April 18, 1950 J. D. CHESSROWN 2,504,650

TOY BALL

Filed Oct. 12, 1946 3 Sheets-Sheet 1

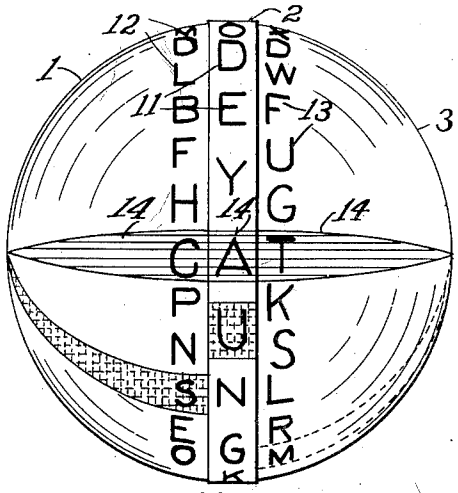


Fig. 1.

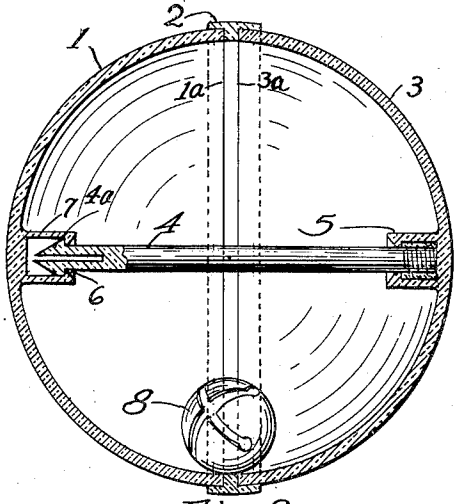


Fig. 2.

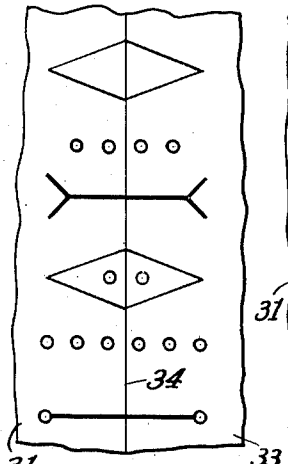


Fig. 8

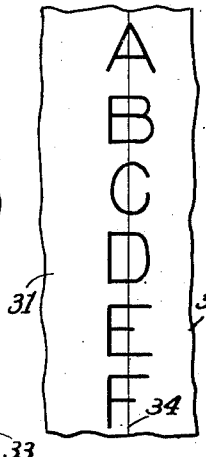


Fig. 9

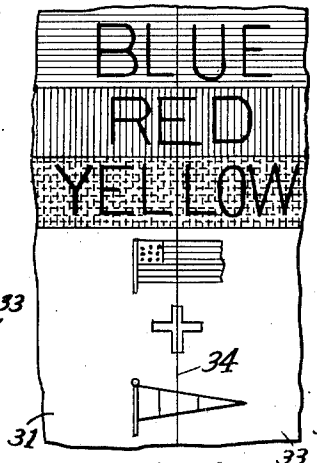


Fig. 10

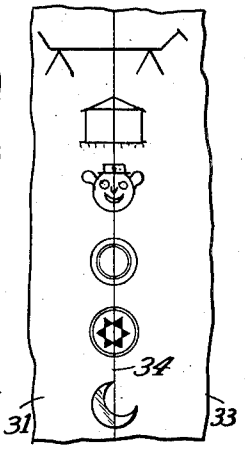


Fig. 11

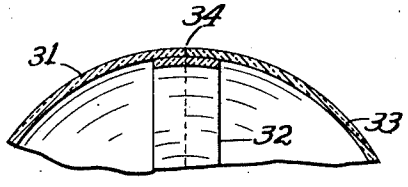


Fig. 4

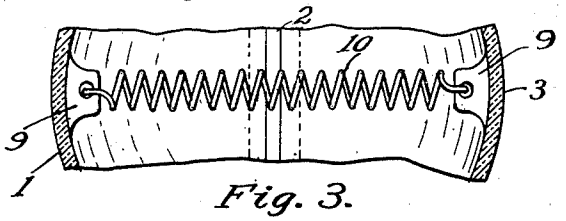


Fig. 3.

