



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/HU90/00059 (22) International Filing Date: 16 August 1990 (16.08.90) (30) Priority data: 4233/89 17 August 1989 (17.08.89) HU (71)(72) Applicants and Inventors: PATAKI, Zoltán [HU/HU]; MSZMP Üdülö, H-8171 Balatonaliga (HU). CSOMÓS, Géza [DE/DE]; Heimhuder Str. 46, D-2000 Hamburg (DE). (74) Agent: PATENT AND LAW OFFICE FOR INTERNATIONAL AFFAIRS; Dalszínház u. 10, H-1061 Budapest VI (HU).</p>		<p>(81) Designated States: AT (European patent), BE (European patent), BR, CH (European patent), DE (European patent)*, DK (European patent), ES (European patent), FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent), US.  Published <i>With international search report.</i></p>
<p>(54) Title: SOLID PUZZLE DEVICE - A LOGICAL TOY</p>		
<p>(57) Abstract</p>		
<p>This invention relates to a solid puzzle device - logical toy - having a regular or irregular or amorphous main body built up of diverse profiles as sign-carriers forming a uniform whole, wherein said profiles forming the main body can be divided into different groups, whereas within the single groups the profiles are identically shaped and in the inside of the main body a core member promoting the re-arrangement of the profiles can be realized by rotating about the spatial axes crossing the geometric centre of the main body. The main body (1) has the shape of a discus and is assembled of a central part (2) built up from profiles (4) as well as of additional profiles (3) adjacent to the central part (2), wherein re-arrangement of the profiles (3, 4) representing the main body (1) can be realized by rotating about the co-ordinate axes (X, Y) located in the symmetry plane of the main body, crossing the geometric centre of said body and running perpendicularly to each other.</p>		

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## SOLID PUZZLE DEVICE - A LOGICAL TOY

Technical Field

The invention relates to a solid puzzle device - logical toy - having a regular or irregular or amorphous main body built up of diverse profiles as sign carriers forming a uniform whole, wherein said profiles forming the main body can be divided into different groups, whereas within the single groups the profiles are identically shaped and in the inside of the main body a core member promoting the re-arrangement of the profiles is to be found, re-arrangement of the profiled can be realized by rotating about the spatial axes crossing the geometric centre of the main body.

Background Art

A plurality of solid puzzle devices - logical toys -  
15 have been known, with which the aim lies in to re--arrange the elements by rotating about given co--ordinate axes of the space. Among these the most known toy is the solution as specified in the Hungarian Patent HU-PS 170 062. This toy has a main cube in the  
20 inside of which a small cube is arranged, having one flexible pin each in direction of the axes crossing the main cube. The main cube is formed by 27 spatial elements - minor cubes - while the external shape of the single elements corresponds to the shape of the main  
25 cube. Re-arrangement of the elements can be realized by rotating.

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The Hungarian Patent Specification HU-PS 180 385 describes another similar solid puzzle device - logical toy -. The main body of these logical toy - as described here - has the shape of an octahedron,  
5 consisting of elements which can be divided into three groups and the elements are identical within the single groups. Re-arrangement of the elements can be realized by rotating about the four co-ordinate axes of the space. The drawback of these known solid puzzle devices  
10 - logical toys - lies in that essentially in course of rotating, by changing the position of the edges also the position of the elements building-up the main body will change.

#### Disclosure of Invention

15 The aim of the invention lies in to provide a solid puzzle device - logical toy - by which partly the deficiencies of the known toys can be eliminated and an enjoyable toy developing manual skill and combinative ability can be achieved, partly it can be well used for  
20 other purposes - so carrying advertisements - in a wide circle.

The aim to be attained can be achieved according to the present invention by means of a solid puzzle device, which has a discus-shaped main body assembled of a  
25 central part consisting of profiles as well as of additional profiles adjacent to said central part, wherein re-arrangement of the profiles forming the main body can be realized by rotating about two co-ordinate axes located in the symmetry plane of the main body crossing

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the geometric centre of the main body and running perpendicularly to each other.

