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(54) **ANIMATED PUZZLE HAVING INTERLOCKING ELEMENTS**

ANIMIERTES PUZZLE MIT INEINANDERGREIFENDEN ELEMENTEN

PUZZLE ANIME A ELEMENTS IMBRIQUES

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Description

Field of the Invention

[0001] This invention relates generally to puzzles and particularly to those having an animated or movement feature in combination therewith.

Background of the Invention

[0002] For many years jigsaw puzzles have enjoyed a consistent and ever increasing popularity among a wide range of players. Jigsaw puzzles are often utilized by extremely young children as well as mature adults. Not surprisingly, practitioners in the art have responded to this long term and extensive popularity by providing a virtually endless variety of jigsaw puzzles. One of the attractive aspects of jigsaw puzzles as seen by the manufacturers thereof is its ready adaptability to suit the age, development, and skills of a particular user. While all jigsaw puzzles include the same basic elements primary among which is a plurality of irregularly shaped generally flat elements which interlock when assembled in the proper fashion. Each jigsaw puzzle element supports a small portion of an overall image such that when the jigsaw pieces are properly combined a particular picture or image is depicted. Also certain jigsaw puzzles have been provided with a backing having a confining frame for the jigsaw puzzle elements.

[0003] Thus practitioners are able to vary elements such as the size and complexity of the puzzle elements to target a particular age group.

[0004] The basic play pattern of jigsaw puzzles has proven to be an excellent skill development tool requiring the exercise of skills such as spatial relationships, shape distinction, color matching, and problem solving.

[0005] Perhaps one of the more interesting developments in the jigsaw puzzle art has been a variety of so called "animated" jigsaw puzzles. While some variation of function has occurred the animation is usually provided by puzzle elements which are moveable in response to the users manipulation of a lever, wheel, or the like. For example US Patent 3,417,996 issued to Janiszewski sets forth a JIGSAW PUZZLE WITH ROTATABLE PIECES having a supporting board upon which a plurality of rotatable elements are supported. A plurality of interlocking gears support the rotatable pieces so as to provide concurrent movement thereof in response to movement of one of the rotatable element gears. A plurality of interlocking non-engaged jigsaw puzzle pieces are assembled about the rotatable pieces interlocking therewith to complete the puzzle.

[0006] US Patent 2,585,419 issued to Zarlengo sets forth ANIMATED JIGSAW PUZZLES having a supporting board defining a plurality of socket portions therein. A plurality of figures each formed of a further plurality of interlocking puzzle components is supportable upon the board in pivotal support using the sockets. In addition

connecting links between the puzzle pieces are provided to cause movement of all pieces when one puzzle piece is pivoted.

[0007] US Patent 4,202,134 issued to Morrison sets forth a WATER TOY formed of a plurality of interlocking puzzle pieces fabricated of a light weight floatable material. When assembled the puzzle pieces are interlocked in a selected assemble relation to provide a animal figure such as a fish.

[0008] US Patent 4,508,348 issued to Lapointe sets forth ANIMATED PUZZLE BLOCK GAME having an open top box including side walls and at least one floor. A plurality of similar regular blocks designed to be removably contained in the box are provided. At least one of the blocks includes a moveable part embedded therein. The moveable part includes a top face occupying a restricted portion of one of the faces of at least one of the blocks to constitute an animated portion.

[0009] British Patent 2,091,566 sets forth a GAME APPARATUS having a base supporting an angularly disposed upwardly extending member which generally provides a silhouette of a head. A plurality of moveable elements are attachable to the upwardly extending member and are provided with interlock to a moving mechanism supported within the base. As a result the user is able to manipulate the facial elements to change expressions ect.

[0010] US Patent 3,748,748 issued to Bevan et al sets forth VOICE PUZZLE GAME for receiving selected ones of a plurality of uniquely shaped elements to form a sentence or phrase which is autoblized by a sound system within the puzzle.

