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(11) **EP 1 190 753 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication: **27.03.2002 Bulletin 2002/13** (51) Int Cl.7: **A63H 33/18, A63B 43/06**

(21) Application number: **01307893.6**

(22) Date of filing: **17.09.2001**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

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(30) Priority: **19.09.2000 JP 2000282905**
03.07.2001 US 897597

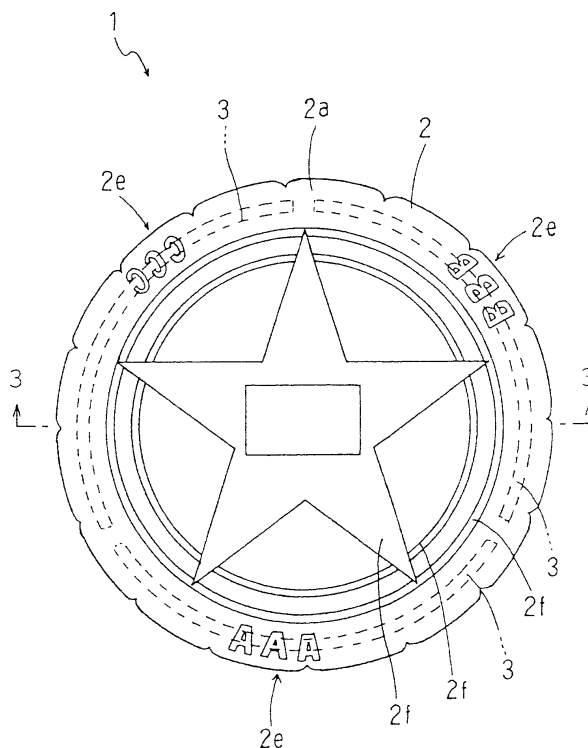
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(54) **Revolving and flying toy**

(57) A highly entertaining revolving and flying toy is described. It can be manufactured at low cost and can be seen in the dark. A revolving disk-shaped body (2) which may be made of plastics and be inflatable to form

a relatively rigid flying disc, comprises means such as an insert pocket (2g) into which one or more containers containing a chemiluminescent pair of reactants held separate until use by a separating member, for example a chemical luminous body (3), may be placed.

FIG. 1



Description

[0001] This invention relates to a revolving and flying toy, designed to be played with by being thrown into the air so that it revolves as it flies.

[0002] A well-known such toy has been widely commercialised under the Trade Mark FRISBEE. Such toys are very popular, but have the disadvantage that they are unsuited for playing with after dark or in a dark place. To solve this problem, luminous paint has been applied to such toys so that they can be seen in the dark, but there has been little of an entertaining nature in the luminescence itself. The problem underlying the invention is accordingly to develop such toys so as to provide a highly entertaining revolving and flying toy which can be seen in the dark and manufactured at low cost.

[0003] To achieve this object, the present invention provides a flying body with the characterising features as set out in the main claim. Further developments are evident from the subsidiary claims.

[0004] Broadly, the revolving and flying toy of the invention comprises a flying body to which is fitted at least one luminous body, the luminous body being designed to emit light by a chemical reaction between two types of chemical liquids which can be caused to emit light by mixing. These are separately stored, or with the remainder of in the revolving and flying toy prior to use. When the toy is to be used, a separating portion keeping the two types of liquid from reacting is broken by outside force, the chemical liquids mix together and thereby emit light. By suitable choice of materials for the liquids, the colour, intensity and duration of light emission may be adjusted as desired.

[0005] Such pairs of liquids, which emit light by chemiluminescence on being mixed are widely known. Mixing provokes a chemical reaction, generally between an oxidising liquid and a liquid capable of luminescence. Known oxidisers, in this connection, are dimethyl phthalate, H_2O_2 (hydrogen peroxide) and sodium salicylate. Known fluorescent liquids include fluorescent substances based on dimethyl phthalate. Generally one liquid is contained in an ampoule made of thin glass, and located in a cylindrical plastics container which also contains the other liquid, and which can be bent if it is desired to break the ampoule. When the cylindrical container is bent and the ampoule broken, the two types of liquid mix together and emit light. The colour of the emitted light depends on the chemiluminescent materials, and on whether one or more of the liquids, one or more parts of the cylindrical container, or one or more parts of a sheet mounted on the cylindrical container or one or more parts of an insert pocket forming part of the flying body, is coloured. The colour of the light emitted may, if desired, be adjusted by these means or in any other known way.

[0006] The toy is preferably manufactured from a soft material capable of folding and fabricated to form a ring-shaped air bag, preferably with an air opening through which air may be blown into or released from the air bag

so as to inflate or deflate it, the shape of the inflated air bag being a disk.

[0007] The structure of the inflatable body should enable the container(s) of chemical luminous materials to be placed in or on the body and also to be removed freely therefrom after the light emission has died down, for example by providing an insert pocket to which the chemical luminous body can be inserted. The body may be arc-shaped and positioned to appear as a narrow ring of light when the toy is being used, i.e. thrown spinning into the air.

[0008] The containers may be attached to or incorporated in pockets in the inflatable body during manufacture, and, by suitable design, the body may then be folded and packed without breaking the separating portions therein (which would lead to premature reaction and the toy, when unpacked, no longer being capable of emitting light). Alternatively, the inflatable body and the containers may be packed separately and assembled together by the user.

[0009] At least a portion of the disk-shaped body may be transparent or translucent. Means may be provided to enable the revolving and flying toy to emit light in a plurality of colours, which may be positioned so as to mix when the toy is spinning to produce further colour sensations.

[0010] Letters, drawings or patterns may be placed on the surface of the revolving disk-shaped body so as to be visible on the surface when the toy is emitting light.

