



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.04.2012 Bulletin 2012/16

(51) Int Cl.:
A63F 9/08 (2006.01)

(21) Application number: **11184748.9**

(22) Date of filing: **11.10.2011**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(72) Inventor: **Galli, Giordano**
14030 Frinco (Asti) (IT)

(74) Representative: **Deambrogi, Edgardo et al**
Corso Emilia 8
10152 Torino (IT)

(30) Priority: **12.10.2010 IT BI20100013**

(71) Applicant: **Galli, Giordano**
14030 Frinco (Asti) (IT)

Remarks:

A request for correction of the abstract has been filed pursuant to Rule 139 EPC. A decision on the request will be taken during the proceedings before the Examining Division (Guidelines for Examination in the EPO, A-V, 3.).

(54) **Spherical puzzle with slidable and rotatable elements**

(57) A sphere (Fig. 1, 2: 10) for a hand-held puzzle game comprising an inner support frame (Fig. 4: 11); a plurality of plugs (Fig. 1, 2, 3, 8, 9: 12), sliding along the spherical surface (10a) of the sphere (10); a plurality of spherical caps (Fig. 1, 2, 3, 6A, 6B, 7: 14) pivoting on the same spherical surface (10a), each one defining, along an edge (14a) thereof, a plurality of seats (14b) to receive and accommodate the sliding plugs (12); and a plurality of fixed cover elements (Fig. 1, 2, 5: 17), secured to the

inner support frame (11), which cover those areas of the spherical surface (10a) which are not occupied by the sliding plugs (12) and pivoting spherical caps (14); wherein each sliding plug (12) has at least two areas coloured in different colours (M-R, M-V', B-G, etc.), each spherical pivoting cap (14) has a plurality of coloured areas, particularly four, in different colours (V'-A-V''-Z, M-R-B-G, etc.), corresponding to the seats (14b) for the plugs, and each fixed cover element (17) and coloured in only one colour (A, R, V', M, etc.).

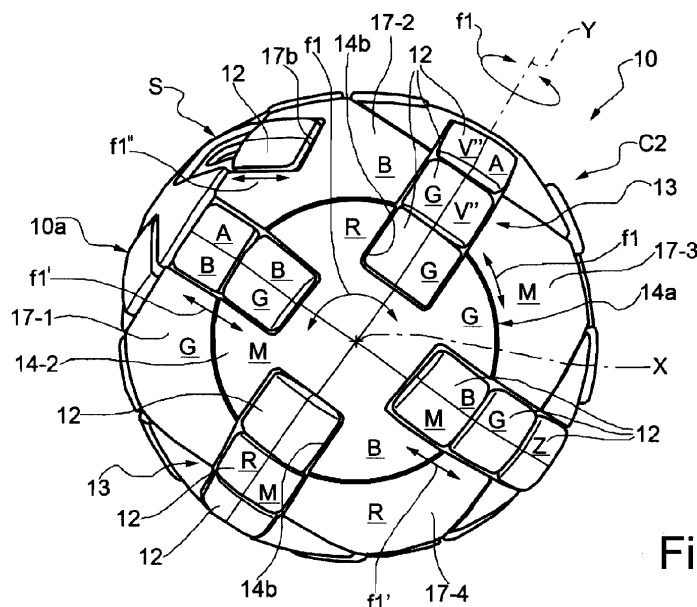


Fig. 1

DescriptionField of the invention

[0001] The present invention generally relates to the field of games, and more particularly it relates to a hand-held puzzle game of the type comprising a sphere, or similarly shaped body, which has on the outer spherical surface thereof a plurality of plugs, spherical caps and/or similar elements suitable to be variously displaced and scrambled relative to each other in a manual manner, wherein the main point of the game, and thus the skills required from the player thereof, consists in reconstructing and re-obtaining a determined initial combination on the sphere surface, by moving, and/or sliding, and/or rotating these various elements.

[0002] For example, in this determined initial combination, the various elements arranged on the sphere surface are either ordered such as to provide with the respective colours eight slices in uniform colours, though different from each other, or they are ordered to provide an identifiable image on the spherical surface.

[0003] More particularly, the object of the invention is a sphere for a hand-held puzzle game according to the preamble of claim 1.

Background of the art

[0004] Games have been known for a long time, also called "magic spheres" due to typical spherical shape thereof, which have a plurality of elements, such as plugs, pawns, tesseras or other similar elements, which are provided for being scrambled and arranged in a disordered and random manner relative to each other, starting from a determined and ordered initial configuration on the spherical surface of the sphere, whereby the game consists in the player having to recombine and then reorder these elements by moving and displacing them along the spherical surface, such as to re-obtain and reconstruct the determined initial configuration.

[0005] The different possibilities of scrambling and arranging these plugs or the like in a disordered manner, relative to the determined initial combination or configuration, and thus reconstructing the latter, subsequently, by moving and displacing the plugs along the sphere surface, identify the characteristics of the game and accordingly the specific manual skills required from the player thereof, when he/she is playing with it.

[0006] It should be particularly noted how a number of these game spheres or magic spheres, while having a spherical shape, resemble very much the so-called "Rubik cube" game, or similar hand-held puzzle games in the actual performance of the game, and hence they require manual skills which are similar to and comparable with said game.

[0007] Obviously, despite a number of forms and variants of these hand-held puzzle game spheres and magic spheres are currently offered on the market, there is an interest for this type of games, or the like, which are even more original and attractive, i.e. capable of seizing the interest of the players in order to try and play with them, and particularly have new, different and more complex possibilities of scrambling and restoring the various plugs and elements, such as to make the game different, more interesting and more compelling than the existing ones, which have lost much of their aspect of novelty and interest, mainly because they have been played and offered on the market for a long time.

[0008] Among the magic spheres and known games of this type, the ones described in the following laid-open Chinese Patents and Utility Models are mentioned, CN201283216Y, CN201283216Y, CN101007214A, CN2638800Y, CN2618652Y, CN2564210Y, CN2423003Y, CN2445783Y, CN2290370Y, CN2191 015Y, CN2346475Y.

[0009] In addition, US 5 816 571 and CN 2734287Y describe hand-held puzzle games wherein a sphere has sequences of plugs sliding along three maximum-radius circumferences of the sphere which are orthogonal relative to each other.

[0010] On the other hand, US 5 575 476, which is the closest prior art, describes a game in which the sliding plugs belong to six polar caps, pivoting about three orthogonal axes of the sphere and tangential to each other at the plugs translation pathway. The plugs can be transferred from a first cap to a second adjacent cap along an arc of circle of a maximum diameter of the sphere due to the provision of a clearance from the corresponding plug in one of the caps. More particularly, the game comprises six caps and four movable plugs per cap in diametrically opposite positions, except for an incomplete cap, which only provides for three movable plugs and an exchange clearance in place of the fourth plug. Generally, the number of plugs is twenty-three and each of them can take one in twenty-four positions on the sphere.

[0011] To the purpose, it should be noted that the variety and the high number of games as described in these Chinese patents and utility models, and in other patents as well, which are not mentioned herein for brevity reasons, demonstrate, inter alia, that much room is left for the development and proposal of further new and original embodiments of these game spheres.

[0012] However, like the known game spheres, those proposed in the above Chinese patents and utility models also appear to have limited possibilities of scrambling and restoring the elements thereof, such as to create a low interest in the player or however being destined to decrease rapidly, in view of the relative easiness by which the player succeeds, after several attempts, in carrying out and finishing the play, i.e. recomposing the initial configuration of the sphere.

Summary of the invention

[0013] Accordingly, the main object of the present invention is to provide a novel and interesting game, in the specific field of sphere-shaped games of the type comprising a plurality of plugs and/or similar elements that can be scrambled and restored on the respective spherical surface, which is characterized by novel and original possibilities of scrambling and restoring the various elements, as compared with games of this type which have been known and marketed for some time, such as to capture the interest of the playing public thanks to the novel operations and manual skills that are required from the player and involved while playing with the new game sphere.

