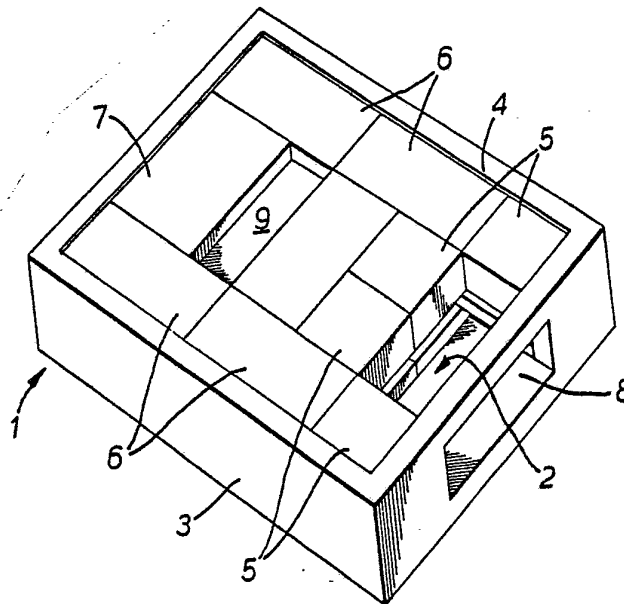


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/GB83/00169 (22) International Filing Date: 8 July 1983 (08.07.83) (31) Priority Application Number: 8220678 (32) Priority Date: 16 July 1982 (16.07.82) (33) Priority Country: GB</p> <p>(71) Applicant (for all designated States except US): KEL-RACK LIMITED [GB/GB]; 28 Waldegrave Park, Strawberry Hill, Twickenham, Middlesex TW1 4TQ (GB). (72) Inventor; and (75) Inventor/Applicant (for US only) : KNOTT, Michael, Walter [GB/GB]; 28 Waldegrave Park, Strawberry Hill, Twickenham, Middlesex TW1 4TQ (GB). (74) Agent: HYDE, HEIDE &amp; O'DONNELL; 146 Buckingham Palace Road, London SW1W 9TR (GB).</p>		<p>(81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB (European patent), JP, LU (European patent), NL (European patent), SE (European patent), US.</p> <p><b>Published</b> <i>With international search report.</i></p>

(54) Title: PUZZLE



## (57) Abstract

A puzzle comprises a holder (1) defining a field of movement for rectangular pieces (5, 6, 7) which are slidable within said holder, the problem being to effect a sequence of displacements which will bring a key-piece (7) to a position at the opposite end of the holder (1). The key-piece can then be further moved to cause a portion (9) thereof to project out of the holder, through an aperture (8). The key-piece is in the form of a container for confectionery pieces or other objects which can be removed only by solving the puzzle and moving the key-piece (7) into said projecting position.

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1.

PUZZLE

This invention relates to puzzles of a kind comprising one or more movable members and a holder defining an area within which such member(s) is (are) bodily displaceable in a given plane but so that a problem is involved in finding a sequence of displacements which will bring the or a particular member into a predetermined (hereafter called "home") position.

Some known puzzles of this kind are in the form of a maze. The holder supports a pattern of barrier walls within the field of movement of a movable member and the problem is to discover a route along which such member can move to reach the "home" position.

Other known puzzles of the kind referred to comprise a plurality of movable pieces assembled like pieces of a mosaic within a holder which leaves restricted free space, and the problem is to re-arrange the assembly by successive movements of pieces, to bring a given one of the pieces (hereafter called the "key-piece") to the "home" position. Such mosaic puzzles, like the maze puzzles above referred to, can obviously be of various degrees of difficulty. A mosaic puzzle which is very testing of patience and skill can be posed by apparatus comprising a holder which defines a rectangular field of movement for a plurality of pieces having in their plane of movement rectangular shapes of various sizes each of which is equal to or a multiple of a square module which is an aliquot portion of the said rectangular field, the free or uncovered area in the field being greater than the area of some but not all of the pieces. One piece can be larger than any of the others and such largest piece can be the

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key-piece which has to be brought to the "home" position. There may for example be at least four square pieces equal in size to the basic module, a number of rectangular pieces of length and breadth dimensions  $2L \times lL$  where  $L$  is the edge length of the basic module, and a single square component of edge length  $2L$ . A particular example of such a puzzle is described in British Patent specification 592.536.

