# (12) UK Patent Application (19) GB (11) 2 454 182 (13) A

(43) Date of A Publication

06.05.2009

(21) Application No:

0721214.5

(22) Date of Filing:

30.10.2007

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(51) INT CL:

A63F 9/20 (2006.01) A63F 9/10 (2006.01) A63F 9/00 (2006.01)

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www.traxgame.co.uk

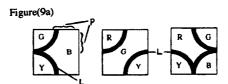
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(58) Field of Search:

INT CL A63F

Other: WPI & EPODOC

- (54) Abstract Title: Tessellating pieces for a game
- (57) Apparatus for a game comprises a plurality of tessellating pieces which are flat, shaped pieces having a design on at least one surface. The pieces may have between 3 to 6 sides, the length of the sides being equal so that the pieces can be placed adjacent to each other to form a tessellating pattern. The surface design is such that when pieces are placed next to each other a continuous pattern may be formed. The surface design may comprise lines, coloured zones or two or more topologically different layouts. The game is played according to a predetermined set of rules. The design of the playing pieces may be used in an electronic game using the same set of rules.



Figure(9b)

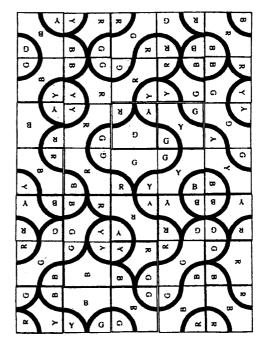


Figure (1)

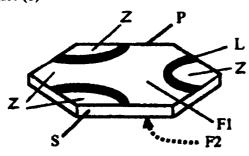


Figure (2)

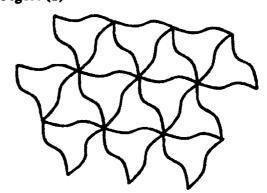


Figure (3)

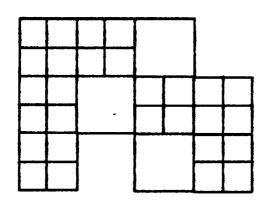


Figure (4)

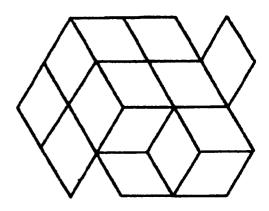


Figure (5)

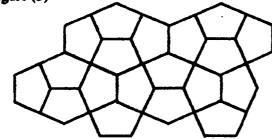


Figure (7)

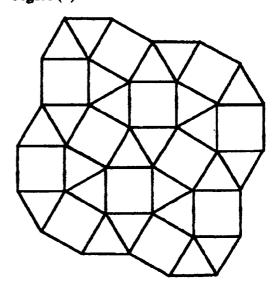
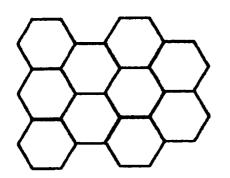
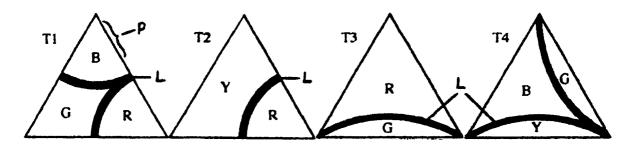