[0014] Another non-secondary object of the invention is also to renew the interest in this typology of game spheres, or the like, which after the considerable commercial success of several years ago after the launch of the Rubik's Cube and other similar games, have been progressively declining in the preferences of the public and players, also due to the competition with the electronic games.

[0015] These objects are reached by the sphere for a hand-held puzzle game, according to the invention, having the characteristics as defined in claim 1.

[0016] Particular and advantageous embodiments of the invention are as defined in the dependent claims.

[0017] The game sphere of the invention has a number of advantages, and particularly, as it will appear from the description below, it provides new possibilities of scrambling and subsequently restoring the various movable elements on the respective spherical surface, such that it is proposed as a certainly unique and original game of its kind, and also as a real innovation in the field of these game spheres.

Brief description of the drawings

[0018] These and other objects, characteristics and advantages of the present invention will appear from the following description of several preferred embodiments thereof, which are given by way of non-limiting examples, with reference to the annexed drawings, in which:

Fig. 1 shows a sphere for a hand-held puzzle game, according to the invention, comprising a plurality of sliding elements pivoting on the respective spherical surface, in a first configuration where these elements have been mutually scrambled, i.e. arranged in a disordered manner relative to each other, as compared with a determined and ordered initial combination;

Fig. 2 shows the game sphere of Fig. 1 in a second configuration thereof, where the several sliding and pivoting elements have been restored on the spherical surface, i.e. arranged in an ordered manner relative to each other, in accordance with the determined and ordered initial combination;

Fig. 3 is a view showing the game sphere of Fig. 1 and 2 decomposed in the various parts thereof;

Fig. 4 shows a part, consisting of an inner support frame, of the game sphere of Fig. 1 and 2;

Fig. 4b shows the inner support frame in an exploded condition, which can be obtained from a manufacturing mould, before assembly;

Fig. 5 shows the game sphere of Fig. 1 and 2 in a partially assembled configuration;

Fig. 5b shows from the inner side a cover element that can be fixed to the frame;

Fig. 6A and 6B show from the outer side and inner side, respectively, a general pivoting cap of the game sphere of Fig. 1 and 2;

Fig. 7 shows from the outer side and in a scrambled form the various pivoting spherical caps of the game sphere of Fig. 1 and 2;

Fig. 8 shows in an enlarged scale from the outer and inner sides a general sliding plug of the game sphere of Fig. 1 and 2;

Fig. 9 shows from the outer side and in the scrambled form the several sliding plugs of the game sphere of Fig. 1 and 2.

Detailed description of a preferred embodiment of the invention

[0019] With reference to the figures, a sphere for a hand-held puzzle game, also called game sphere or simply sphere herein below, in accordance with the present invention is generally designated with 10.

[0020] Particularly, the game sphere 10 comprises:

a frame or inner support body 11, adapted to support the various parts of the game sphere 10;

a plurality of sliding plugs or tesseras or like elements, generally designated with 12 and individually with 12-1, 12-2, 12-3, etc., which are arranged on the outer spherical surface 10a of the sphere 10 and are adapted to slide along said spherical surface 10a of the sphere 10;

a plurality of pivoting spherical caps, or like elements, generally designated with 14 and individually with 14-1, 14-2,

14-3, etc., also arranged on the surface 10a of the sphere 10, which are adapted to rotate about respective fixed axes of rotation of the sphere 10; and
 a plurality of cover elements, generally designated with 17 and individually with 17-1, 17-2, etc., fixed on the inner support frame 11, which cover those areas of the spherical surface 10a of the sphere 10 that are not occupied by the sliding plugs 12 and pivoting spherical caps 14.

[0021] As shown in detail in Fig. 4 and Fig. 4b, the support frame 11 consists for example of three annular elements 11 a, 11b and 11c, corresponding to maximum-diameter circles of the sphere 10, which are arranged along the three symmetry planes, perpendicular to each other, i.e. the two polar planes and the equatorial plane of the sphere 10, such as to intersect in six intersection areas symmetrically arranged relative to the center of the sphere 10.

[0022] This support frame 11 comprises two semi-frames 11' and 11" equivalent to each other, which can be obtained for example by means of moulding, each comprising two annular semi-elements 11'a, 11'b, 11"a, 11"b, respectively, corresponding to half the respective maximum-diameter circle of the sphere, and an annular semi-element 11'c, 11"c, respectively, corresponding to a maximum-diameter circle of the sphere, of half width, adapted to be mechanically coupled to the corresponding annular semi-element of the other semi-frame (11"c, 11'c, respectively). Advantageously, each annular semi-element 11'c, 11"c comprises a pair of projections 111 which are angularly alternated with a pair of grooves 112 to allow for shape-coupling between the two halves of the frame, which can be subsequently fastened to each other, for example, by means of gluing.

[0023] As shown in Fig. 3 and 7, the pivoting spherical caps 14 are for example six, designated accordingly with 14-1, 14-2, 14-6, and are arranged on the spherical surface 10a from opposite sides and symmetrically about the center of the sphere 10, i.e. with two caps being arranged at the two poles and the other four being arranged along the equatorial band of the sphere 10, such as to be suitable to rotate about respective fixed axes of rotation X, Y, Z, which correspond to the symmetry axes of the sphere 10.

[0024] To the purpose, each of the six pivoting spherical caps 14-1, 14-2, etc. is mounted to the inner support frame 11 at a respective conical hole 14c in the six intersection areas between the respective annular elements 11a, 11b and 11c and with a slight clearance, by means of a pin or fitting peg 15 (Fig. 1, 2, 6A), , whereby each spherical cap 14-1, 14-2, .. 14-6 is free to rotate, by sliding with the inner face 14d thereof (Fig. 6B) in contact with the annular elements 11a-11c of the support frame 11.

[0025] Furthermore, each spherical cap 14-1, 14-2, etc. has, along the circular edge 14a thereof, a plurality of seats 14b, for example four as illustrated in the drawings, which are provided for receiving and accommodating the sliding plugs 12-1, 12-2, 12-3, etc. when the game is being played, as will be described in greater detail herein below.

[0026] Particularly, these seats 14b are configured as recesses, along the edge 14a, each suitable to snugly accommodate one sliding plug 12, and are symmetrically arranged and angularly spaced by 90° from each other about the axis of rotation X or Y or Z of the respective spherical cap.

[0027] Furthermore, on the surface 10a of the sphere 10, each of the spherical caps 14-1, 14-2, ... 14-6 has - in the currently preferred embodiment - four areas coloured in different colours, extending from the center of the spherical cap, i.e. from the respective axis of rotation, to the circular edge 14a, such that the surface of the spherical cap results to be divided into four areas or quadrants, coloured in different colours, which correspond to the four seats 14b, formed along the same edge 14a, adapted to receive the sliding plugs 12.

[0028] As shown in Fig. 8, each plug 12 has a substantially rectangular shape, with two rectilinear sides facing the radial walls of the seats 14b of the cap in which it is temporarily or permanently accommodated and two sides that are curved according to the curvature radius of the circular edge 14a of the spherical cap, which face the center of the cap and the outer edge thereof, respectively, the latter being such as to allow a rotation without jamming of the cap during the transfer to a position facing the fixed cover elements.

[0029] The plugs 12, as stated above, are adapted to slide on the spherical surface 10a of the sphere 10, particularly along guides 13 (Fig. 1, 2, 5) extending on this surface 10a along limited portions or arcs of circle having the sphere 10 diameter as the maximum diameter thereof.

[0030] These guides 13 are defined both by the fixed parts and the movable parts arranged on surface 10a, i.e. by the seats 14b of the pivoting spherical caps 14 and by facing profiles or portions 17a (Fig. 5) of the edge of the cover elements 17, which are fixed to the support frame 11.

[0031] For example, when the sphere 10 has, as described above, six spherical caps 14 each provided with four seats 14b for the sliding plugs, the number of these guides 13 is twelve, such as to partition the outer surface 10a of the game sphere 10 into eight equal spherical sectors, which are symmetrically arranged relative to the center of the sphere 10.