According to the present invention a puzzle of the kind referred to in the first paragraph of this specification incorporates or is associated with a container so that an exit mouth of the container via which contents of the container can be removed is free or freeable to allow passage of contents from the container only when the or a particular movable member has been brought into the "home" position.

The container of a device according to the invention can be used for example as a confectionery packaging device.

The puzzle of a device according to the invention can e.g. be of a maze or mosaic type as hereinbefore referred to.

In preferred embodiments of the invention the member whose displacement into the "home" position signifies successful solution of the puzzle is itself formed to serve as the container. Preferably the holder provides a support surface underlying the movable member(s) and the said displaceable member-cum-container is in the form of an inverted box whose mouth is closed by said support surface until such member is moved into the "home" position. Advantageously



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the said member has a step portion, i.e. a portion of reduced height, along one margin and the holder for the pieces provides in the vicinity of the "home" position a boundary wall aperture of sufficient height to allow such step portion to protrude therethrough. In these circumstances there need be no aperture in the said underlying support surface because contents of the displaceable member-cum-container can exit via the open bottom of the step portion when it is in that protruding position. As an alternative to that construction, the said underlying support surface can have an exit aperture with which an opening at the bottom of the said member/container registers when that member is in its "home" position. In such embodiments of the invention the puzzle is preferably of the mosaic type hereinbefore referred to, the container being formed by the key-piece. It is very satisfactory for example for the puzzle pieces to be rectanguloid pieces of various shapes in plan aspect e.g. as described in British patent specification 592.536 already mentioned.

In another embodiment of the invention the puzzle forms or forms part of the closure of an adjoining container. For example the mouth of the container may be covered by a plate over which the movable member(s) of the puzzle is (are) displaceable and which has a local exit aperture for the contents of the container, and the said displaceable member or a particular one of them if there is more than one, can have an aperture which registers with said aperture in the cover plate only when such member is in its "home" position. In such embodiments of the invention, the puzzle can be of a maze or mosaic type.

## 4.

The movable member(s) of the puzzle may be retained in the plane of displacement by retaining means on the holder. In the case of a mosaic type puzzle the movable pieces can be retained by retaining means on the holder or in part by such means and in part by an inter-engagement of the pieces with each other e.g. as hereafter exemplified. Retaining means on the holder may e.g. comprise a top grid with open areas sufficient to allow access of a finger to the movable member(s), or marginal retaining lips extending inwardly from boundary or barrier walls of or in the field of movement of said member(s).

An embodiment of the invention, selected by way of example, is illustrated in the accompanying diagrammatic drawings, in which: Fig.1 is a perspective view of a puzzle-cum-container, Fig.2 is a side view of one of the elongate playing pieces and Fig.3 is a side elevation of the largest playing piece, which is the key-piece.

The puzzle comprises a holder 1 comprising a bottom wall 2 and a peripheral vertical wall 3 which forms a continuous boundary of the field of movement of ten playing pieces which are slidable relative to each other within that field, subject to the restrictions imposed by that boundary wall and the limited area of the free space available within that field. A retaining lip 4 projects inwardly from the top of the vertical boundary wall 3 so as to overlie marginal portions of whatever playing pieces are for the time being against that wall.

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Considering the playing pieces in plan aspect, there are four small square pieces 5, five rectangular pieces 6 each of which is twice the size of one of the small squares, and a large square piece 7 (the "key-piece") which is four times the size of a small square. The aggregate area of the playing pieces is accordingly equal to eighteen small squares. The field of movement defined by the holder is equal to twenty small squares.

