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(54) Puzzle set and puzzle pieces

(57) A puzzle set comprises a first puzzle piece (1) and a second puzzle piece, the first and second puzzle pieces being adapted to allow the second puzzle piece to be juxtaposed with the first puzzle piece (1) at a plurality of possible positions relative to the first puzzle piece (1), one of the positions being an intended position. The puzzle set comprises a detection system for detecting the juxtaposition of the second puzzle piece at a position in a set of possible positions, and a signalling system, interacting with the detection system, and arranged to emit a first output signal only in response to detection of the juxtaposition of the second puzzle piece with the first puzzle piece (1) at the intended position. The signalling system is arranged to emit a second output signal differing from the first output signal only in response to detection of the juxtaposition of the second puzzle piece with the first puzzle piece at at least one further position in the set of possible positions.

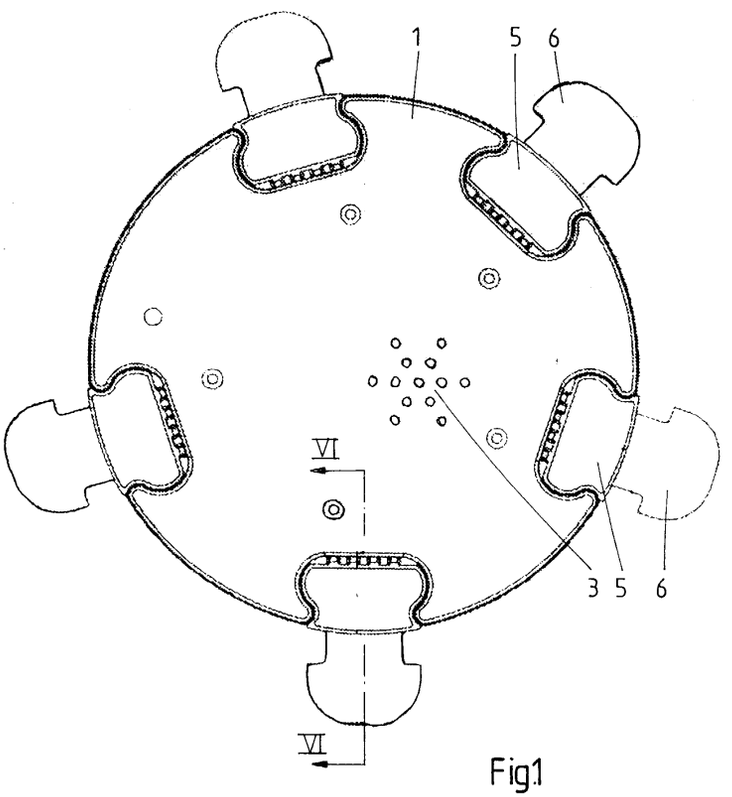

Fig.1

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Description

[0001] The invention relates to a puzzle set, comprising a first puzzle piece and a second puzzle piece, the first and second puzzle pieces being adapted to allow the second puzzle piece to be juxtaposed with the first puzzle piece at a plurality of possible positions relative to the first puzzle piece, one of the positions being an intended position, wherein the puzzle set comprises a detection system for detecting the juxtaposition of the second puzzle piece at a position in a set of possible positions, and a signalling system, interacting with the detection system, and arranged to emit a first output signal only in response to detection of the juxtaposition of the second puzzle piece with the first puzzle piece at the intended position,

[0002] The invention further relates to a first puzzle piece in such a puzzle set.

[0003] An example of such a puzzle set is known e.g. from GB-A-2284359. That publication discloses a range of jigsaws which employ combinations of audio clues and accompaniments. These indicate the correct interrelationship of the pieces. Where regularly-shaped jigsaw pieces are used with no pictures on their surface to provide visual clues for assembly, then a mechanism would allow interrogation of the sound clue associated with each edge of each piece. When two pieces are located, each with a sound clue in common, those pieces should be joined with those edges forming the boundary. The jigsaw would then make the sound as an accompaniment to indicate that the pieces formed the logically correct interrelationship.

