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(54) **KNIGHT-WALK PUZZLE GAME**

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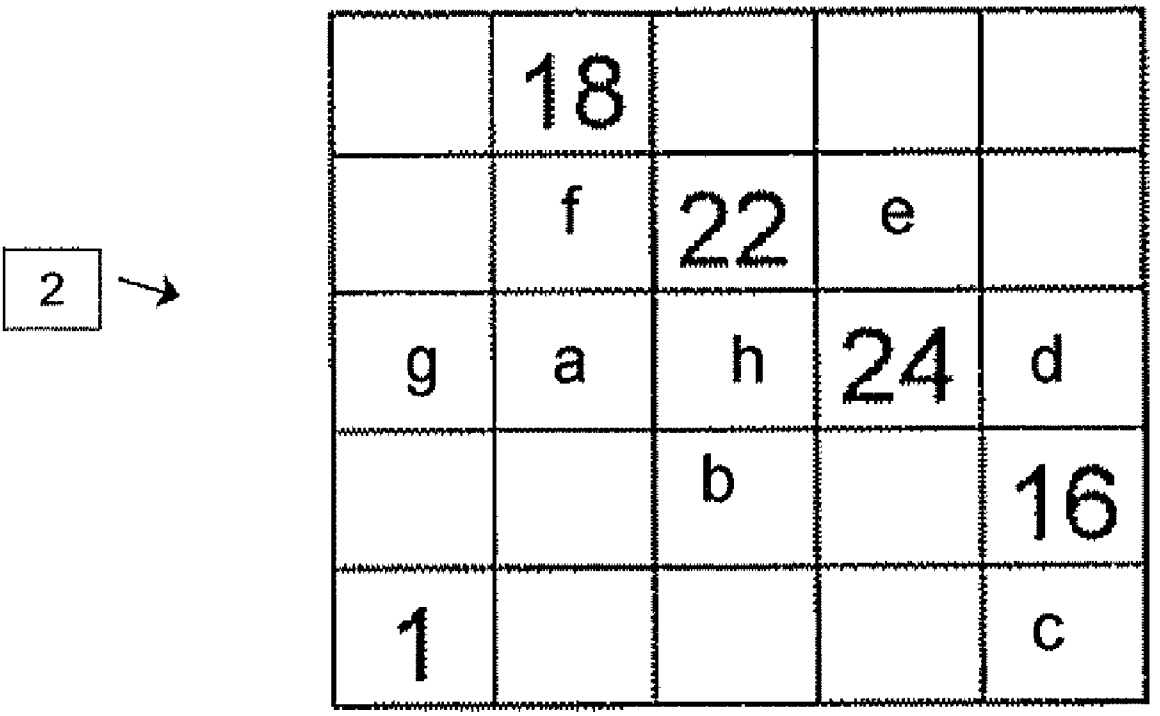
(57) **ABSTRACT**

A puzzle game of the present invention consists of a field of play having associated positions upon which place-indicators are placed during game play along a predetermined game path. Placement of the place-indicators represents a sequential series of steps from a starting point along a game path in the field of play to an end point. Each of the steps is dependent on a predetermined step pattern and the place-indicator is placed on the position upon which the end of the step pattern falls. The solution to the puzzle is achieved by the placement of all place-indicators between the starting point and the end point. In order to indicate a particular game path, at least two place-indicators are pre-placed as givens in the solution. The place-indicators may be, by non-limiting example, numerals, letters or a group of shapes with a predetermined series displayed on the game play interface, but outside of the field of play.