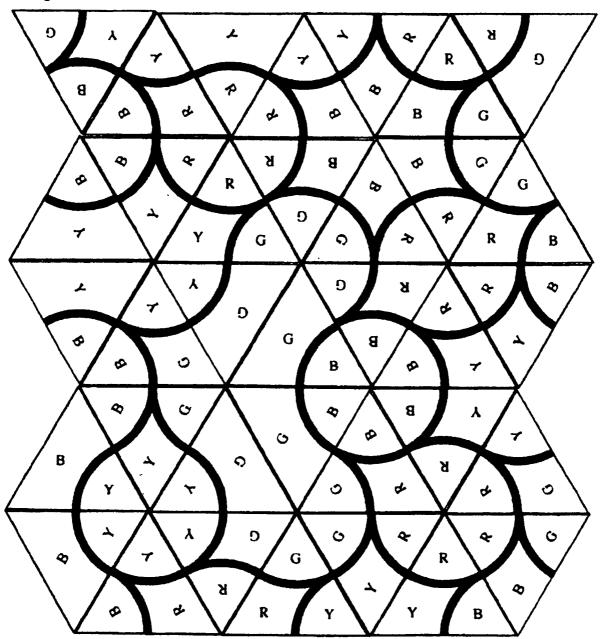
Figure (6)

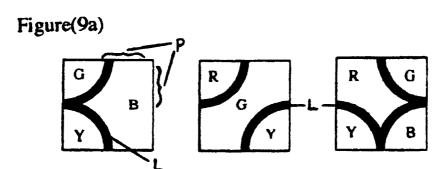


Figure(8a)

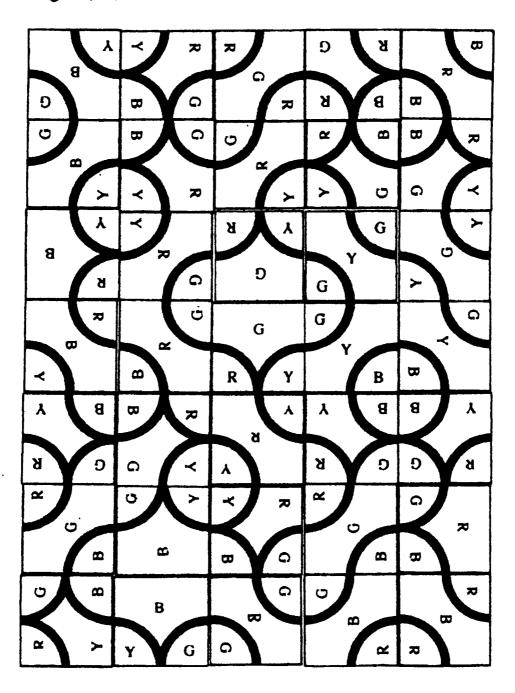


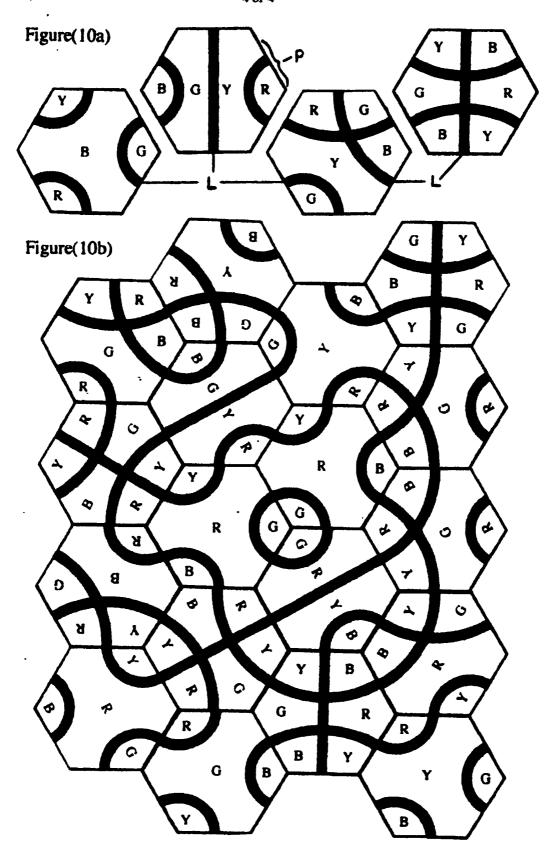
Figure(8b)





Figure(9b)





# Tessellating playing pieces

## Background

Many games and ideas for games utilise the principle of placing playing pieces onto a game board or table top in a strategic way to gain some playing advantage over an opponent. Some of these games have all the pieces 'in play' from the start while others involve the progressive tactical placement of pieces onto a board or into an array according to certain rules of placement. Of this second type the playing pieces may be of a particular shape or utilise colours, pictures, patterns or numbers on their surface which, subject to the rules of the game, govern the way in which pieces may be placed in relation to each other.