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April 18, 1950 J. D. CHESSROWN 2,504,650

TOY BALL

Filed Oct. 12, 1946 3 Sheets-Sheet 2

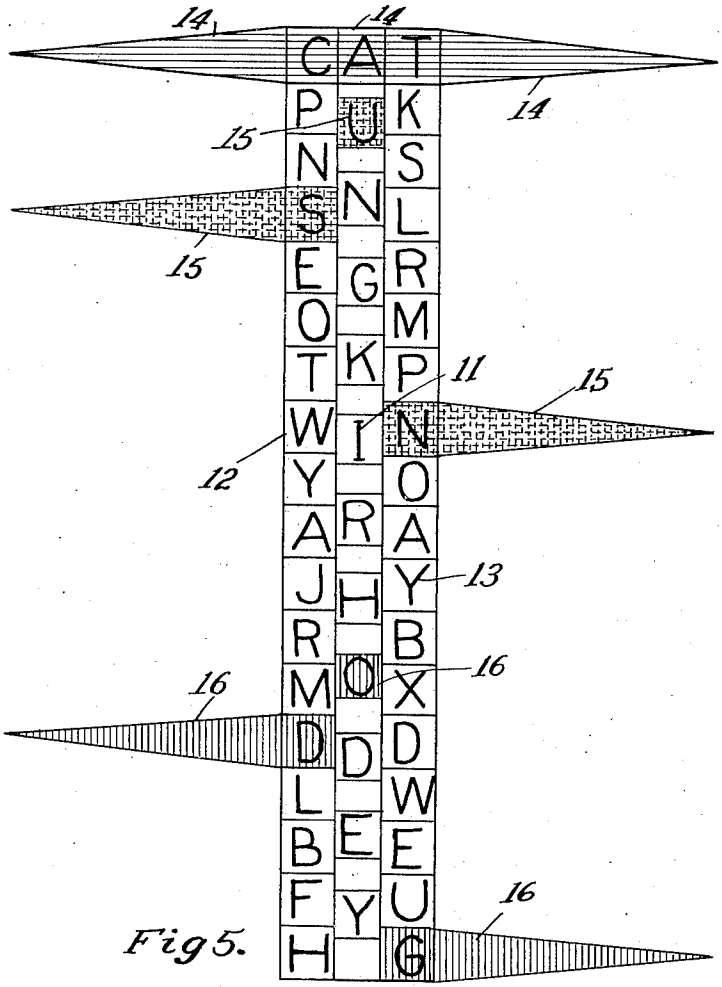


Fig 5.

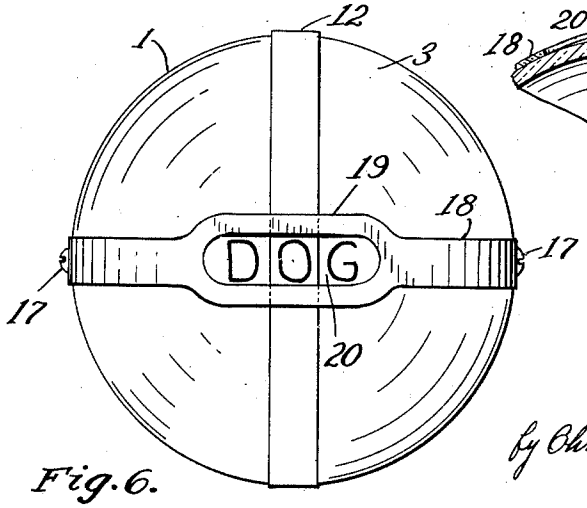


Fig. 6.