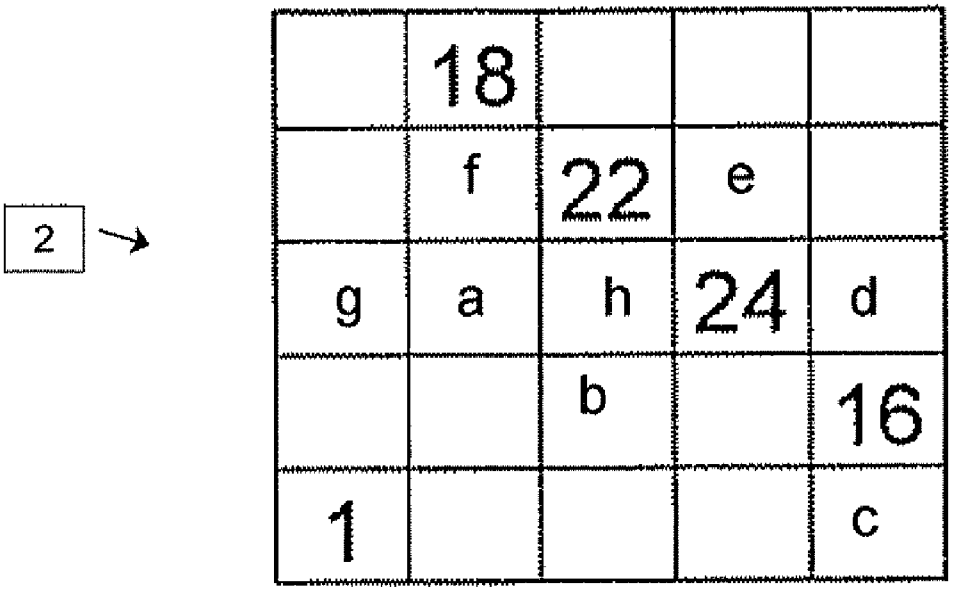

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FIG. 1

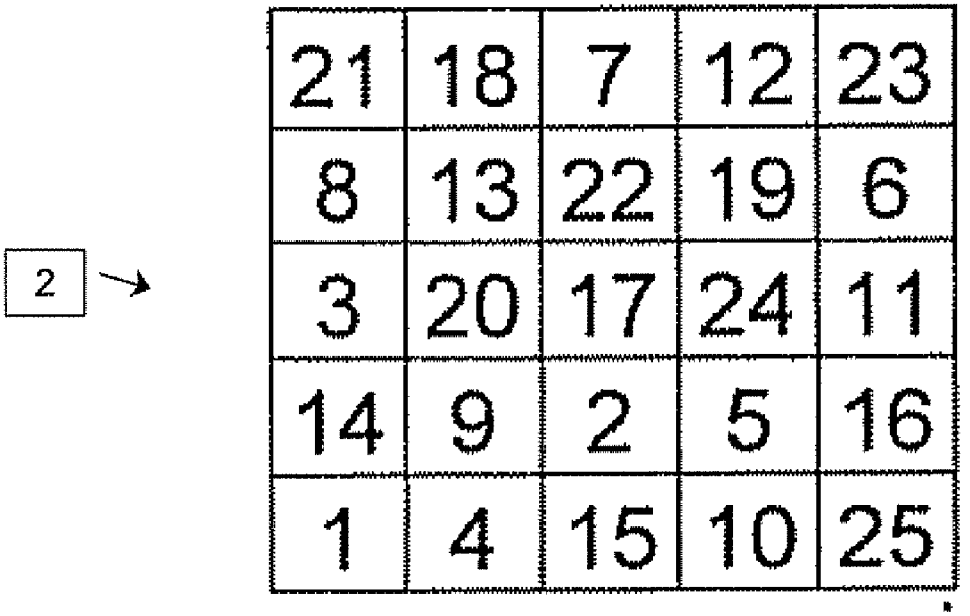
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FIG. 2

