

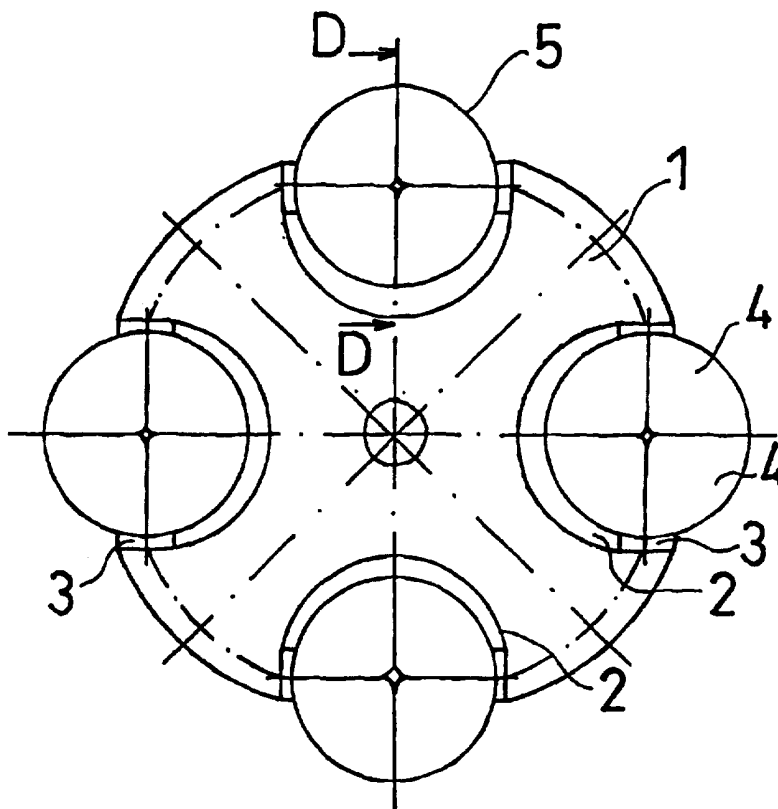


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(54) Title: SPATIAL LOGICAL TOY

(57) Abstract

The invention concerns a spatial logical toy consisting of different rotatable profiles, as sign carriers (5) and of carrier element (1) fastening the sign carriers (5) into one common unit. The spatial logical toy according to the invention can be characterized in that the flat arcuated carrier-element (1) consists of two halves (5, 6), in the recesses (2) of the carrier-element (1) sign carriers (5) are arranged which can be divided into two separate groups which are rotatable in respect to each other, simultaneously they can be turned around the axis of the carrier-element (1).



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SPATIAL LOGICAL TOY

5 Technical Field of the Invention

The invention relates to a spatial logical toy consisting of different rotatable profiles as, sign-carriers and of a carrier element fastening the sign-carriers into a common unit.

Background of the Invention

10 Several spatial logical toys - three-dimensional-puzzles - have been known, with which the aim of the game lies in to rearrange the elements forming the toy by rotating them along given coordinate axes of the space. The most known toy based on said principle is represented by the toy according to the Hungarian PS-HU 170062. Said toy has an enclosing cube-shaped body in the inside of which a small
15 cube is arranged, provided with resilient pins each pointing to the direction of the axes transversing the cube. The cube-shaped body is formed by 27 spacial profiles, the external shape of which corresponds to the shape of the enclosing body. Rearrangement of the profils or elements can be carried out by rotation.

Another similar spatial logical toy is disclosed in the Hungarian Patent PS-HU
20 180 385. With this solution the enclosing body is formed as an octahedron built up of elements which can be divided in three groups. Each group consists of identically shaped elements. Rearrangement of the elements can be carried out by a rotary motion along the four coordinate axes of the space.

Disadvantageous features of the known spatial logical toys lie in, in so far as, by
25 changing essentially the position of the edges the position of the elements forming the enclosing body may be changed too.

Additionally, spatial logical toys have been also known, with which the enclosing body is formed with rounded off spherical shape. According to the Hungarian Patent PS-HU 205 017 the enclosing body is ball-shaped (spherical) built up of profiles
30 which can be divided essentially in three groups.