[0011] The present invention is illustrated by way of example with reference to the accompanying drawings in which:

Figure 1 is a plan view of a first embodiment of a revolving and flying toy according to the invention;

Figure 2 is a bottom view of the toy of Figure 1;

Figure 3 is a sectional view taken along the lines 3-3 in Figure 1;

Figure 4 is a sectional view similar to Figure 3, but illustrating the toy deflated;

Figure 5 is a detailed view of part of the toy of Figure 1;

Figure 6 is a diagrammatic plan view of a second embodiment;

Figure 7 is a diagrammatic section of a chemical luminous body for use in the invention;

Figure 8 is a cross-sectional view of the body along the line 8-8 in Figure 7;

Figure 9 is a diagrammatic plan view of a third embodiment;

Figure 10 is a diagrammatic plan view of a further embodiment;

Figure 11 is a diagrammatic plan view of a fifth embodiment;

Figure 12 is a diagrammatic plan view of a further embodiment adapted to be folded for transportation and storage;

Figure 13 is a diagrammatic plan view of the toy of Figure 12 folded at lines 13-13 and 13'-13'; and

Figure 14 is a view of the fully folded toy of Figure 12 folded at lines 14-14 and put into a box.

[0012] The embodiment shown in Figures 1 to 5 consists of a revolving and flying toy 1 which has a revolving disk-shaped body 2 which is made of a soft material, e. g. plastics sheet 2a, to which is attached an air bag 2b mounted on the lower part of the revolving disk-shaped body 2. A transparent and arc-shaped insert pocket 2g is mounted below sheet 2a. The upper surface of the revolving disk-shaped body 2, i.e. sheet 2a, is made of a soft material, which is capable of transmitting light, and which is decorated with a plurality of colours to form letters 2e and patterns 2f on the surface of the body 2. Air bag 2b may be inflated via an air inflation opening 2c. Each insert pocket 2g has an insertion opening 2h at one end enabling a chemical luminous body 3 to be slipped therein. Body 3 consists of an outer cylindrical container 3a surrounding a breakable ampoule 3b. Two chemical liquids 3c and 3d are located between ampoule 3b and container 3, and in ampoule 3b, respectively (see Figures 7 and 8). Ampoule 3b is easily broken. The disk-shaped section 2a is preferably of transparent plastics film and of a circular shape. The air bag 2b may be made by placing two soft plastics film annuli together, the external diameter of which are substantially identical to that of the disk-shaped section 2a. The edges of the inner circumference and the edge of the outer circumference may then be welded to form the inflatable air bag 2b, which is conveniently welded at its outer circumference to the edge of the disk-shaped section 2a. The insert pockets 2g which are arc-shaped, belt-shaped and transparent, may be made of a soft plastics film likewise welded to the film of air bag 2b. This insert pocket 2g, as shown in Figure 5, is bag-shaped wherein two longer sides and one shorter side of the edges of the outer circumference of the insert pocket 2g are attached to the lower side of the air bag 2b, the remaining side being left not welded to bag 2b, so as to form opening 2h. Through this opening 2h, body 3 can be inserted into the insert pocket 2g on the air bag 2b. Three insert pockets 2g are mounted on three places on the lower side of the air bag 2b, as shown in Figures 1 and 2. In place of welded assembly, the parts may be adhered together.

[0013] On the upper side of the revolving disk-shaped body, i.e. on sheet 2a, there is provided the drawing section 2f consisting of a combination of two circumferential lines and a star shape, the star shape having a rectangular-shaped section in its centre. Further, lettering 2e can be provided on the outer circumferential side of the drawing section 2f and on the upper side of the disk-shaped body 2.

[0014] In order to play with the revolving and flying toy 1 of the present invention, air is first blown into air bag 2b through the air inflation opening 2c. When the air bag 2b is inflated, changing from the state shown in Figure 4 to that shown in Figure 3, it has doughnut shape defining the shape of the revolving disk-shaped body 2. When play is to commence, a force is applied to bend the chemical luminous body 3, causing the ampoule 3b placed inside the container 3a to break, thereby mixing liquid 3c and liquid 3d together, which mixture then emits light by a chemical reaction. The now luminous body 3 is then placed on the revolving disk-shaped body 2 by inserting it into the insert pocket 2g through the opening 2h as shown in Figure 5. In this way, three chemical luminous bodies 3, which may be identical or which may emit light of different colours, are put in place.

[0015] The chemically luminescing bodies 3 render the revolving disk-shaped body 2 highly conspicuous which is especially entertaining if the three bodies 3 emit light of different colours, since then, when it is thrown spinning into the air, the emission of light with three different colours makes it look like a ring shape of a combination colour. Letter sections 2c that are put in three places appear with different colours so as to be recognisable and stand out. Furthermore, the drawing sections 2 stand out in the light emitted by the chemical luminescent bodies 3. Different drawings enable different toys to be recognisable even if a plurality of such toys are being used in one place such as a beach or public park. Moreover, by emitting light in this way, the toy 1 is unlikely to be lost even if used in the dark and during the dark hours, as it is easy to locate even when it flies out of sight.

[0016] Because the chemical luminous body 3 is freely removable, it is possible to exchange one chemical luminous body 3 for one emitting a different colour.

[0017] A further advantage of the embodiment of Figures 1 to 5 is that because the revolving disk-shaped body 2 has an inflated air bag 2b, while so inflated, it will float on water, so reducing the chances of losing the toy if being played with by a river or lake, or by the sea. The inflatable structure is also very safe, as even if the flying toy 1 is thrown into the air accidentally hits a person or object the chances of injury to the person or breakage of the object are minimal.

[0018] After the use of the toy 1, the chemical luminous bodies 3 can be removed simply by being pulled out from the insert pockets 2g. Next, the air is released from the bag 2b through the air inflation opening 2c so the toy becomes as shown in Figure 4. Since it is made

of a soft plastics material, it is possible to carry or store the toy 1 by folding it to make it compact, which is very convenient, e.g. enabling the folded toy to be put into a garment pocket, which makes it possible to carry it readily.