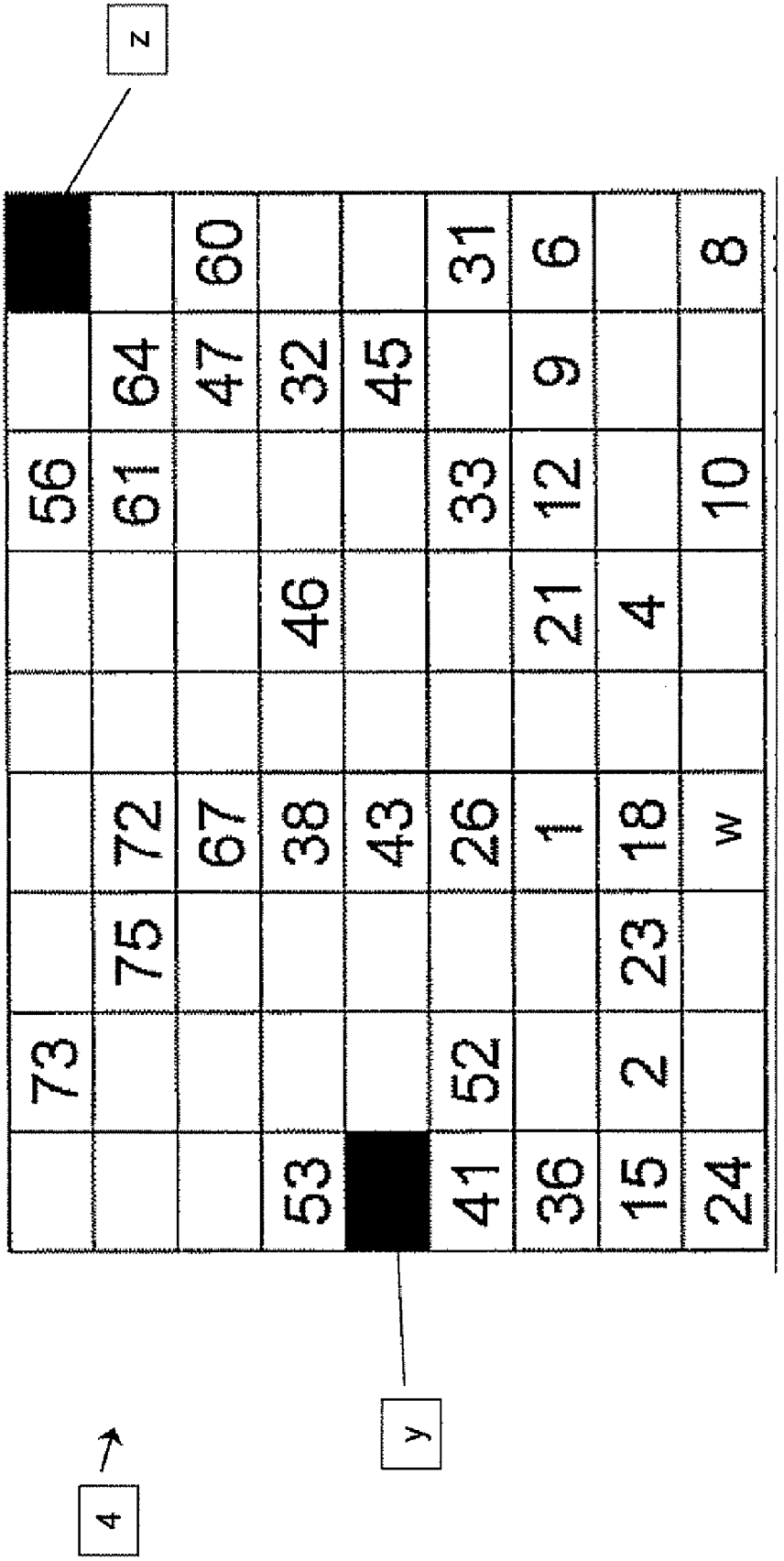
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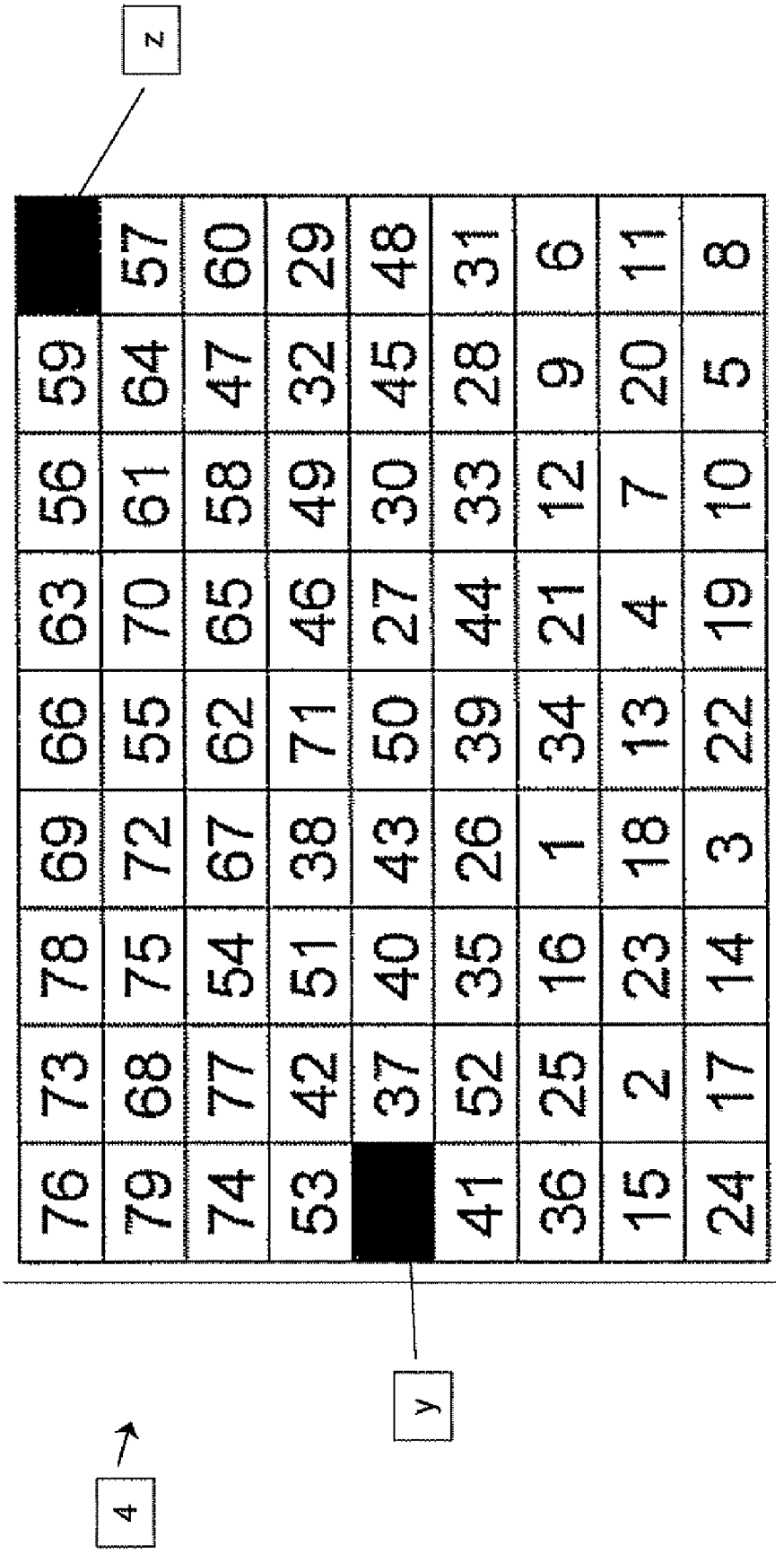
FIG. 3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73 68 77 42 37 52 25 2 17
78 75 54 51 40 35 16 23 14
69 72 67 38 43 26 1 18 3
66 55 62 71 50 39 34 13 22
63 70 65 46 27 44 21 4 19
56 61 58 49 30 33 12 7 10
59 64 47 32 45 28 9 20 5
57 60 29 48 31 6 11 8