Summary of the Invention

The aim of the present invention is to develop a spatial logical toy with which

partly the drawbacks of the known toys can be eliminated , on the other hand manual skill can be improved combinative ability developed, simultaneously rich assortment can be enabled. The target set for the invention can be reached by means of a spatial logical toy composed of a flat arcuatly shaped carrier-element assembled of two halves, furtheron, consisting of sign-carriers having been arranged in the recesses of the carrier element, to be divided into two separate groups, which are interconnected in a turnable way and which can be put into rotation also along the axis of the carrier-element. With a preferred embodiment of the invention the carrier-element consists of two halves interconnected by turnable sign-carriers which can be rotated along the axis of the carrier-element while the carrier-element is provided with 2-6 recesses having been formed in compliance with the shape of the carrier-element. furtheron it is provided with sign-carriers having been formed as regular or irregular amorphous bodies, divided into segments which can be rotated in respect to each other.

With a preferred embodiment of the spatial logical toy the carrier-element is formed essentially of two halves of the carrier-element. Said halves have the shape of a disc, including four semicircular recesses; in the recesses there is an axial element arranged, being coaxial with the diameter and divided in the plane of the plane of the diameter; On the axial elements of the carrier-element spherical sign-carrier elements are arranged, divided along the spherical main circles in a rotatable manner, forming two groups which can be rotated as pairs each, but turnable also in respect to each other composed of segments of sign carriers 4 interconnected mutually. The connecting segments of the sign-carriers are provided with arcuate recesses promoting the turn on the axial element with another preferred embodiment of the spatial logical toy according to the invention segments of the sign-carrier can be divided into two groups; segments belonging to the first group contain a spring and a cavity receiving a ball moving against the spring, while the segments belonging to the other group are provided with a recess receiving the balls arranged in the cavities of the segments belonging to the first group, with a further preferred embodiment the halves of the carrier- element are provided with arresting means formed by springs and balls moving against the springs, resp. with cavities receiving

the balls of the arresting means.

All preferred embodiments of the spatial logical toy according to the invention can be characterized in, that the outer surface of the sign carriers are formed with
5 different marks, so colour, number, picture or other symbols.

Brief Description of the Drawings

One of the embodiments of the spatial logical toy according to the invention, serving here as an example, will be described in detail with reference to the figures enclosed, wherein

- 10 Fig. 1. is a top view of the spatial logical toy according to the invention;
Fig. 2. is a top view of the upper half of the carrier element;
Fig. 3. shows the side view at the upper-carrier-element according to the Fig. 2;
Fig. 4. shows a top view of the lower half of the carrier-element according to the Fig. 1.
15 Fig. 5. is a sectional view of the lower half of the carrier-element along the plane C-C according to the Fig. 4;
Fig. 6. is an enlarged sectional view of the lower half of the carrier-element along the plane
A-A according to the Fig. 4;
20 Fig. 7. shows a sectional view of the lower half of the carrier-element along the plane B-B of
the Fig. 4;
Fig. 8. is a top view of a segment of the sign-carrier according to the Fig. 1;
Fig. 9. is a side view of a segment of the sign-carrier according to the Fig. 8;
25 Fig.10 shows a sectional view of the sign-carrier segment of the Fig. 9. along the plane A-A;
Fig.11 is an enlarged view of the detail „A” of the sign-carrier according to the Fig. 9;
Fig.12 is a side view of another segment of the toy according to the Fig. 1;

Detailed Description of the Preferred Embodiment

As it becomes obvious from Fig. 1, the spatial logical toy according to the

invention consists essentially of two halves 6, 7 of the carrier-element i.e. of the turnable arcuated disc-shaped 1 carrier-element formed by the two halves which can be rotated in respect to each other.

5 The spatial logical toy is built up of turnable sign-carriers 5 formed in a spherical shape, arranged in the recesses 2 of the carrier element 1, having been subdivided in 4 and 4a segments, totally eight segments 4, 4a, which can be rotated also in respect to each other and arranged along the spherical main circles.

The shape of the recesses 2 in the carrier-element 1 is always in compliance with the shape of the sign-carrier 5, so in the present case we can see semicircular
10 recesses. Number of the recesses 2 may vary within the range between two and six.

In recesses 2 axial elements 3 with the axis 9 are arranged (see Fig. 2.) said axis 9 is coaxial with the diameter of the semicircle and the axial elements 3 are also subdivided in the dividing plane of the carrier-element 1, while the sign-carriers 5 are to be found on the axial elements 3.