To solve the puzzle sequential sliding movements of pieces 5-7 have to be made (usually only one piece can be moved /a time) to bring the key-piece 7 into a position alongside and centrally of what in the aspect of Fig.1 is the nearest side of the boundary wall 3 of the holder, at which position there is an aperture 8 in that wall. For convenience that side of the holder will be referred to as the front. As appears most clearly in Fig.3, the key-piece has along one margin a portion of reduced height forming a step 9. This step is sufficiently shallow to be pushed through the said holder aperture 8.

All of the playing pieces are open at the bottom. In other words they have the form of open-topped boxes which have been inverted. The key-piece 7 contains confectionery, and it is of course closed at the bottom by the bottom wall 2 of the holder. When the key-piece-cum-container 7 has been brought into a position alongside and opposite the aperture 8 it can then be pushed further forward to advance its step 9 through the slot 8. For this puzzle that advanced position is the "home" position. When the key-piece is in that "home" position confectionery can exit from the bottom of the step portion 9.



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The puzzle is of a convenient size for holding in one hand, the outside dimensions of the holder being, for example 88 mm x 71 mm x 18 mm. By placing the other hand beneath the step of the key piece as it advances through the aperture 8 and by advancing the step portion 9 only partly through the aperture 8, the user can if desired restrain the fall of confectionery pieces and allow only one or two pieces to escape. The pieces of the puzzle can of course be "re-shuffled" to prepare the puzzle for re-use with the playing pieces in their original start positions or in other start positions. The puzzle therefore has a continuing usefulness even if the key-piece-cum-container is empty. This piece can of course be re-filled with confectionery or other objects if so desired.

Each of the playing pieces has a horizontal rib, such as the rib 10 of piece 6 shown in Fig.2, which rib extends along the major part of each of two adjacent sides of the piece. A groove such as the groove 11 of piece 6 shown in Fig.2 extends along the other two sides of each piece. The cross-sectional dimensions of the ribs and grooves are such that the ribs and grooves of adjacent faces of contiguous pieces inter-engage while allowing relative sliding motion of the pieces. Considering the puzzle in its Fig.1 orientation, the north and west sides of each of the playing pieces carry the rib and the east and south sides of each component have the groove, and as all the pieces maintain their initial north-south orientation during use the situation never arises in which two grooved sides are together or two ribbed faces obstruct movement of two pieces alongside each other. The inter-engagement of the ribs and grooves, and the





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overlapping of the outer pieces by the retaining lip 4 on the holder combine to prevent the pieces from falling out of the holder if it is inverted.

5 It is very suitable for the holder and playing pieces of the illustrated puzzle to be plastics mouldings.

The illustrated puzzle-cum-container can be used as a packaging device for various objects and materials. In the confectionery field it is very suitable for use in retailing mints, which have a relatively long shelf-life.

10 By way of modification of the illustrated embodiment of the invention, the bottom wall 2 of the holder could be provided with an opening through which contents of the container-cum-key piece 7 can exit when the key piece is in a position alongside and centrally of the front  
15 side of the holder. In such an embodiment, that position of the key-piece is its "home" position and there is of course no need for the aperture 8. In a said modification, the container-cum-key-piece can have a bottom wall with a small local aperture and/or the opening in the bottom wall 2  
20 of the holder can be smaller than the bottom area of the key-piece so that the passageway for the exit of objects from the container is relatively restricted.

As a further modification, the key-piece 7 can be made shallow enough to permit the entire key-piece to pass  
25 through the aperture 8 after the puzzle has been solved by bringing the key-piece into position alongside and in register with that aperture.

In any given embodiment of the invention the device, in addition to having said exit mouth which is freed  
30 by solving the puzzle, can be formed to enable contents



8.

of the container to be removed without solving the puzzle, should this for any reason be required.

