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(71) Applicant
Dennis Bransky
Fiat 9, Ivor Court, 102 Crouch Hill, London, N8

(72) Inventor
Dennis Bransky

(74) Agent and/or Address for Service
Marks & Clerk
57-60 Lincoln's Inn Fields, London, WC2A 3LS

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A63F

(54) **Puzzle or ornament**

(57) A puzzle or ornament shown comprises a circular board, Fig 1, with seven pivot holes (11). Each of the seven holes receives a removable or fixed rotatable overlay member 21, Fig 3, on which are six pattern positions. The overlay members overlap one another. At each pattern position of an overlay member is a pattern marking (eg a colour patch 33, numeral, letter or image) or a transparent region or window 31 to reveal a pattern marking of an underlying overlay member or the board itself. The rotatable overlay members 21 may be reduced in number to three or four. The object of the puzzle is, for example, to set the overlay members so that the overall appearance corresponds to that of the base board with the overlay members removed; or to achieve some other predetermined appearance.

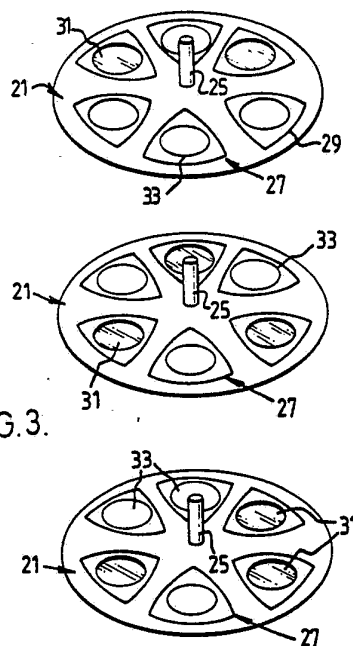
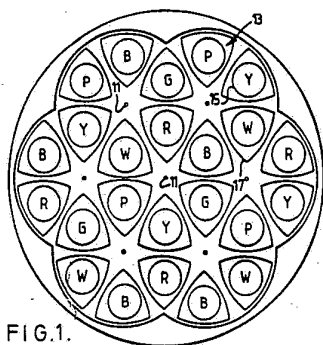


FIG. 3.

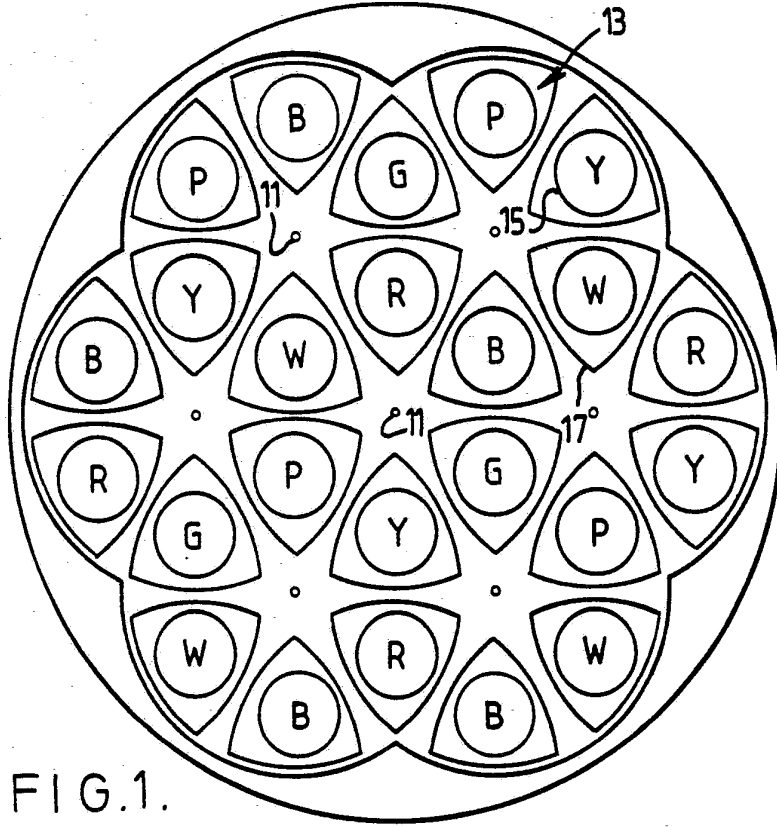


FIG. 1.