15 For the sake of order it should be mentioned that the shape of the sign carriers 5 can be optional. It can be a regular or irregular amorphous body, which are subdivided in compliance with the game in segments 4 and 4a, promoting rotation and rearrangement.

It goes without saying that shape of recesses 2 of the carrier element 1 may change
20 in dependence of the shape of the sign-carriers 5.

Fig. 2. illustrates the top view of the upper half 6 of the carrier element of the spatial logical toy according to the invention. Fig. 2 shows excellently the shape of the axial elements 3 arranged in the recesses 2. Fig. 3 is the side-view of the half of the carrier-element 6 according to Fig. 2. Fig 4 is the top-view of the lower half of
25 the carrier-element 7. As already mentioned earlier, axial elements 3 in the recesses 2 are formed divided in the contact plane of the two carrier-elements 6 and 7; there is a groove 10 provided for receiving the segments 4 and 4a of the sign-carriers 5 (see Fig. 9 and 12) resp. the extensions of said segments 4 and 4a. On all of the axial elements 3 two grooves 10 are to be found. Formations of the groove 10 is to be seen
30 in Fig.11. Formations of the segment 4 and 4a forming the sign-carrier elements 5 are illustrated in fig. 9, 10 and 12. The segments 4 and 4a are essentially profile

making the eighth part of a sphere. That means that on the axial element 3 of the carrier-element 1 the segments 4, 4a are arranged consisting of eight profiles each. The segments 4 and 4a are interconnected in pairs; rotation of segments 4 and 4a in relation to each other can be realized by arresting means, while said arresting means are formed by the ball 13 arranged in the cavity 11 on the segment 4 and moving against the force of the spring 12 resp. by the dent 14 on the segment 4. Such a connection between segments 4 and 4a enables the relative rotation in such a manner that when the ball 13 is leaving the dent in the segment 4 against the force of the spring 12 arranged in the cavity 11 of the segment 4 in such a manner that it is pressed into the cavity 11 where after following the rotation it will be snapped into the dent 14 of the next segment 4a. In such a manner it becomes obvious that an arresting motion is created. The segments 4 and 4a are provided with recesses 22 and 23 promoting rotary motion. Fig. 4 illustrates the formation of the bore 8, the axis of which is coaxial with the axis of the carrier-element 1, receiving the fixing element - preferably a screw - interconnecting the halves 6, 7 of the carrier-element 1. Fig. 5 illustrates the sectional view taken along the plane C-C of the half 7 of the carrier element according to Fig. 4 showing well the longitudinal shape of the bore 8. Fig. 6 shows the sectional view taken along the plane A-A of the half 7 of the carrier-element. As it becomes obvious from the Fig. 6 in the cavities 16 of the half 7 of the carrier-element arresting means are to be found, consisting essentially of the spring 17 and the ball 18, in course of the rotary motion the ball 18 is moving away against the spring 17 leaving the cavity of the half 6 of the carrier element, thereafter, after the turn of predetermined range the ball 18 snaps into a next cavity of the half 6 of the carrier-element. In the half 7 of the carrier element further arresting means are to be found, namely perpendicularly to the axis 3 receiving the segments 4 and 4a of the sign carriers 5. Said arresting means are formed of the spring 20 and balls 21 having been arranged in bores 19 on the connecting parts of the axes 3 of the half 7 of the carrier-element (see Fig. 7). Actuating of the toy and use thereof are detailed below. The aim of the game lies in the rearrangement of the segments 4 and 4a of the sign-carriers 5. In case, if segments 4 and 4a of the sign-carrier 5 arranged on the axial elements 3 of the carrier-element 1 are provided with

some coloured symbol, the aim lies in getting a sphere consisting of segments 4 and 4a of the same colour arranged on one axial element 3. The aim set is reached so, in so far as halves 6 and 7 of the carrier-element 1 are rotated to the required extent around the axis of the connecting element arranged in the bore 8 of the half 7 of the carrier element. The segments 4 and 4a of the sign-carriers 5 are also rotated. The Rotation is realized around the axis 9 of the axial element 3 arranged in the recess 2 of the carrier element 1. Process of turning is continued and repeated resp.as long as the sign carriers 5 are brought into the expedient position. Safe rotations of the single elements, so segments 4 and 4a of the halves 6, 7 of the carrier element are promoted by the earlier mentioned arresting means.