[0032] Particularly, two seats 14b, facing and matching each other, belonging to two different spherical caps 14 and each adapted to snugly accommodate a sliding plug 12, define the end areas of each guide 13, while the facing profiles 17a of two different fixed cover elements 17, define the central area thereof.

[0033] Since the cover elements 17 are configured to separate the several spherical caps 14 from each other, according to a space corresponding to a plug 12, the total number of the spaces occupied by the guides 13 on the spherical surface

10a is twelve times three, i.e. thirty-six, which also corresponds to the total number of the sliding plugs 12.

[0034] As shown in Fig. 8, each plug 12 has on the outer side thereof, i.e. along the surface 10a of the sphere 10, a substantially rectangular shape, and on the inner side facing the center of the sphere 10, a protuberance tapering towards the end thereof, for example according to a V-shaped profile which defines a groove 12a that is, in turn, suitable to co-operate, while the plug 12 is manually caused to slide on the spherical surface 10a, with matching guide profiles 13a (Fig. 5, 6A, 7), defining the various guides 13, wherein this guide profiles 13a are formed both on the facing portions 17a of the edges of the cover elements 17 and along the recess-shaped contour of the seats 14b provided along the edge of the spherical caps 14.

[0035] Similar to the spherical caps, in the currently preferred embodiment, the plugs 12 are also coloured, and particularly each of them has two areas coloured in different colours, according to twelve different pairs or combination of two colours, whereby the sliding plugs 12 result to be divided into twelve groups, designated with g-1, g-2, ... g-12, each composed of three sliding plugs 12 and defined by a determined pair or combination of two different colours.

[0036] Again, consistently with the number of the pivoting spherical caps 14-1, 14-2, etc., the number of the cover elements 17 fixed to the support frame 11 is eight, accordingly designated with 17-1, 17-2, ... 17-8, and are also arranged symmetrically and opposite to each other, two-by-two, on the surface 10a of the sphere 10, such as to clear both the space for mounting the caps 14-1, 14-2, etc. on the support frame 11, and the space, interposed between the facing profiles 17a of the cover elements, corresponding to the guides 13 such that the sliding plugs 12 can slide along the spherical surface 10a, as clearly shown in Fig. 5.

[0037] Advantageously, each cover element 17 has, on the inner face and short side thereof, i.e. the side intended to co-operate with the annular elements 11a, 11b, 11c in order to support the cover element thereon, hooking teeth 171 that are shaped as to hook the element under the three arcs of the annular elements 11a, 11b, 11c.

[0038] One of these cover elements 17, for example the element 17-2, has an exchange area or clearance, generally designated with S and shown in Fig. 2, which is adapted to allow the sliding plugs 12 to slide when the game is being played, as will be further detailed below.

[0039] Particularly, this clearance S is defined by a parking seat, designated with 17b and provided along an edge of the cover element 17-2, which has a recess-like shape adapted to receive and snugly accommodate any of the plugs 12, in order to temporarily park the latter while the game is being played and exchange it with another plug 12, within the same seat 17b.

[0040] These cover elements 17-1, 17-2, etc. of the sphere 10 fixed to the support frame 11 are also coloured.

[0041] However, unlike the sliding plugs 12 and pivoting spherical caps 14, which have, on the surface 10a of the sphere 10, variously coloured areas such as to have different colours along the respective edges, the eight fixed cover elements 17 are of a single colour, i.e. they are coloured in eight different colours, each of them being coloured in only one of the eight colours used on the sphere 10, i.e. each of them is coloured with only one colour, which is, in turn, different from that of the other cover elements.

[0042] Alternatively, the cover elements can be either partially or completely transparent, or have a notch in the central area thereof.

[0043] In brief, for clarity's sake, the following tables report the colours, eight in total, of the coloured areas of each one of the different plugs 12-1, 12-2, etc. and of each one of the different spherical caps 14-1, 14-2, etc., and the unique colour of each one of the cover elements 17-1, 17-2, etc., according to the following terminology.

M = Brown
 R = Red
 V' = Dark green
 B = Blue
 G = Yellow
 A = Orange
 V'' = Light green
 Z = Light blue

36 sliding two-colour plugs 12-1, 12-2, 12-3, ... , 12-35, 12-36, divided into twelve groups g-1, g-2, ... g-12, each one composed of three sliding plugs, defined by 12 different colour pairs.
--

EP 2 441 502 A1

(continued)

5	Group of three plugs	Colour							
		M	R	V'	B	G	A	V''	Z
10									
	g-1	X	X						
	g-2	X		X					
	g-3				X	X			
15	g-4						X	X	
	g-5		X			X			
	g-6	X			X				
	g-7		X						X
20	g-8			X					X
	g-9			X			X		
	g-10							X	X
	g-11					X		X	
25	g-12				X		X		

30	6 pivoting spherical caps 14-1, 14-2, 14-3, 14-6, each one having four areas coloured in different colours.								
	Spherical cap	Colour							
35		M	R	V'	B	G	A	V''	Z
	14-1			X			X	X	X
	14-2	X	X		X	X			
40	14-3	X		X	X		X		
	14-4	X	X	X					X
	14-5		X			X		X	X
	14-6				X	X	X	X	

45	8 fixed cover elements 17-1, 17-2, 17-8, of a single colour, coloured in 8 different colours	
50	Cover element	Colour
	17-1	G
	17-2	B
	17-3	M
55	17-4	R
	17-5	V'
	17-6	A

(continued)

Cover element	Colour
17-7	V"
17-8	Z

Operation of the game sphere of the invention and execution of the game

[0044] During the execution of the game, the various spherical caps 14, the various plugs 12, and the various cover elements 17 of the sphere 10 are initially arranged, each relative to the others, in a determined and ordered initial combination or configuration, designated with C1 and shown in Fig. 2.

[0045] Particularly, this determined and ordered initial combination C1 is defined by a determined correspondence between the colours of the various coloured areas of these various elements, i.e. the spherical caps 14, the plugs 12, e the cover elements 17, which areas are arranged adjacent to each other, on the surface 10a of the sphere 10, in this determined and ordered initial combination C1.

[0046] For example, as shown in Fig. 2, in the combination or configuration C1 the blue-coloured areas B of the plugs 12 and pivoting caps 14 are arranged in an orderly manner about the cover element 17-2 in blue colour B, such as to define, on the surface 10a of the sphere 10, a sector or triangular spherical slice S2 in blue colour B.

[0047] Again, in the combination C1, the areas in brown colour M of the plugs 12 and of the pivoting spherical caps 14 are arranged in an orderly manner about and along the edges of the cover element 17-3 in brown colour M, such as to define, on the surface 10a of the sphere 10, a spherical sector S1 in brown colour M, and so on for the other colours, whereby in the combination C1 the surface 10a of the sphere 10 has a total of eight spherical sectors or coloured slices S1-S8, which are clearly distinct from each other, corresponding to the eight different colours M, R, V', B, G, A, V", Z used to define the coloured areas of the spherical caps 14 and plugs 12, and the unique colours of the cover elements 17.

[0048] Particularly, Fig. 2 shows four of these sectors or slices, in blue B, brown M, orange A, and dark green V' colours, respectively.

[0049] Obviously, in the determined initial combination C1, the sphere also has, on the surface 10a thereof, as shown in Fig. 2, the parking seat 17b for the sliding plugs 12, which is formed on a cover element 17.

[0050] Subsequently, during a preparatory step of the game, this determined and ordered initial combination C1 is completely scrambled, as shown in Fig. 1.

[0051] In detail, during this preparatory step, the initial combination C1 is altered and scrambled in a random manner and without following any particular order, by rotating the spherical caps 14, as indicated by arrows f1, by parking the various plugs 12 from time to time into the parking seat 17b, as indicated by an arrow f1", and further sliding the plugs 12, as indicated by the arrows f1', 12 along the guides 13, which are thus formed on the surface 10a. Thereby, the spherical caps 14 and the plugs 12 are arranged in a completely random and disordered manner relative to each other and to the fixed cover elements 17, on the spherical surface 10a, whereby the sphere 10 adopts the configuration as shown in Fig. 1 and indicated with C2, in which the configuration with eight distinct coloured spherical sectors S1-S8 and the chromatic correspondences of the initial combination C1 are completely lost, and particularly the various plugs 12 and the various spherical caps 14 have different colours about and along the edge of each cover element 17.