[0004] When using the known jigsaw, there is no way of determining whether the jigsaw is still functioning other than to repeatedly try to find the correct position for a puzzle piece until a sound is emitted to indicate that the correct logical interrelationship has been established.

[0005] It is an object of the present invention to provide an alternative puzzle set and a first puzzle piece in such a set as defined above that provides feedback throughout assembly of the puzzle.

[0006] This object is achieved by the puzzle set according to the invention, which is characterised in that the signalling system is arranged to emit a second output signal differing from the first output signal only in response to detection of the juxtaposition of the second puzzle piece with the first puzzle piece at at least one further position in the set of possible positions.

[0007] The second output signal may differ from the first output signal either in type or in content. That is, if the first output signal is a sound, the second output signal may be a different kind of humanly perceptible signal, e.g. a visual signal, or a different kind of sound. In the invention, the first output signal is used to indicate that the second puzzle piece has been placed at the intended position. The second output signal is used to indicate that the second puzzle piece has been placed at an unintended, i.e. 'incorrect' position. Thus, the user is provided with immediate feedback upon placing the second puzzle piece at one of the possible positions. The user need not doubt that the puzzle set is functioning, but knows that another position should be tried.

[0008] In a preferred embodiment, the first and second puzzle pieces comprise locking means, arranged such that the second puzzle piece is interlocked with the first puzzle piece when juxtaposed at each position in the set of possible positions.

[0009] Thus, the locking means define the set of possible positions in a unique manner. Because the second puzzle piece is locked into position, the detection of the juxtaposition of the second piece is facilitated.

[0010] A preferred embodiment comprises at least one further puzzle piece, adapted to be juxtaposed with the first puzzle piece at at least one shared position in the set of possible positions for the second puzzle piece.

[0011] Thus, use of the puzzle set is made more interesting. The player must position the correct one of the second and further puzzle pieces at the shared position, by taking into account, for instance, the markings on the puzzle pieces, or by using the output signal clues that are made available through the use of different output signals.

[0012] Preferably, the detection system is adapted to distinguish between the juxtaposition of the second puzzle piece and the juxtaposition of a further puzzle piece at the shared position.

[0013] Thus, this variant solves the problem that, where two or more puzzle pieces fit into the shared position, it should be possible to provide an audible and/or visible indication of a first type when the correct one has been placed, and an audible and/or visible indication of a different type, when one of the other puzzle pieces has been placed in the shared position.

[0014] In a preferred embodiment, at least one of the second and further puzzle pieces comprises a body and a connector, separately attached to the body and shaped to engage appropriately shaped locking means of the first puzzle piece.

[0015] Where the second and further puzzle pieces are adapted to be interlocked with the first puzzle piece when placed into a shared position, manufacturing is more difficult, since it is not longer possible to die cut the first, second and further puzzle pieces using one cutting die. Because one first part of the cutting die can only separate the first and second puzzle pieces, a different part, or different cutting die, must be used to die cut the further pieces. Differences between the first part of the cutting die and the different part or different cutting die, lead to deviations in shape between the second and further pieces, meaning that the further pieces do not fit very well into the first piece. By using second and further pieces comprising a body and a connector that is separately attached to the body, the connectors of the second and further pieces that fit into a shared position can be shaped identically, e.g. by use of a single die or

mould. This leads to a better fit.

[0016] Preferably, the first puzzle piece comprises the signalling system and the detection system.

[0017] Thus, the use of a separate board or playing surface is avoided. This makes the puzzle set cheaper to manufacture and more compact in size.

[0018] Preferably, the puzzle set comprises a plurality of additional puzzle pieces, adapted to be juxtaposed with the first puzzle piece at at least an associated intended position relative to the first puzzle piece, such that the second and additional puzzle pieces substantially encircle the first puzzle piece when each is at its intended position.

[0019] Thus, when the first puzzle piece comprises the signalling system, a maximum number of other puzzle pieces, i.e. the second and additional puzzle pieces, can be placed at their intended positions with accompanying audio clues.

[0020] According to another aspect of the invention, there is provided a first puzzle piece in a puzzle set according to the invention, characterised by comprising the signalling means and the detection means.

