrusion on the doll casing is part of a spring-loaded detent pin mounted in the doll casing.

13. A doll as defined in claim **11,** wherein:

the inward bias of the protrusion on the doll casing is provided from the elasticity of the material of a flexible wall of the casing itself.

14. A doll as defined in claim **1,** further comprising:

a leg cavity in the leg portion of the doll casing; a rotatable leg member received within the leg cavity, and a leg opening in the leg portion exposing a surface portion of the rotatable leg member to the same side as the face and belly openings; and

a plurality of different leg or leg covering designs on the leg member, each design occupying a different rotational segment thereof so that only one particular leg or leg covering design is visible in the leg opening.

15. A doll as defined in claim **14,** wherein:

the exterior configuration of the doll casing approximates the frustum of a vertical cone; and

the rotatable leg member in the leg portion of the cone is similarly frustum-shaped and is rotatable around the vertical cone axis.

* * * * *