[0052] At this stage, the game consists in the player having to recombine the various elements, i.e. the sliding plugs 12, the pivoting spherical caps 14 and the fixed cover elements 17, such as to reconstruct on the surface 10a the initial combination C1, shown in Fig. 2, which exhibits the eight spherical sectors S1-S8 in eight different colours, respectively.

[0053] Accordingly, during this actual game step, the player rotates the various caps 14 and slides the various plugs 12 on the spherical surface 10a of the sphere 10 until he/she re-obtains the initial combination C1, which is, in turn, clearly recognizable by the presence of the eight slices or triangular spherical sectors, S1, S2, ... S8, each in a different colour, on the same surface 10a.

[0054] In greater detail, during this actual execution step of the game, the player proceeds by steps by typically carrying out the following operations:

- he/she rotates, from one step to another, the spherical caps 14, as shown by the arrows f2 in Fig. 2, such as to change the mutual arrangement between the seats 14b of the various adjacent spherical caps, whereby the plugs 12 accommodated within these seats 14b are moved and displaced from the one to the other of the sliding guides 13 being defined on the spherical surface 10a;
- he/she causes the various plugs 12 to slide along the guides 13, as indicated by the arrows f2', in order to remove them from the previous seats 14b and insert them in new seats 14b of the spherical caps 14;
- from time to time, i.e. between one rotation and another of the spherical caps 14 and one sliding and another of the

plugs 12 along the guides 13, he/she temporarily parks a plug 12 within the parking seat 17b, formed in one of the fixed cover elements 17, as indicated by an arrow f2", such as to exchange this plug 12 with the plug 12 that had previously been accommodated within the parking seat 17b, and at the same time clearing space on the spherical surface 10a such as to allow the plugs 12 to slide therealong.

[0055] Accordingly, in this manner, i.e. by sequentially carrying out many of these operations, the player progressively moves, step by step, the various plugs 12 from one area to another of the spherical surface 10a, and furthermore he/she causes the sliding plugs 12 to rotate about themselves relative to the initial position, if required.

[0056] The game is carried out until the player, by keeping on moving, displacing and recombining, on the spherical surface 10a the various elements relative to each other, i.e. the sliding plugs 12, the pivoting spherical caps 14 and the fixed cover elements 17, gets to reconstruct and re-obtain the initial combination C1, which, as stated above, can be easily recognized, since it has on the surface 10a thereof, as shown in Fig. 2, eight spherical sectors designated with S-1, S-2, S-3, etc., each in a different colour, and thus clearly distinguished from each other, which correspond, in turn, to the eight colours that have been used to define the various coloured areas of the plugs 12 and caps 14, and the unique colours of the cover elements 17.

[0057] Accordingly, it should be understood from what has been discussed above, that the present invention fully achieves the objectives that had been set, and particularly proposes a sphere for a hand-held puzzle game which is characterized by novel and original possibilities of manually scrambling and restoring the various elements on the spherical surface thereof, which makes the execution of the game quite complicated such as the latter results to be particularly attractive for those people passionate about these hand-held puzzle games.

[0058] In the preferred embodiment 10 described above, the number of the spherical caps 14 of the game sphere is six, each being provided with respective four seats 14b for accommodating the plugs 12, which seats are symmetrically arranged about the center of the sphere 10, i.e. at the poles and along the equatorial band of the sphere 10.

[0059] Furthermore, the sphere 10 has a number of thirty-six sliding plugs 12 in two-colours and a total number of eight fixed cover elements 17 of a single colour. In general, the plugs are in a much greater number than the number of plugs as described in the prior art, and each of them can adopt one in seventy-two positions on the sphere.

[0060] Again, in this embodiment 10, eight different colours have been used, which correspond, in turn to the eight fixed cover elements 17-1, 17-2, ... 17-8 in a single colour, for defining the two coloured areas of each sliding plug 12 and the four coloured areas of each spherical cap 14.

[0061] However, it is understood that the above numbers, related to the embodiment 10, are non-limiting, and that a game sphere comprising a number of pivoting spherical caps other than six, as well as a number of seats for each spherical cap other than four, or a number of fixed cover elements other than eight, and accordingly a number of corresponding different colours other than eight for defining the coloured areas of the various elements of the sphere should be however considered as being within the scope of the present invention.

[0062] Furthermore, in the example described above, the determined and ordered initial combination C1, i.e. the combination which forms the result of the game, is defined by a determined chromatic correspondence, which is, in turn, based on the adoption of eight different colours, among the colours of the areas that are arranged adjacent to each other, of the various elements arranged on the surface 10a, i. e. the plugs 12, the caps 14 and the fixed cover elements 17, in this combination C1.

[0063] Also in this case, however, it is clear that this combination can be also defined in other ways, and from the correspondence of other characteristics, which are different from the and/or coloured areas, between the elements that can be scrambled and restored on the sphere surface.

[0064] For example, the combination that the player is required to reconstruct by playing with the sphere of the invention, can consist of a determined and clearly recognizable image which is printed on the spherical surface of the sphere, and which is accordingly divided into a plurality of areas matching the various sliding plugs, pivoting caps and fixed cover elements of the sphere.

[0065] Or the combination that the player is required to reconstruct can be based and defined by the correspondence of surface characteristics, such as roughness or other, of these elements, or from the correspondence between characters and/or graphic symbols printed thereon.

Variant Embodiments

[0066] The basic concepts of the present invention being given, it should be also understood that variations, modifications and further improvements can be carried out to the sphere for a hand-held puzzle game described herein above, without however departing from the scope of protection of the invention.

[0067] For example, each fixed cover element, secured to the support inner frame, while having one single colour throughout the extension of its edge, which colour is intended to, in turn, match the colours of the various plugs and spherical caps in the determined initial configuration, can have, in those areas that are away from the edge and for

example in the central area of the cover element, one or more different colours.

[0068] In addition, the recess-shaped parking seat provided for temporarily parking the sliding plugs while the game is being played, can be formed along the edge of a pivoting cap rather than along the edge of a fixed cover element.

5

Claims

1. A sphere (10) for a hand-held puzzle game comprising:

- 10 - a frame or inner support body (11);
 - a plurality of substantially equal sliding plugs (12, 12-1, 12-2, 12-3, etc.), or like elements, arranged on the spherical surface (10a; 11a) of said sphere (10) and adapted to slide therealong;
 - a plurality of pivoting spherical caps (14, 14-1, 14-2, 14-3, etc.), or like elements, arranged on said spherical surface (10a) and adapted to rotate about respective axes (X, Y, Z) relative to said inner support frame (11),
 15 each of said pivoting spherical caps (14) having along the circular edge (14a) thereof a plurality of recess-shaped seats (14b), adapted to receive and accommodate said sliding plugs (12), said plugs (12) being adapted to slide on the spherical surface (10a) of the sphere (10) along guides (13) being defined by portions or arcs of circle having the maximum diameter of the sphere (10) as the maximum diameter thereof, which extend between two matching seats (14b) provided along the edges of two different spherical caps (14);
 20 - a plurality of fixed cover elements (17, 17-1, 17-2, etc.), secured to said inner support frame (11) which cover those areas of said spherical surface (10a) that are not occupied by the sliding plugs (12) and pivoting spherical caps (14); and
 - at least one clearance (S, 17b; S') provided on the surface (10a) of the sphere (10), said clearance being such as to accommodate a sliding plug (12) in order to allow for the plugs (12) to slide along said guides (13) while
 25 the game is being played;

characterized in that said fixed cover elements (17) are configured such as to separate, on said spherical surface (10a), one pivoting cap (14) from another, thereby said guides (13), for the sliding movement of said plugs (12), extending between two matching seats (14b) of two different pivoting spherical caps (14), are defined in a respective
 30 central area by the facing edges (17a) of two different fixed cover elements (17), which define at least one intermediate seat adapted to receive and accommodate a sliding plug,
 wherein, while the game is being played, the spherical caps (14, 14-1, 14-2, etc.) are manually rotated (f2) about the respective axes (X, Y, Z), and the various plugs (12) are manually caused by a player to slide (f2') on said spherical surface (10a), along said guides (13), such as to move and displace, step by step, the various plugs (12)
 35 from one area to another of the spherical surface (10a) and from one of the other of the seats (14b) provided on the spherical caps (14) and between the fixed cover elements (17), in order to reconstruct and re-obtain a determined initial combination (C1; C1') of said pivoting spherical caps (14), said sliding plugs (12), and said fixed cover elements (17), on the surface (10a) of said sphere (10).

