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- (57) Claim

1. Logical mosaic-puzzle comprising: mosaic toy-elements forming three groups, the toy-elements being arranged in a plurality of at least three circles overlapping one another, a frame surrounding the outer periphery of the circles and in engagement therewith, said frame consisting of an outer casing and an inner clamping-frame inserted in said casing to define a groove therebetween, said groove being in peripheral surrounding relation to said plurality of circles, said toy-elements being connected to each other loosely for turning simultaneously on a plurality of said overlapping circles about the axis of the circles, said turning being restrained in said casing and clamping-frame only by engagement of the casing and clamping-frame with the outer periphery of said circles; the circles each consisting of at least six toy-elements, of which one toy-element forms one of said groups and part of three overlapping circles while the overlapping circles are further formed of toy-elements arranged into two further groups, and which toy-elements include projections and grooves, with the projections of one toy-element extending into the groove of another toy-element and into the groove defined by the casing and clamping-frame to join the elements together and to the casing and clamping frame.

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25 Invention Title:
"Logical Mosaic-Puzzle"

30 The following statement is a full description of this invention, including the
best method of performing it known to us:

LOGICAL MOSAIC-PUZZLE

5 The invention relates to a logical mosaic puzzle.

The most general types of the mosaic puzzles are based on an arrangement in which different elements such as plates are fitted to each other with the aim of producing a pre-determined shape and configuration respectively.

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Mosaic-puzzles, in which the elements start from a given place have been considered as novelties, as the place of one element was left empty, whereby the desired formation or configuration can be obtained by displacing the puzzle-elements. The puzzle elements are provided with colours, numbers or other
15 markings.

A small number of planar toys or toys with a planar effect are available in which motion of the elements is solved in a different way, e.g. by the transformation of spatial possibilities into the plane, so e.g. by means of balls, gears and pins, by
20 sliding elements into one another etc. Far lower is the number of toys in which simultaneously several elements can be put into motion.

The invention relates to a logical mosaic-puzzle with a planar effect in which the elements of the toy - simultaneously a plurality of elements - can be turned to



form the desired configurations. By mixing up the elements several variations may be obtained.

By virtue of shape and easy manipulation, toys according to embodiments of
5 the invention are well suited for the development of logical and combinative abilities. For turning the toy-elements several logical mosaic-puzzles are disclosed in PS-SU-1238773, GB-PS 2199 755 and GB-PS 2 117 256. However, the devices of these prior patent specifications suffer from the disadvantage that the ease of construction and of manipulation have been developed or improved to the detriment of the actual
10 use of the toy.

French patent specifications no. A2, 2489 164 and A1, 2490 102 disclose mosaic-puzzle toys. The toys described in these patent specifications rely on the principle that three circular plates of proper thickness, extending into one another,
15 sliced into curved puzzle-plates can be rotated in respect to each other, thereby mixing up the mosaic-puzzle plates.

The disadvantage of the above patents is that their formation does not allow - because of the spatial sweep - for the elements to be extended in a secure, playable
20 manner. A further disadvantage is that the toys according to the above patent specifications can be produced in series only over a given size-limit. Due to the extreme size of the toy and the risk of it falling to pieces continued use of the toy is not normally possible.



A preferred object of the present invention is the provision of a toy formation which enables an increased number of mosaic plates and by virtue of this increase an increase in the number of possible variations, by which a more exciting and more interesting toy can be formed. Moreover, it preferably enables the production of the
5 toy in the desired size and makes the toy more enjoyable to use.

According to a first aspect of the present invention there is provided a logical mosaic-puzzle comprising: mosaic toy-elements forming three groups, the toy-elements being arranged in a plurality of at least three circles overlapping one
10 another, a frame surrounding the outer periphery of the circles and in engagement therewith, said frame consisting of an outer casing and an inner clamping-frame inserted in said casing to define a groove therebetween, said groove being in peripheral surrounding relation to said plurality of circles, said toy-elements being connected to each other loosely for turning simultaneously on a plurality of said
15 overlapping circles about the axis of the circles, said turning being restrained in said casing and clamping-frame only by engagement of the casing and clamping-frame with the outer periphery of said circles; the circles each consisting of at least six toy-elements, of which one toy-element forms one of said groups and part of three overlapping circles while the overlapping circles are further formed of toy-elements
20 arranged into two further groups, and which toy-elements include projections and grooves, with the projections of one toy-element extending into the groove of another toy-element and into the groove defined by the casing and clamping-frame to join the elements together and to the casing and clamping frame.