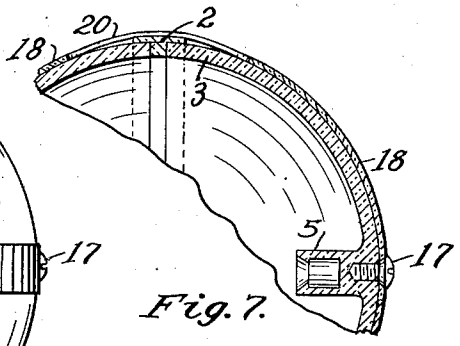


Fig. 7.

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April 18, 1950 J. D. CHESSROWN 2,504,650

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Filed Oct. 12, 1946 3 Sheets-Sheet 3

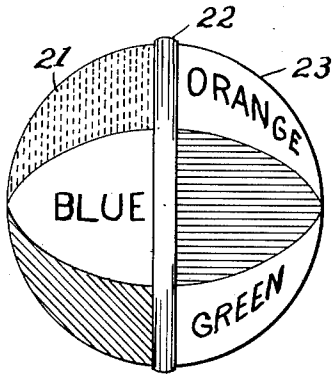


Fig. 12

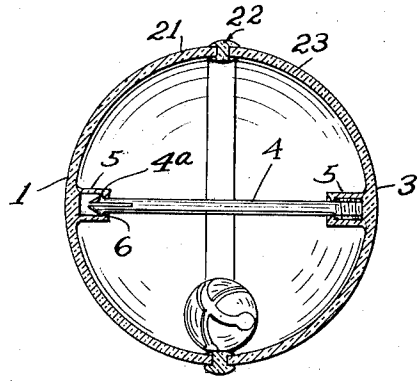


Fig. 13.

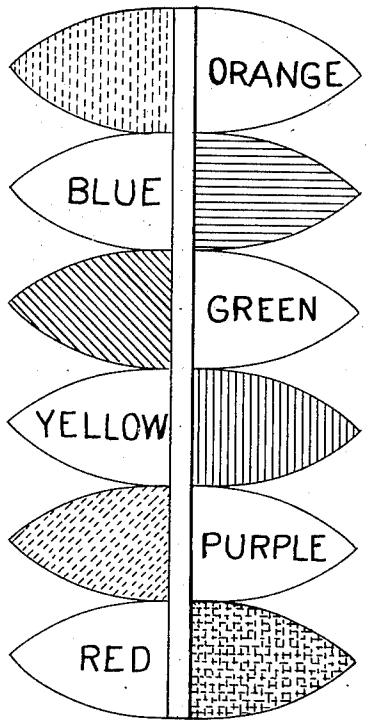


Fig. 14

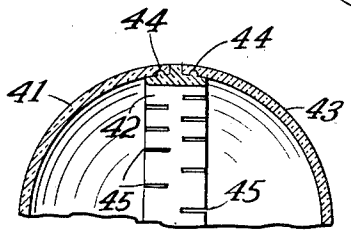


Fig. 15.

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UNITED STATES PATENT OFFICE

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TOY BALL

James D. Chessrown, Youngstown, Ohio

Application October 12, 1946, Serial No. 703,017

5 Claims. (Cl. 35—35)

1

My invention relates to toy balls, and consists in a ball constructed of a plurality of sections of a sphere which, when assembled to form the ball, are relatively rotatable.

The external surface of each section is decorated with a circumferential series of letters, figures, characters or other visual elements, and such visual elements on each section are of incomplete significance, but are adapted one by one to be brought, by the relative rotation of the sections, to registry and completion with complementary visual elements on the other section or sections of the ball. The ball is useful in dual capacity. It serves as a plaything, and serves as an educational device which is promotive of the intellectual development of a child. These features, and others presented in the following specification, are in accordance with the objects of my invention.