The advantageous feature of the toy according to the invention lies in, that manual skill and spatial view are developed additionally an enjoyable game may be played for all age groups.

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LIST OF REFERENCES

- 5
- 1 - carrier-element
2 - recess
3 - axial element
- 10 4, 4a - segments
5 - sign-carrier
6 - half of the carrier element
7 - half of the carrier element
8 - bore
- 15 9 - axis
10 - groove
11 - cavity
12 - spring
13 - ball
- 20 14 - dent
15 - axis
16 - cavity
17 - spring
18 - ball
- 25 19 - bore
20 - spring
21 - ball
22 - recess
23 - recess
- 30

CLAIMS

5 1. Spatial logical toy comprising different rotatable profiles, as sign-carriers and a carrier element fastening the sign carriers into one single common unit c h a r a c t e r i z e d in that the flat arcuated carrier element (1) consists of two halves and in the recesses (2) of the carrier element (1) sign carriers(5) are arranged for, which belong to two separate groups, these can be rotated in respect to each other, simultaneously
10 the sign carriers can be turned around the axis of the carrier-element (1).

2. Spatial logical toy as claimed in claim 1, c h a r a c t e r i z e d in that a connecting element is provided for, interconnecting the halves (6, 7) of the carrier-element (1) having been arranged in the bore (8) of the halves(7) of the carrier-element.

15 3. Spatial logical toy as claimed in claim 1 or 2 c h a r a c t e r i z e d in that in the carrier element (1) there are two to six recesses (2) formed, the shape of which is in compliance with the shape of the sign-carrier (5).

4. Spatial logical toy as claimed in any of the claims 1 to 3, c h a r a c t e r i z e d in that it comprises sign carriers (5) consisting of regular or irregular or amorphous
20 bodies, divided into segments (4 and 4a) which can be rotated in respect to each other.

5. Spatial logical toy as claimed in claims 1 to 4, c h a r a c t e r i z e d in that the carrier element (1) is formed essentially of two halves (6, 7) having the shape of a disc including four semicircular recesses (2), in the recesses there is an axial element
25 (3) arranged being co-axial with the diameter and divided by the plane of the diameter.

6. Spatial logical toy as claimed in any of the claims 1 to 5, c h a r a c t e r i z e d in that on the axial elements (3) of the carrier element (1) spherical sign-carrier elements (5) are arranged in a rotatable manner divided along the spherical main circles forming two groups, assembled of segments (4, 4a) interconnected so that
30 these can be rotated in pairs each.

7. Spatial logical toy as claimed in any of the claims 1 to 6, characterized in that the connecting segments (4, 4a) of the sign carrier (5) are formed with an arcuated recess (22,23) promoting rotation about the axial element (3).

5 8. Spatial logical toy as claimed in any of the claims 1 to 7, characterized in that the segments (4,4a)of the sign-carrier (5) can be divided into two groups; the segments (4) of the first group are provided with a spring (12) and with a cavity (11) receiving a ball (13) pressured by the spring (12), while the segments (4a) belonging to the second group are provided with dents (14) receiving the balls (13) being in the cavity (11) of the segments (4) belonging to the first group.

10 9. Spatial logical toy as claimed in any of the claims 1 to 8, characterized in that the carrier-element-halves (6, 7) forming the carrier element(1) are provided with arresting means composed of springs (17,20) and balls (18,21) moving against the spring (17,20) furtheron with cavities receiving the balls (18,21) of the arresting means.

15 10. Spatial logical toy as claimed in any of the claims 1 to 9, characterized in that the outer surface of the sign carriers (5) is provided with different signs, so colours, numbers, configuration or other symbols.