In one embodiment of the invention the mosaic puzzle has thirteen toy-elements arranged into three different groups on three circles overlapping one another.

5 In another embodiment of the invention the mosaic puzzle has nineteen toy-elements arranged into three different groups on five circles overlapping one another.

In another embodiment of the invention the mosaic puzzle has sixteen toy-
10 elements arranged into three different groups on four circles overlapping one another.

Preferably the toy-element forming part of three overlapping circles is essentially a prism having the form of a regular arch-triangle surrounded by lateral
15 arches, on each three sides of which a projection is formed.

Preferably, the visible surfaces of the toy-elements are provided with distinguishing colours or other markings, and turning of the different toy-elements included in the casing and the clamping-frame respectively can take place
20 simultaneously from two sides of the space only, as a consequence the planar characteristics of the toy change it into a solid.

Embodiments of the invention will now be described by way of example only with reference to the accompanying drawings in which:-



- Figure 1 is the top view of an embodiment of the invention having three circles of toy-elements;
- Figure 2 is a top view of the casing of the logical mosaic-puzzle of figure 1;
- 5 - Figure 3 is a sectional side-view of the casing as shown in figure 2;
- Figure 4 is a top view of the clamping-frame shown on figure 1;
- Figure 5 is a sectional side-view of the clamping-frame of figure 4;
- Figure 6 is a top view of a puzzle-element of the logical mosaic-puzzle shown in figure 1;
- 10 - Figure 7 is a side-view of the puzzle-element shown on figure 6;
- Figure 8 is a top view of a puzzle-element arranged in the second group of the logical mosaic-puzzle shown in figure 1;
- Figure 9 is a side-view of the puzzle-element as shown in figure 8;
- Figure 10 is a top view of a further puzzle-element of the logical mosaic-puzzle shown on figure 1;
- 15 - Figure 11 is the side view of the puzzle-element as shown in figure 10;
- Figure 12 is the top view of an embodiment of the invention having five circles of toy elements;



- Figure 13 is the top view of an embodiment of the invention having four circles of toy-elements.

The logical mosaic-puzzle as per figure 1 is built-up of 15 elements, which can
5 essentially be divided into two main elements a casing (1) and a clamping-frame



(2) as well as the 19 pieces of moveable toy-elements (3, 4, 5) surrounded by the casing (1) and the clamping-frame (2). The puzzle-elements (3, 4 and 5) can be ranged into three different groups, however in a group the toy-elements have the same shaping. The first group consists only of one element, element no. 3. which is also part of three intersecting circles. This toy-element (3) is essentially a prism having the base of a regular arch-triangle surrounded by lateral arches (12), on each three sides of which a projection (11) can be found in order to assure the connection with the neighbouring puzzle-elements (4). (See figure no. 6 and 7).

The toy-elements (4) belong to the second group, which join on the one hand the puzzle-elements (3) and on the other hand the toy-elements (5) and the total number of the toy-elements (4) is 9. The toy-elements (4) have the form of a prism, surrounded with two convex arch-sides, (13) and a concave arch-side (14) joining these convex arch-sides, the convex arch-sides (13) of the prism are provided with projections (15) joining the toy-element (5), while the concave arch-sides (14) are provided with gooves (19) taking up the projections (11) and (15) resp. of the connecting toy-elements (3) and (4) (see figures 8 and 9).

Finally, to the third group belong (3 pieces) the toy-elements (5) assuring the formation of the three circles, which toy-element (5) is connected to the puzzle-elements (4) and fulfill resp. the free parts of the casing (1) and the clamping-frame (2). The toy-elements (5) of the group have the form of a prism having two concave arch-sides (17) and a convex

arch-side (16) which is provided with a projection (18) joining the suitable part of the casing (1) and the clamping-frame (2) resp. while the concave arch-sides (17) are provided each with grooves (20) and (21) taking
5 up the projections (15) of the joining elements (4). (See figures no. 10 and 11.)

When assembling the logical mosaic-puzzle of the invention the toy-elements (3), (4) and (5) - the projections (11) (15) and (18) and the grooves (19), (20)
10 and (21) are fitted into each other and placed into the casing (1) so as to form three circles extending parts symmetrically into each other.

When inserting the clamping frame (2) essentially a groove will be formed between the casing (1) and the
15 clamping frame (2) which consist of curved parts. All the grooves and projections of the puzzle are fitting accurately, however loosely. In such a manner it becomes possible that in any position six elements each of one, two or all the three circles could be turned in respect
20 to the other elements independently, by means of two fingers. In accordance with the aim set, from turn to turn we can change the position of the puzzle-elements (3), (4) and (5), one element (3), (4) and (5) each may be transferred from one circle to the other, than to the
25 third, fifth one and back etc. The sense of the game becomes obvious, if visible surfaces of the elements (3), (4) and (5) are provided with distinguishing markings, such as colour or other signs.