For example, in a puzzle-cum-container of the form represented in the accompanying drawings, the holder 1  
5 can have one or more weakened zones to enable the bottom wall 2 or a portion thereof to be easily removed or broken so as to leave a bottom opening through which the contents of the container-cum-key piece 7 can  
10 escape. Such removable or breakable zone may for example be so located and be of such size that said bottom opening communicates with the interior of said piece 7 whatever be its position in the holder or only when that piece is in its illustrated initial position.



9.

## CLAIMS:

1. A puzzle of a kind comprising one or more movable members and a holder defining an area within which such member(s) is (are) bodily displaceable in a given plane but so that a problem is involved in finding a sequence  
5 of displacements which will bring the or a particular member into a predetermined (in subsequent claims called "home") position, characterised in that the puzzle incorporates or is associated with a container so that an exit mouth of the container via which contents of the  
10 container can be removed is free or freeable, to allow contents of the container to escape via that mouth, only when the or a particular displaceable member has been brought into the "home" position.
2. A puzzle according to claim 1, wherein said  
15 particular member is itself formed to serve as said container.
3. A puzzle according to claim 2, wherein the holder provides a support surface underlying the movable member(s) and such displaceable member-cum-container  
20 is in the form of an inverted box whose mouth is closed by said support surface until such member is moved into the "home" position.
4. A puzzle according to claim 3, wherein said  
25 displaceable member-cum-container has a step portion, i.e. a portion of reduced height, along one margin and the holder provides in the vicinity of the "home" position a boundary wall aperture of sufficient height to allow such step portion to protrude therethrough.



10.

5. A puzzle according to claim 3, wherein said underlying support surface has an exit aperture with which an opening at the bottom of said displaceable member-cum-container registers when that member is in its "home" position.
6. A puzzle according to claim 4 or 5, wherein the puzzle is of the mosaic type, the said container being formed by the key-piece of the puzzle.
7. A puzzle according to any preceding claim, wherein said holder defines a rectangular field of movement for a plurality of said movable members, which members have in their plane of movement rectangular shapes of various sizes each of which is equal to or a multiple of a square module which is an aliquot portion of the said rectangular field, the free or uncovered area in the field being greater than the area of some but not all of said members.
8. A puzzle according to claim 7, the puzzle being as described and shown in British Patent specification 592.536.
9. A puzzle according to claim 1, 7 or 8 wherein the puzzle forms or forms part of the closure of an adjoining container.
10. A puzzle according to claim 9, wherein the container is covered by a plate over which the movable member(s) of the puzzle is (are) displaceable and which has a local exit aperture for the contents of the container, and the said displaceable member or said particular one of them if there is more than one, has an aperture which registers with said aperture in the cover plate only when such member



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is in said "home" position.

11. A puzzle according to any preceding claim, wherein  
in addition to said exit mouth there is a facility which  
can be used if required to permit contents to be removed  
5 from the container without having first to solve the  
puzzle.