The invention will be understood upon reference to the accompanying drawings, in which:

Fig. 1 is a view in side elevation of a ball of the invention;

Fig. 2 is a view of the ball in diametrical section;

Fig. 3 is a fragmentary sectional view of the ball, illustrating a variant in the means for securing the relatively rotatable sections of the ball in assembly;

Fig. 4 is another fragmentary view of the ball structure, showing a modification in structural detail;

Fig. 5 is a developed plan view of the significant decorations that are applied to the ball sections;

Fig. 6 is a view of the ball in side elevation, illustrating an elaboration in construction;

Fig. 7 is a fragmentary sectional view of the structure of Fig. 6;

Figs. 8, 9, 10 and 11 are fragmentary views, showing surface portions of two adjacent ball sections, and serving to illustrate the many forms in which the significant decorations may be provided;

Fig. 12 is a view of a ball of the invention of modified construction;

Fig. 13 is a sectional view of the ball of Fig. 12;

Fig. 14 is a developed plan of the decoration applied to the ball in Fig. 12; and

Fig. 15 is a fragmentary view of a ball of still further modified construction.

Referring to Figs. 1 and 2, a ball of the invention is formed of a plurality of sections of a sphere, in this case three sections 1, 2 and 3. The sections 1 and 3 here are shown in the form of two hemispherical shells, while the section 2 consists of an equatorial band or ring portion. Preferably, but not necessarily, the ball sections are formed of a molded plastic material, any one of several of the usual and well-known molding plastic compounds may be used.

2

The equatorial band or ring portion 2 is of T shape in cross section, and in the assembled ball the leg of the T fits between the edges of the hemispherical shells 1 and 3, while the cross-arm of the T overlaps the adjacent surfaces of the shells. The T-sectioned band or ring portion is in effect a grooved or rebated structure, within which the edges 1*a* and 3*a* meet substantially edge to edge, in an engagement permissive of the relative rotation of each hemispherical shell relatively to the other and relatively to the equatorial band. Means are provided for securing the ball sections in assembly, while permitting the relative rotation of the sections, and it is to be noted that the engagement of the band 2 with the edges of the shells prevents the lateral displacement or misalignment of such edges when the ball is squeezed, dropped, bounced, or otherwise subjected to dislocative stress.

The means for securing the ball sections in relatively rotatable assembly are advantageously concealed within the ball structure, and preferably consist of a diametrical member 4 cemented in a socket portion 5 integrally formed in the shell 3, and provided at opposite end with a slotted conical head 4*a* that is inserted or "snapped" into engagement with a shoulder 6 formed within the mouth of a socket portion 7 formed integrally in the shell 1. The diametrical pin member 4 may be formed of plastic or of metal; it is serrated at the end which is rigidly cemented in the socket portion 5, while at opposite end the engagement of the shoulder 6 in socket portion 7 with the head 4*a* prevents the separation of the assembled ball sections that are relatively rotatable on the axis of said diametrical member 4. The structure manifestly provides for the facile assembly of the parts, it being necessary (after the member 4 has been rigidly secured to the shell 3) to bring the shell sections together in the direction of extent of member 4, with the effect that the conical head 4*a* enters the socket 7 of shell 1. Then, the pressing of the shell sections together causes the slotted head 4*a* to yield or contract radially, until the head has moved inward of the shoulder 6 and expands into the locked position shown. The engagement of the conical head 4*a* with shoulder 6 provides a rotary union or joint in the means for securing the ball sections in assembly.

It may be noted that the socket portion 5 is

identical in structure with the socket portion 7, wherefore the hemispherical shell 1 is identical in structure with the shell section 3. The advantage of having identical structure in each shell section will be clear to the manufacturer in mass production, that is, standardized dies and minimized variations in inventory.

If desired a toy rattle effect may be provided by including a sleigh-bell 8 (Fig. 2) or other sound-producing device within the assembled ball.

Fig. 3 illustrates that the shells 1 and 3 of the ball may be formed with internal eye-lugs 9, and that a coiled spring 10 may be engaged at its ends to the lugs while the shells are held apart, and then the two shells assembled and held in assembly under spring tension. The spring will permit the shells to be relatively rotated through sufficient range.