In the general form of realization, in the starting
30 position of the toy ~~according to the invention~~ (see



figure 1.) the puzzle-element (3) is arranged in the centre; its colouring corresponds to the colours of the clamping-frame (2) and the casing (1). A circle each (I, II, III) contains independently three puzzle-elements (4) of one type and one puzzle-element (5) of another type. As a matter of fact, due to overlapping, in respect to colours four elements each can be distinguished on each circle, three pieces of the type (4) and one piece of the type (5). Starting position: red: 4a, 5a; green 4b, 5b; blue 4c, 5c; yellow: elements 3, 2, 1. As a general approximation the aim of the game lies in to turn back the elements from any position into the original starting configuration, while obtaining any other configuration can be aimed at, too. Several possibilities of variation render the game increasingly exciting.

Figure 2. shows an embodiment of the invention with five circles, where the number of the puzzle-elements (3), (4) and (5) is 19 and when inserting the clamping-frame (2) a groove will be formed between the casing (1) and the clamping-frame (2) which consist of the curved parts (6), (7), (8), (9) and (10).

In the general form of realization, in the starting position of the toy ~~according to the invention~~ the puzzle-element (3) is arranged in the centre; its colouring corresponds to the colours of the clamping-frame (2) and the casing (1). A central-circle each contains three puzzle-elements (4) of one type and one puzzle-element (5) of another type, while the further circles each contain two puzzle-elements (4) and one puzzle-element (5). As a matter of fact, due to overlapping, in respect to colours three-four elements



each can be distinguished on each circle. As a general approximation the aim of the game lies in to turn back the elements from any position into the original starting configuration, while obtaining any other configuration can be aimed at, too. Several possibilities of variation render the game increasingly exciting.

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Figure 13 shows an embodiment of the invention with four circles, where the number of the puzzle-elements (3), (4) and (5) is 16.

In the general form of realization, in the starting position of the toy the
10 puzzle-element (3) is arranged in the centre; its colouring corresponds to the colours of the clamping-frame (2) and the casing (1). A circle each contains three puzzle-elements (4) of one type and one puzzle-element (5) of another type, while the fourth circle contains two puzzle-elements (4) and one puzzle-element (5). As a
15 matter of fact, due to overlapping, in respect to colours three-four elements each can be distinguished on each circle. As a general approximation the aim of the game lies in to turn back the elements from any position into the original starting configuration, while obtaining any other configuration can be aimed at, too. Several possibilities of variation render the game increasingly exciting. An additional
20 advantage of the invention is, that the surfaces can be used for advertising purposes as well.

Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group
25 of integers but not the exclusion of any other integer or group of integers.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. Logical mosaic-puzzle comprising: mosaic toy-elements forming three groups, the toy-elements being arranged in a plurality of at least three circles overlapping one another, a frame surrounding the outer periphery of the circles and in engagement therewith, said frame consisting of an outer casing and an inner clamping-frame inserted in said casing to define a groove therebetween, said groove being in peripheral surrounding relation to said plurality of circles, said toy-elements being connected to each other loosely for turning simultaneously on a plurality of said overlapping circles about the axis of the circles, said turning being restrained in said casing and clamping-frame only by engagement of the casing and clamping-frame with the outer periphery of said circles; the circles each consisting of at least six toy-elements, of which one toy-element forms one of said groups and part of three overlapping circles while the overlapping circles are further formed of toy-elements arranged into two further groups, and which toy-elements include projections and grooves, with the projections of one toy-element extending into the groove of another toy-element and into the groove defined by the casing and clamping-frame to join the elements together and to the casing and clamping frame.
2. Logical mosaic-puzzle according to claim 1, having thirteen toy-elements arranged into three different groups on three circles overlapping one another.
3. Logical mosaic-puzzle according to claim 1, having nineteen toy-elements arranged into three different groups on five circles overlapping one another.
4. Logical mosaic-puzzle according to claim 1, having sixteen toy-elements arranged into three different groups on four circles overlapping one another.
5. Logical mosaic-puzzle according to claim 1, wherein the toy-element forming part of three overlapping circles is essentially a prism having the form of a regular arch-triangle surrounded by lateral arches, on each three sides of which a projection is formed.