In a preferred embodiment of the solid puzzle device - logical toy - according to the invention, in the central  
5 part of the main body there is core member surrounded by four identically shaped and congruent profiles, said core member having preferably the shape of H-profile. In an other preferred embodiment of the solid puzzle device - logical toy - according to the invention, the profiles  
10 forming the central part are prisms with a semi-circle shaped base, which are provided with recesses for receiving the extensions of the core member and of the additional profiled forming the main body; preferably the recesses are L-shaped.

15 In a further preferred embodiment of the solid puzzle device - logical toy - according to the invention the profiles forming the main body and surrounding the central part have the shape of an elongated semi-sphere, which are provided with extensions connected to  
20 the profiled of the central part. Preferably these extensions are T-shaped.

In another preferred embodiment of solid puzzle device -logical toy - according to the invention the profiles forming the central part are provided with  
25 shoulders running parallel with one of the diameter of the main body.

In a further preferred embodiment of the invention the number of the profiles forming the main body and

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surrounding the central part amounts to at least eight, however it must be an even number by all means, while all the profiles are identically formed.

In all the preferable and expedient embodiments of the solid puzzle device - logical toy - according to the invention the outer surface of the profiles representing the main body may be coloured and/or carry a letter and/or a number or any other marking.

#### Brief Description of Drawings

- 10           The invention is described in detail in the following, with reference to the accompanying drawings showing a preferred embodiment of the solid puzzle device, wherein
- 15           Fig. 1       is a top view of the embodiment of the solid puzzle device - logical toy - according to the invention;
- Fig. 2       is a sectional view of the solid puzzle device - logical toy - according to the invention along line A-A in Fig. 1;
- 20           Fig. 3       is a sectional view along line B-B in Fig. 1;
- Fig. 4       is a top view of the profile forming the central part of the solid puzzle device of Fig. 1;
- Fig. 5       is a top view of the additional profiled forming the solid puzzle device of Fig 1;
- 25           Fig. 6       is a side view of the profiles according to Fig. 5;

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Fig. 7 is a sectional view of the core element of the solid puzzle device according to the invention.

#### Best Mode for Carrying Out the Invention

5 Fig. 1 illustrates a top view of the solid puzzle device - logical toy - according to the invention. The main body 1 of the logical toy according to the invention has the shape of a discus consisting of a central part 2 and of concentrically arranged profiles 3 surrounding the central part 2. Similarly, the central part 2 is assembled of profiled, these are identically formed. Profiles 3 of the central part 2 are provided with a shoulder 9 arranged parallel with the diameter of the main body 1.

15 Fig. 2 illustrates a sectional view along line A-A of the logical toy of Fig. 1; from the Fig. 2 it becomes obvious that in the inside of the central part 2 a core member 5 is arranged which enables the rotary motion of the profiles. Further from the Fig. 2 it becomes obvious that the profiles 3 forming the central part and additionally building up the main body are connected via a T-shaped extension to the recesses 6 - similarly T-shaped - of the profiles 4 forming the central part 2. As it is to be seen in the Fig. 2 the Y axis is one of the axes of rotation, about which the profiles 3 - forming the main body - can be rotated.

25 Fig. 3 illustrates a sectional view along line B-B

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in Fig. 1, showing well the other axis X of rotation, which corresponds essentially to the axis of the core member 5 arranged in the central part 2; preferably said core member is a H-shaped profile.

5           The core member 5 itself is surrounded by the profiles 4 forming the central part 2, these profiles 4 are identically shaped and they are provided with recesses 6 and 7 for receiving the extensions 10 of the core member 5, as well as the extension 8 of the profiles 3. For the sake of order it should be mentioned  
10           that formation of the extension 8 and 10 as well as the recesses 6 and 7 respectively may be optional.

          Fig. 4 illustrates a top view of the profiles 4 forming the central part of the logical toy according to  
15           the invention. Preferably, the profiles 4 are formed by prism the previously mentioned shoulder 9 is arranged.