[0019] Other examples of the embodiments of the revolving and flying toy are shown in Figures 6 and 9 to 14. In Figure 6, the chemical luminous bodies 3 are mounted directly on the revolving disk-shaped body 2, without pockets. Figure 9 shows a version without radially mounted containers 3, while Figure 10 shows a version with a single extended container 3 forming a diameter of the revolving toy. Figure 11 shows a version with two concentric arcuate containers 3 affixed to the air bag 2b.

[0020] In the embodiment shown in Figures 12 to 14, six chemical luminous bodies are mounted on a revolving disk-shaped body in the form of a hexagonal shape. This arrangement enables the disk-shaped body, when not inflated, to be folded with the chemical luminous bodies already installed, and to be packed in a box. When the toy is to be used, the disk-shaped body is unfolded with the luminous body, i.e. still attached. The bodies can be caused to emit light by bending them without taking them out from the disk-shaped body, either before or after the disk-shaped body is inflated. In this embodiment, since the chemical luminous bodies are already mounted on the disk-shaped body, the player can easily use the toy simply by unpacking and inflating it.

[0021] It is also possible to conceive of designing the toy so that, as the disk-shaped body is inflated, the luminous bodies are stressed so as to break the separating portions and start the light emission, so avoiding the need for the user to carry out the steps of rendering the bodies light emitting and inflating the toy separately.

[0022] The present invention thus provides a highly entertaining revolving and flying toy which can be seen in the dark so as not to be lost and which can be manufactured at low cost. The revolving disk-shaped body can be made of a soft material and include a ring-shaped air bag on its lower part so that it can be folded when not in use making it possible to be stored in a much smaller volume. When in use, it floats on water. The chemiluminescent light source can be easily removed when spent and replaced with a fresh source of chemical illumination. The revolving flying toy looks highly entertaining, especially if the light source is arc-shaped, and if at least a portion of the disk-shaped body is transparent or translucent, the light emission can occur with a plurality of colours, and the conspicuousness of the revolving and flying toy can be further enhanced by providing with letters, drawings or patterns on its surface.

Claims

1. A revolving and flying toy (1), designed to be played

with by being thrown into the air, comprising a flying body (2) and **characterised by** means enabling at least one luminescent container (3) to be attached thereto, and at least one container (3) containing at least two liquids which, when mixed, emit light, and which are kept apart until desired by means of a separating member (3b), whereby when the separating member (3b) is broken by an outer force, the two liquids mix to emit light to enable the flying body (2) to be seen in darkness.

2. A revolving and flying toy according to Claim 1, **characterised in that** the flying body (2) comprises a ring-shaped air bag made of a soft material and capable of folding, the air bag having an air opening (2c) through which the bag may be inflated to form the disk-shaped flying body or air may be released to enable the bag to be folded up.

3. A revolving and flying toy according to Claim 1 or 2, and **characterised by** means (2g) enabling the container (3) to be mounted on the flying body and removed freely therefrom.

4. A revolving and flying toy according to Claim 3 and **characterised in that** the flying body comprises an insert pocket (2g) into which the container (3) may be inserted and from which the container may be removed.

5. A revolving and flying toy according to any one of the preceding Claims, **characterised in that** the container (3) is arc-shaped.

6. A revolving and flying toy according to any one of the preceding Claims, **characterised in that** at least a portion of the flying body (2a) is transparent or translucent.

7. A revolving and flying toy according to any one of the preceding Claims and **characterised by** means enabling the emission of light to occur with a plurality of colours.

8. A revolving and flying toy according to any one of the preceding Claims and **characterised by** letters, drawings or patterns on the surface of the flying body which are visible when the container(s) (3) is/ are emitting light.

9. A revolving and flying toy according to any one of the preceding Claims and **characterised by** means enabling it to be folded for storage or transportation with the container(s) mounted on the flying body (Figures 12-14).

10. A revolving and flying toy according to any one of the preceding Claims and **characterised by** at least

two containers (3) which, when their respective separating members (3b) are broken, emit light of at least two different colours by virtue of chemiluminescence.