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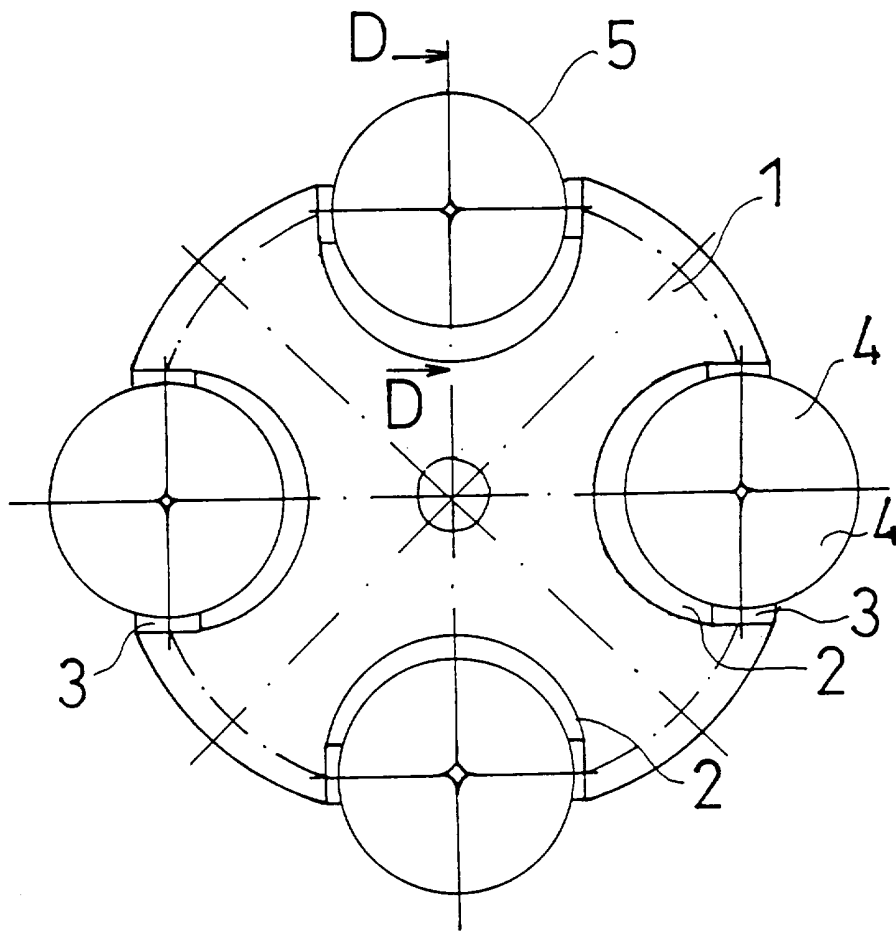


Fig. 1

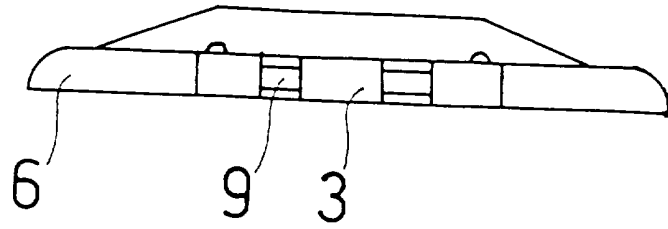


Fig. 3.