          Fig. 5 shows a top view of the profile 3, therefrom the main body is assembled, surrounding the central part 2; essentially the top view corresponds to a sector.

20           Fig. 6 illustrates a section of the profile 3 of Fig. 5 corresponding to an elongated semi-circle and which is provided with a T-shaped extension 8 fitted to the profiles 4 of the central part 2.

          Fig. 7 shows a sectional view of the core member 5  
25           having the shape of H, the extensions 10 of which are connected into the recesses of the profiles 4 forming the central part 2.

          The game with the toy according to the invention will take place in the following manner:



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On the outer surface of the profiles diverse markings can be found, the aim of the game lies in to rearrange said markings in compliance with some system, resp. to form a regular pattern. This markings on the profiles may be colours and/or numbers and/or letters or any other markings, so the arrangement can be expediently used for advertising purposes. Now, the aim of the game - resp. of the re-arrangement - lies in to lay out some characteristic pattern or words or any other pattern depending on the markings. With the solid puzzle device - logical toy - according to the invention re-arrangement can be realized by the rotary motion around two axes. In the first step the profiles 4 of the central part should be rotated so, that the shoulders 9 should occupy a parallel position. This rotary motion involves turning around the axis Y, this axis Y is nothing else, than the summary axis of the core member 5, that means, that when the profiles 4 are rotated, essentially rotation around the axis of the core member 5 will be realized. After having finished this step, the profiles 3 surrounding the central part 2 should be rotated essentially this rotary motion is taking place around the axis running perpendicularly to the axis Y - i.e. to the symmetry axis of the core member 5 - along the axis Y crossing the geometric centre of the main body 1. In course of rotating the profiles 3 a position should be achieved in which a profile 3 each should face the shoulder 10. After having performed the previously mentioned rotary motion, by rotating about the axis X the two profiles 3 facing one another are interchanged.

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These are rotated about the axes X and Y as long, as the desired inscription or pattern on the surface of the main body is obtained. It goes without saying that order of sequence of rotating can be interchanged. The  
5 advantage of the solid puzzle device - logical toy - according to the invention lies in that manual skill and combinative ability can be developed, simultaneously an enjoyable game can be played.

A additional advantage lies in that it can be used  
10 excellently for advertising purposes.

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CLAIMS

1. Solid puzzle device - logical toy - having a regular or irregular or amorphous main body built up of diverse profiles as sign-carriers forming a uniform whole, wherein said profiles forming the main body can  
5 be divided into different groups, whereas within the single groups the profiles are identically shaped and in the inside of the main body a core member promoting the re-arrangement of the profiles is to be found, re-arrangement of the profiles can be realized by rotating  
10 about the spatial axes crossing the geometric centre of the main body, characterized in that the main body (1) having the shape of a discus is assembled of a central part (2) built-up from profiles (4) as well as of additional profiles (3) adjacent to the central  
15 part (2), wherein re-arrangement of the profiles (3, 4) representing the main body (1) can be realized by rotating about the co-ordinate axes (X, Y) located in the symmetry plane of the main body, crossing the geometric centre of said body and running perpendicularly to each  
20 other.

2. Solid puzzle device - logical toy - as claimed in claim 1, characterized in that in the central part (2) of the main body (1) there is a core member (5) surrounded by four identically formed and  
25 congruent profiles (4) forming said central part (2).

3. Solid puzzle device - logical toy - as claimed in claim 1 or 2, characterized in that the core member (5) has the shape of H.

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4. Solid puzzle device - logical toy - as claimed in any of claims 1 to 3, characterized in that the profiled (4) of the central part (2) are prisms with semi-circular bases which are provided with recesses (6, 7) for receiving the extensions (10, 6) of the core member (5) and of the additional profiles (3) forming the main body (1).

5. Solid puzzle - logical toy - as claimed in claim 4, characterized in that the profiles (4) of the central part (2) are provided with L-shaped recesses (6, 7).