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FIG. 1

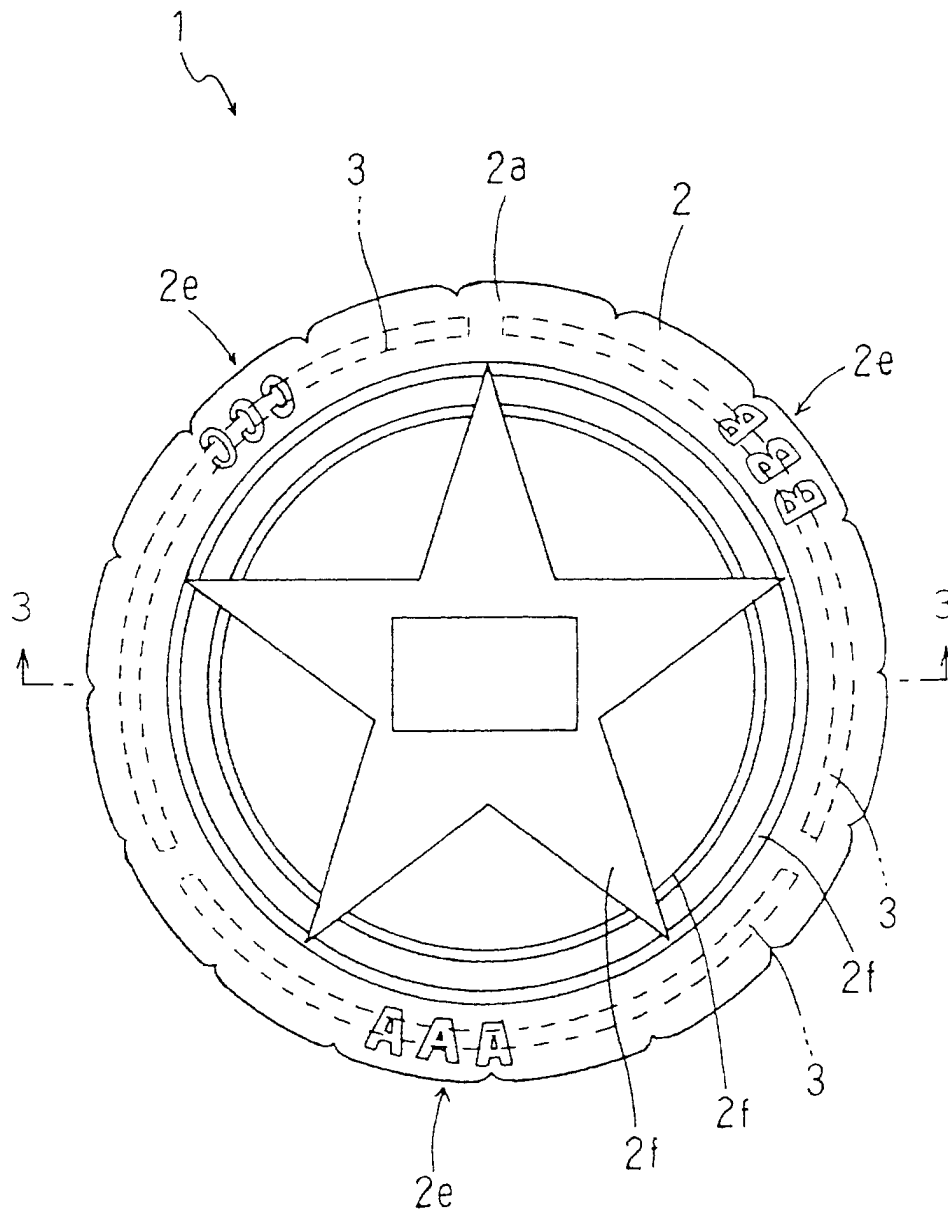


FIG. 2

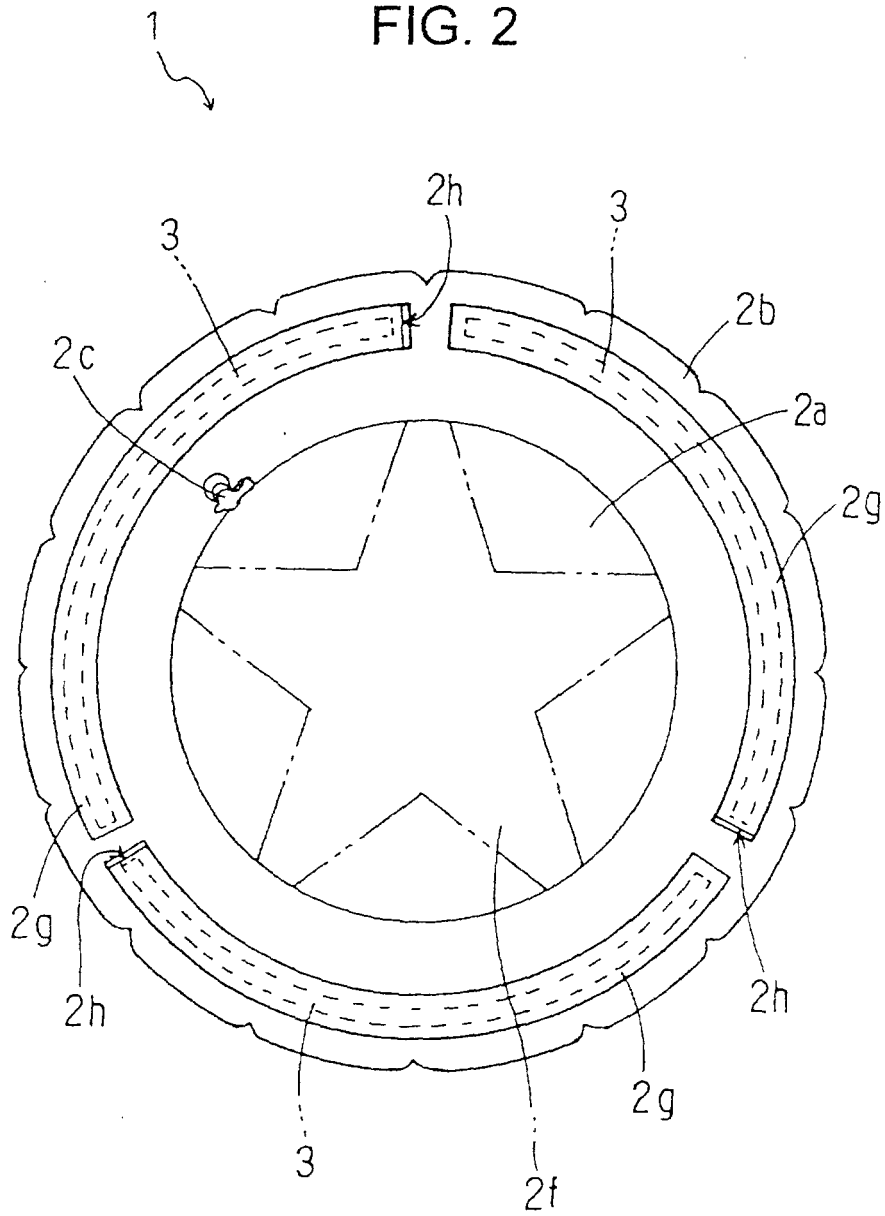


