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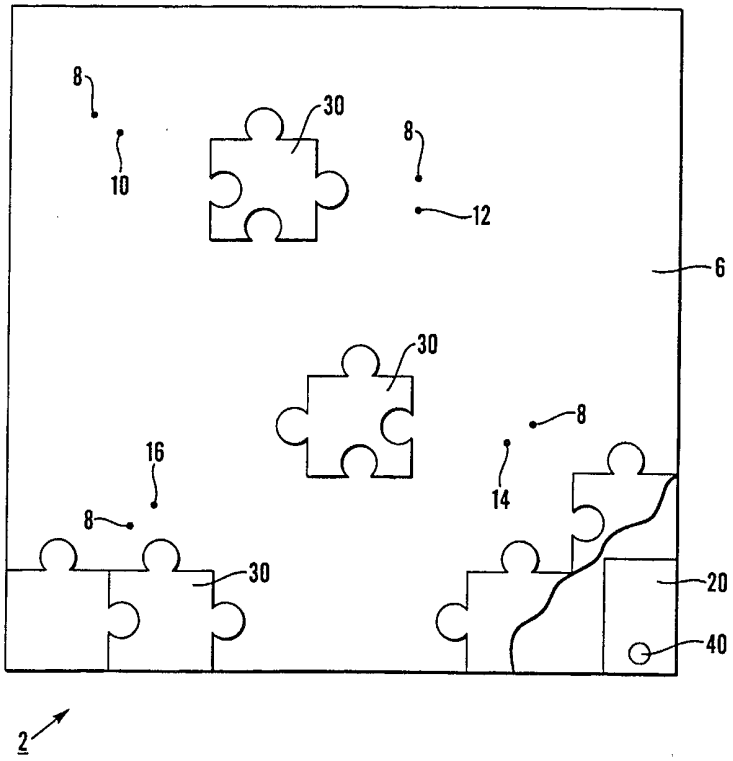
(54) Title: JIGSAW PUZZLE APPARATUS

(57) Abstract

Jigsaw puzzle apparatus comprises a plurality of individual pieces (30, 32) capable of being fitted together to constitute a completed design, and a base board (2) onto which said individual pieces (30, 32) are positioned, characterised in that the base board (2) includes one or more sensor means (8, 10 to 8, 16) arranged to produce a signal in response to the placing thereon of an associated piece (32) of the jigsaw puzzle and sound–emitting means (40) interconnected with the sensor means (8, 10 to 8, 16) to emit a sound in response to a signal from the sensor means (8, 10 to 8, 16).



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JIGSAW PUZZLE APPARATUS

TECHNICAL FIELD

This invention relates to jigsaw puzzle apparatus.

BACKGROUND

Conventionally, jigsaw puzzles comprise a plurality of individual, differently-shaped pieces which, once correctly interlocked, constitute a completed picture. The number of pieces to the puzzle and the sizes of the individual pieces can vary to provide differing degrees of difficulty in completing the puzzle.

The particular interest of the person building up the puzzle may lie in any one or more of a number of aspects of the puzzle, such as the shape of the puzzle, the nature of the picture on the completed puzzle, the time taken to complete the puzzle or the like.

However, once completed, it is not unusual for a conventional puzzle to be taken to bits and never again completed by that person, primarily through lack of further interest.

Although children tend to re-do a given jigsaw puzzle more often than adults, there is still a tendency for interest to decline after a relatively short time.

SUMMARY OF THE INVENTION

It would be desirable to be able to provide additional interest in building up jigsaw puzzles by providing novel jigsaw puzzle apparatus.

According to the present invention there is provided

jigsaw puzzle apparatus comprising a plurality of individual pieces capable of being fitted together to constitute a completed design, and a base board onto which said individual pieces are positioned, characterised in that the base board includes one or more sensor means arranged to produce a signal in response to the placing thereon of an associated piece of the jigsaw puzzle, and sound-emitting means interconnected with the sensor means to emit sound in response to a signal from the sensor means.

In a preferred embodiment of the invention there are a plurality of sensor means arranged on the base board each for co-operation with an associated one of a corresponding plurality of pieces of the jigsaw puzzle, the sound emitted by the sound-emitting means being representative of the jigsaw piece creating the signal.

In one embodiment of the invention, the sensor means each comprise a pair of electrical contacts, the corresponding pieces of jigsaw puzzle each including a conductive element for completing an electrical circuit when the piece is correctly positioned on the base board.