6. Solid puzzle device - logical toy - as claimed in any of claims 1 to 5, characterized in that the profiles (3) forming the main body (1) and surrounding the central part (2) show the shape of an elongated spherical sector being provided with an extension (8) connected to the profiles (4) of the central part (2).

7. Solid puzzle device - logical toy - as claimed in claim 6, characterized in that the profiles (3) are provided with T-shaped extensions (8).

8. Solid puzzle device - logical toy - as claimed in any of claims 1 to 7, characterized in that the profiles (4) of the central part (2) are provided with shoulders (9) arranged parallel with one of the diameters of the main body (1).

9. Solid puzzle device - logical toy - as claimed in any of claims 1 to 8, characterized in that the number of the profiles (3) representing the

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main body (1) and surrounding the central part (2) amounts to at least eight, however, it should be an even number by all means, while said profiles (3) are identically formed.

10. Solid puzzle device - logical toy - as claimed in any of claims 1 to 9, characterized in that the profiles (3, 4) on their surfaces representing the main body (1) are marked with colours and/or letters and/or numbers or any other markings.

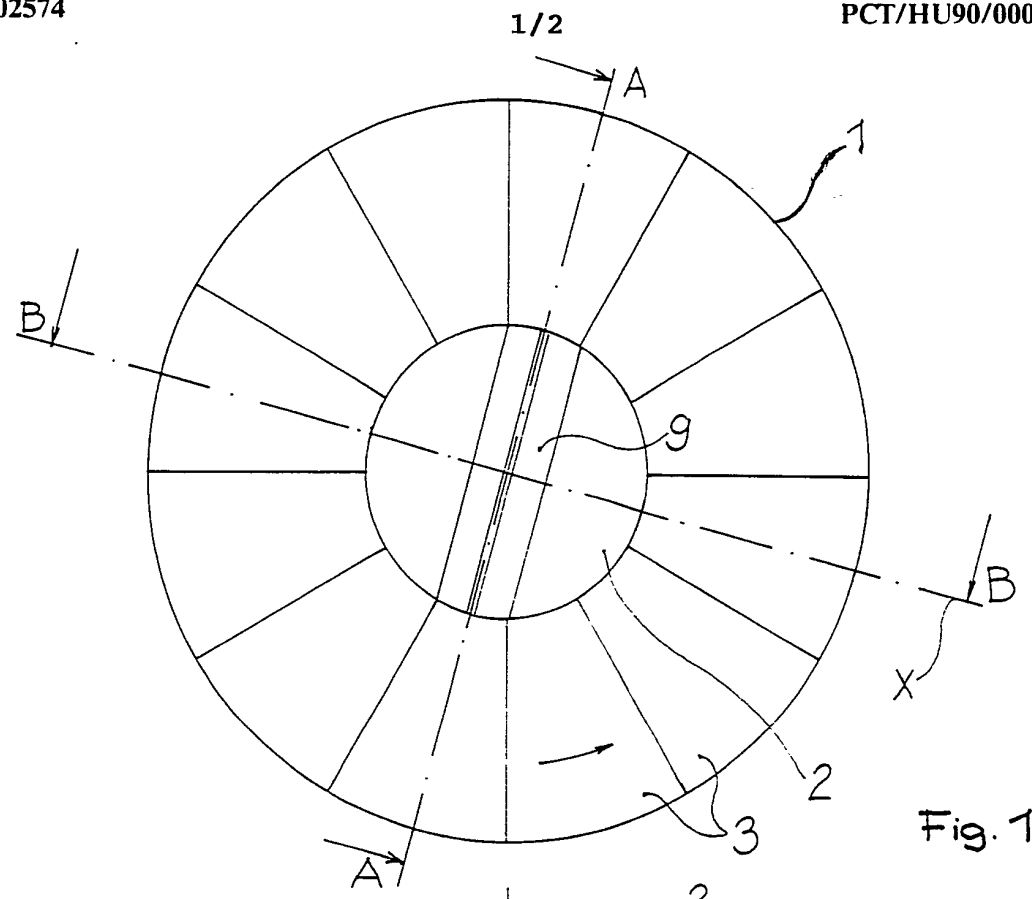


Fig. 1.