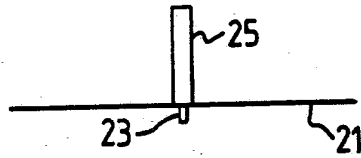


FIG. 2.

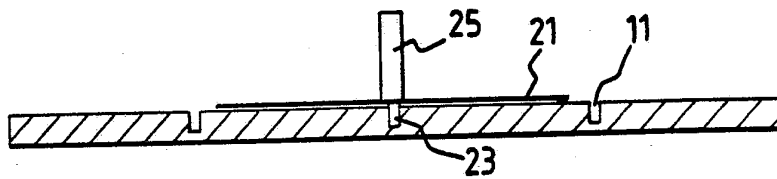


FIG. 4.

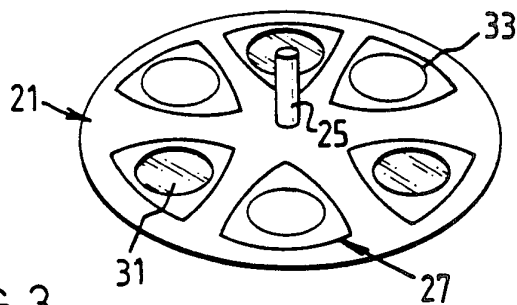
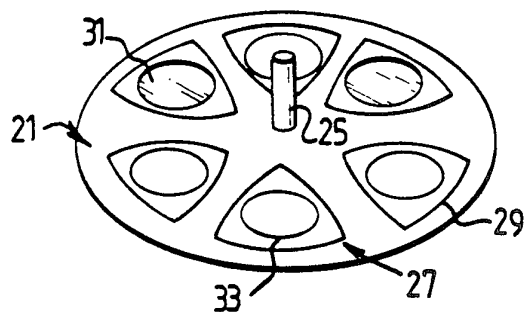


FIG. 3.

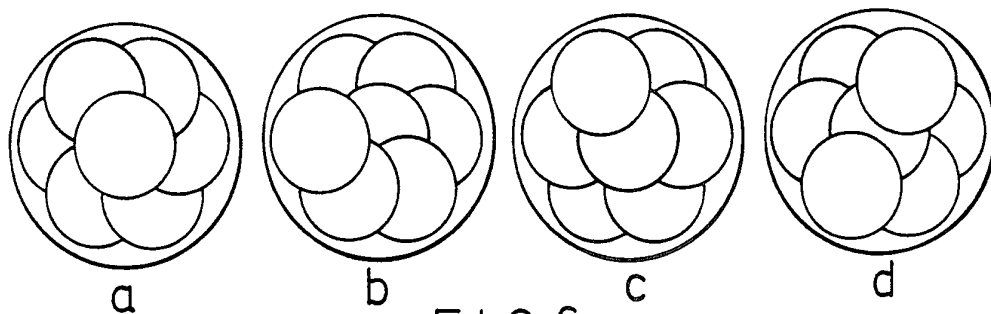
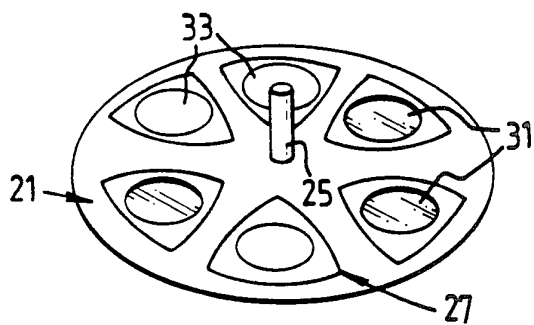


FIG. 6.