The significant decoration of the ball may consist in a circumferential sequence of the letters of the alphabet. The outer surface of the equatorial ring portion 2 may carry a sequence of letters 11, and the surfaces of the shells 1 and 3 may carry on circumferential surface areas or bands contiguous with the ring portion 2 series of letters 12 and 13, respectively. The letters in each series need not be arranged in alphabetical order, and, in fact, are not so arranged in the structure illustrated.

The child playing with the ball may, by rotating the ring portion 2 and the hemispherical shells 1 and 3 relatively one to another, bring the combination of three letters into alignment that spell a selected three-letter word; for example, the word "cat" is spelled in Fig. 1. Thus the ball is a spelling device as well as a toy. In playing with this so-called "spelling ball" a child's interest in word formation is aroused, and a certain intellectual development accompanies amusement.

Fig. 5 illustrates in developed plan the three bands 11, 12 and 13 of alphabetical letters that are arranged on the respective three ball sections. In refinement, say for the younger children, various color combinations may be incorporated in the surface decoration or visual elements applied to the ball to facilitate the alignment of letters to spell certain pre-selected words. For example, the letter "C" in band or sequence 12, the letter "A" in band 11, and the letter "T" in band 13 may be arranged in a background of blue color, as indicated at 14, so that the child, by bringing the blue areas into alignment, spells the word "cat". Similarly, the letters "S," "U" and "N" may be arranged in backgrounds 15 of yellow or gold, to spell "sun" when moved into alignment; and the letters "D," "O" and "G" may be displayed in areas 16 of red, etc. Thus, visual elements may be provided on each of the several ball sections, with the elements on one section complementary to those on the other sections, and adapted by relative rotation of the sections to be brought into correlated positions of completed significance.

A modified device for assisting the indexing of the visual elements or letters in correlated positions consists in a band or ring 18 that is pivoted on a diametrical axis of the spherical ball, by means of pins or screws 17. The band or ring 18 may be semi-circular or completely circular, either partially or entirely encompassing the ball, the cardinal feature being that it provides an index to assist in focusing attention upon the letters arranged to spell the chosen word. In

the present case the index band 18 is formed with an enlargement 19 that includes a window 20 within which to display one letter of each band of letters on the ball.

In a less specialized, but nonetheless important form of the ball of this invention, the equatorial band serves as a structural element only. As shown, in Figs. 12 and 13, the two hemispherical shells 21 and 23 are assembled with an equatorial band 22 in the cross-sectional shape of the capital letter H, laid on its side, with the edges of the hemispherical shells slideably secured in the rebated regions between the legs of the H and abutting upon the cross-bar of the H.

I have shown the band 22 to be rotatable relatively to each shell, but it will be understood that such band may be rigidly secured to or integral with the edge of one shell without interfering with the relative rotation of the two shell elements. Alternately, the equatorial band which prevents the lateral relative displacement of the edges of the shells may consist of a band of complete or incomplete circumferential continuity arranged within the ball, as indicated at 32 in Fig. 4. Here the shell elements 31 and 33 meet in actual edge to edge sliding contact, providing a visible seam-line 34 between the assembled shells. The internal band 32 may be cemented to the internal surface of one shell and slideably bear upon the internal surface of the other shell, the edge of the shell to which the band is cemented and the body of the band forming a rebated seat for the edge of the companion shell. In further modification the internal band may take the form of a flange that is integrally formed with and inset from the edge of one shell to receive the edge of the companion shell in the desired engagement.

The complementary visual elements or decorations provided on the surfaces of the shells 21 and 23 of Figs. 12 and 13, or on the shells 31 and 33 of Fig. 4, may comprise equi-spaced segmental areas. The series of areas of one shell may be severally colored and carry the names of colors spelled out, while certain of the areas on the other shell are presented in the hues of the colors spelled out on the companion shell, and carry the spelled-out names of the colors on the companion shell all as will be understood upon comparing the ball in Fig. 12 with the developed plan of Fig. 14. The child may, by rotation of the ball sections, learn to match each color with its name and spelling.