Of all these games some make use of a playing board with a prescribed matrix of playing spaces, while others are 'table top' games where there is no boundary restriction to the creation of an array of pieces. The set of playing pieces which is the subject of this application can be played with on any flat surface, or in the form of an electronic game, and incorporates design elements, combined with rules of placement of the playing pieces within an array, which are believed to be original.

#### Statement of invention

Playing pieces, not necessarily of uniform shape, each piece having two predominantly flat faces and of a size suitable for easy handling, which can be placed on a flat surface in such a way as to form a tessellating array. The size, shape and surface design of each playing piece govern whether, and how, that piece may be placed in edge contact with other pieces that have already been placed into the array. The playing pieces provide game opportunities for one or more players. Games based on these game playing pieces could also be played on a computer or some other electronic game playing device.

## Introduction to drawings

Figure (1) shows how a playing piece of a regular hexagonal shape might look, with flat faces (F1 and F2) and sides (S) marked. Also marked are zone boundary lines (L) which delineate the zones (Z) which, together, make up the zone layout on the uppermost face.

Figures (2) to (7) show a range of possible alternative shapes for playing pieces. Any of these tessellating shapes could, with appropriate surface markings (not shown) and rules of play, provide game opportunities similar to those described below in the preferred embodiment of this invention.

Figure (8a) shows a range of possible zone layouts for equilateral triangles (T1 to T4). As will be explained in the detailed description, T1 and T2 are compatible with each other in

terms of their zone layouts as are T3 and T4. However those two pairs are not compatible with each other and could not form part of the same array, an example of which is shown in Figure (8b) where the zone layouts T1 and T2 only are used. Also illustrated are the zone boundary lines (L) and the zone identifying elements within each zone (R, B, G and Y).

Figures (9a) and (9b) show a possible range of zone layouts for squares and the sort of tessellating array that such squares might produce, using the same four zone identifying elements R, B, G and Y.

Figures (10a) and (10b) show a possible range of zone layouts for regular hexagons (the preferred embodiment) and the sort of tessellating array that such hexagons might produce, using the same four zone identifying elements R, B, G and Y.

## Detailed description of the invention

# Size and shape of the playing pieces

This invention relates to playing pieces that can be played with on any flat surface and, apart from a suitable container for the playing pieces such as a bag, do not need any other accessories such as dice or a game board. The way the pieces are played with requires that they should be of a suitable size, thickness, weight and material for convenient handling, cleaning and durability. These playing pieces could also form the basis for a game or games played on a computer or other electronic game playing device.

The playing pieces have two predominantly flat faces (F1 and F2), each face in a parallel plane to the other so that they can be placed, for playing purposes, in a stable position on a flat surface with one face uppermost, and visible, and the other face in contact with the supporting surface and hidden from view. Playing pieces may not all be of the same size, may vary in the shape of their perimeter (P in Figures (1), (8a), (9a) and (10a)) and may vary in their surface design, elements of which are significant for game playing purposes, such elements being able to be applied to one or both of their flat faces.