FIG. 3

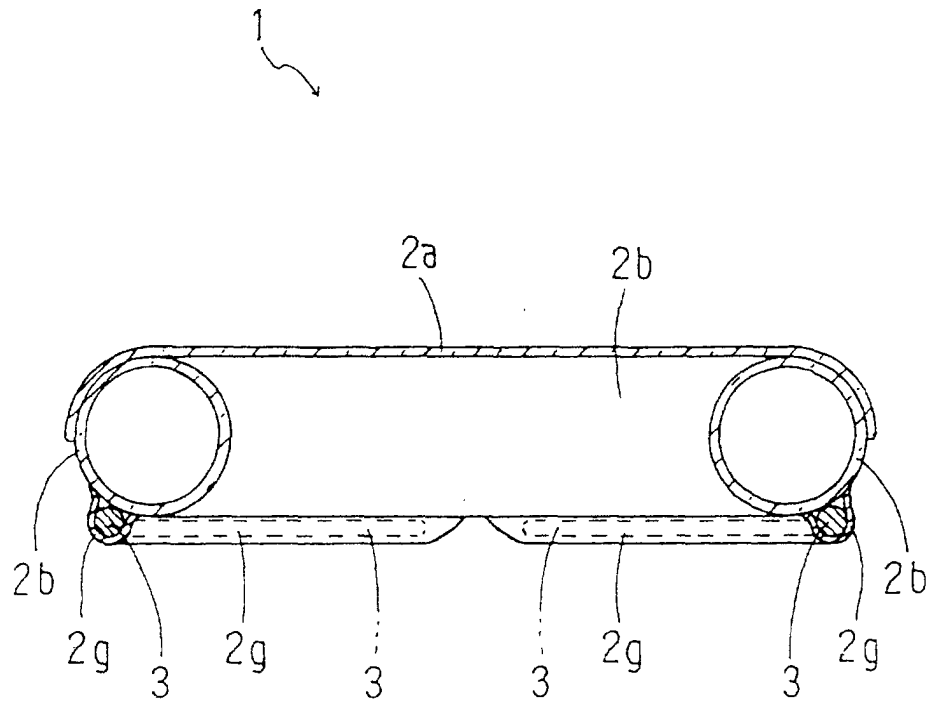


FIG. 4

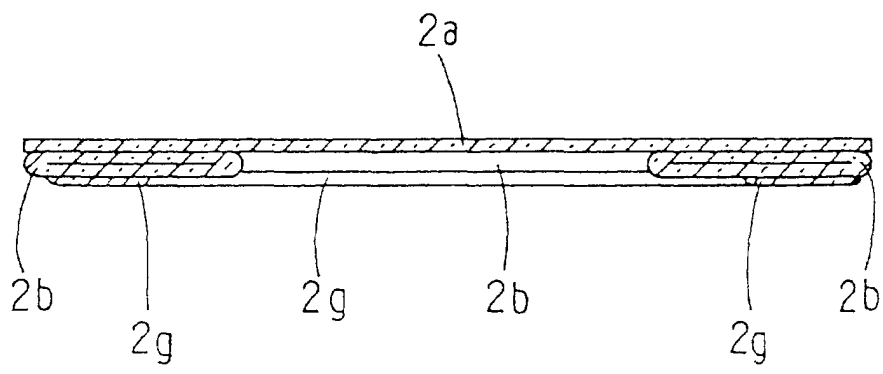


FIG. 5

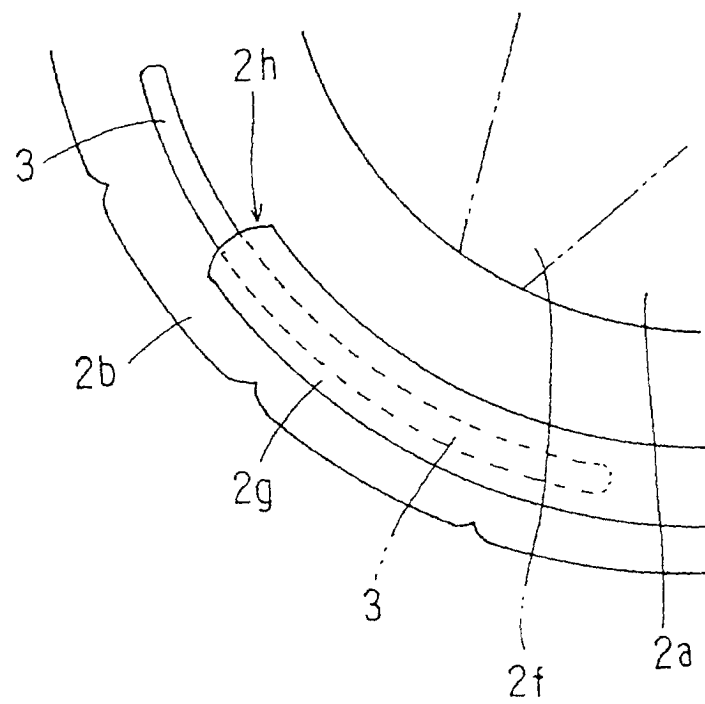