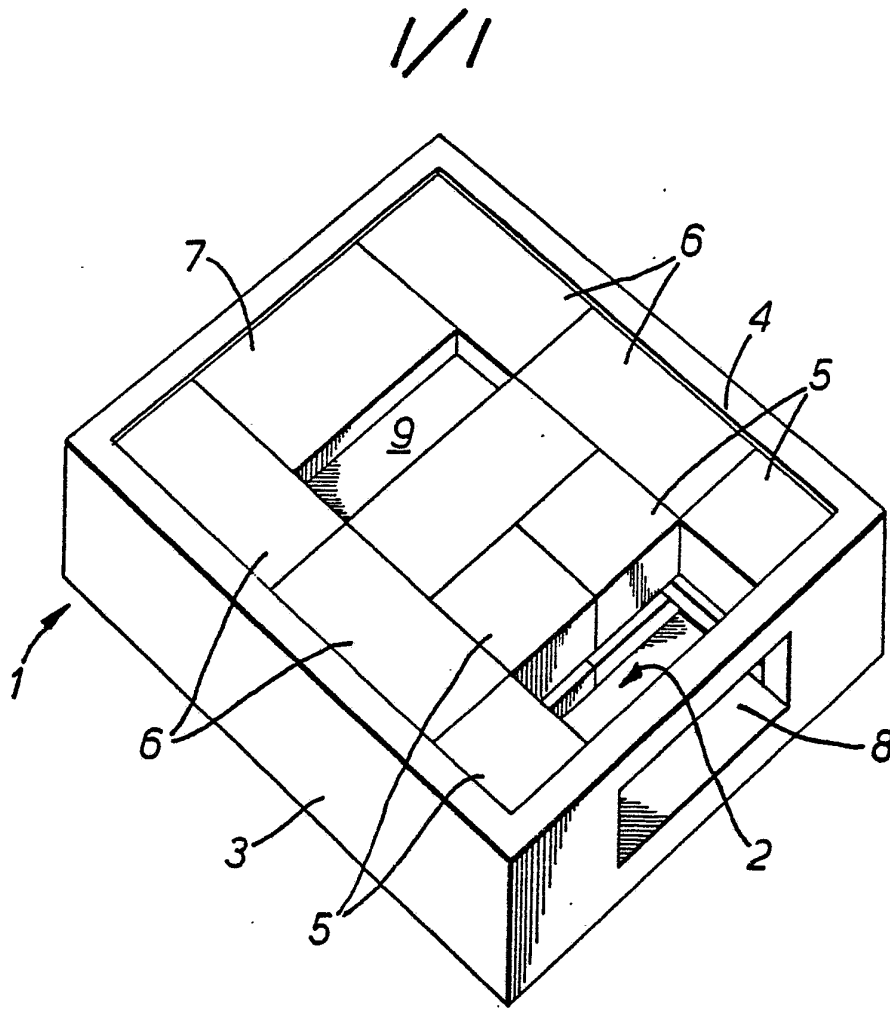


FIG. 1.

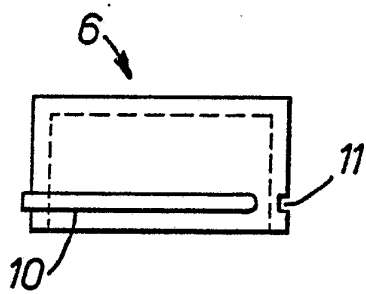


FIG. 2.

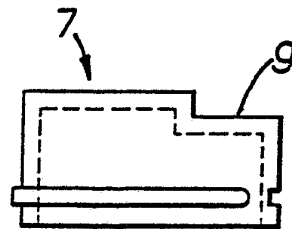
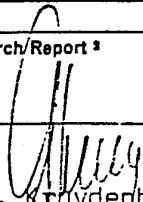


FIG. 3.

# INTERNATIONAL SEARCH REPORT

International Application No **PCT/GB 83/00169**

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>3</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC <sup>3</sup> : <b>A 63 F 9/08</b>		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>4</sup>		
Classification System	Classification Symbols	
IPC <sup>3</sup>	<b>A 63 F; G 09 F</b>	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>5</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <sup>14</sup>		
Category <sup>*</sup>	Citation of Document, <sup>16</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>	Relevant to Claim No. <sup>18</sup>
A	<b>GB, A, 592536 (SAUNDERS) 22 September 1947 cited in the application</b>  -----	
<p><sup>*</sup> Special categories of cited documents: <sup>16</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search <sup>3</sup>	Date of Mailing of this International Search/Report <sup>3</sup>	
5th October 1983	<b>26 OCT. 1983</b> 	
International Searching Authority <sup>1</sup>	Signature of Authorized Officer <sup>20</sup>	
EUROPEAN PATENT OFFICE	G.L.M. Krydenberg	

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON

INTERNATIONAL APPLICATION NO. PCT/GB 83/00169 (SA 5473)

This Annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 19/10/83

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB-A- 592536		None	

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For more details about this annex :  
see Official Journal of the European Patent Office, No. 12/82