For game playing purposes, a 'set' of playing pieces would be used comprising a plurality of playing pieces that can be placed together on a flat surface in such a way as to produce a tessellating array with compatible surface design elements. Examples of some of the range of shapes which may be comprised within a set are illustrated, without the inclusion of any surface design elements, in Figures (2) to (7). It will be seen from those illustrations that

- The pieces that make up a tessellating array, and could therefore comprise a set, do not necessarily all have to be the same shape (Figure(7))
- Some pieces may be of the same shape but not all necessarily of the same size (Figure (3))
- The pieces do not necessarily have to have straight edges (Figure(2))

For any set of playing pieces the size and shape of each piece within the set must have sufficient compatibility with the size and shape respectively of some, or all, of the other pieces within the set to enable each piece, subject to prevailing rules of play, to be placed in edge contact with other pieces of the same set to form a tessellating array. A traditional jigsaw puzzle uses shape (and surface design) to determine how the pieces fit together to form a tessellating array but in the case of a jigsaw puzzle there is only one correct 'fit' for any particular piece and only one possible shape and design for the finished array. By contrast, the playing pieces that are the subject of this application can fit together to form a plurality of different arrays, not necessarily conforming to a single overall shape.

Surface design of the playing pieces: zones, zone layouts and zone boundary lines. The size and shape of a playing piece determines whether it can physically fit together in edge contact with other pieces on a flat surface as part of a tessellating array. Assuming that there are positions within the array where a playing piece can physically fit, whether any of those positions are 'allowable' for that piece is governed by rules of placement which, among other things, determine whether a playing piece is compatible with, or 'matches', the playing pieces with which it has edge contact. The interest and challenge of playing with these playing pieces derives mainly from trying to find matching spaces to place a piece into the array while at the same time gaining a playing advantage over opponents.

The elements within the surface design of a playing piece that may be used for the purposes of determining whether a 'match' exists between one playing piece and another with which it has edge contact may be of many types, such as numbers, shapes, directional hatching, words, pictures or colours. Tactile elements suitable for blind or partially sighted people could also be used. These elements may be contained within non-overlapping 'zones', of variable shape (R, B, G and Y in Figures (8a), (9a) and (10a)), on one or both of the faces of a playing piece, thereby giving each zone an identity for matching purposes. For example, if numbers were the zone identifying element within the surface design it may be required that the numbers on the adjoining zones of adjoining playing pieces must add to ten. If words were used it might be required that the words in adjoining zones must link to form a single word. If colours are used, as in the preferred embodiment of this idea, it might be required that adjoining zones be of the same colour or, possibly, not be of the same colour. What may constitute a match is governed by the prevailing rules of play.

Each zone is bounded partly by a portion of the perimeter of the playing piece (P in Figures (8a), (9a), and (10a)) and partly by one or more of the other zones on the same face of the playing piece from which it may be separated by a 'zone boundary line' (L), such arrangement of zones within a single face of a playing piece being referred to as a 'zone layout'.

Zone boundary lines do not have to be of a specific width or colour, although they are black in the preferred embodiment of this invention. They could also be indented or

raised relative to the surface of the zones. They merely perform the function of delineating the boundary of a zone where that boundary does not coincide with the perimeter of the playing piece.

A set of playing pieces, even if they are all the same shape and size, may utilise more than one zone layout and if pieces of more than one shape are contained within a set then inevitably there will be more than one zone layout represented within the set. Zone layouts that are contained within one set of playing pieces must be compatible with each other, regardless of whatever design elements may be used within individual zones. This means that it must be possible for all the playing pieces in a set to be placed together to form a tessellating array, with the zone boundary lines having continuity within that array, where continuity is understood to mean that a zone boundary line, at whatever point or points it meets the perimeter of its own playing piece, has a connection with at least one other zone boundary line of another playing piece, which gives visual continuity to those lines regardless of the angle at which they meet, such continuity being broken only at the perimeter of the array. This has the consequence that linked zone boundary lines either form closed 'loops' of variable shape or continue unbroken, but possibly merging with other lines or loops, until they reach the perimeter of the array. These loops and unbroken lines are clearly visible in Figures (8b), (9b), and (10b).