FIG. 6

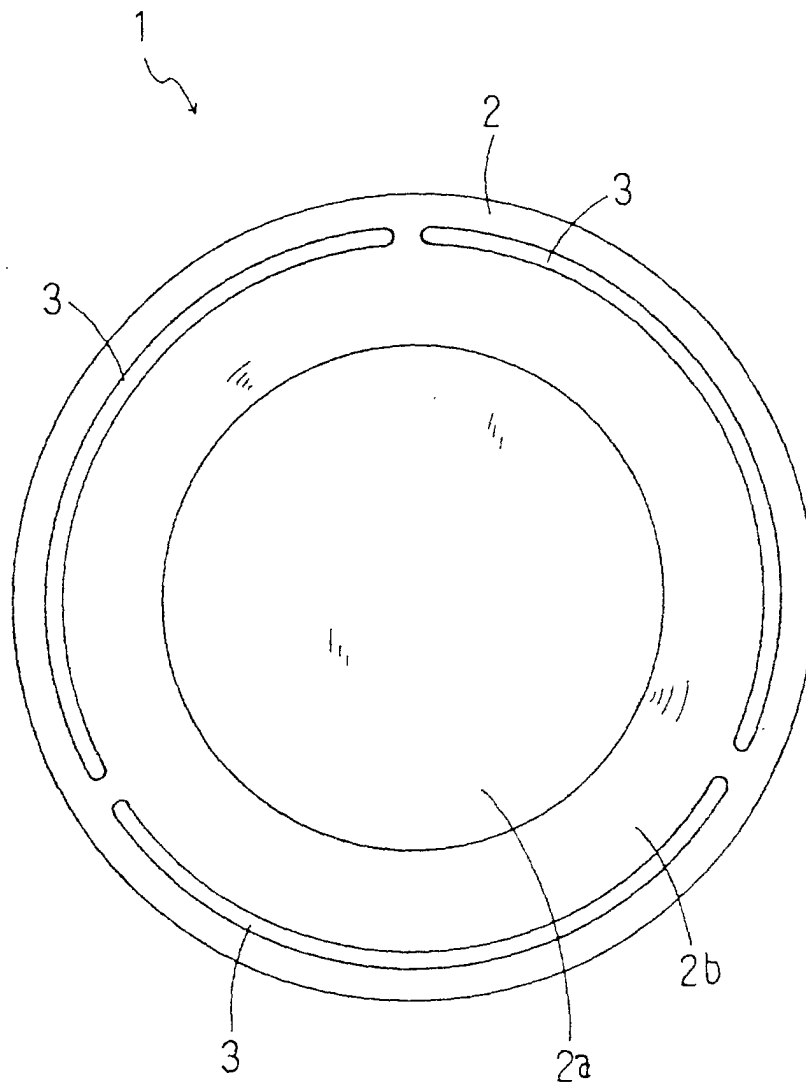


FIG. 7

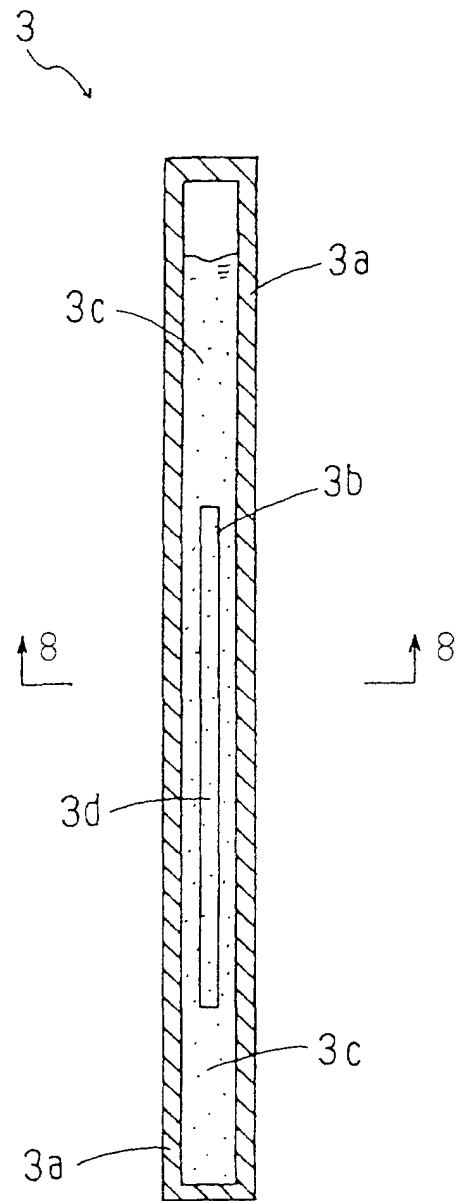


FIG. 8

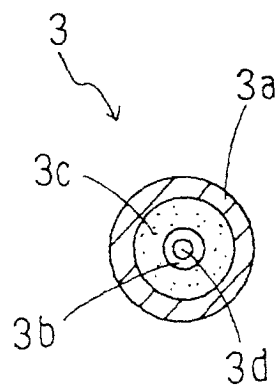