[0021] The first output signal is used to indicate that the second puzzle piece has been placed at the intended position. The second output signal is used to indicate that the second puzzle piece has been placed at an unintended, i.e. 'incorrect' position. Thus, the user is provided with immediate feedback upon placing the second puzzle piece at one of the possible positions. The user need not doubt that the puzzle set is functioning, but knows that another position should be tried. This functionality is provided entirely by the first puzzle piece according to the invention, thus providing more feedback to the user of the puzzle set, without requiring a further playing board or other elements in the puzzle set than the second and preferably some further puzzle pieces.

[0022] The invention will be further described with reference to the accompanying drawings, in which:

Fig. 1 is a top plan view of the first puzzle piece and interlocking connectors in an embodiment of the puzzle set,

Fig. 2 is a perspective view of the same embodiment,

Fig. 3 is a perspective inside view of a top housing part of the first puzzle piece in the same embodiment,

Fig. 4 is a bottom plan view of a connector for use in a second or further puzzle piece in the puzzle set,

Fig. 5 is a perspective view of a pin array for the first puzzle piece in the puzzle set,

Fig. 6 is a cross-sectional view along part of section A-A in Fig. 1, showing the connector engaging the locking means of the first puzzle piece.

[0023] The exemplary embodiment of a puzzle set to be described herein comprises a central puzzle piece 1. The central puzzle piece comprises a top housing part 2, shown in perspective from the inside in Fig. 2, and a bottom housing part (not shown). The top housing part 2 and bottom housing part encase a printed circuit board and loudspeaker (not shown), which form a detection and signalling system. Holes 3 in the top housing part 2 allow the sound to escape.

[0024] As shown in Fig. 1, the top housing part 2 comprises five recesses 4, distributed around its circumference. The recesses 4 are each shaped to accommodate one of five connectors 5 fitting substantially exactly into the recesses 4.

[0025] The connectors 5 are adapted to be attached to the body of a circumferential puzzle piece (not shown). Preferably, the circumferential puzzle pieces comprise a laminated cardboard body. A tab 6 of the connector is incorporated into the body as a layer in the laminate. Other means of attaching the connector 5 to the body of the circumferential puzzle piece, for example gluing onto its surface or locking it mechanically, are possible.

[0026] In the shown embodiment, each of the five connectors 5 fits into each of the five recesses 4. The connectors 5 and the recesses 4 thus define locking means arranged such that a circumferential puzzle piece comprising one of the connectors 5 is held tightly in position when juxtaposed with the central puzzle piece 1 with its connector 5 engaged in a recess 4. In the shown embodiment the five recesses 4 define five possible positions in which each circumferential puzzle piece can be inserted. Of course other variants are possible, in which each connector 5 fits only into some of the recesses 4, but not in the others. Also, the shapes of the circumferential puzzle pieces, which are positioned such that they encircle the central puzzle piece 1, may preclude some of the circumferential puzzle pieces from being placed adjacent each other.

[0027] Preferably, the surface of the top housing part 2 and of each circumferential puzzle piece is provided with some sort of decoration or image giving a clue as to which of the five possible positions is the intended position of the circumferential puzzle piece. When the connector 5 of a circumferential puzzle piece is inserted into one of the possible recesses 4, the circumferential piece is interlocked with the central puzzle piece 1 and its position is precisely defined.

[0028] Referring to Fig. 4, each connector 5 comprises a part including a number of protrusions 7. The number and location of the protrusions 7 differs between connectors 5, such that this part of a connector 5 has a unique shape. It is noted that the unique shape could be provided in another way. For instance, in another embodiment (not shown), each connector comprises a bottom housing and a top plastic cover, in between which is sandwiched a metal plate. The metal plate is differently shaped for each of the connectors fitting into a particular recess. The part of the metal plate that gives it its unique shape protrudes from the connector. The advantage of this alternative embodiment is that each of the

bottom housings can be injection moulded using a single mould specially adapted to the shape of the recesses. The metal piece, which may be die cut, for instance, is the only part unique to each connector, but provides it with a unique shape.