6. Logical mosaic-puzzle according to claim 5, wherein the toy-element is arranged into a second group of elements joining the toy-element and also forming part of overlapping circles, said toy-element is essentially a prism having the form of an arch-triangle surrounded by two convex arch-sides and a concave arch-side
5 joining these convex arch-sides, the convex arch-sides of the prism being provided each with a projection joining neighboring toy-elements, and the concave arch-side being provided with a groove receiving the projections, of neighboring toy-elements.

7. Logical mosaic-puzzle according to claim 6, wherein the number of the toy-
10 elements arranged into the second group is nine.

8. Logical mosaic-puzzle according to claim 6, including thirteen toy-elements forming the second group, which also take part in the formation of further circles and which join the toy-element having a form of an arch triangle.
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9. Logical mosaic-puzzle according to claim 6, including eleven toy-elements forming the second group, which also take part in the formation of further circles and which join the toy-element having a form of an arch triangle.

20 10. Logical mosaic-puzzle according to claim 6, wherein the toy-element forming a third group of the toy-elements joining the toy-elements and filling up free parts of the casing and of the clamping-frame and forming part of said overlapping circles, said toy-elements being a prism having two concave arch-sides and a convex arch-side joining the concave arch-sides, the convex arch-side of the prism is being
25 provided with a projection extending into the groove of the casing and the clamping-frame while the concave arch-sides are provided each with grooves taking up the projections of the neighboring elements.

11. Logical mosaic-puzzle according to claim 10, wherein three toy-elements form
30 the third group.

12. Logical mosaic-puzzle according to claim 10, wherein five toy-elements form



the third group.

13. Logical mosaic-puzzle according to claim 10, wherein four toy-elements form the third group.

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14. Logical mosaic-puzzle according to claim 10, wherein visible surfaces of the toy-elements are provided with distinguishing colors or other markings.

15. Logical mosaic-puzzle according to claim 1, wherein two sides of the toy-elements are accessible whereby turning of different toy-elements included in the casing and the clamping-frame can take place simultaneously from said two sides, as a sequence of which the planar characteristics of the toy change into a solid.

16. Logical mosaic-puzzle according to claim 1 wherein the casing and clamping-frame when assembled together define an opening therethrough, which opening exposes opposite sides of said toy-elements.

17. A logical mosaic-puzzle substantially as hereinbefore described with reference to the accompanying drawings.

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DATED this 13th day of December, 1993.

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25 By Their Patent Attorneys

DAVIES COLLISON CAVE



ABSTRACT

5 The invention relates to a logical mosaic-puzzle
containing toy elements forming three groups. In its
built-up form the toy is arranged in circles (I, II, III)
extending partly into each other in a frame consisting of
two parts (1, 2) in the assembled state of the toy. The
10 toy-elements (3, 4, 5) belonging to the circles (I, II,
III) which are fitted to each other accurately, however
loosely, can be turned simultaneously along the axis of a
circle each in respect to the other circles, further, one
circle each consists of six toy-elements (3, 4, 5), out
15 of which in the starting position one element (3) forms
the part of three circles (I, II, III), said toy-elements
(3, 4, 5) are provided with projections (11, 15, 18)
joining each other, the casing (1) and the clamping frame
(2) respectively and with grooves (19, 20, 21) taking up
20 the projections (11, 15, 18).