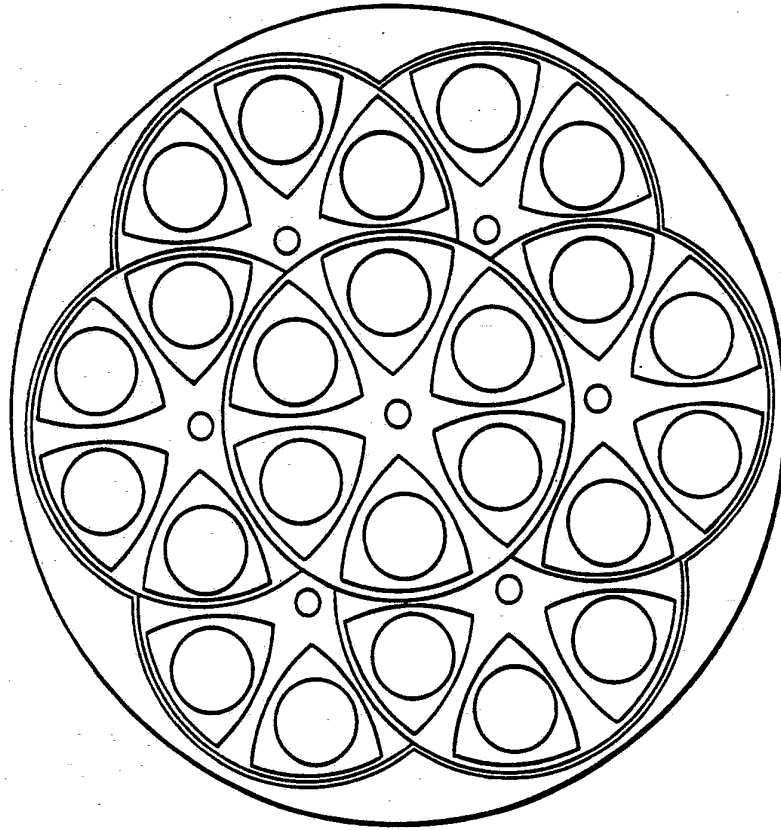


FIG.5.

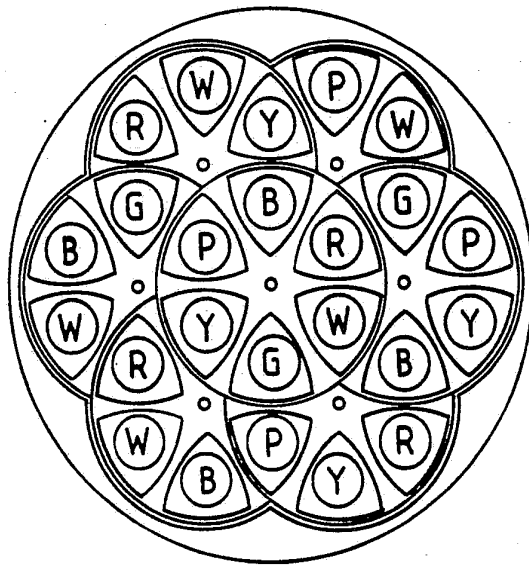


FIG.7.

M&C FOLIO: 230P53511

PUZZLE OR ORNAMENT

This invention relates to a device presenting a distinctive visual appearance, intended to be used primarily as a puzzle but usable also as an ornament of variable appearance.