FIG. 4

KNIGHT-WALK PUZZLE GAME

[0001] This application claims priority from U.S. Provisional Patent Application 60/786,797 filed on 29 Mar. 2006.

FIELD AND BACKGROUND OF THE INVENTION

[0002] The present invention relates to puzzle games and, in particular, it concerns a puzzle game in which the game field is filled by placing numerals in specific positions spaced apart one from another by a predetermined step pattern along a predetermined path in a grid.

[0003] Puzzle games in which squares on a grid are filled with numbers dictated by a solution are known in the art. One example of games in this genre is Sudoku, a logic-based number placement puzzle. The objective is to fill a 9×9 grid so that each column, each row, and each of the nine 3×3 boxes contains the digits from 1 to 9. The puzzle is provided with a partially completed grid. Other games include Latin Squares and Magic Squares.

[0004] There are no puzzles known in the art in which the solution follows a predetermined path along which there is a predetermined relationship between each step.

[0005] There is therefore a need for a puzzle game in which the game field is filled by placing numerals in specific positions spaced apart one from another by a predetermined step pattern along a predetermined path in a grid.

SUMMARY OF THE INVENTION

[0006] The present invention is a puzzle game in which the game field is filled by placing numerals in specific positions spaced apart one from another by a predetermined step pattern in a grid along a predetermined path

[0007] According to the teachings of the present invention there is provided, a puzzle game comprising a field of play configured for placement of place-indicators such that placement of the place-indicators represents a series of sequential steps from a starting point along a game path in the field of play to an end point, and each step of the series of steps has a predetermined step pattern and each the place-indicator is placed on the field of play at an end of a respective the step of the series of steps and a solution to the puzzle is the placement of all place indicators between the starting point and the end point, and at least two the place-indicators are pre-placed as givens in the solution.

[0008] According to a further teaching of the present invention, the step pattern is similar to a move that can be made by a chess piece on a chessboard during a game of chess.

[0009] According to a further teaching of the present invention, the step pattern is similar to a move that can be made by a knight during a game of chess.

[0010] According to a further teaching of the present invention, one or more place-indicators are pre-placed in its predetermined position along the game path by a game setter prior to a beginning of play.

[0011] According to a further teaching of the present invention, the game path is configured such that there is a single solution to the puzzle along a given the game path between the starting point and end point that includes the one or more pre-placed place-indicators in proper sequence.

[0012] According to a further teaching of the present invention, there is also provided a computer program programmed to: a) determine a size of the field of play; b) determine the step pattern; c) choose the starting point; d) determine the game path; and e) indicate positions of the at least two given place-indicators, as determined by a solution to the puzzle game, on a game play interface.

[0013] According to a further teaching of the present invention, the computer program provides a process for varying a level of difficulty of the puzzle game.

[0014] According to a further teaching of the present invention, the computer program generates a game play interface.

[0015] According to a further teaching of the present invention, the game play interface is printed material.

[0016] According to a further teaching of the present invention, the game play interface is displayed on a display monitor.

[0017] According to a further teaching of the present invention, the display monitor is implemented on any one from a list that includes: computer monitors, game consoles, cellular phones, PDAs, TV set, and handheld electronic games.

[0018] There is also provided according to the teachings of the present invention, a puzzle game comprising: a) a field of play that includes a grid on which numerals are placed along a game path determined by a solution to the puzzle such that the game path is a sequential series of steps having a predetermined step pattern, the game path continuing from a starting point to an end point with a solution to the puzzle being the placement of all the numerals between the starting point and the end point, and at least two the numerals are pre-placed as givens in the solution; b) a device for presenting a game play interface that depicts at least the field of play; and c) a computer program configured to determine at least one parameter of game play and generate the game play interface.

[0019] According to a further teaching of the present invention, there is also provided at least one algorithm for determining the at least one parameter of game play.

[0020] According to a further teaching of the present invention, the at least one parameter of game play includes at least one of: a) a size of the grid; b) a step pattern for the steps; c) the starting point; d) the game path; and e) indication of a position on the grid of one or more of the numerals, as determined by the solution, on a game play interface.

[0021] According to a further teaching of the present invention, the computer program is configured such that the step pattern is similar to a move that can be made by a chess piece on a chessboard during a game of chess.

[0022] According to a further teaching of the present invention, the computer program is configured such that the step pattern is similar to a move that can be made by a knight during a game of chess.

[0023] According to a further teaching of the present invention, the game play interface is printed material.

[0024] According to a further teaching of the present invention, the game play interface is a display monitor.

[0025] According to a further teaching of the present invention, the game path includes at least 80% of points on the grid.

[0026] According to a further teaching of the present invention, the computer program is deployed as a server so as to provide game play to client devices.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] The invention is herein described, by way of example only, with reference to the accompanying drawings, wherein:

[0028] FIG. **1** is an example of a first preferred embodiment of a game play interface constructed according to the teachings of the present invention, shown here before game play has begun;

[0029] FIG. **2** is the game play interface of FIG. **1** after completion of the game;

[0030] FIG. **3** is an example of a more complex variation of the game play interface of FIG. **1**, shown here before game play has begun;

[0031] FIG. **4** is the game play interface of FIG. **3** after completion of the game;

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0032] The present invention is a puzzle game in which the game field is filled by placing numerals in specific positions spaced apart one from another by a predetermined step pattern along a predetermined path in a grid.