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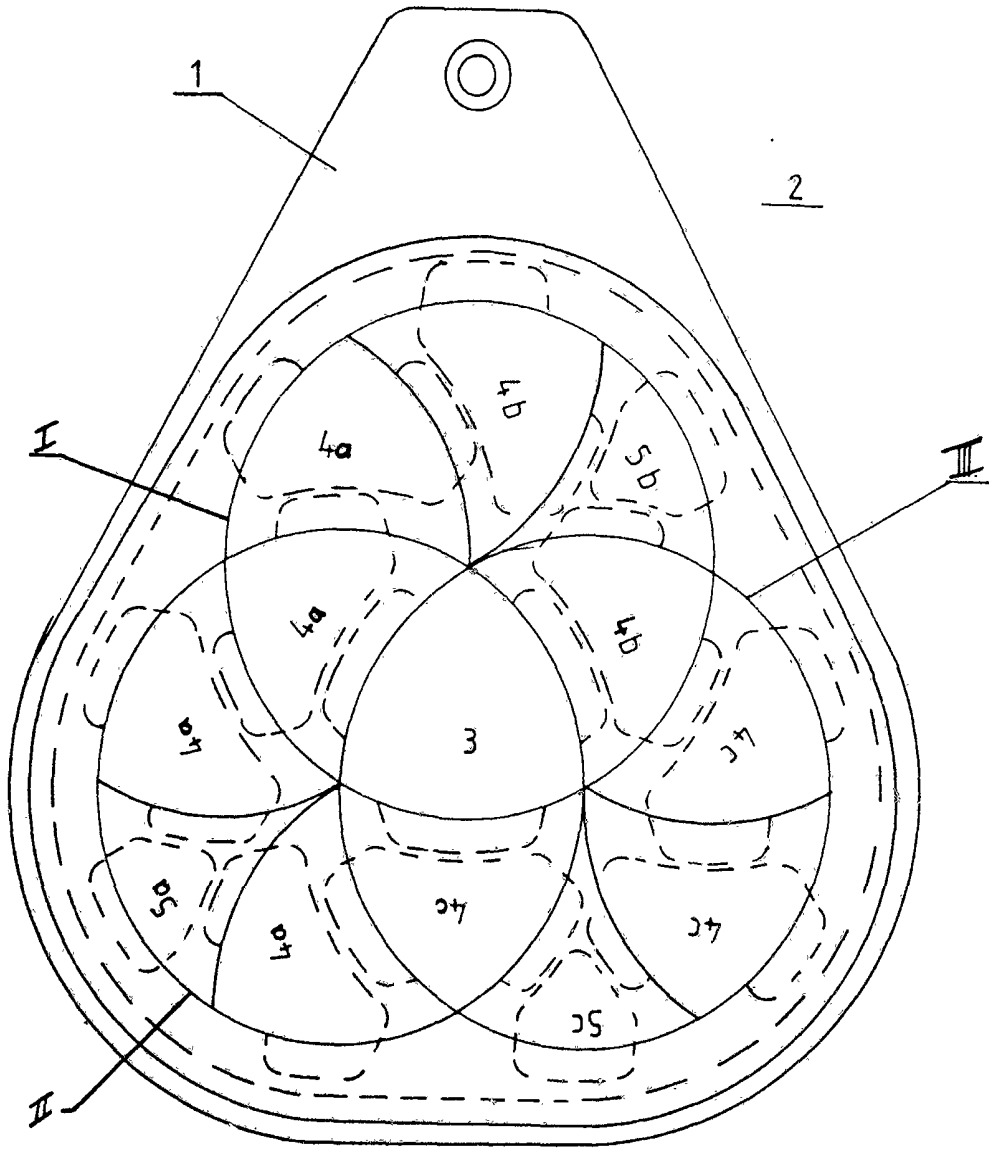