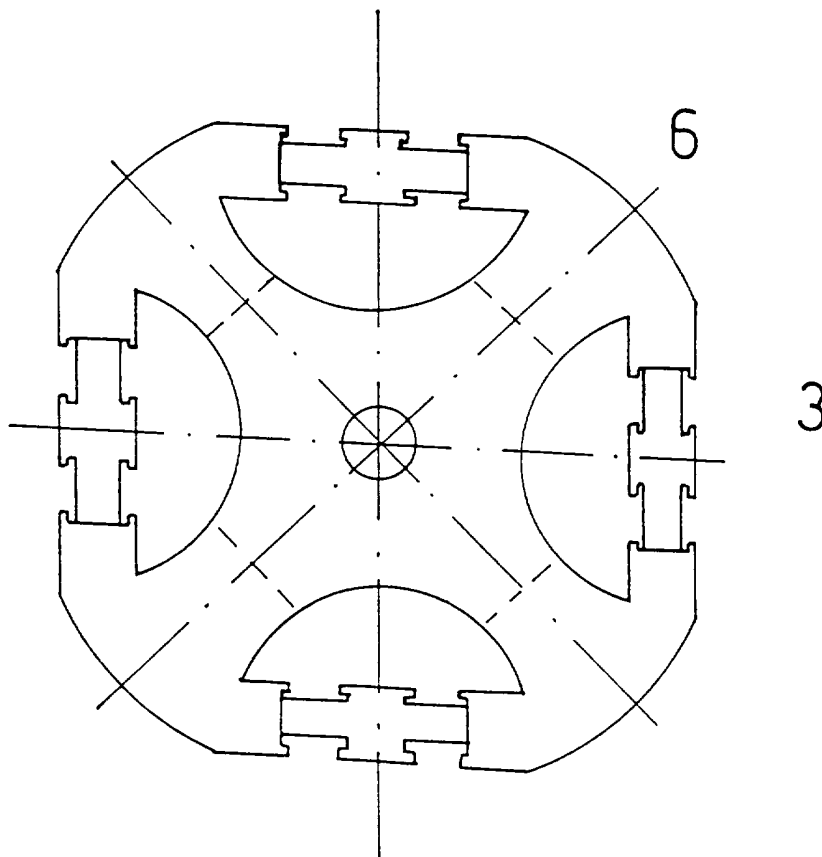


Fig. 2.

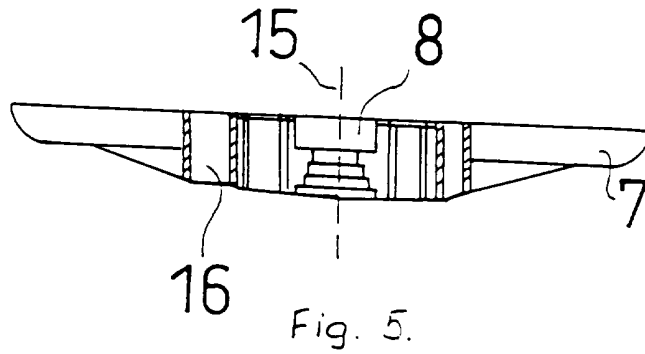


Fig. 5.