FIG. 9

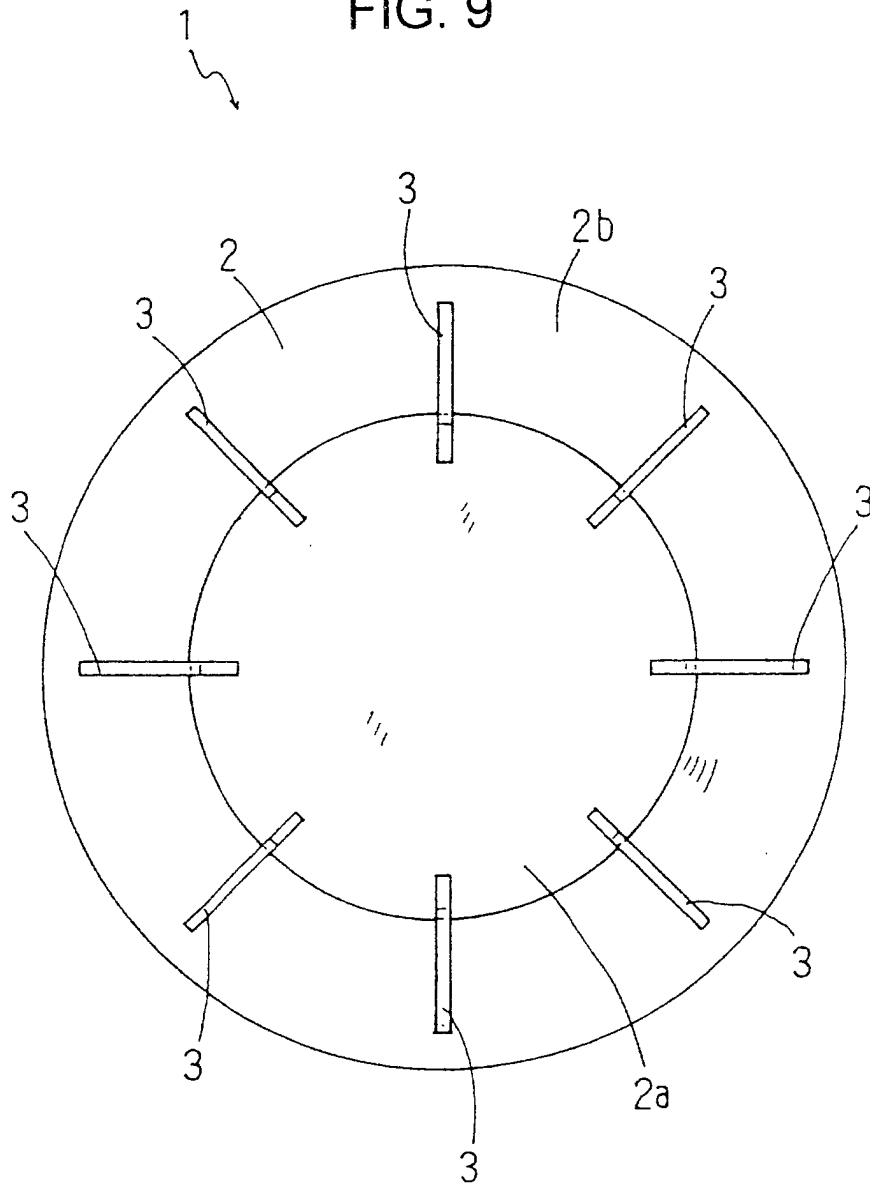


FIG. 10

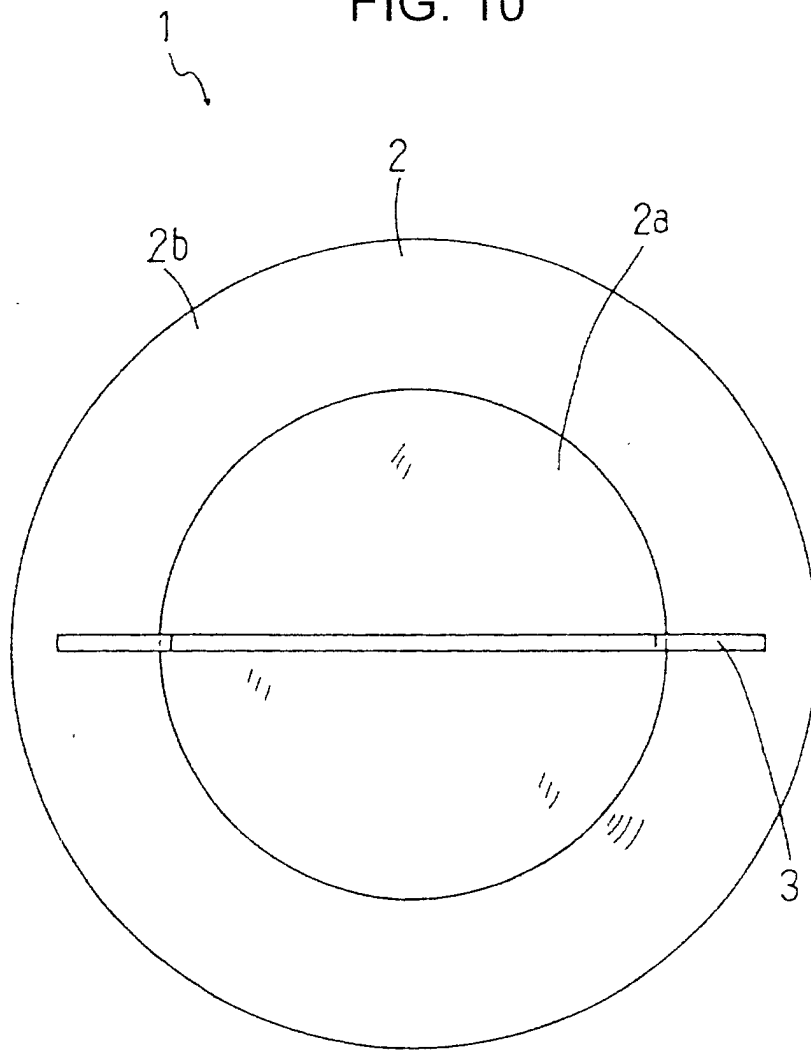
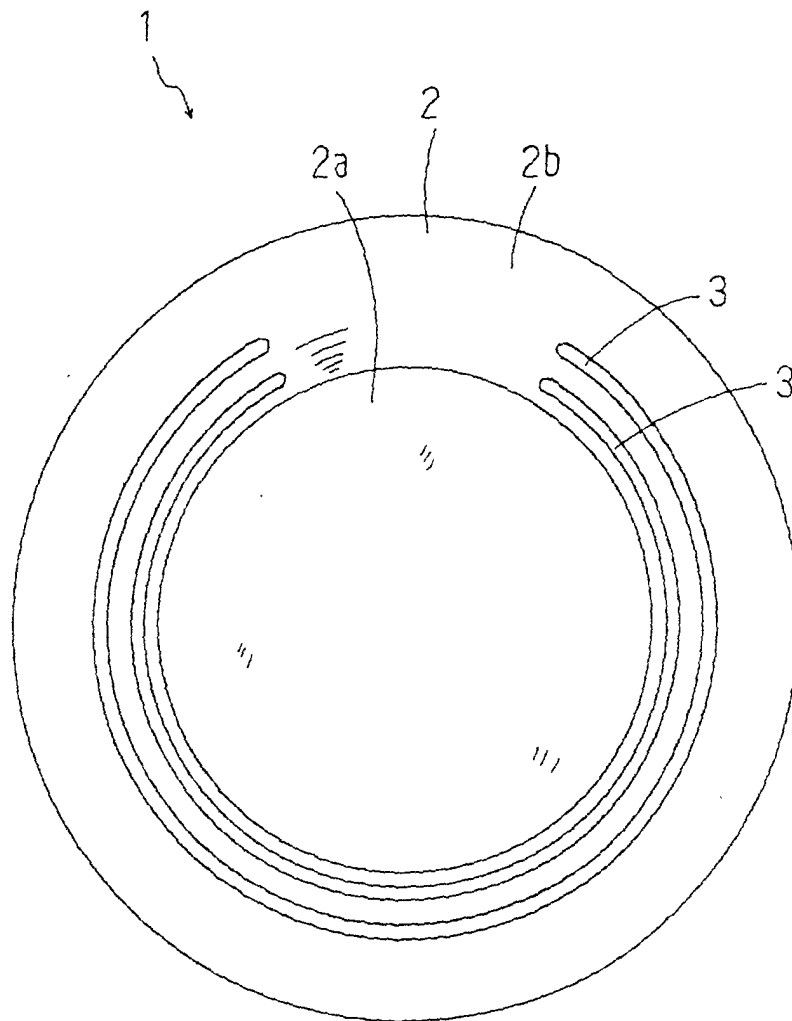