Fig 1

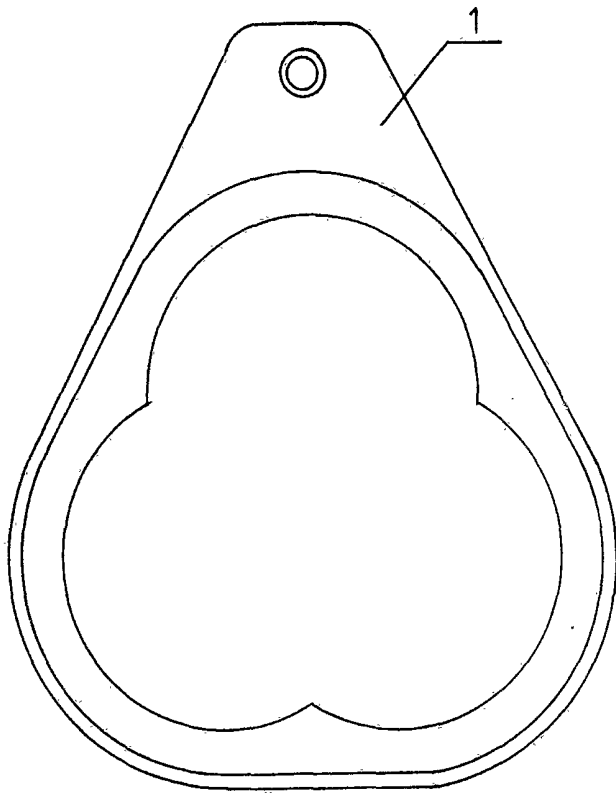


Fig. 2



Fig. 3

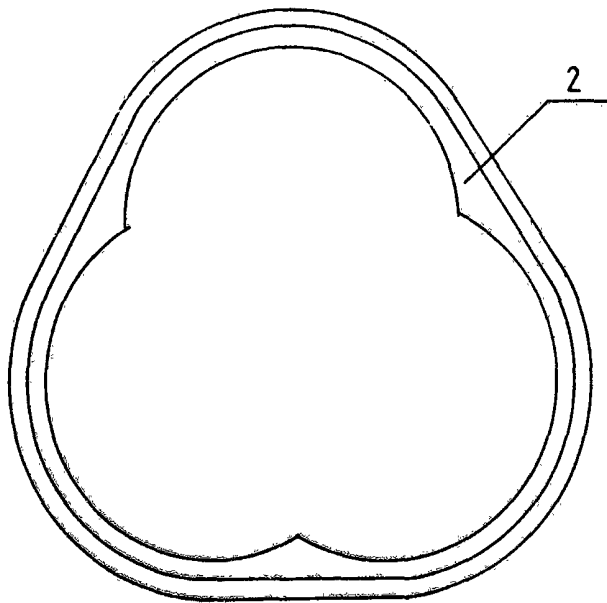


Fig. 4

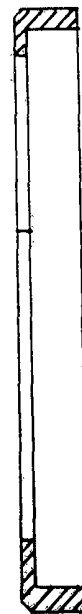


Fig. 5

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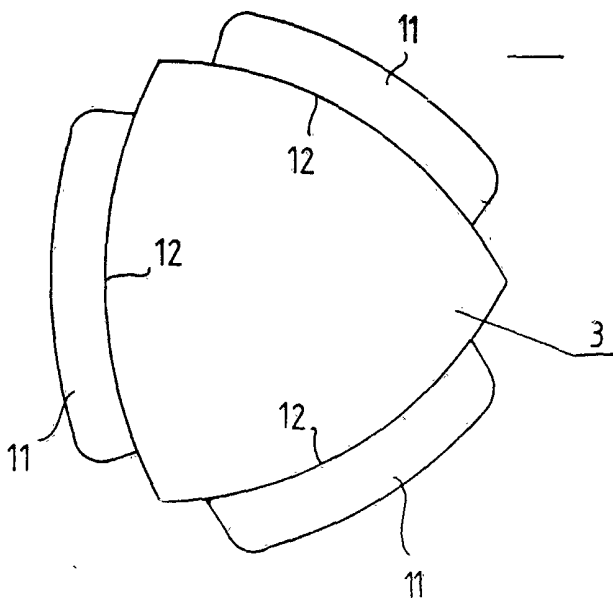