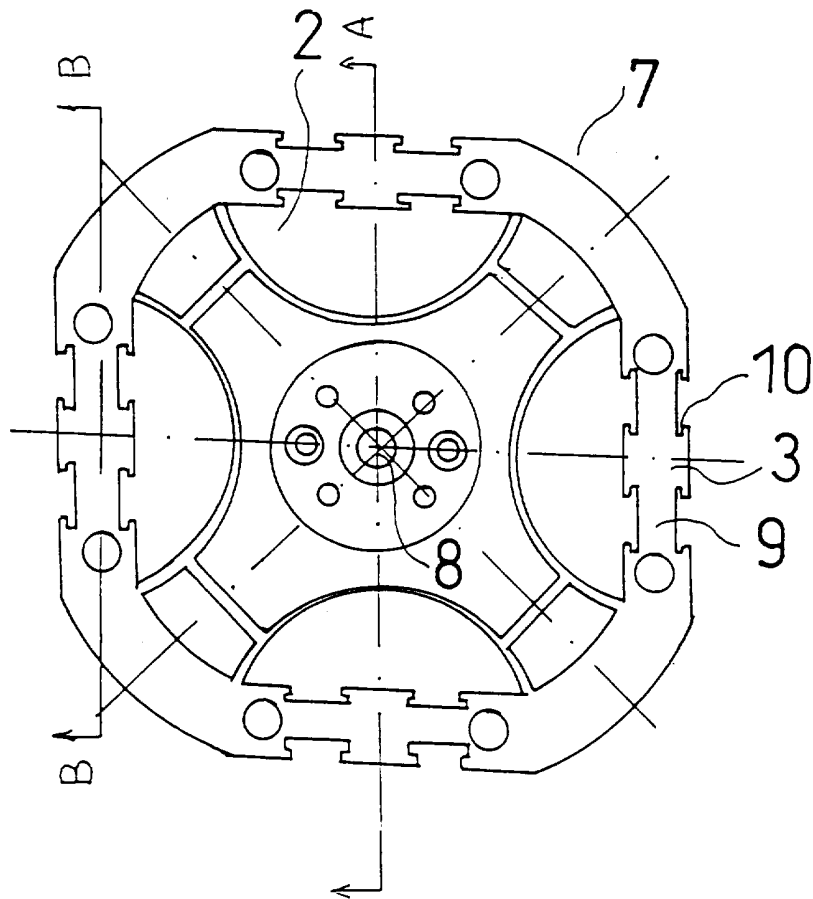
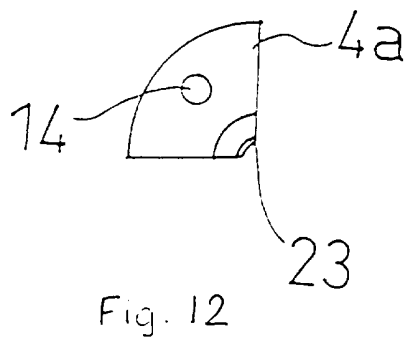
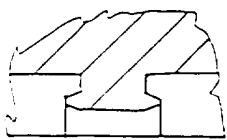
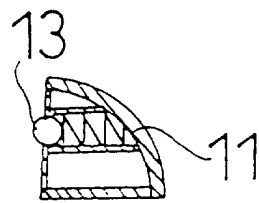
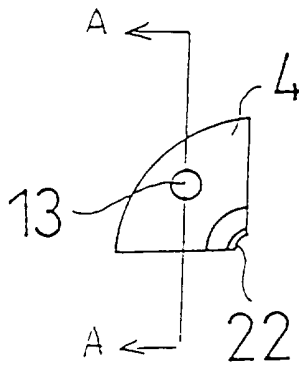
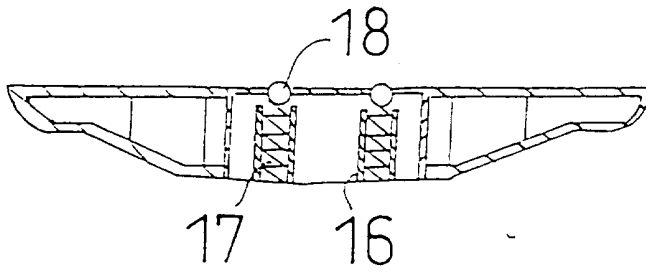
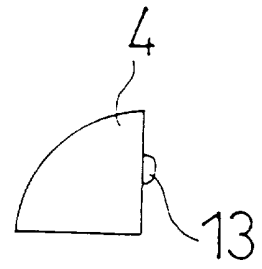
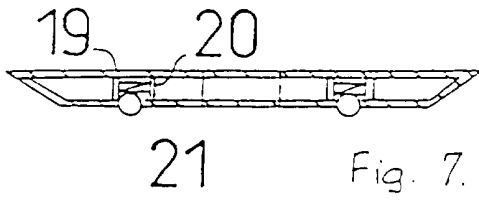


Fig. 4.



INTERNATIONAL SEARCH REPORT

International application No.

PCT/HU 95/00044

A. CLASSIFICATION OF SUBJECT MATTER

IPC⁶: A 63 F 9/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁶: A 63 F 9/06, 9/08, 9/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO 83/01 009 A1 (SZEGED ES VIDEKE ALTALANOS FOGYASZTASI ES EPTEKESITŐ SZÖVETKEZET) 31 March 1983 (31.03.83), fig. 3,4.	1,2,3,4,10 5,6,7,9
X A	DE 38 21 297 A1 (UNIVERSAL CONNECTIONS STECKVERBINDUNGEN VERTRIEBS GMBH) 28 December 1989 (28.12.89), fig. 1,2.	1,3,4,10 2,5,6
X A	GB 2 116 049 A (BUTLER) 21 September 1983 (21.09.83), fig. 1-4.	1,2,3,4,10 5,6
A	WO 82/02 340 A1 (KÖZPONTI VALTO-ES HITELBANK RT INNOVACIOS ALAP) 22 July 1982 (22.07.82), fig. 15; page 9, lines 27-33.	1,8

 Further documents are listed in the continuation of Box C. See patent family annex.

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Date of the actual completion of the international search

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Date of mailing of the international search report

05 December 1995 (05.12.95)

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WD A1 8301009	31-03-83	EP A1 88782 HU B 193521 JP T2 58501613	21-09-83 28-05-84 29-09-83
DE A1 3821297	28-12-89	keine - none - rien	
GB A 2116049		GB A1 2116049 GB B2 2116049	21-09-83 23-04-86
WD A1 8202340	22-07-82	AU A1 80023/82 EP A1 68009	02-08-82 05-01-82