40 2. The game sphere (10) according to claim 1, wherein said determined initial combination (C1; C1') to be reconstructed by playing with the sphere is defined by a determined correspondence between the characteristics of said pivoting caps (14), said sliding plugs (12) and said fixed cover elements (17) in the areas adjacent thereto (12, 14, 17) in said determined initial combination (C1; C1'), and
 particularly said initial combination (C1, C1') is defined by the correspondence between the colours of coloured areas, which are arranged adjacent to each other in said determined combination (C1; C1') of said pivoting caps (14), said sliding plugs (12) and said fixed cover elements (17); or
 45 by a determined image printed on the spherical surface of the sphere and divided into a plurality of elementary areas corresponding to the various elements arranged on the sphere surface, i.e. the pivoting caps, sliding plugs and fixed cover elements; or by the correspondence between specific superficial characteristics of the adjacent areas of said
 50 pivoting caps (14), said sliding plugs (12) and said fixed cover elements (17); or by the correspondence between symbols and/or characters printed thereon.

55 3. The game sphere (10) according to any preceding claim, wherein said clearance (S), for allowing the sliding of the plugs (12) on the surface (10a) of the sphere (10) is defined by a parking seat (17b), in the shape of a recess provided along the edge of one of said pivoting caps (14) or of one of said fixed cover elements (17), said parking seat (17b) being adapted for temporarily parking, while the game is being played, and between one step and another, the various plugs (12).

4. The game sphere (10) according to claim 3, wherein on the surface of said sphere (10), each one of said plugs (12) has at least two areas coloured in different colours (M-R, M-V', B-G, etc.); each of said spherical caps (14) has along the edge (14a) thereof a number of areas coloured in different colours (V'-A-V"-Z, M-R-B-G, etc.) which correspond to the seats (14b), as defined by the spherical cap, to receive the sliding plugs (12); and each of said cover elements (17) is coloured in only one colour (G, B, M, etc.), particularly along the edge of the cover element, and wherein said determined combination (C1, S1-S8) is defined by the correspondence between the colours (M, R, V', B, G, A, V", Z) of the coloured areas of said pivoting spherical caps (14) and said sliding plugs (12) and the colours of said fixed cover elements (17), along the edges, which are arranged adjacent to each other in said determined combination (C1) of said pivoting spherical caps (14), said sliding plugs (12) and said fixed cover elements (17).
5. The game sphere (10) according to claim 4, wherein said pivoting spherical caps (14) are six in number, and each has four seats (14b), corresponding to four different colours, which are symmetrically arranged and angularly spaced by 90° about the axis of the spherical cap; wherein said sliding plugs (12) are thirty-six in number, and each has two areas in different colours; wherein said fixed cover elements (17) are eight in number; wherein eight different colours (M, R, V', B, G, A, V", Z) can be used to define the various coloured areas of the thirty-six plugs and eight spherical caps and the single colours of said eight cover elements; and wherein said determined initial configuration (C1) has eight different spherical sectors or slices (S1-S2-...-S8) corresponding to said eight different colours.
6. The game sphere (10) according to any preceding claim, wherein each of said sliding plugs (12) consists of a body having, on the outer spherical surface (10a; 11a) of said sphere, a substantially rectangular shape, and has, on the side facing the inside of the sphere, a groove (12a), which is, in turn, adapted to co-operate with corresponding recess-shaped guide profiles (13a) formed along the contour of said seats (14b) and along the edge (17a) of said cover elements (17), in order to guide the plug (12) during the manual sliding along a surface (10a) of the sphere (10).
7. The game sphere (10) according to any preceding claims, including an inner support frame (11) comprising three annular elements (11a, 11b, 11c), corresponding to circles having the maximum diameter of the sphere, which are arranged along the three symmetry planes, perpendicular to each other, of the sphere (10), such as to intersect in six intersections areas that are symmetrically arranged relative to the center of the sphere.
8. The game sphere (10) according to claim 7, wherein said support frame (11) comprises a pair of semi-frames (11', 11"), each of which comprises two semi-annular elements (11'a, 11'b; 11"a, 11"b), and an annular semi-element (11'c), adapted to be coupled to a matching annular semi-element of the other semi-frame (11"c) and subsequently fastened thereto.
9. The game sphere (10) according to claim 7 or 8, wherein each cover element (17) has hooking teeth (171) adapted to co-operate with the annular elements (11a, 11b, 11c) to hold said cover element (17) in position.
10. The game sphere (10) according to any claim 7 to 9, wherein said support frame (11) has respective fitting holes (14c) at the intersection areas between the annular elements (11a, 11b e 11c), adapted to receive and hold a fitting pin (15) for said pivoting spherical caps (14-1, 14-2, etc.), whereby each spherical cap (14-1, 14-2, ... 14-6) is free to rotate on said annular elements (11a-11c) of the support frame (11).