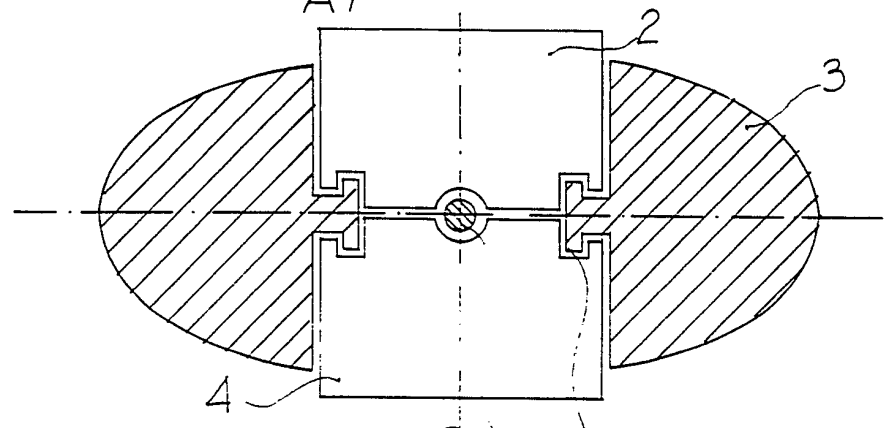


Fig. 2.

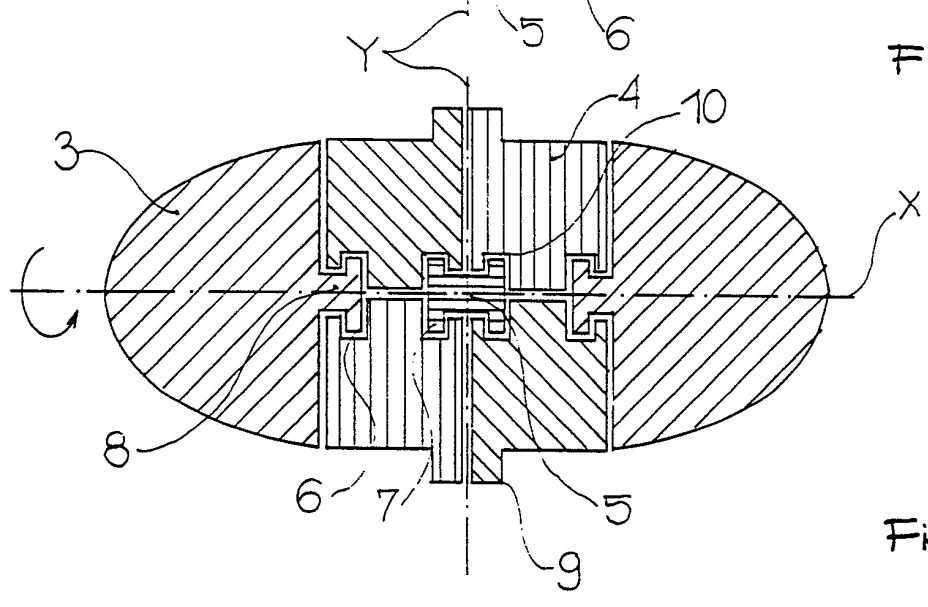


Fig. 3.

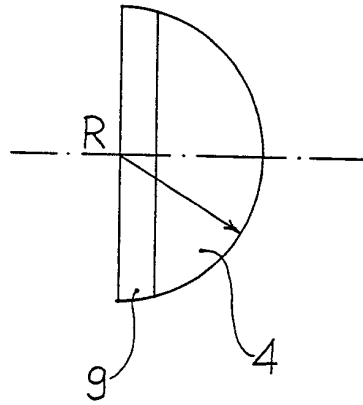


Fig. 4.