- 5 The present invention resides in a puzzle or ornament comprising a support plate or the like, a plurality of pattern-carrying overlay members each rotatable on the support plate or the like about respective axes so placed that each overlay member
- 10 overlaps at least one adjacent overlay member, each overlay member having thereon an annular regular array of pattern positions such that where said members overlap, at least one pattern position of each overlapping member can be placed in register,
- 15 each overlay member having in at least one pattern position a marking, and in at least one further pattern position being adapted to reveal a marking provided below said member, whereby the overall appearance presented by the puzzle or ornament comprises the
- 20 combination of markings not obscured by overlying markings, said combination being selectable by rotation of the overlay members.

Preferably, the overlay members are removable, so that each can be placed in any one of the available positions for said members on the support plate or the like and so that the overlap relationship among the said
5 members can be changed. This greatly increases the number of combinations of markings providing the overall appearance.

Preferably, the support plate or the like is provided with an array of pattern positions
10 corresponding to the pattern positions on the overlay members when these are in register with one another, and at least some of the pattern positions on the support plate or the like are provided with markings, so that the markings provided on the support plate or the like
15 can be obscured or revealed by the overlay members according to the position of the latter and can therefore contribute to the overall appearance.

It will be seen that by rotating the overlay members, and optionally by moving them to different
20 positions on the support plate or the like and/or changing the overlap relation between adjacent overlay members, the user can generate a very large number of combinations of visible markings.

The user can treat the device simply as an ornamental object, presenting a combination of markings which he can select. However, I envisage that the primary object of the device is as a puzzle, the aim of the user being to generate a predetermined overall appearance, or an overall appearance falling within a predetermined class. Specifically, the device is intended to be used as a puzzle, with the object of generating an overall appearance consisting of a plurality of interlocking arrays of pattern positions (each array corresponding to the array of pattern positions on one overlay member when in the in-register position), such that in each such array in the final appearance, no marking is repeated; or alternatively, some other predetermined relationship among the markings is achieved.

It will be understood that in each pattern position of each such array of the final appearance, what is visible may be a marking provided on the overlay member which is uppermost at that particular pattern position, or a marking on an underlying overlay member visible through the overlying member or members, or a marking on the support plate or the like visible through the overlying overlay member or members at that position. Because rotating any overlay member changes the overall appearance not only by moving the markings on that member but also by revealing or obscuring

markings below it, and revealing or obscuring markings on it according to the configuration of any overlay member or members above it, predicting the effect of any such rotation, and achieving a desired overall appearance, requires great patience, skill and ingenuity on the part of the user.

In a particularly preferred arrangement, each overlay member carries a single ring of pattern positions, at intervals of 60° and constant radius, the radius being identical for each overlay member; and there are at least six overlay members, placeable with their respective axes at the apexes of a regular hexagon, so that each overlay member has two pattern positions coincident with a respective pair of pattern positions of each adjacent overlay member. Preferably, a seventh overlay member is placed to rotate about an axis at the centre of the hexagon so that its pattern positions register with pattern positions of the six outer overlay members.

It is to be understood that the arrangement of markings on each overlay member can be quite arbitrary. For example in the embodiment just referred to, any overlay member may have markings in one to six of its pattern positions, in any spatial arrangement, and the

markings may be all different, all identical, or of any combination of difference and identity.

The markings themselves can be of any nature, for example numbers, letters, colour patches, images; 5 provided that the number of different markings available must be at least equal to the number of pattern positions in each array, so that it is possible for the user to generate an overall appearance in which no marking is repeated in any of the visible arrays.

10 Each overlay member may for example be a transparent disc, with a marking provided on it at one or more of its pattern positions; alternatively each overlay member may be an opaque disc, provided with a marking at one or more pattern positions, and with a window at one or more 15 pattern positions to reveal underlying markings. The latter configuration has advantages in manufacture, because it does not require a high degree of accuracy in the placing of its markings and rotation axes, to provide a clean overall appearance. The former 20 configuration, unless it is manufactured and assembled with great accuracy, may not ensure that at each pattern position, the uppermost marking completely obscures markings under it.

A preferred embodiment of the invention will now be described with reference to the accompanying drawings.