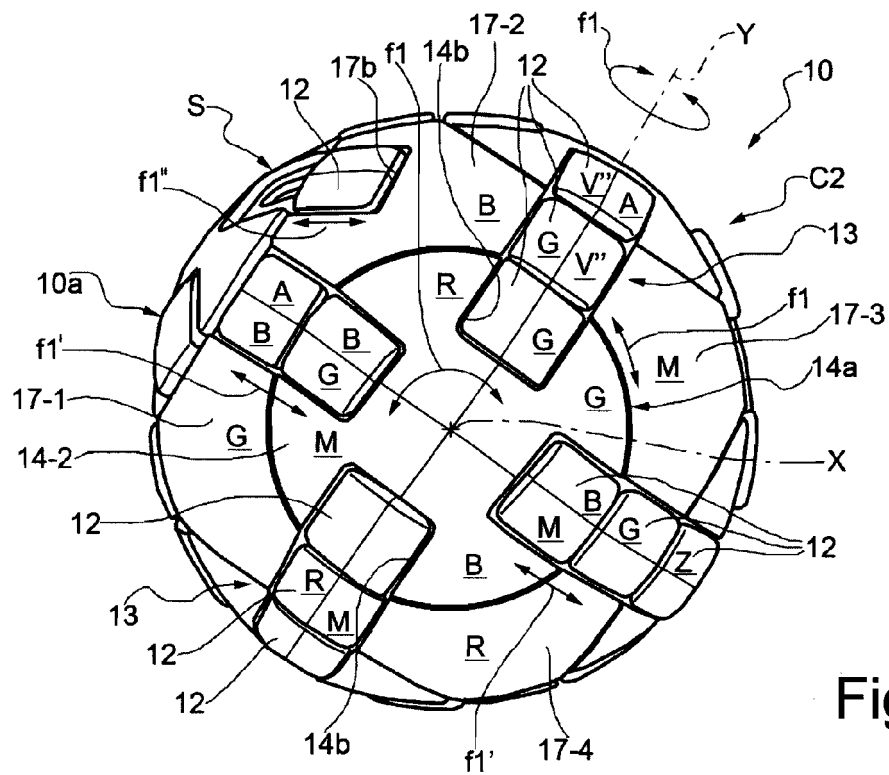


Fig. 1

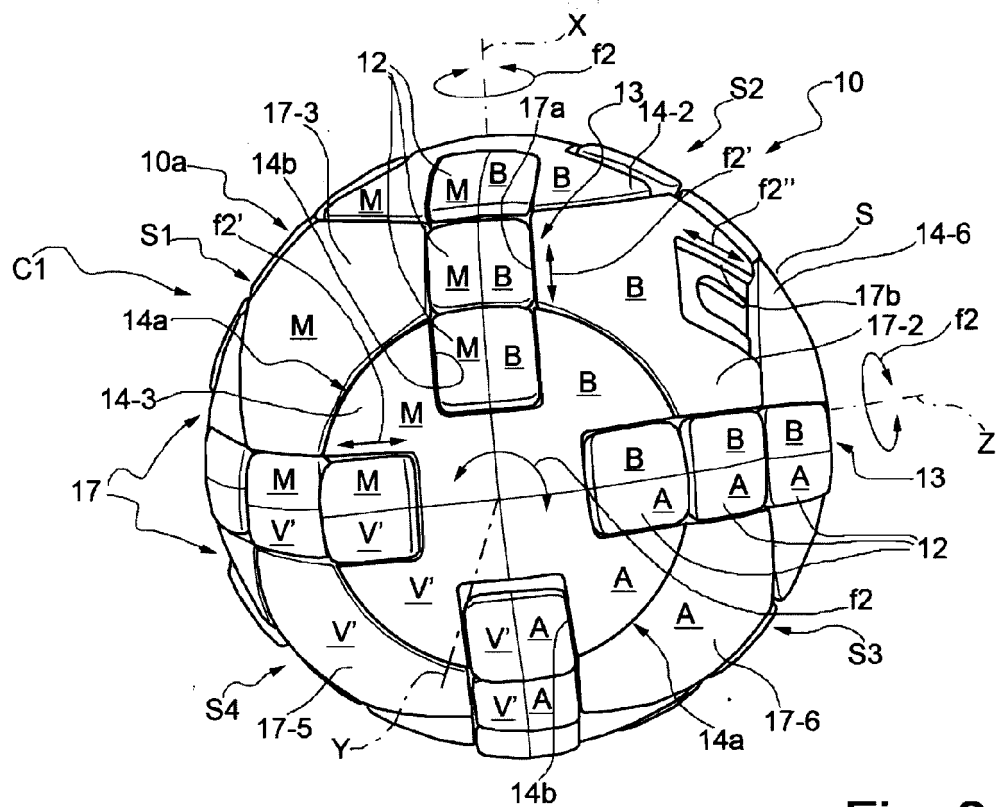


Fig. 2

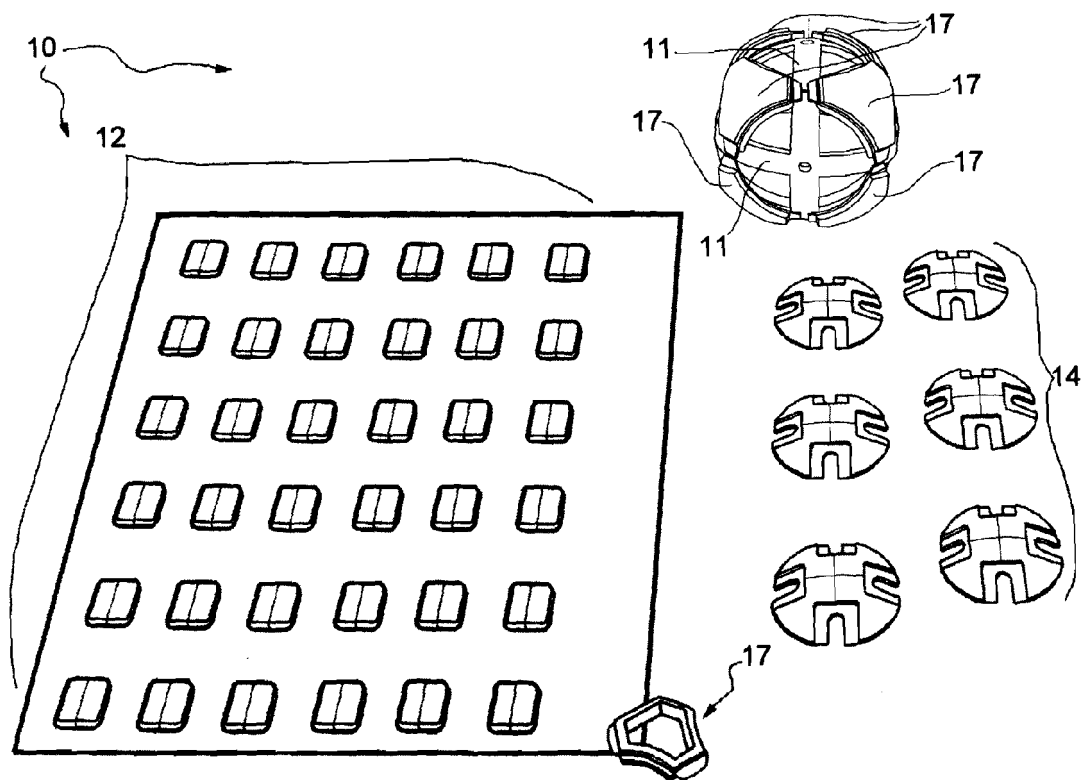


Fig. 3

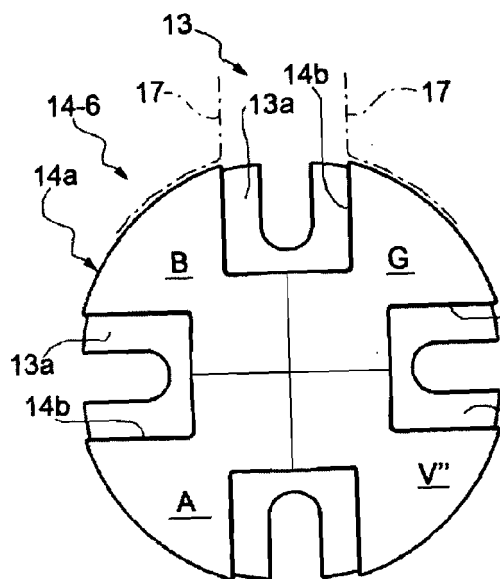


Fig. 6A

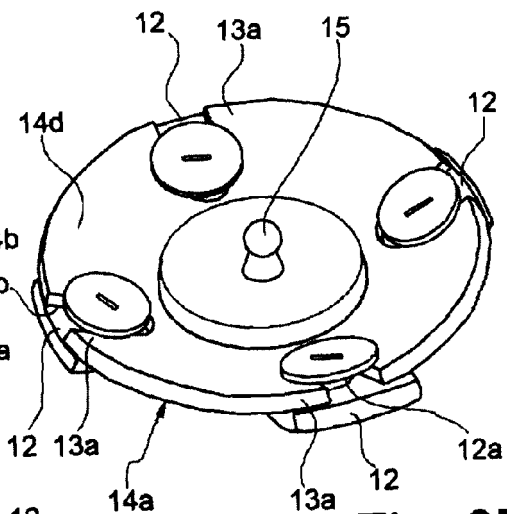
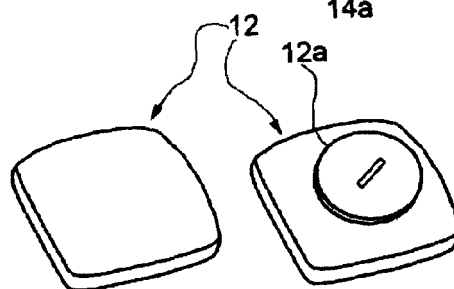