The zone boundary lines of the hexagons in Figure (10a) will automatically always have continuity within an array because every side of every hexagon, whichever one of the four zone layouts the hexagon may have, is designed to have a zone boundary line meeting it halfway along its length. Figure (10b) illustrates the appearance of this continuity in an array. However the two zone layouts, T1 and T2, of the equilateral triangles in Figure (8a) are designed so that some, but not all, sides have a zone boundary line meeting them halfway along their length. This does not make the zone layouts incompatible because, with careful arrangement, a set of triangles comprising these two zone layouts can be placed together to form a tessellating array (Figure (8b)) while still conforming to the rule that zone boundary lines must always have continuity. Zone layouts T3 and T4 in Figure (8a) are also compatible in this way between themselves but are not compatible with T1 and T2 because there would not be continuity of zone boundary lines if all four zone layouts were represented within a single array.

Figure (9a) shows three zone layouts that could be used for square playing pieces. These are compatible as is shown by the array in Figure (9b). Assuming that the edge length of these squares is the same as the edge length of the equilateral triangles of Figure (8b) then both the squares and the triangles could be combined within the same tessellating array in a compatible way because their zone boundary lines can be made to link together in a continuous way. Such a combination of squares and triangles is shown in Figure (7) but without the detail of the zone layouts.

The continuity of zone boundary lines has the effect of delineating areas, hereafter referred to as 'patches', of variable size and shape, of visually linked zones. These patches are illustrated in Figures (8b), (9b) and (10b) by the linked zones of common

identity, the range of identities being R, B, G and Y. Some of the patches can be seen to be 'closed' by being completely surrounded by other patches and some remain 'open' and capable of being extended by the placement of additional playing pieces. The particular design of the zone layouts in each of those illustrations permit the creation of a wide variety of patch shapes and sizes which yield an attractive mosaic type of pattern. It is unlikely that someone using a set of these playing pieces would, by chance, ever create the same pattern twice.

This pattern making quality that is possible with these playing pieces has most significance when the zone identifying elements are such that the patches of linked zones display a coherence within the array, for example by patches comprising zones of a matching colour. Such playing pieces offer the challenge of 'edge matching' as well as 'patch building'. If the zone identifying elements were, say, words or numbers then there would probably be less need for a range of different zone layouts to give a variety of patch shapes and sizes. Such playing sets would probably be more focused on the edge matching characteristics of the playing pieces rather than the pattern forming possibilities.

Some game opportunities provided by these playing pieces work best with two or four players while other games can be suitable for any number of players (although more than five would probably seem cumbersome). There are also interesting game options for solo playing.

These playing pieces could also be used as the basis for games played on a computer or some other electronic device capable of playing games.

More detailed rules of play for one particular set of playing pieces are described later, including methods of scoring, as well as some possible variations of play.

## The preferred embodiment

The preferred embodiment of this invention is represented by the hexagonal playing pieces illustrated in Figures (10a) and (10b). Each zone within the zone layouts of each of those hexagons are given identity by the use of one of the four colours red, blue, green and yellow (R, B, G and Y respectively)

The four zone layouts illustrated in Figure (10a) are all topologically different from each other. The difference in zone layouts ensures that, when zones of a matching colour adjoin each other within an array there is the possibility that, with some arrangements of the playing pieces, the matching zones may all meet at a single common point and, with other arrangements, they may not. As has been already pointed out, this enables the 'patches' of linked zones of the same colour that are formed within the array to be assembled in a wide variety of shapes and sizes (Figure (10b)).

The same colour never appears in adjacent zones on any playing piece and if a colour appears twice on one surface of a playing piece it will be in zones that are diagonally opposite each other. Also, all four colours appear on every playing piece.

Within the parameters listed above, and using the zone layouts that have been selected, the maximum number of hexagonal playing pieces that are all different from each other is fifty six. This would be a reasonable and fairly logical number of these playing pieces to include in a set. If zone layouts are applied to both faces of each playing piece, it would be possible to have fewer pieces within a set, useful perhaps for a 'travelling' set, and it could give some different game playing options. The reverse face could even be used for a different game altogether.