In the drawings:

Figure 1 is a plan view of a playing board,

5 Figure 2 is a side view of a playing piece,

Figure 3 shows three possible playing pieces in perspective,

Figure 4 shows in cross-section a playing piece fitted onto the board,

10 Figure 5 shows the complete puzzle comprising the board and seven playing pieces, in one possible arrangement,

Figure 6a-d shows different arrangements of the playing pieces, and

15 Figure 7 shows the puzzle, completed.

The illustrated board is circular, but any other convenient shape can be used. Its upper surface is provided with seven holes 11, placed respectively at the apexes and centre of a regular hexagon. Centred on
20 each hole as axis is a ring of six pattern positions 13 at angular intervals of 60° about the corresponding axis 11. The rings are of identical radius, which is such that pattern positions of adjacent rings coincide

and in all, the six rings provide only twenty four
pattern positions. Specifically, in the six rings
centred on the axes ll at the apexes of the hexagon,
each ring has two pattern positions shared with a
5 neighbouring ring on one side and a further two pattern
positions shared with a neighbouring ring on the other
side; each pattern position of the central ring, centred
on the centre of the hexagon, coincides with a
respective shared pattern position of two of the outer
10 pattern position rings.

At each pattern position is a circular colour patch
15, enclosed by a border 17 in the form of an
equilateral triangle with convex sides, the outermost
side being centred on the axis ll of the corresponding
15 pattern ring.

Each colour patch 15 is one of six colours,
indicated in the drawings as follows:

B - blue
G - green
20 R - red
W - white
Y - yellow
P - purple.

It will be seen that in each of the seven rings of colour patches centred on the axes 11, no colour is repeated.

For simplicity, the pattern of colour patches on the board is preferably fixed. However, means may be provided for changing this pattern, for example this base pattern on the board may be on a separate sheet of material which can be replaced by another sheet carrying a different pattern of colours. Alternatively, one or more such separate sheets may be provided, to be placed over a fixed pattern provided on the board.

The puzzle further comprises seven (or more) playing pieces. Each of these playing pieces consists of a circular overlay disc 21 with a diameter substantially equal to that of each of the circular pattern arrays on the board, a central pin 23 on the underside of the disc, which pin can fit into any one of the holes 11 of the board, and a handle 25 on the upperside, coaxial with the pin 23. Thus, any playing piece can be fitted onto the board with its pin 23 in any of the holes 11, and can then be rotated about that pin by means of the handle 25.

Each overlay disc 21 carries a circular array of pattern positions 27, each consisting of a triangle 29 identical to the triangles 17 in shape, size and position relative to the axis defined by the hole 11 and pin 23. Each disc 21 is opaque, but may be provided with a window 31 at one or more of its pattern positions. These windows, if provided, correspond in position and are slightly smaller in size than the colour patches 15. Pattern positions on the playing pieces, where there is no window, have colour patches 33 like those on the board. However in the case of the playing pieces, one or more colours may be repeated, though in general it is preferable to ensure that all the colour patches on any disc are different. The placing of the colour patches and windows will in general be different, from one disc to another.

It will be easily seen that, when seven playing pieces are fitted onto the board, each disc will overlap or be overlapped by its two neighbours in the outer ring of six pieces, and the central disc. By way of example only, Figure 5 shows an arrangement in which the central disc is uppermost and overlaps the other six discs; below it, the left and right-hand discs overlap the other four discs; and the upper left and lower right-hand discs overlap the upper right and lower left-hand discs.

Figure 6 shows, in simplified representation, four further possible overlapping arrangements.

The user can arrange the discs in any order and in any overlapping arrangement.

5 In use of the puzzle, each playing piece is rotated until its pattern positions are in register with those of its three neighbours and those of the underlying board. It will readily be seen that the overall appearance presented by the puzzle, for any selected
10 locations and settings of the playing pieces, will depend on how the discs 21 overlap, and how their windows 31 reveal colour patches of underlying discs or the underlying board. Rotating any single disc changes the colour arrangement visible not only in the circle of
15 six pattern positions centred on the axis of that disc, but of course also in the three neighbouring circles of pattern positions which overlap with or are overlapped by that disc.