[0029] The purpose of giving each connector 5 a sub-part with a unique shape will be explained with reference to Figs. 5 and 6. Fig. 5 shows a contact array 8, comprising a number of flexible fingers 9. The contact array 8 is advantageously made of metal. It is incorporated into the top housing part 2 of the central puzzle piece 1, such that the flexible fingers 9 protrude through openings 10, shown in Fig. 3. When a connector 5 engages the locking means of the central puzzle piece 1, i.e. is inserted into one of the recesses 4, the sub-part with a unique shape, for example the unique configuration of protrusions 7, makes contact with a sub-set of the flexible fingers 9. Referring to Fig. 6, the locking means of the central puzzle piece 1 comprise a plurality of complimentary electrical contacts 10,11, of which a first one 10 is in contact with one of the flexible fingers 9. If the flexible finger 9 is flexed through contact with the uniquely shaped sub-part of a connector 5, it bends the first contact 10, so that a circuit comprising the first contact 10 and a complimentary second contact 11 is closed. In the shown example, there are four flexible fingers 9 with a corresponding pair of complimentary first and second contacts 10,11 behind each one of them. Thus, the unique combination of flexible fingers 9 depressed through contact with the unique sub-part of a connector 5, results in the closure of a unique combination of electrical circuits. This in turn, results in a unique combination of electrical signals to the printed circuit board (not shown). Thus, the detection system can distinguish between the five connectors 5, and consequently between the circumferential puzzle pieces in which they are incorporated.

[0030] The purpose of being able to determine which connector 5 has been inserted into which recess 4, is to be able to provide an appropriate audio accompaniment after each juxtaposition of a circumferential puzzle piece with the central puzzle piece 1. According to the invention, a sound of a first type is emitted when a circumferential puzzle piece has been incorrectly placed. This is advantageously a voice recording telling the player to try again. If the circumferential puzzle piece has been correctly placed, a message associated with the particular piece is preferably played back. Thus, there could be six different messages, one for a wrongly placed circumferential piece and one for each correctly placed circumferential piece. Of course, the phrase `different output signal' could also refer to the pitch of a whistling sound, a sound not comprising a voice recording, etc. It is further noted that the output signal given need not be an audio signal, but may also be a visible signal, such as the flashing of one or more light-emitting diodes on the central or circumferential piece.

[0031] The invention is not limited to the above-described embodiment, which can be varied in a number of ways within the scope of the attached claims. For instance, other mechanisms for distinguishing between connectors or circumferential puzzle pieces will occur to the skilled person. In addition, further audible or visible rewards in the shape of appropriate output signals may be given upon completion of certain parts or of the entire puzzle.

Claims

1. Puzzle set, comprising a first puzzle piece (1) and a second puzzle piece, the first and second puzzle pieces being adapted to allow the second puzzle piece to be juxtaposed with the first puzzle piece (1) at a plurality of possible positions relative to the first puzzle piece (1), one of the positions being an intended position, wherein the puzzle set comprises a detection system for detecting the juxtaposition of the second puzzle piece at a position in a set of possible positions, and a signalling system, interacting with the detection system, and arranged to emit a first output signal only in response to detection of the juxtaposition of the second puzzle piece with the first puzzle piece (1) at the intended position, **characterised in that** the signalling system is arranged to emit a second output signal differing from the first output signal only in response to detection of the juxtaposition of the second puzzle piece with the first puzzle piece at at least one further position in the set of possible positions.

2. Puzzle set according to claim 1, wherein the first and second puzzle pieces comprise locking means (4,5,8-11), arranged such that the second puzzle piece is interlocked with the first puzzle piece (1) when juxtaposed at each position in the set of possible positions.

3. Puzzle set according to claim 1 or 2, comprising at least one further puzzle piece, adapted to be juxtaposed with the first puzzle piece (1) at at least one shared position in the set of possible positions for the second puzzle piece.

4. Puzzle set according to claim 3, wherein the detection system is adapted to distinguish between the juxtaposition of the second puzzle piece and the juxtaposition of a further puzzle piece at the shared position.