Fig 6

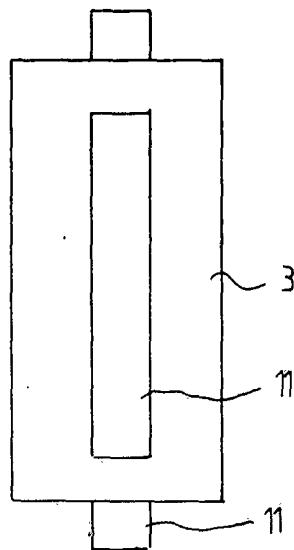


Fig 7

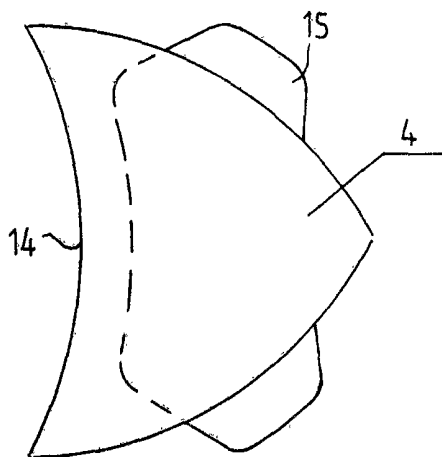


Fig. 8

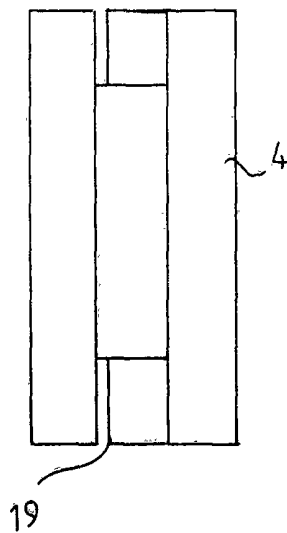


Fig. 9

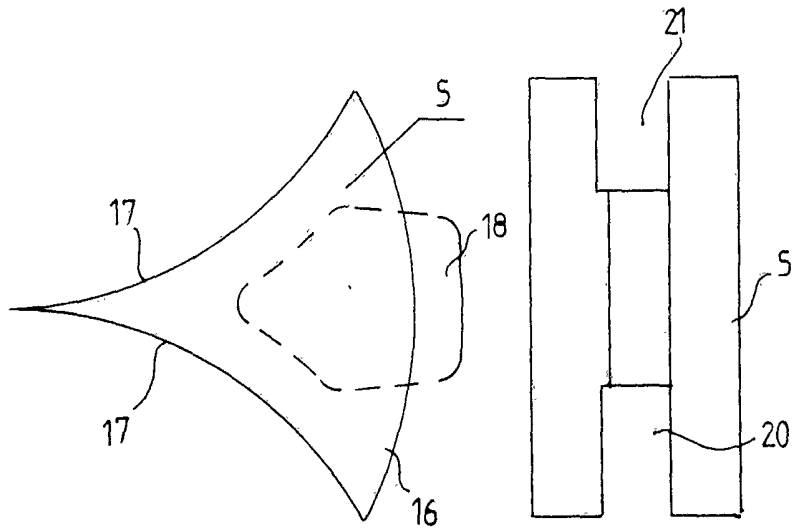
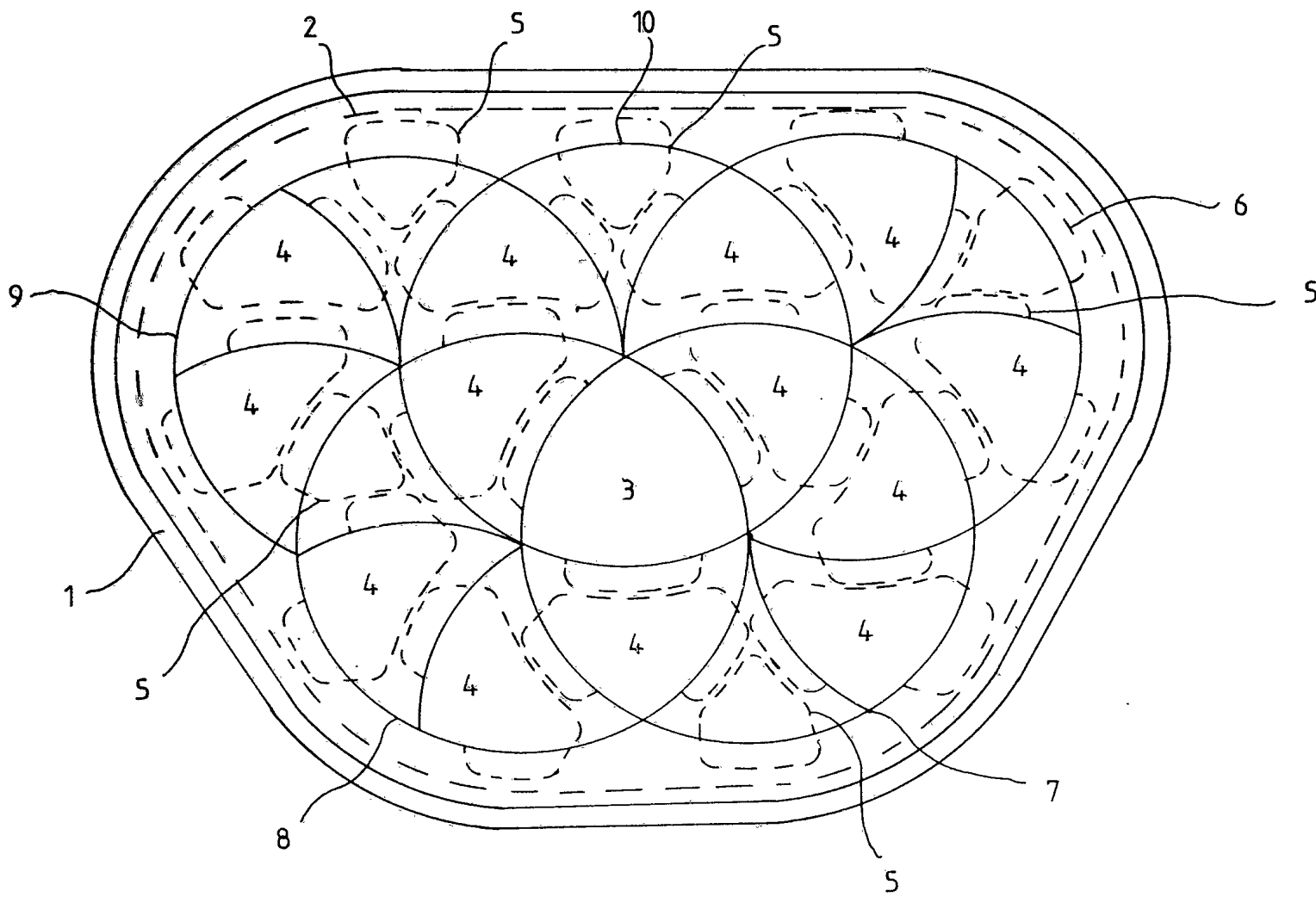