In an alternative embodiment of the invention, the base board includes an upper layer and a lower layer, the sensor means comprising electrically conductive material on the undersurface of the upper layer, and a plurality of electrically conductive tracks, one associated with each of said plurality of pieces of jigsaw puzzle, on the lower layer and normally spaced from the conductive material on

the upper layer, the arrangement being such that, on correct positioning of an associated piece of jigsaw puzzle on the upper layer, and on pressing down of that piece, an electrical circuit is completed between the electrically conductive material on the upper layer and the associated track on the lower layer to create a signal and associated sound.

Preferable the sound-emitting means are provided on a printed circuit board positioned on, in or around the base board.

Conveniently the sound-emitting means comprises a microchip programmed for generating a selected sound for a predetermined period of time in response to a respective signal from a respective sensor means.

The sensor means and the sound-emitting means are preferably interconnected by electrical circuitry on or in the base board.

The apparatus may further include light-emitting means for actuation in response to a signal from the sensor means, which light-emitting means may be incorporated within each piece of jigsaw puzzle including a conductive element.

Thus it will be appreciated that the jigsaw puzzle apparatus according to the invention provides considerable added interest to the user, in that sounds can be created during and subsequent to assembly of the puzzle. Ideally the sounds that are created are associated with that section of the overall picture of which the relevant

jigsaw piece is part.

For example, the completed picture may comprise a number of different nursery rhyme characters, and the sound emitted by the correct positioning of a given piece of jigsaw on the base board may be the nursery rhyme associated with the characters of which that piece of jigsaw forms part.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a plan view from above, partly cut-away, of a first jigsaw puzzle apparatus according to the invention with the jigsaw puzzle partly completed;

Fig. 2 is an end view of a piece of the jigsaw puzzle of the apparatus of Fig. 1;

Fig. 3 shows the electrical circuitry within the base board of the apparatus of Fig. 1, and

Fig. 4 is a plan view from above of part of second apparatus according to the invention with the jigsaw puzzle partly assembled.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to the drawings, the illustrated jigsaw puzzle apparatus comprises a base board indicated generally at 2 of sandwich construction, including a lower layer 4 and an upper layer 6 between which is positioned the electrical circuitry of the apparatus.

The circuitry comprises a plurality of pairs of electrical contacts each of which pairs includes a negative or earth contact 8 and a positive contact 10, 12, 14 or 16. The negative contacts 8 are interconnected with

each other and to contact 18 of a printed circuit board 20, while each of the positive contacts 10 to 16 is connected to an associated contact 22 to 28 respectively of the printed circuit board 20. In the embodiments of Figs. 1 and 3, the board 20 is sandwiched between the layers 4, 6 of the base board 2.

The contacts 8 to 16 project through associated holes in the upper layer 6 of the board 2 as is apparent from Fig. 1, the overall electric circuit being battery powered.

The jigsaw puzzle apparatus further includes a plurality of interlocking jigsaw pieces 30 some of which are shown in position in Fig. 1. Four of the pieces are arranged to seat over the four pairs of electrical contacts 8, 10 to 8, 16, one of these pieces 32 being shown in Fig. 2.

The pieces 32 each comprise a conventional jigsaw piece with tabs 34 and recesses 36 for interlocking with adjacent pieces 30, the bottom of a piece 32 comprising a layer 38 of electrically conductive material. When a piece 32 is correctly positioned on the board 2, the layer 38 thereon engages the associated pair of electrical contacts 8, 10 to 8, 16 thereby to complete an associated electrical circuit between the contact 18 and one of the contacts 22 to 28 on the printed circuit board 20.

This board 20 has a sounder 40 associated therewith, the arrangement being such that a given sound is created dependent upon which pair of contacts 8, 10 to 8, 16 are

completed, the sound being emitted for a given period of time.

The relationship between the jigsaw pieces 32 and the contacts 8, 10 to 8, 16 may be such that, subsequent to initial emission of the sound on making of the contacts, the sound can be reproduced as and when required by pressing the jigsaw piece 32 down on the associated contacts.

Thus it will be appreciated that a given sound can be created during assembly of the puzzle when a piece 32 is first correctly positioned on the board 2, and thereafter as required, for example subsequent to completion of the puzzle.

The sound may be musical or verbal, for example in accordance with the portion of the puzzle of which the particular piece 32 forms part, or by way of instruction.