5. Puzzle set according to claim 2 and claim 3 or 4, wherein at least one of the second and further puzzle pieces comprises a body and a connector (5), separately attached to the body and shaped to engage appropriately shaped locking means (4,8-11) of the first puzzle piece (1).

6. Puzzle set according to claim 5, wherein the locking means (4,8-11) comprised in the first puzzle piece comprise a plurality of electrical contacts (10,11) adapted to be brought into contact by a sub-part (7) of the connector (5) when the connector (5) engages the locking means.

7. Puzzle set according to claim 6, wherein each of the second and further puzzle pieces comprises a sub-part (7) having a spatial configuration adapted to close an electrical circuit comprising a sub-set of the plurality of the electrical contacts (10,11) having a composition unique to the second or further puzzle piece when the connector (5) engages the locking means (4,8-11) of the first puzzle piece (1).

8. Puzzle set according to any one of the preceding claims, wherein the first puzzle piece (1) comprises the signalling system and the detection system.

9. Puzzle set according to claim 8, comprising a plurality of additional puzzle pieces, adapted to be juxtaposed with the first puzzle piece (1) at at least an associated intended position relative to the first puzzle piece (1), such that the second and additional puzzle pieces substantially encircle the first puzzle piece (1) when each is at its intended position.

10. Puzzle set according to any one of the preceding claims, wherein the signalling system comprises a device for reproducing a voice recording.

11. First puzzle piece in a puzzle set according to any one of claims 1-10, **characterised by** comprising the signalling system and the detection system.