FIG. 11



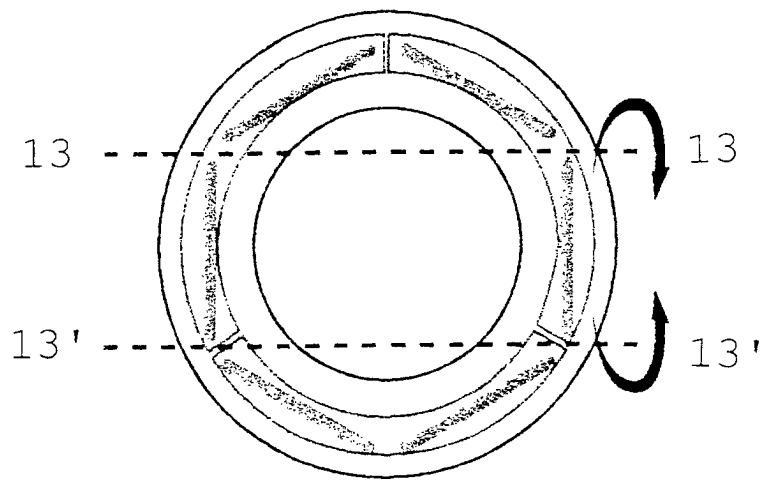


FIG. 12

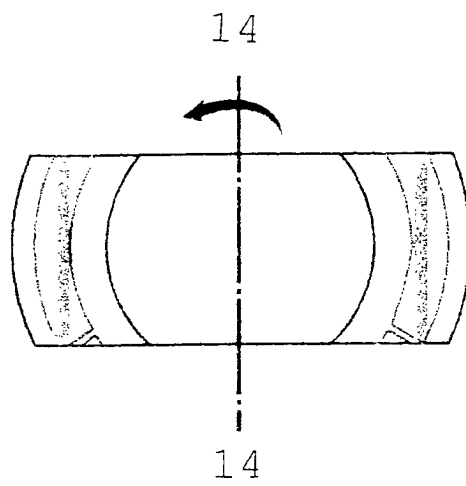
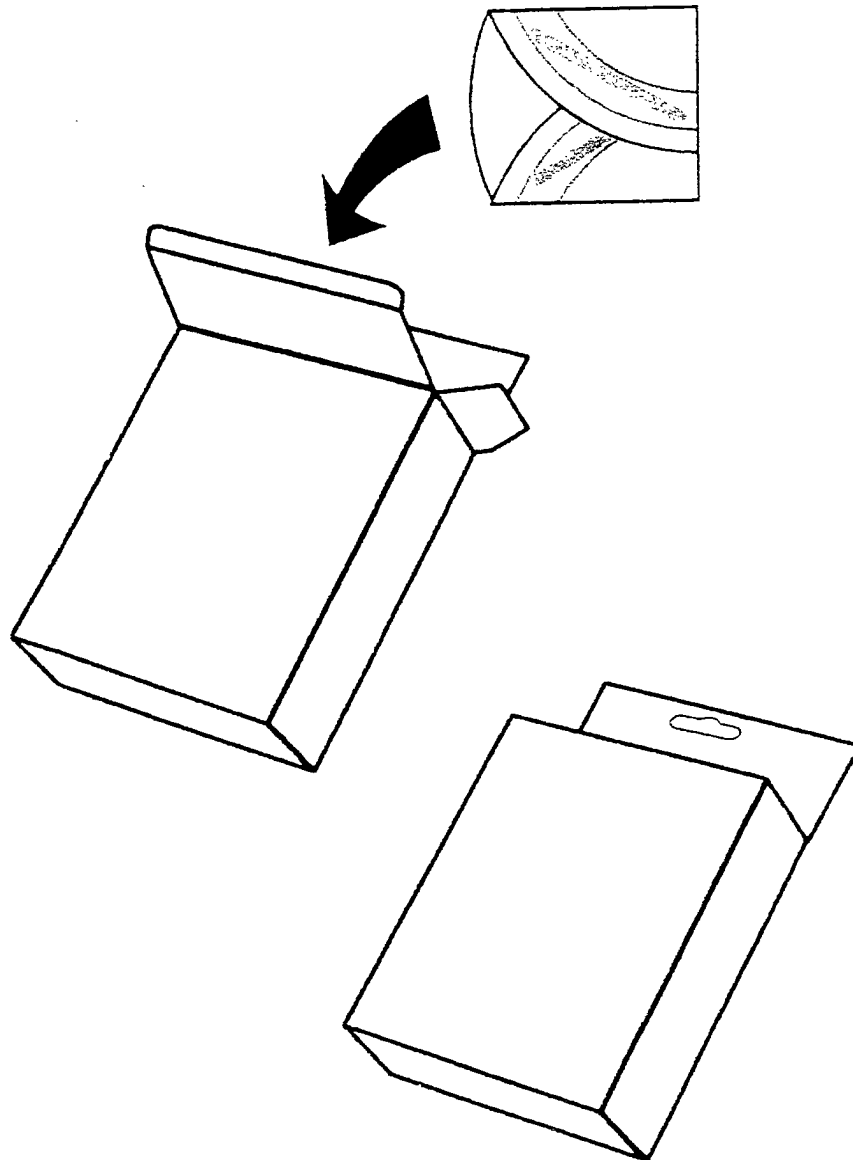


FIG. 13

FIG. 14





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EUROPEAN SEARCH REPORT

Application Number
EP 01 30 7893

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The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 21 January 2002	Examiner Curzi, D
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21-01-2002

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