[0033] The principles and operation of a puzzle game according to the present invention may be better understood with reference to the drawings and the accompanying description.

[0034] By way of introduction, the puzzle game of the present invention consists of a field of play having associated positions upon which place-indicators are placed during game play along a predetermined game path. Placement of the place-indicators represents a sequential series of steps from a starting point along a game path in the field of play to an end point. Each of the steps is dependent on a predetermined step pattern and the place-indicator is placed on the position upon which the end of the step pattern falls. The solution to the puzzle is achieved by the placement of all place-indicators between the starting point and the end point. In order to indicate a particular game path, at least two place-indicators are pre-placed as givens in the solution. That is to say, at least two given place-indicators are pre-placed by the puzzle setter. The place-indicators may be, by non-limiting example, numerals, letters or a group of shapes with a predetermined series displayed on the game play interface, but outside of the field of play.

[0035] In a preferred embodiment of the puzzle game of the present invention, the field of play is a grid of squares such that some of the squares represent the associated positions in the field of play. Some of the squares are empty and are included in the field of play. Other squares may be excluded from the field of play. These squares may be noticeably indicated as blocked from play by, for example, being completely colored in. Alternately, squares excluded from the field of play may be left empty so as to appear to the player as being included in the field of play. Therefore, it will be up to the player to eliminate such squares from the field of play as part of finding the solution to the puzzle. Other squares that are included in the field of play contain a numeral as a given in the solution of the puzzle.

[0036] The solution to the puzzle of the present invention follows a predetermined path along which there is a predetermined relationship between each step. To solve the puzzle the player must fill all empty squares such that the numerals represent the sequence of steps having a predetermined pattern, beginning at the square with the numeral 1 and continuing in numerical sequence until the entire field of play is filled while continuing the same step pattern. It should be noted that the predetermined step pattern may be substantially any relationship between two squares on the grid such as, but not limited to, one square vertically or one square horizontally, one square vertically, horizontally or diagonally, three squares horizontally and one vertically or three vertically and one horizontally, and four squares either horizontally, vertically or diagonally. It will be readily understood that the number of step patterns is limited only by the size of the field of play and the imagination of the game setter. It should be noted that the terms "step" and "move" may be used interchangeably herein and both terms refer to movement according to the predetermined step pattern along the solution path of the puzzle.

[0037] It should be noted that the use of the term "grid", which usually connotes substantially horizontal and vertical lines, and the term "square(s)" are used herein as non-limiting examples only and that the relationship between places on the field of play upon which numerals are to be placed need not be limited to a grid per se. That is to say, the outer contour of the field of play need not be square or rectangular, but may take any shape such as, but not limited to, circles and other closed curves, and the outer contour of animate and inanimate objects such as, but not limited to, toys, vehicles, plants and animals. Further, the shape of the place on the field of play upon which numerals are placed is not to be limited by the term "square(s)" as used herein, the term "square(s)" is intended to include substantially all representations of a point or substantially any non-rectangular shape such as, but not limited to, triangles, pentagons, hexagons and circles and other closed curves, as well as squares and rectangles.

[0038] In the non-limiting preferred embodiment of the puzzle game of the present invention described herein, the field of play is indeed a square or a rectangle having a grid of squares similar to a chessboard, and the predetermined pattern of the steps is similar to that of a knight during a chess game. That is, a step of two squares horizontally and one vertically or two vertically and one horizontally. The numeral indicating a particular step number in the sequence is placed on the last square in the step pattern. The path along which the "knight" moves, starts at square number 1, then moves to square number 2, and so on in numerical sequence until the field of play is filled with numerals indicating each step taken. It should be noted that in a test

version of the game, variant step patterns similar to the moves taken by the King and Rook were included.

[0039] It is preferable that a puzzle should have a single solution and that the solution should not require trial-and-error or backtracking. Rather that the solution may be found by logic.