Fig. 6B

Fig. 8



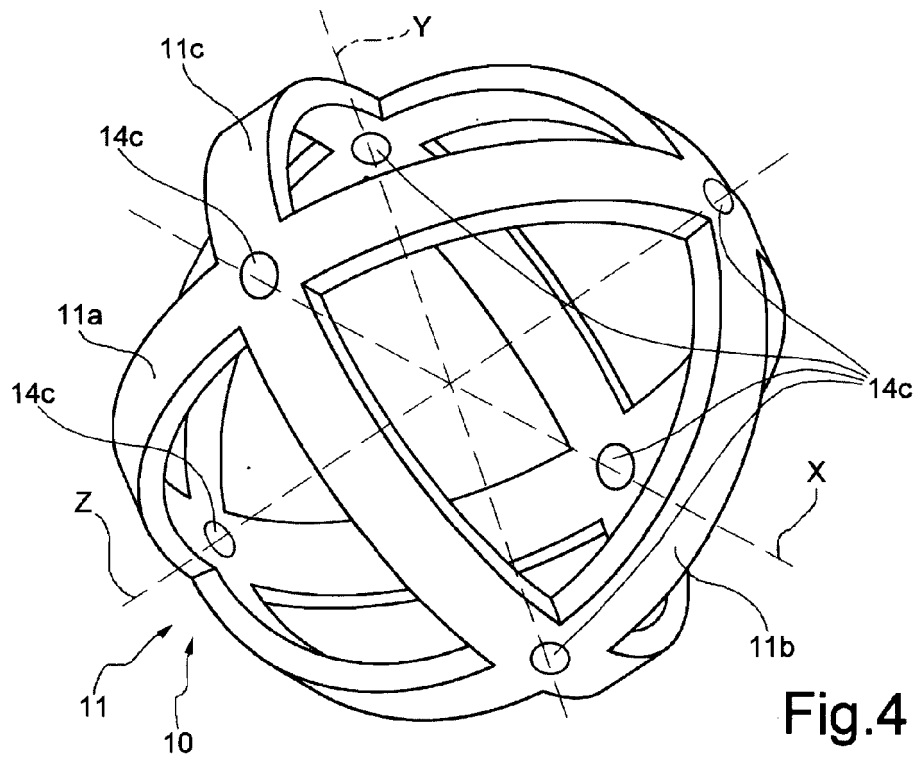


Fig. 4

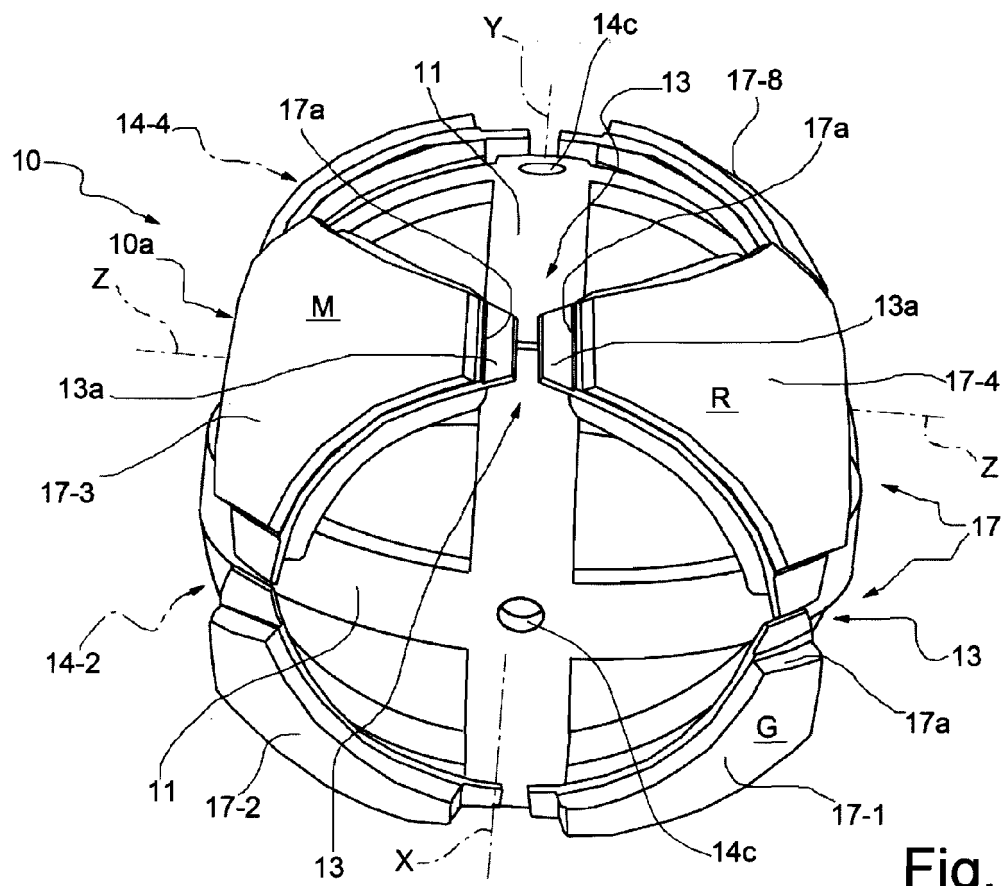


Fig. 5

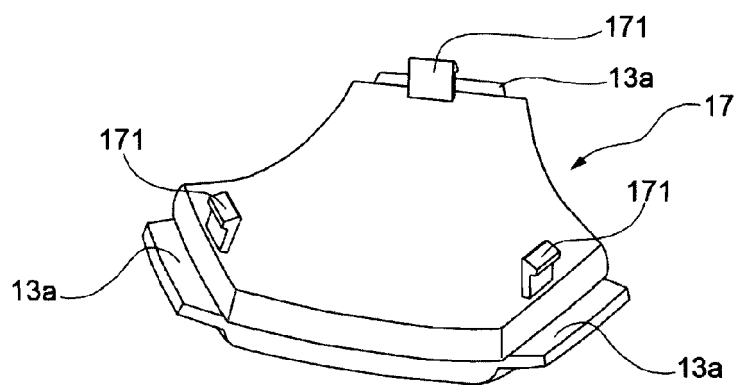


FIG. 5b

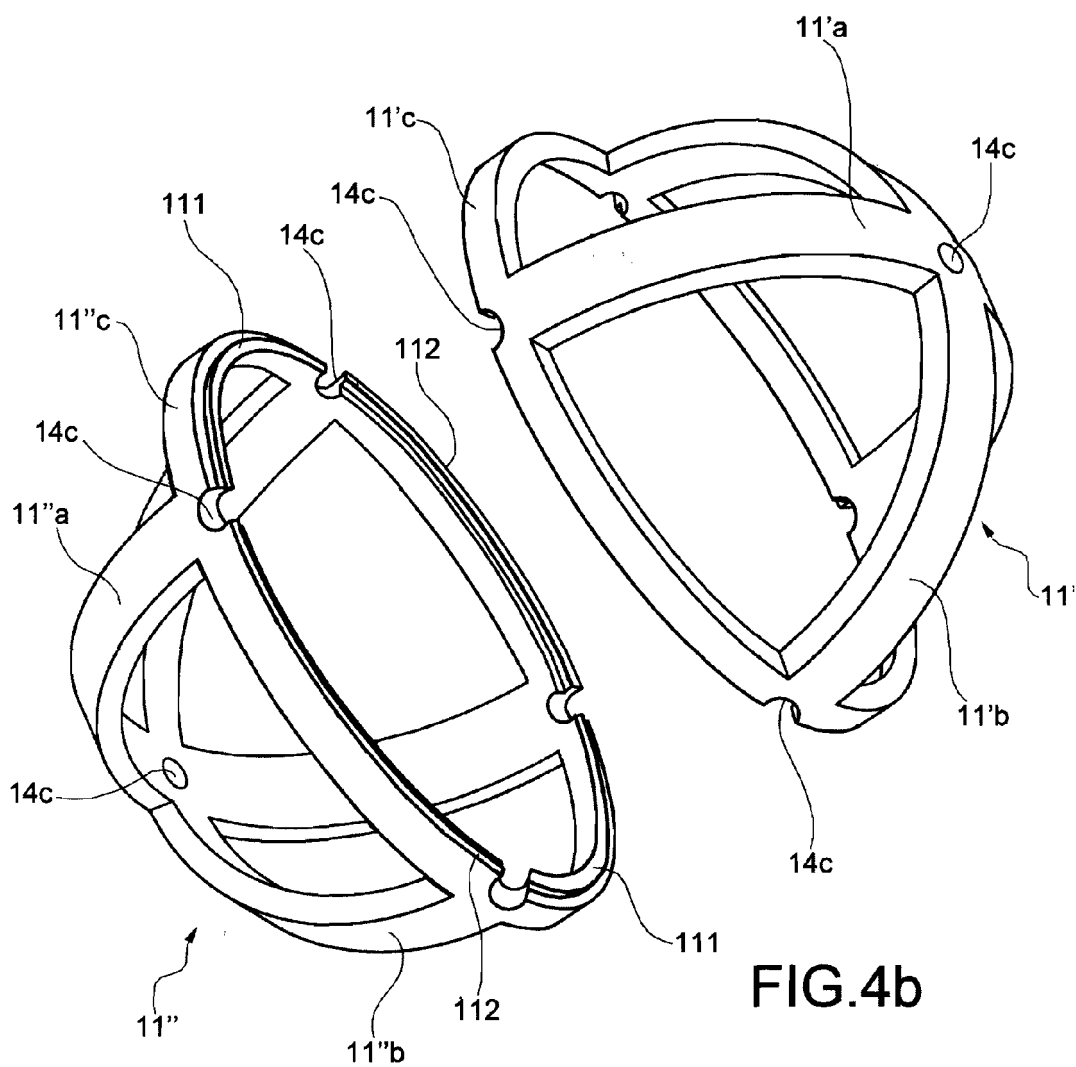


FIG. 4b

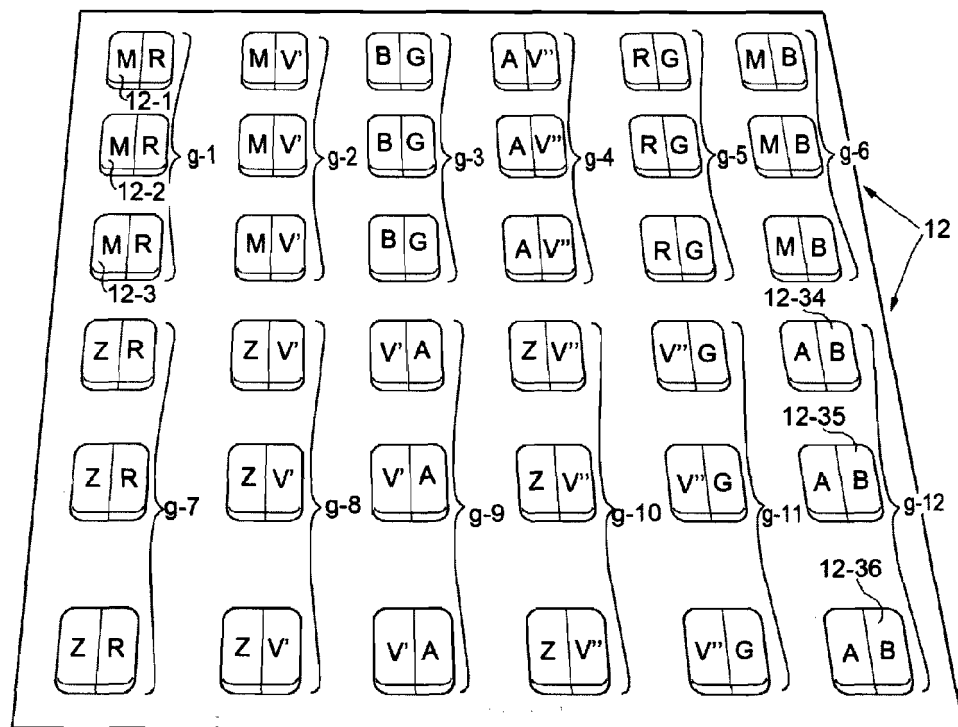


Fig. 9

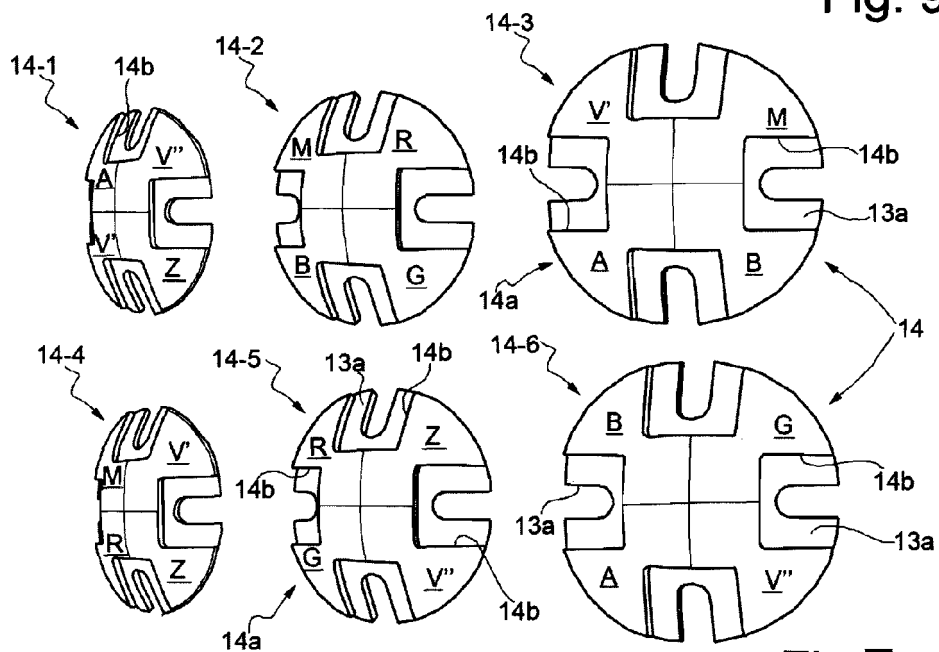


Fig. 7



EUROPEAN SEARCH REPORT

Application Number
EP 11 18 4748

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	SU 1 161 125 A1 (EVDOKIMOV VLADIMIR S) 15 June 1985 (1985-06-15)	1-6	INV. A63F9/08
Y	* column 1, line 12 - column 2, line 31; figures 1-5 *	7-10	
A	US 5 215 305 A (HSUN YAN-JU [TW]) 1 June 1993 (1993-06-01) * claims 1-5; figures 1-6 *	1-6	
Y	US 5 389 063 A (WU OTTO [TW]) 14 February 1995 (1995-02-14) * abstract; figures 1-3 *	9	
Y	US 2007/057456 A1 (LIU XUELIANG [CN]) 15 March 2007 (2007-03-15) * claims 1-8; figures 1-3 *	7-10	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A63F
Place of search		Date of completion of the search	Examiner
Munich		6 February 2012	Shmonin, Vladimir
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

2

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 18 4748

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

06-02-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
SU 1161125 A1	15-06-1985	NONE	
US 5215305 A	01-06-1993	NONE	
US 5389063 A	14-02-1995	AU 651054 B3	07-07-1994
		CA 2102588 A1	06-05-1995
		FR 2712489 A3	24-05-1995
		GB 2283175 A	03-05-1995
		US 5389063 A	14-02-1995
US 2007057456 A1	15-03-2007	CN 1876209 A	13-12-2006
		EP 1769829 A1	04-04-2007
		JP 3124602 U	24-08-2006
		US 2007057456 A1	15-03-2007

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 201283216 Y [0008]
- CN 101007214 A [0008]
- CN 2638800 Y [0008]
- CN 2618652 Y [0008]
- CN 2564210 Y [0008]
- CN 2423003 Y [0008]
- CN 2445783 Y [0008]
- CN 2290370 Y [0008]
- CN 2191015 Y [0008]
- CN 2346475 Y [0008]
- US 5816571 A [0009]
- CN 2734287 Y [0009]
- US 5575476 A [0010]