Fig. 10

Fig. 11



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Fig. 12

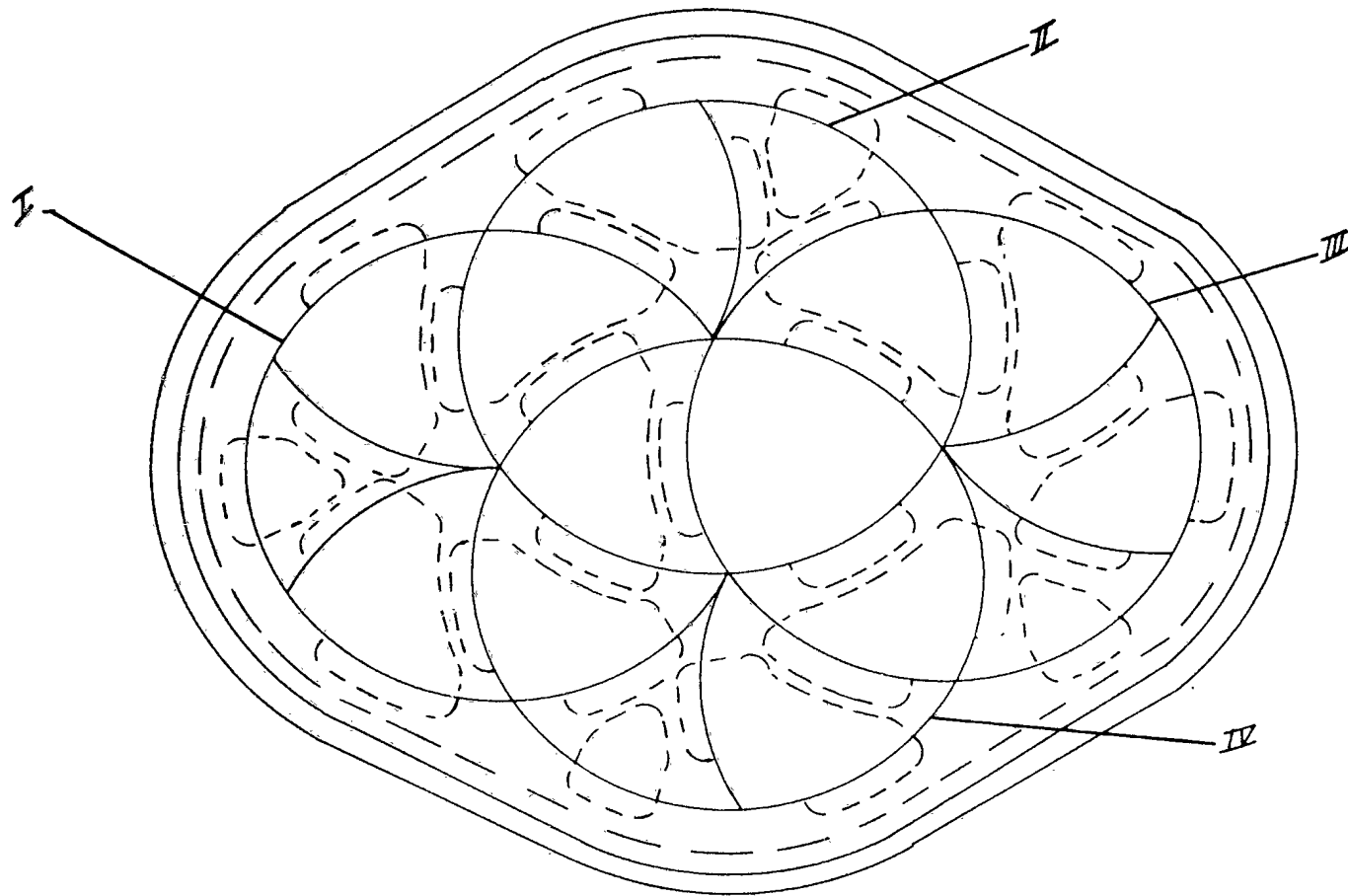


Fig. 13

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