[0011] US Patent 3,881,274 issued to Kanda sets forth INTERLOCKING UNITS MESHED GEARS AND DRIVE MEANS FOR A MOVEABLE TOY THEREON formed of a plurality of generally square interlocking elements each culpable to an adjacent square and each having a gear drive element which interlocks under such coupling. When a plurality of square pieces are coupled together, the movement of one of the moveable elements produces corresponding movement of the others.

[0012] While the forgoing described prioric devices have improved the art and in some instances enjoyed commercial success, there remains nontheless a continuing need in the art for ever more improved, amusing, and readily manufacturable animated jigsaw puzzles.

Summary of the Invention

[0013] Accordingly it is a general object of the present invention to provide an improved animated jigsaw puzzle. It is a more particular object of the present invention to provide an improved animated jigsaw puzzle which further includes mechanical element perception and understanding for young children.

[0014] In accordance with the present invention there is provided an animated puzzle comprising the features of claim 1 wherein the features set forth in the preamble

are known from US-A-3,417,996.

Brief description of the drawings

[0015] The features of the present invention, which are believed to be novel, are set forth with particularity in the appended claims. The invention, together with further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings, in the several figures of which like reference numerals identify like elements and in which:

Figure 1 sets forth a front view of the present invention animated puzzle fully assembled;

Figure 2 sets forth a rear view of the interlocking animated puzzle elements of the present invention puzzle removed from the remainder of the puzzle;

Figure 3 sets forth the animated elements of figure 2 having been move to an alternate configuration in accordance with the present invention;

Figure 4 sets forth a section view of the present invention animated puzzle taken along section lines 4-4 in figure 1; and

Figure 5 sets forth a partial perspective assemble view of the present invention animated puzzle having the animated elements removed.

Description of Embodiment

[0016] Figure 1 sets forth a front view of the present invention animated puzzle in its fully assembled configuration and generally referenced by numeral 10. Puzzle 10 includes a base 11 preferably formed of a molded plastic material or the like and defining a generally rectangular outer wall 12. Base 11 further includes a generally plainer puzzle piece surface 13 which extends within outer wall 12 to an inter wall 83 (better seen in figure 5) to form a plainer surface upon which puzzle pieces may be fitted. Base 11 further defines a raised portion 20 generally contiguous with outer wall 12 having a curved edge 21 and a recess 22 formed therein. By means set forth below in greater detail a lever 50 having a knob 51 extends downwardly into recess 22.

[0017] Puzzle 10 further includes a plurality of interlocking puzzle pieces 30-41 each having an image on one surface thereof. The individual images on puzzle pieces 30 through 41 are portions of a combined total image in accordance with conventional jigsaw puzzle fabrication. In further accordance with conventional jigsaw puzzle fabrication each of puzzle pieces 30-41 defines multiply curved edges which interlock with adjacent puzzle pieces to form combined image shown.

[0018] In accordance with the present invention and

means set forth below in figure 4, puzzle 10 further includes an animated element 60 supported above puzzle pieces 30-41 as shown below. Puzzle 10 further includes an animated element 61 supported between element 60 and puzzle pieces 30-41. The apparatus by which animated element 60 and animated element 61 are supported is shown in greater detail in figure 4. However suffice it to note here that animated element 60 being raised above animated element 61 allows elements 60 and 61 to move with respect with each other without contacting or abutting to interfere with the element motion.

[0019] By means set forth in greater detail in figure 2, animated elements 60 and 61 include respective gears 65 and 62 which engage and couple elements 60 and 61 together. As is also better seen in figure 2, lever 50 includes a gear segment 52 which engages gear 65 of animated element 60.