Conveniently the printed circuit board 20 incorporates a microchip adapted to create the selection of sounds, which board 20 may be located between the upper and lower layers 4, 6 of the board 2 as in Figs. 1 and 3, or as an extension of the board 2 as in Fig. 4.

Fig. 4 indicates a finger 42 applying downward pressure on a jigsaw piece 32 to recreate an associated sound.

The apparatus may further include light emitting means which are activated whenever a circuit is completed by a jigsaw piece 32 to supplement the associated sound that is created. Such light emitting means, for example

an LED, may be incorporated in some at least of the pieces 32 whereby a piece 32 itself is illuminated when depressed to complete the associated circuit.

The various components of the jigsaw puzzle apparatus, in particular the layers 4, 6 of the board 2 and the pieces 30, 32, may be made of any suitable material such as wood, cardboard, plastic, metal and the like, while the layer 38 may comprise any suitably conducting material such as copper.

The electrical circuitry of the apparatus may be other than as illustrated, while the number and disposition of the contact pairs 8, 10 and 8, 16, and the corresponding number of conductive jigsaw pieces 32, can be varied to suit particular requirements.

In an unillustrated embodiment of the invention, the base board is of sandwich construction and comprises an upper component the undersurface of which comprises a layer of metal foil, and a lower component on which are formed a plurality of electrically conductive tracks one associated with each of a plurality of jigsaw pieces adapted to create sounds. The layer of foil and the tracks are interconnected with an associated printed circuit board on, in or around the base board and including a microchip and sounder.

The upper and lower components are separated by a thin layer of electrically insulating material such as paper or card in which are formed, immediately below each activating jigsaw piece and immediately above part of the

associated track, an aperture.

Under normal conditions, the insulating material separates the metal foil on the upper board component from the tracks on the lower board component. However, on correct positioning of an activating jigsaw piece on the upper board component and on depression of that piece towards the lower board component, the metal foil on the upper board component contacts the associated track on the lower board component through the associated aperture in the insulating layer to complete an electrical circuit and to create the associated sound.

Subsequent depression and release of the jigsaw piece will recreate the sound as and when required.

The jigsaw pieces 30, 32 may be shaped to interlock with one another or to fit against one another to complete a picture, which may be any one of a variety of final shapes, such as rectangular or circular, and any one of a variety of patterns or a combination of sub-patterns.

Other modifications and variations from the described and illustrated arrangements will be apparent to those skilled in the art.

CLAIMS

1. Jigsaw puzzle apparatus comprising a plurality of individual pieces (30, 32) capable of being fitted together to constitute a completed design, and a base board (2) onto which said individual pieces (30, 32) are positioned, characterised in that the base board (2) includes one or more sensor means (8, 10 to 8, 16) arranged to produce a signal in response to the placing thereon of an associated piece (32) of the jigsaw puzzle, and sound-emitting means (40) interconnected with the sensor means (8, 10 to 8, 16) to emit sound in response to a signal from the sensor means (8, 10 to 8, 16).

2. Apparatus as claimed in claim 1 in which there are a plurality of sensor means (8, 10 to 8, 16) arranged on the base board (2) each for co-operation with an associated one of a corresponding plurality of pieces (32) of the jigsaw puzzle, the sound emitted by the sound-emitting means (40) being representative of the jigsaw piece (32) creating the signal.

3. Apparatus as claimed in claim 1 or claim 2 in which the sensor means each comprise a pair of electrical contacts (8, 10 to 8, 16), the corresponding pieces (32) of jigsaw puzzle each including a conductive element (38) for completing an electrical circuit when the piece (32) is correctly positioned on, and pressed against, the base board (2).

4. Apparatus as claimed in claim 1 or claim 2 in which

the base board includes an upper layer and a lower layer, the sensor means comprising electrically conductive material on the undersurface of the upper layer, and a plurality of electrically conductive tracks, one associated with each of said plurality of pieces of jigsaw puzzle, on the lower layer and normally spaced from the conductive material on the upper layer, the arrangement being such that, on correct positioning of an associated piece of jigsaw puzzle on the upper layer, and on pressing down of that piece, an electrical circuit is completed between the electrically conductive material on the upper layer and the associated track on the lower layer to create a signal and associated sound.

5. Apparatus as claimed in any one of claims 1 to 4 in which the sound-emitting means (40) are provided on a printed circuit board (20) positioned on, in or around the base board (2).