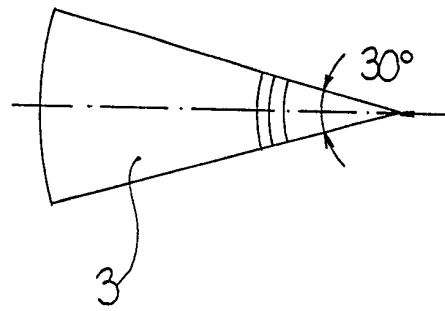


Fig. 5.

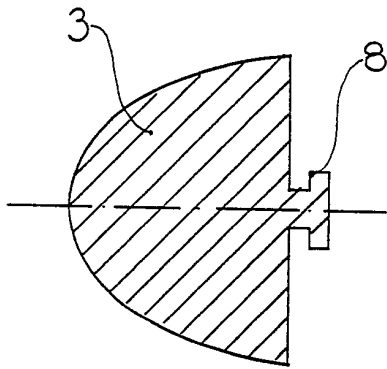


Fig. 6.

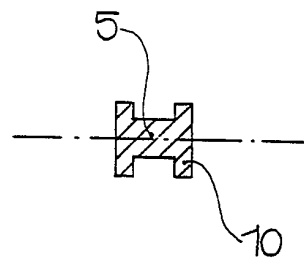
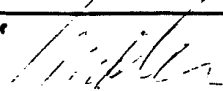


Fig. 7.

# INTERNATIONAL SEARCH REPORT

International Application No PCT/HU 90/00059

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>6</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC <sup>5</sup> : A 63 F 9/08		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
Int.Cl. <sup>5</sup>	A 63 F 9/08, 9/00, 9/06, 9/12	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>8</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT <sup>9</sup></b>		
Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
A	DE, A1, 3 140 580 (LAKIES) 28 April 1983 (28.04.83), see totality.	(1,2,4,5,9,10)
A	CH, A5, 653 902 (VONDERLINN) 31 January 1986 (31.01.86), see fig. 1-8.	(1,5,7,9,10)
A	DE, A1, 3 143 582 (KONSUMEX K.V.) 30 September 1982 (30.09.82), see fig. 1-6.	(1,10)
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<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
17 October 1990 (17.10.90)	24 October 1990 (24.10.90)	
International Searching Authority	Signature of Authorized Officer	
AUSTRIAN PATENT OFFICE		



Anhang zum internationalen Recherchenbericht über die internationale Patentanmeldung Nr.

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Annex to the International Search Report on International Patent Application No. PCT/HU 90/00059

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Annexe au rapport de recherche internationale relatif à la demande de brevet international n°.

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Im Recherchenbericht angeführtes Patentdokument Patent document cited in search report Document de brevet cité dans le rapport de recherche	Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
DE-A1- 3140580	28-04-83	None	
CH-A5- 653902		CH-A - 653902	31-01-86
DE-A1- 3143582	30-09-82	AR-A1- 227338 AT-A - 4669/81 AT-B - 386963 BE-A1- 891019 BR-A - 8107217 DE-C2- 3143582 ES-U - 261296 ES-Y - 261296 ES-Y1- 261296 FI-A - 813475 FR-A1- 2493715 FR-B1- 2493715 GB-A1- 2087245 GB-B2- 2087245 HU-B - 180612 IE-B - 52080 IT-A - 1142051 JP-A2-57131470 JP-B4-63008792 NL-A - 8104968 NO-A - 813698 PT-A - 73941 PT-B - 73941 SE-A - 8106494 US-A - 4410179 YU-A - 2637/81 YU-B - 41040	15-10-82 15-04-88 10-11-88 06-05-82 27-07-82 11-04-85 01-05-82 01-12-82 10-12-82 10-05-82 14-05-82 25-10-85 26-05-82 19-09-84 28-03-83 10-06-87 08-10-86 14-08-82 24-02-88 01-06-82 10-05-82 01-12-81 18-02-83 10-05-82 18-10-83 29-02-84 31-10-86