[0020] In the anticipated play pattern of puzzle 10, the user moves knob 51 within recess 22 in either direction to produce pivotal motion of lever 50. In accordance with the gear couplings sets forth in figure 2, the pivotal movement of lever 50 produces corresponding pivotal movements of animated element 60 and animated element 61 with respect to the image surface upon puzzle pieces 30-41. For example, when knob 51 is moved in the direction indicated by arrow 70 lever 50 is correspondingly pivoted causing animated element 60 to pivot in the direction indicated by arrow 71. In addition the pivotal movement of animated element 60 causes animated element 61 to pivot in the direction indicated by arrow 72. Conversely the movement of knob 51 in the direction indicated by arrow 73 pivots element 60 in the direction of arrow 74 and element 61 in the direction indicated by arrow 75.

[0021] As a result the manipulation by the child user of puzzle 10 in the assembled configuration is more entertaining and of using than the play pattern provided by prior art animated puzzle. The animated elements of the present invention puzzle move at different heights from the underlining puzzle pieces to facilitate more intricate and interesting movement while nonetheless being fabricated of relatively simple easily assembled components. In accordance with additional aspect of the present invention better seen in figure 2, the gear and gear segment coupling by which pivotal movement by knob 51 results in pivotal movement of elements 60 and 61 and the assembly thereof into puzzle 10 provides the child user with additional development of mechanical skills. For example, the interlocking gears and gear segments utilized in the present invention must be understood by the child user to fully assemble puzzle 10 in the manner seen in figure 1. As a result the child user is presented with a more complex set of skill developments which is beneficial for very young children.

[0022] Figure 2 sets forth a rear view of animated elements of 60 and 61 together with lever 50 apart from the remainder of puzzle 10 in order to illustrate the gear

drive mechanism thereof. Thus lever 50 defines a knob 51 and an aperture 54 together with a gear segment 52. Aperture 54 receives a post 55 (seen in figure 4) formed within base 11 to provide a pivoting support for lever 50. Animated element 60 supports a gear 65 on its rear surface having an aperture 66 formed therein. Similarly animated element 61 supports a gear 62 on its rear surface which in turn defines an aperture 63 therein.

[0023] In the assembly of the gear drive train shown in figure 2 it will be apparent that gear segment 52 engages gear 65 while gear 65 further engages 62. It will also be noted that gear segment 52 and lever 50 as well as animated element 61 are both positioned beneath or behind animated element 60. This relative positioning facilitates the above mentioned motion capabilities of elements 60 and 61 with respect to each other.

[0024] Figure 2 the rear view of the animated portions of the present invention puzzle as shown in figure 2 having been moved in response to pivoting lever 50. More specifically as animated element 60 supports a gear 65 having an aperture 66 formed therein. An animated element 61 supports a gear 62 having an aperture 63 formed therein. A lever 50 having a knob 51 is pivotally supported at an aperture 54 and includes a gear segment 52. Gear segment 52 and gear 62 each engage gear 65 of element 60.

[0025] In the example of figure 3 knob 51 of lever 50 has been moved in the direction indicated by arrow 45. This motion of lever 50 produces a corresponding clockwise motion of gear segment 52 which due to the engagement thereof with gear 65 causes a counter clockwise rotation of gear 65. This counter clockwise rotation in turn is imparted to element 60 causing it to rotate in the direction indicated by arrow 46. Concurrently the counter clockwise rotation of gear 65 causes gear 62 to rotate in the clockwise direction which in turn rotates element 61 in the clockwise direction indicated by arrow 47. It will be apparent to those skilled in the art that the opposite direction motions of elements 60 and 61 provides an added interest element for the present invention animated puzzle. It will be equally apparent to those skilled in the art that the movement of lever 50 in the opposite direction from that indicated by arrow 45 produces corresponding opposite direction motions of elements 60 and 61 such that they define a substantial mirror image of the elements configuration shown in figure 3.