[0040] It will be appreciated that puzzles may be of various levels of difficulty from very easy to very hard. Further, the size of the field of play may be varied independent of, or in conjunction with, the difficulty level. That is, board sizes (the number of squares on the grid) and shapes may vary. For example 5 squares by 5 squares, 5 squares by 7 squares, 10 squares by 10 squares or any other sizes for a rectangular board. Variation of size and level may also be provided for puzzle having non-rectangular outer contours, as mentioned above.

[0041] Additional rules may include restrictions that limit moves or steps along the path such as, but not limited to, a step may not jump over filled squares.

[0042] It will be appreciated that the field of play may be represented by a game play interface in a variety of ways such as, but not-limited to, printed material and electronic displays. When the game play interface is printed material, the puzzle may be solved using a writing utensil such as a pen or pencil for example. When the game play interface is electronic, the puzzle is depicted on the electronic display of such devices as, but not limited to, personal computers both desktop and laptop, game consoles, cellular phones, PDAs, TV set, and handheld electronic game platforms such as GameBoy™. When thusly displayed, the puzzle may be solved using standard input devices such as, but not limited to, keyboards, a mouse, game pads, joysticks and touch screens.

[0043] When the game is displayed electronically, a computer program controls the display, input and logic. The computer program can also store various pre-made puzzles and or create new ones. The computer program may also be configured to provide help to the player upon request by giving hints such as, but not limited to:

[0044] 1. Showing all valid moves from a particular square.

[0045] 2. The location of a particular number already marked on the board.

[0046] 3. The status of each number.

[0047] 4. A partial or full solution of the puzzle.

[0048] 5. Warnings in case the player has made an error of some kind.

[0049] 6. Hints such as, but not limited to, the next move.

[0050] Puzzles of the present invention can be created at random or systematically. Further, the puzzles and solutions may be transferred through computer networks such as, but not limited to, LANs, WANs, the Internet and by e-mail. Alternatively, a server computer may be configured to provide client computers with puzzles and solutions upon request via LANs, WANs, and the Internet.

[0051] Referring now to the drawings, FIG. **1** illustrates a puzzle game field of play **2** according to the teaching of the present invention, in which the step pattern is similar to that of a Knight in a game of chess, two squares horizontally and one vertically or two vertically and one horizontally. Accordingly, the step from square **1** can go to either square a or square b.

[0052] In the electronic version of the game of the present invention, when the cursor is moved to square **1**, squares a and b may be highlighted.

[0053] If the player decides to move to square b, then the numeral 2 is placed in square b, which is the last square in the step pattern. It will be readily understood that when the game play interface is printed material the term "place" is used herein to mean "write".

[0054] The step from square **2** can go to any one of squares c, d, e, f or g. Game play continues until all of the squares in the field of play on the game play interface are filled, as illustrated in FIG. **2**, which shows the solution of the puzzle of FIG. **1**.

[0055] It will be readily appreciated that there is only one solution (game path) to the puzzle that begins at square **1** and passes through the squares **16**, **18**, **22** and **24** in proper sequence. A vast array of different puzzle solutions are possible by changing one or more of the game parameters such as, but not limited to:

[0056] 1) The staring point, the position of square **1**;

[0057] 2) The end point, the position of square **25** in the example of FIGS. **1** and **2**;

[0058] 3) The placement of any intermediate place-indicators, such as numerals **16**, **18**, **22** and **24** in the example of FIGS. **1** and **2**; and

[0059] 4) The size of the field of play as illustrated in FIGS. **3** and **4**.

[0060] It should be noted that, although the solution will show a sequential path of steps from square **1** to the end, which is number **25** in the case of the game of FIGS. **1** and **2**, the puzzle need not be solved as a continuous sequential path of steps. That is to say, a player may choose to find to location of intermediate squares using the other numerals that are indicated on the field of play at the beginning of the puzzle, such as squares **16**, **18**, **22** and **24** in FIG. **1**. Therefore, a player may choose, for example, to solve the puzzle along the path from square **16** to square **18** by placing a numeral **17** in either square e or square h before deciding where to place the numeral **2**.