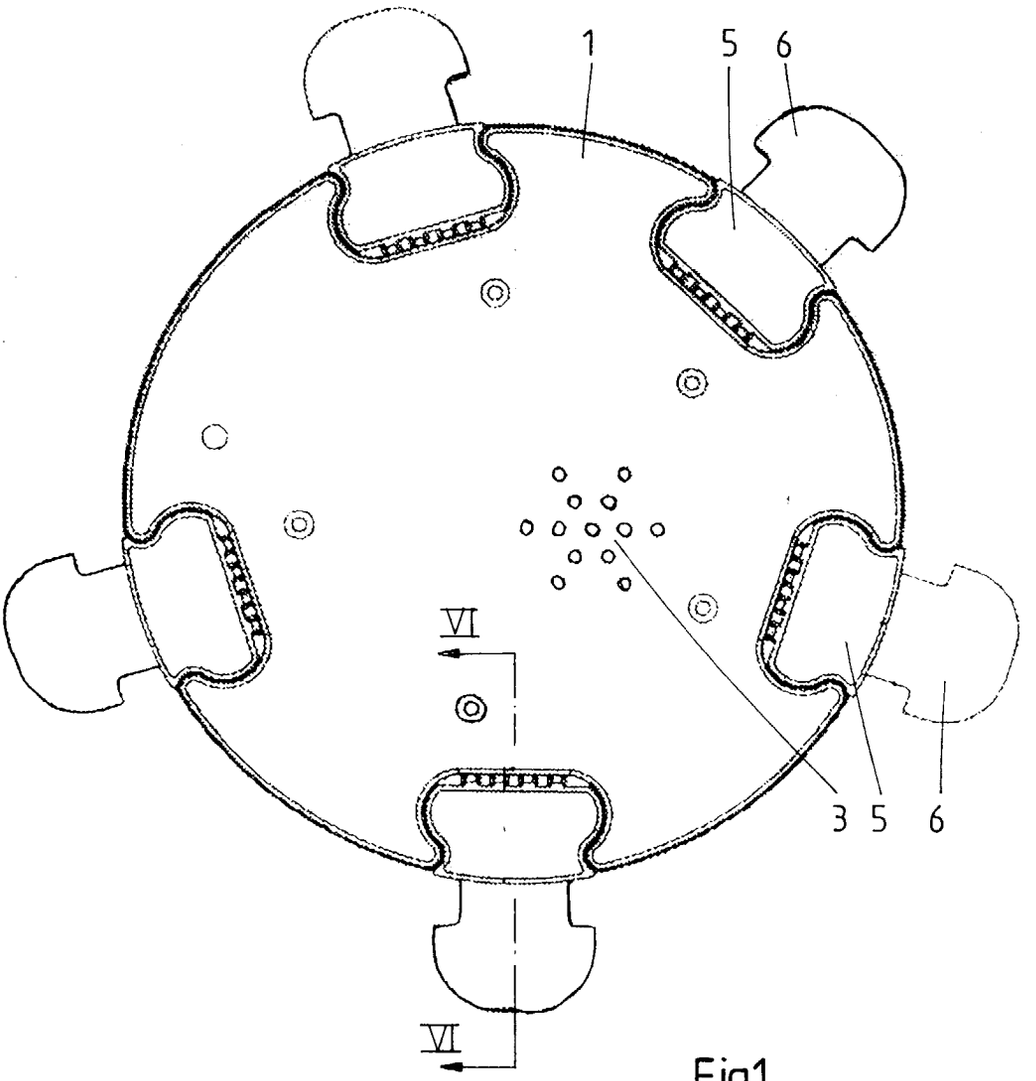

Fig.1

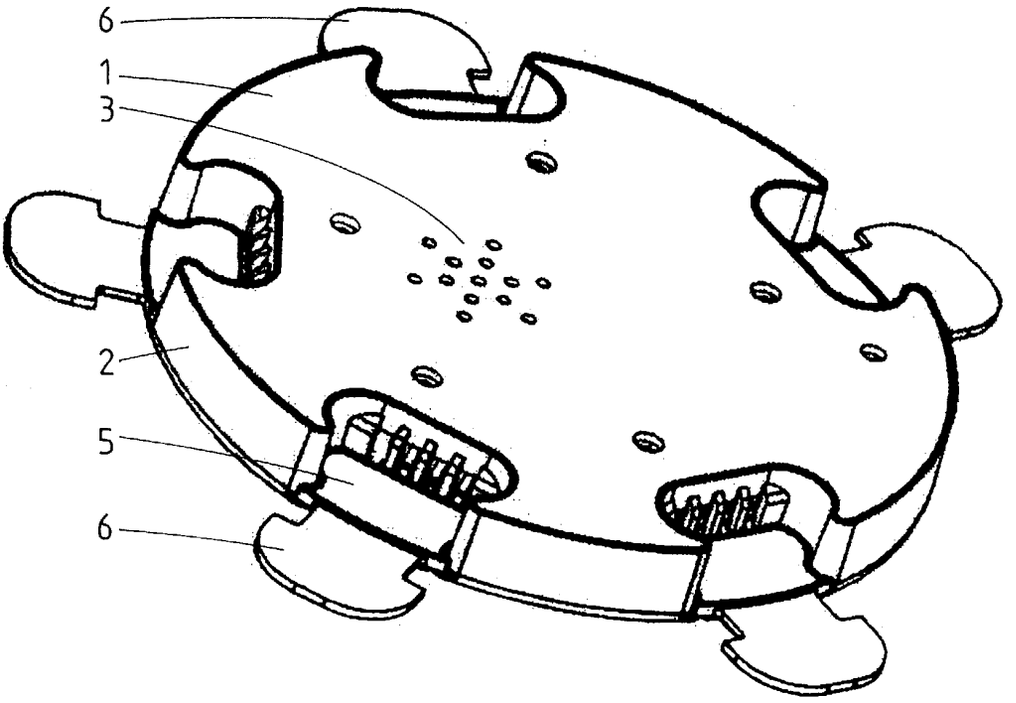

Fig.2

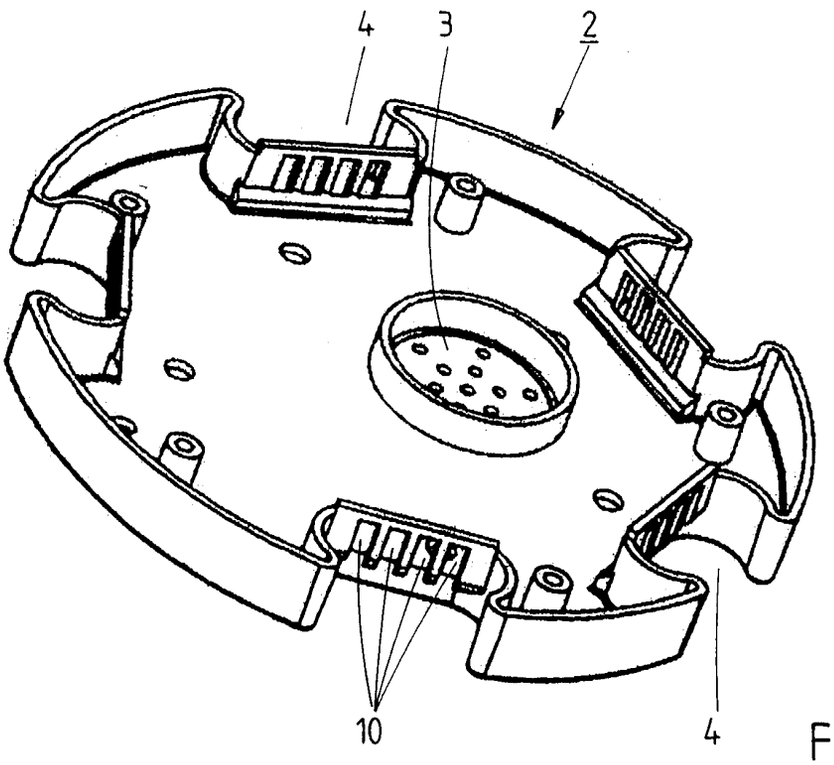

Fig.3

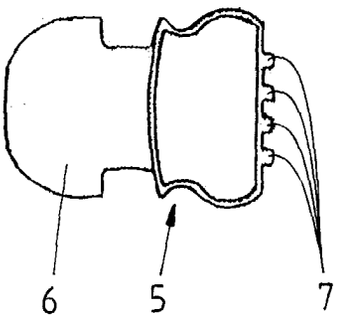

Fig.4

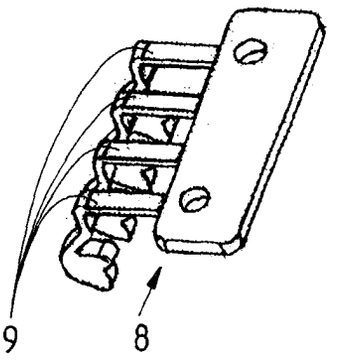

Fig.5

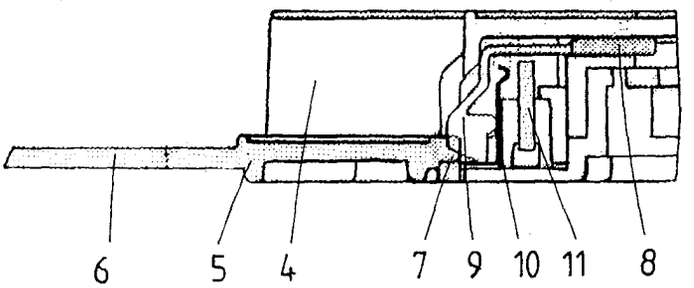

Fig.6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 10 1161

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 4 796 891 A (MILNER RONALD E) 10 January 1989 (1989-01-10) * column 1, line 40 - column 2, line 25; figures 1,4-6 *	1-8,10, 11	A63F9/10 G09B5/06 G09B7/06 A63F9/00
X A	US 4 023 807 A (SANTIANNI BLAISE F) 17 May 1977 (1977-05-17) * column 1, line 19-58 * * column 2, line 37-68 * * column 3, line 9 - column 4, line 11 * * column 4, line 32-45; figures 1-5 *	1-8,11 9,10	
X	US 2 505 230 A (COMPOSTO FRANK R) 25 April 1950 (1950-04-25) * the whole document *	1-8,11	
X A	EP 0 527 269 A (CHANG MORGAN) 17 February 1993 (1993-02-17) * column 1, line 18-30; figures 1,6,8 * * column 3, line 5-17 *	1 2-11	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

A63F
G09B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	25 September 2003	Brumme, I

CATEGORY OF CITED DOCUMENTS

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25-09-2003

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