6. Apparatus as claimed in any one of the claims 1 to 5 in which the sound-emitting means comprises a microchip programmed for generating a selected sound for a predetermined period of time in response to a respective signal from a respective sensor means (8, 10 to 8, 16).

7. Apparatus as claimed in any one of claims 1 to 6 in which the sensor means (8, 10 to 8, 16) and the sound-emitting means (40) are interconnected by electrical circuitry on or in the base board (2).

8. Apparatus as claimed in any one of claims 1 to 7 and further including light-emitting means for actuation in response to a signal from the sensor means (8, 10 to 8, 16).

9. Apparatus as claimed in claim 8 in which the light-emitting means are incorporated within each associated piece (32) of jigsaw puzzle.

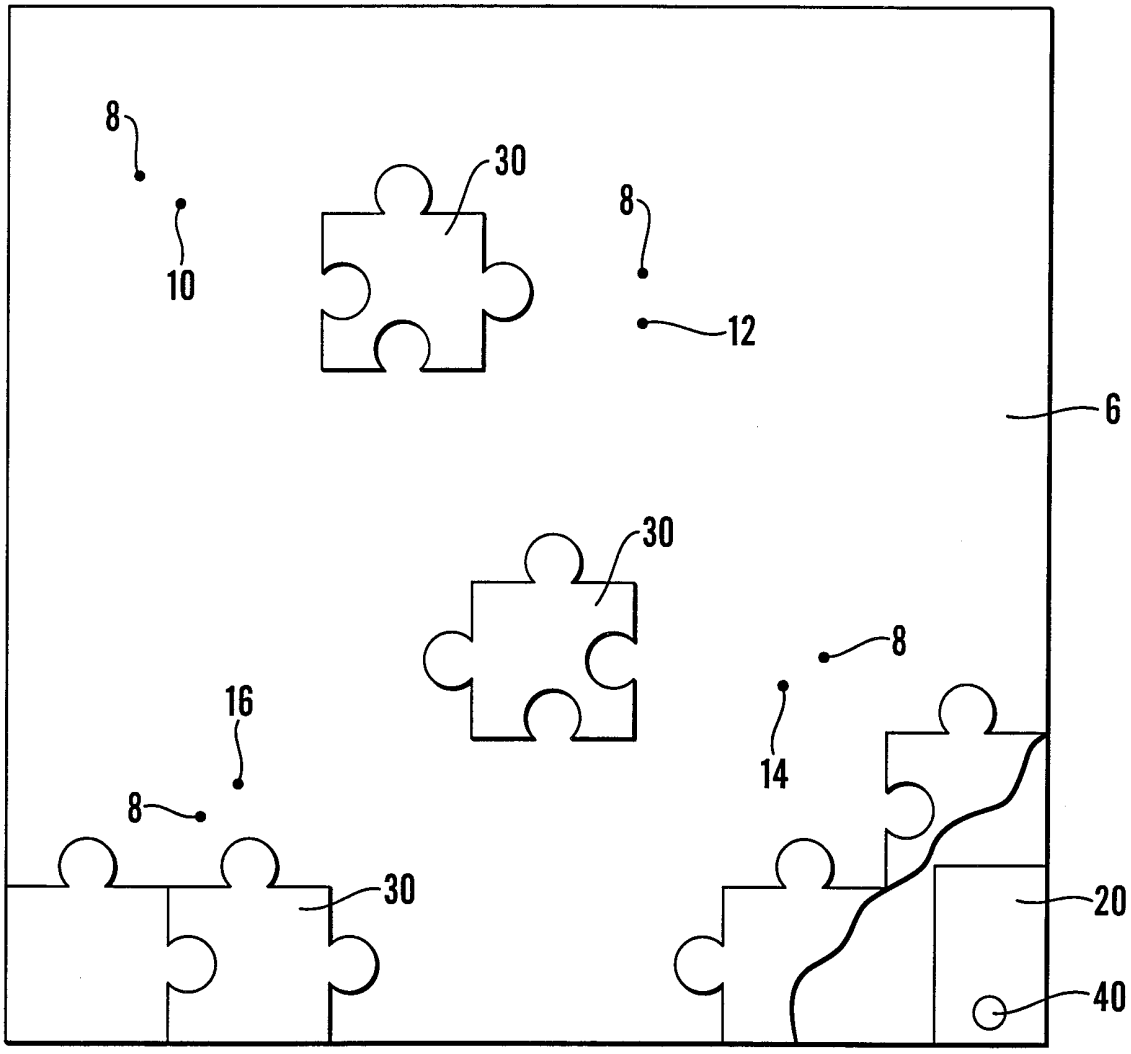

Fig.1

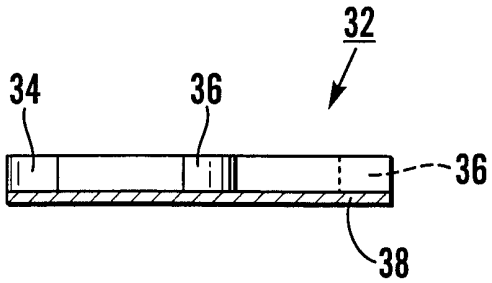

Fig.2

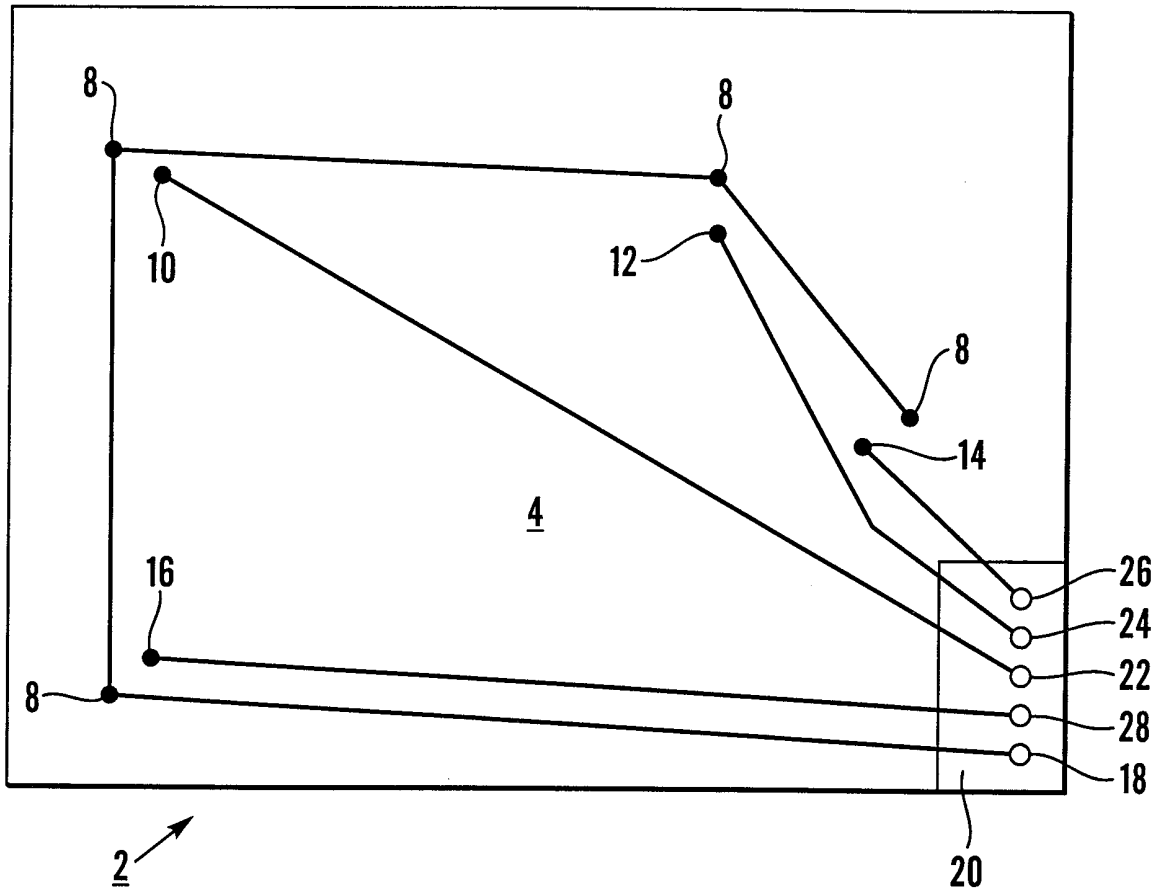

Fig.3

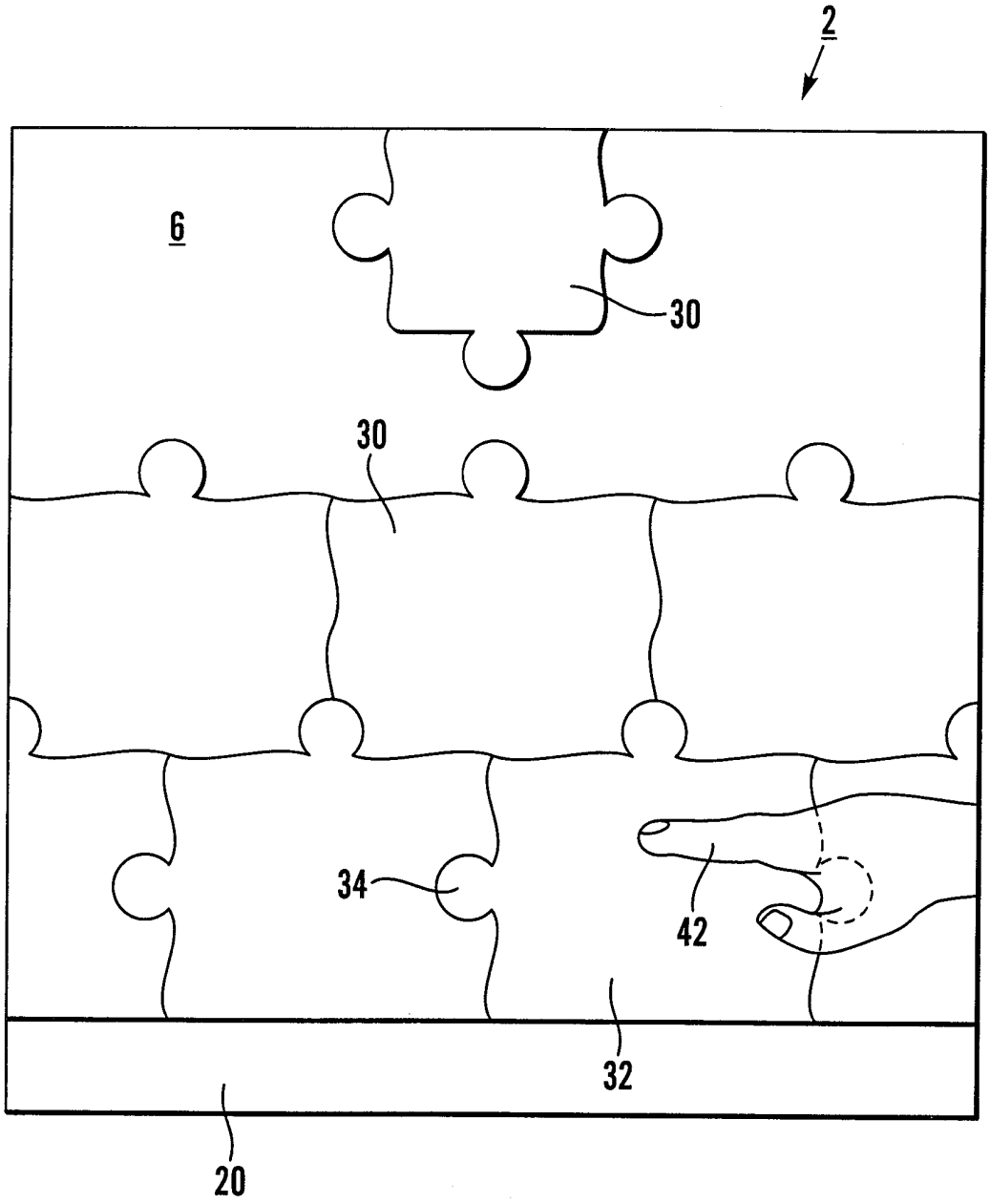

Fig.4

INTERNATIONAL SEARCH REPORT

Inte ional Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A63F9/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A63F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 527 269 A (CHANG) 17 February 1993 (1993-02-17) the whole document	1,3-7
X	WO 95 06503 A (ERLIGMANN) 9 March 1995 (1995-03-09) abstract	1,3-7
X	US 4 417 732 A (GUILL) 29 November 1983 (1983-11-29) column 3, line 26 - line 38; figures 1,2	1,3-9
X	US 4 893 817 A (SHILO) 16 January 1990 (1990-01-16) column 2, line 40 - line 43	1,2,4-9

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[X] Further documents are listed in the continuation of box C.

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information on patent family members

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