[0061] The puzzle of FIGS. **3** and **4** illustrates a variation in size and also illustrates the phenomenon of squares y and z that are not included in the field of play of the puzzle shown on the game play interface. Here, squares y and z are simply blacked out. However, substantially any mode of indicating that the squares fall outside of the field of play is within the scope of the present invention.

[0062] As shown in FIG. **3**, squares **1** and **2** are already indicated on the game play interface, therefore, the player needs to decide where to place the numeral **3** along the path to square **4**. Due to the location of already filled squares, the only choice for placement of numeral **3** is in square w. The solution to the puzzle is shown in FIG. **4**.

[0063] Preferably, the number of blocked squares is low, less than 20% and preferably not more than 7% of all squares on the game play interface.

[0064] It will be appreciated that the above descriptions are intended only to serve as examples and that many other embodiments are possible within the spirit and the scope of the present invention.

What is claimed is:

1. A puzzle game comprising a field of play configured for placement of place-indicators such that placement of said place-indicators represents a series of sequential steps from a starting point along a game path in said field of play to an end point, and each step of said series of steps has a predetermined step pattern and each said place-indicator is placed on said field of play at an end of a respective said step of said series of steps, and a solution to the puzzle is the placement of all place indicators between said starting point and said end point, and at least two said place-indicators are pre-placed as givens in said solution.

2. The puzzle game of claim 1, wherein said step pattern is similar to a move that can be made by a chess piece on a chessboard during a game of chess.

3. The puzzle game of claim 2, wherein said step pattern is similar to a move that can be made by a knight during a game of chess.

4. The puzzle game of claim 1, wherein one or more place-indicators are pre-placed in its predetermined position along said game path by a game setter prior to a beginning of play.

5. The puzzle game of claim 4, wherein said game path is configured such that there is a single solution to the puzzle along a given said game path between said starting point and end point that includes said one or more pre-placed place-indicators in proper sequence.

6. The puzzle game of claim 1, further including a computer program programmed to:

(a) determine a size of said field of play;

(b) determine said step pattern;

(c) choose said starting point;

(d) determine said game path; and

(e) indicate positions of said at least two given place-indicators, as determined by a solution to the puzzle game, on a game play interface.

7. The puzzle game of claim 6, wherein said computer program provides a process for varying a level of difficulty of the puzzle game.

8. The puzzle game of claim 6, wherein said computer program generates a game play interface.

9. The puzzle game of claim 8, wherein said game play interface is printed material.

10. The puzzle game of claim 8, wherein said game play interface is displayed on a display monitor.

11. The puzzle game of claim 10, wherein said display monitor is implemented on any one from a list that includes: computer monitors, game consoles, cellular phones, PDAs, TV set, and handheld electronic games.

12. A puzzle game comprising:

(a) a field of play that includes a grid on which numerals are placed along a game path determined by a solution to the puzzle such that said game path is a sequential series of steps having a predetermined step pattern, said game path continuing from a starting point to an end point with a solution to the puzzle being the placement of all said numerals between said starting point and said end point, and at least two said numerals are pre-placed as givens in said solution;

(b) a device for presenting a game play interface that depicts at least said field of play; and

(c) a computer program configured to determine at least one parameter of game play and generate said game play interface.

13. The puzzle game of claim 12, further including at least one algorithm for determining said at least one parameter of game play.

14. The puzzle game of claim 12, wherein said at least one parameter of game play includes at least one of:

(a) a size of said grid;

(b) a step pattern for said steps;

(c) said starting point;

(d) said game path; and

(e) indication of a position on said grid of one or more of the numerals, as determined by the solution, on a game play interface.

15. The puzzle game of claim 13, wherein said computer program is configured such that said step pattern is similar to a move that can be made by a chess piece on a chessboard during a game of chess.

16. The puzzle game of claim 15, wherein said computer program is configured such that said step pattern is similar to a move that can be made by a knight during a game of chess.

17. The puzzle game of claim 12, wherein said game play interface is printed material.

18. The puzzle game of claim 12, wherein said game play interface is a display monitor.

19. The puzzle game of claim 12, wherein said game path includes at least 80% of points on the grid.

20. The puzzle game of claim 12, wherein said computer program is deployed as a server so as to provide game play to client devices.

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