The primary object of the puzzle is to achieve an
20 overall appearance in which, in each of the seven rings of pattern positions centred on the axes of holes 11, there are six different colours, for example as shown in Figure 7. This overall appearance need not, and in

general will not, correspond to that of the board though it satisfies the same criterion, namely no repeated colour in any ring of pattern positions.

However, the user is of course at liberty to select
5 a different object, that is to say a different criterion for the final appearance of the puzzle, e.g. a uniform set of markings in a selected ring.

Numerous variations of the described puzzle are possible. For example, to position the playing pieces
10 rotatably, the board may have upstanding pins at the apexes and centre of the hexagon corresponding to the holes 11, each playing piece having a corresponding socket, for example in the lower end of its handle 25, to fit over any of these fixed pins. In a simpler form
15 of the puzzle, the rotatable overlay discs may be fixed in position instead of being movable and locatable in different positions.

As already mentioned, each playing piece may
alternatively consist of a transparent disc, carrying
20 one or more colour patches.

For simplicity, for example for use by children, the number of playing pieces and the number of pattern positions in each array, can be reduced. For example, a particularly simple form of puzzle may have only three axes positions at the apexes of an equilateral triangle, and each array of pattern positions may comprise six positions as in the illustrated puzzle, or even only three positions at angular intervals of 120° . Another possible arrangement comprises four pattern positions in each array, at the corners of a square, with four such arrays having their centres at the corners of a square.

CLAIMS

1. A puzzle or ornament comprising a support plate or the like, a plurality of pattern-carrying overlay members each rotatable on the support plate or the like about respective axes so placed that each overlay member overlaps at least one adjacent overlay member, each overlay member having thereon an annular regular array of pattern positions such that where said members overlap, at least one pattern position of each overlapping member can be placed in register, each overlay member having in at least one pattern position a marking, and in at least one further pattern position being adapted to reveal a marking provided below said member, whereby the overall appearance presented by the puzzle or ornament comprises the combination of markings not obscured by overlying markings, said combination being selectable by rotation of the overlay members.

2. The puzzle or ornament claimed in claim 1, in which the overlay members are removable from the support plate or the like, in such a manner that each overlay member can be placed on the support plate selectively in different available positions for said members, and/or the overlap relationship among the said members can be changed.

3. The puzzle or ornament claimed in claim 1 or 2, in which the support plate or the like is provided with an array of pattern positions corresponding to the pattern positions on the overlay members when these are in register with one another, and at least some of the pattern positions on the support plate or the like are provided with markings, so that the markings provided on the support plate or the like can be obscured or revealed by the overlay members according to the position of the latter and can therefore contribute to the overall appearance.

4. The puzzle or ornament claimed in any preceding claim in which each overlay member carries a single ring of pattern positions, at intervals of 60° and constant radius, the radius being identical for each overlay member; and there are at least six overlay members, placeable with their respective axes at the apexes of a regular hexagon, so that each overlay member has two pattern positions coincident with a respective pair of pattern positions of each adjacent overlay member.

5. The puzzle or ornament claimed in claim 4 in which a seventh overlay member is placed to rotate about an axis at the centre of the hexagon so that its pattern positions register with pattern positions of the six outer overlay members.

6. The puzzle or ornament claimed in any preceding claim in which each overlay member is a transparent disc with a marking provided on it and one or more of its pattern positions.

7. The puzzle or ornament claimed in any of claims 1 to 5 in which each overlay member is an opaque disc provided with a marking at one or more pattern positions, and with a window at one or more pattern positions to reveal underlying markings.

8. A puzzle or ornament, substantially as herein described with reference to the accompanying drawings.