Various game options are available with these playing pieces. One of these options for two, three or four players will now be described. For this particular game option it will be assumed that the playing pieces being used are those described in this preferred embodiment and that only one of the two flat surfaces of each playing piece has zone layouts marked on it. Different rules might apply to games played with playing pieces that were a different shape or had different zone layouts or different zone identifying elements.

## The game.

Each player takes seven playing pieces, unseen, from a bag and places them, face up, in front of them visible to other players. A further single playing piece is selected, unseen, from the bag and placed in the middle of the table face up. The remaining playing pieces may be left in the bag (or placed face down on the table if there is enough space).

Whichever player chooses to start must choose from his playing pieces one which can be placed against one edge of the first piece in such a way that the two touching colours match up. Every playing piece placed on the table after this must touch at least two other pieces, that have already been placed, along an edge and must have all touching colours matching up. Each player continues to take turns placing one playing piece on the table with each turn, gradually building up an array. The array can be any shape and may include enclosed, empty spaces. When a player has placed a piece into the array he takes another, unseen, from the bag (for as long as there are pieces left in the bag) so that he always has seven pieces in front of him.

The aim of the game is to make joined up 'closed' patches of colour. A closed patch is completely surrounded by a black line, with no open edges, so it cannot be added on to. It may include one or more enclosed, empty spaces.

The score for a closed patch is the number of playing pieces which are included in it. That score always goes to the player who placed the closing piece of that patch. When it is a player's turn he must place a piece into the array if he can (unless he has used up all his pieces) but if there is no possible space to place a piece then he loses a

point, does not take another piece from the bag, and play passes to the next player. If no other player can place a piece either then the point is not lost and the game ends.

The number of pieces which a player has left over at the end of the game are subtracted from his score.

# Some possible variations of the game

- With two or four players there is the option of each player pre-selecting which colour or colours he is attempting to make his patches from. If the game is played this way then a player would only score points for completed patches in his selected colour, or colours. A player may complete a patch of another player's colour but would not get points for it. He would, though, prevent the other player from completing that patch and scoring some points. Even with three players the game can be played this way with one 'floating' colour that any player can score from in addition to their own selected colour.
- The quota of seven playing pieces that are displayed in front of each player could be varied to be either more or less. This would make it respectively less or more difficult for a player to find a piece that will fit into the array.
- The winner could simply be the player with the highest scoring single patch of any colour. This avoids the necessity of keeping a running score throughout the game and requires the keeping of a watchful eye on the playing pieces that opponents have in front of them (which must be kept visible unless it is agreed at the start of the game that they need not be).
- A player who completes a patch of another player's pre-selected colour could be entitled to take one of that player's unplaced playing pieces thereby reducing that player's quota to, say, six while increasing his own to eight.
- The rules of placement could be reversed so that adjacent zones must <u>not</u> be of a matching colour and, for scoring purposes, only those patches which have at least one of each of the four colours included in it can be counted.

# Ideas for playing solo

- Try to place all the pieces with none left over
- Get as many closed patches as you can
- · Get the biggest closed patch that you can
- Can you make a symmetrical pattern?
- Place the pieces so that no matches occur between the colours of abutting edges

#### Claims

Claim (1): Playing pieces, each comprising:

- (a) two predominantly flat faces, each hereafter referred to as a 'face', in parallel planes to each other such that the playing piece may be placed in a position of stability on a flat surface with one of the faces uppermost, and therefore able to be viewed, and the other in contact with the supporting surface, such position being assumed to be the orientation of the playing piece when placed in relation to other playing pieces:
- (b) a perimeter shape, being the shape which is apparent when the playing piece is viewed perpendicularly to one of its faces, comprising three, four, five or six sides, and a perimeter size, which may permit the placement of the playing piece into a tessellating array of said playing pieces, such placement conforming to the requirement that any such playing piece placed into said array must also tessellate with playing pieces with which it has contact that have already been placed into the array:
- (c) a surface design containing elements which may give identity to said playing piece, or portions of it, and which may, in conjunction with the size and perimeter shape of said playing piece and also in conjunction with prevailing rules of play pertaining to such playing pieces, determine how said playing piece may be placed within a tessellating array of such playing pieces while still complying with the requirement described in 1(b), such elements being applied to one or both faces of the playing piece, and such other areas as may seem fit:

such playing pieces providing game opportunities for one or more players.

Claim (2): Playing pieces according to Claim (1) in respect of each of which the surface design elements may comprise non-overlapping 'zones' which may be of variable shape, each zone being bounded wholly or partly by (a) one or more of the other zones that may be visible on the same face of the playing piece, from which said zone or zones it may be separated by a line, groove, ridge or some other boundary delineator, hereafter referred to as a 'zone boundary line', and if not wholly bounded by (a), then also partly bounded by (b) that portion of the perimeter of the playing piece that borders the zone, such arrangement of zones within a single face of a playing piece being referred to as a 'zone layout'.

Claim (3): Playing pieces according to Claim (2) each of which has a zone layout which, when selected to be uppermost for playing purposes, may permit the placement of said playing piece within a tessellating array of said playing pieces in a way which maintains zone boundary line 'continuity', where continuity is understood to mean that a zone boundary line, at whatever point or points it meets the perimeter of its own playing piece, has a connection with at least one other zone boundary line of another playing piece, which gives visual continuity to said lines with, or without, regard to the angle at which they meet, such continuity being broken only at the perimeter of the array, a consequence of such continuity, within a tessellating array, being that boundaries may be delineated

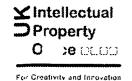
within that array which give definition to areas, hereafter referred to as 'patches', each of which comprises a plurality of adjoining zones.

Claim (4): Playing pieces according to Claim (3) comprising zones each of which may be attributed an identity by the application of an element of surface design, thereby creating the possibility of determining if there is an identity 'match', according to the prevailing rules of play, between zones of different playing pieces when said zones abut each other, or have some other defined spatial relationship to each other, as the result of the placement of said playing pieces into a tessellating array.

Claim (5): Playing pieces according to Claim (4) in respect of which an element of surface design which attributes identity to some or all of the zones within the zone layouts of said playing pieces may be colour.

Claim (6): Playing pieces according to Claims (2), (3), (4) or (5) comprising within their plurality two or more topologically different zone layouts.

Claim (7) Electronic games, that may be played on a computer or any other electronic device with game playing capabilities, which simulate playing pieces according to any of the above Claims.



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**Application No:** GB0721214.5 **Examiner:** Hayley Yates

Claims searched: 1-7 Date of search: 27 February 2008

# Patents Act 1977: Search Report under Section 17

### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-5	GB 1379902 A Chedzoy; see figures 1-4
X	1-6	US 5692749 A Vogeler; see figures and column 3 line 66 to column 4 line 17
X	1-5	US 3643956 A Bovasso; see figures
X	1-5	DE 2903324 A Scharstein; see figures and abstract translation
X	1-7	www.traxgame.co.uk
X	1-7	www.tantrix.co.uk

# Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of	P	Document published on or after the declared priority date but before the filing date of this invention.
&	same category  Member of the same patent family	Е	Patent document published on or after, but with priority date earlier than, the filing date of this application.

## Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>X</sup>:

Worldwide search of patent documents classified in the following areas of the IPC

A63F

The following online and other databases have been used in the preparation of this search report

**WPI & EPODOC** 

## **International Classification:**



For Creativity and Innovation

11

Subclass	Subgroup	Valid From	
A63F	0009/20	01/01/2006	
A63F	0009/00	01/01/2006	
A63F	0009/10	01/01/2006	