Fig. 8 shows fragmentary surface portions of a ball of the structure indicated in Fig. 4, and illustrates various geometrical figures that may be provided on the two halves or shells of the ball, although it is to be understood that the portions of the figures on one shell will not be matched in the order of their sequence with those on the other shell. And this comment applies to the variants shown in Figs. 9, 10 and 11. In Fig. 9, halves of alphabetical letters may be provided on one shell and the complementary halves on the other shell. In Figs. 10 and 11, it will be seen that various objects, colors and correlated words may be displayed, half on the surface of one shell, and half on the surface of the companion shell, such that by the selective rotation and positioning of one shell relatively the other a thing of incomplete significance becomes complete.

In the structures of Figs. 1 to 13, the means securing the shell sections in assembly will be understood to consist in the pin member 4 or

spring 10, or possibly in some other form of suitable diametrically extending pivotal or swivel device. It is to be remarked, however, that in some cases the means for securing the shells in assembly may be combined with the equatorial band which supports the edges of the shells against displacement. In Fig. 15 such means are illustrated, comprising an equatorial band 42 of inverted T shape in cross section. The cross-arm of the inverted T includes ribs 44 which are engaged with sliding fit in complementary grooves formed one in each of the shells 41 and 43. The band 42 is slit or slotted through its opposite edges and at spaced points 45 in its equatorial extent, and by virtue of such structure the two shells may be readily assembled upon the band, and the ribs 44 brought severally into secure but sliding engagement with the complementary grooves formed in the internal surfaces of the shells and parallel to the edges thereof. In this structure too, it will be noted that the two shells 41 and 43 are of identical construction, and it will be realized by those skilled in the art that the grooves in the internal surface of each shell will not prohibit the manufacture of the shell of plastic material in a compression molding or injection molding machine, since the molded article may be stripped or sprung from the male molding die before the plastic body of the molded article has set.

Other variations and modifications, as well as those above described, may be adopted without departing from the spirit of the invention defined in the appended claims.

I claim:

1. An educational device comprising a hollow ball formed of two generally hemispherical shells having their edges engaged in an equatorial sliding joint permissive of full rotation of one shell relatively to the other in either direction, and correlated indicia borne by the surfaces of said shells bordering said sliding joint and adapted by relative rotation of the shells to be brought into complementary relation of significance for the education of a child.

2. An educational device comprising a hollow ball formed of two generally hemispherical shells having their edges engaged in an equatorial sliding joint permissive of full rotation of one shell relatively to the other in either direction, means extending diametrically within the hollow body of the ball and secured to the walls of said shells for retaining the shells united in said sliding joint for relative rotation, and correlated indicia borne by the surfaces of said shells bordering said sliding joint and adapted by relative rotation of the shells to be brought into complementary relation of significance for the education of a child.

3. An educational device comprising a hollow ball formed of two generally hemispherical shells and an equatorial flanged ring, said shells having their edges assembled with said flanged ring in a sliding joint permissive of full rotation of one shell relatively to the other in either direction, means engaging the shell walls for securing the shells united in said sliding joint for said relative rotation, and correlated indicia borne by the surfaces of said shells bordering said sliding joint and adapted by relative rotation of the shells to be brought into complementary relation of significance for the education of a child.

4. The structure of the next-preceding claim, wherein said flanged ring is rotatable relatively to said shells and includes a flange portion overlying the adjacent edges of said shells and extending circumferentially thereof, the surface of said flange portion bearing indicia correlated to the indicia first mentioned.

5. An educational device comprising a hollow ball formed of two generally hemispherical shells of molded plastic material assembled with their edges engaged in an equatorial sliding joint permissive of full rotation of one shell relatively to the other in either direction, means extending diametrically within the hollow body of the ball for retaining the shells united in said sliding joint for relative rotation, said means comprising a portion molded integrally with and extending inwardly from the body of each of said shells and a member secured to such portion of each shell and extending diametrically of said ball, and correlated indicia borne by the surfaces of said shells bordering said sliding joint and adapted by relative rotation of the shells to be brought into complementary relation of significance for the education of a child.

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