[0026] Figure 4 sets forth a partial section view of the present invention puzzle taken along section lines 4-4 in figure 1. A base 11 defines an outer wall 12 and puzzle piece surface 13 extending inwardly from wall 12. As mentioned above puzzle piece surface 13 defines a generally plainer surface upon which the plurality of puzzle pieces (puzzle pieces 30-41 seen in figure 1) are supported. As is better seen in figure 5 base 11 further defines an inner wall 83 and a cylindrical post 81. As is also better seen in figure 5 base 11 further defines a recess 82 having a generally cylindrical post 80 support-

ed therein. A lever 50 defines an aperture 54 which receives a post 55 formed in base 11 to pivotally secure lever 50 upon base 11. Lever 50 further includes a gear segment 52 which extends through an aperture 83 formed in base 11 into recess 82. An animated element 60 includes a generally cylindrical gear support 67 and a gear 65 secured thereto. Gear 65 defines an aperture 66 which rotatably supports gear 65 upon post 80 formed in base 11. As a result gear 65 is rotatable within recess 82. Gear 65 is engaged by gear segment 52.

[0027] An animated element 61 includes a gear 62 having an aperture 63 formed therein. Aperture 63 allows gear 62 to rotatably be supported upon post 81 formed in base 11. In addition, gear 62 engages gear 65. An inner wall 83 (better seen in figure 5) forms a figure-eight shape and defines an interior wall against which puzzle pieces 31, 33, 34, 35, 37, 40 and 41 interlock in an abutting relationship (seen in figure 5).

[0028] It should be noted that in accordance with an important aspect of the present invention puzzle pieces such as pieces 31 and 37 formed the lowest level of the assembled puzzle while animated element 60 forms the highest element of the animated puzzle. Animated element 61 is interposed between puzzle piece 31 and animated element 60. The result is a very pleasing and interesting multi-level animated puzzle structure which has been found to be extremely entertaining to very young children.

[0029] Figure 5 sets forth a perspective assembly view of the present invention puzzle having animated elements 60 and 61 removed therefrom. As described above puzzle 10 includes a base 11 having an outer wall 12 which generally encloses a plainer puzzle piece surface 13. Base 11 further defines a raised portion 20 having a curved edge 21 and a recess 22 formed therein. Base 11 further defines an inner wall 83 which defines a figure-eight like wall formed by intersecting circles and a cylindrical recess 82. Recess 82 in turn defines an aperture 83 in the wall thereof. A cylindrical post 81 extends upwardly from the approximate center of radius of inner wall 83. A similar but larger post 80 also of generally cylindrical shape extends upwardly from the bottom surface of recess 82.

[0030] A lever 50 supports a knob 51 within recess 22 and a gear segment 52. As is set forth above lever is pivotally secured upon base 11 such that gear segment 52 extends partially into recess 82 through aperture 83. With temporary return to figure 4 it will be noted that the extension of gear segment 52 into recess 82 provides the gear coupling there between. Also with temporary reference to figure 4 it will be seen that gear 66 is of sufficient height to facilitate the engagement of gear 62 rotatable upon post 81.

[0031] In accordance with the desire to provide a jigsaw puzzle activity, puzzle 10 includes a plurality of interlocking variously curved puzzle pieces 30-41. In further accordance with the conventional practice of fabricating jigsaw puzzles, various image elements such as

element 25 are shown on the upper surfaces of the puzzle pieces. To facilitate the fabrication of the present invention puzzle, certain ones of puzzle pieces 30-41 define arcuate edges which fit against inner wall 83 to permit insertion of the puzzle piece. For example, puzzle piece 41 defines arcuate edges 48 and 49 which conform to the adjacent portion of inner wall 83 when puzzle piece 41 is assembled.

[0032] Once the present invention puzzle has been assembled to the point indicated in figure 5 and after the last puzzle piece 41 has been placed in its appropriate position, the assembly is completed by initially assembling animated element 61 upon post 81. Finally animated element 60 is placed upon post 80 allowing gear 65 to be brought against gear 62 and gear segment 52 (seen in figure 3). In accordance with the above mentioned mechanical skill enhancement for very young children the assembly of the animated elements to the remainder of puzzle 10 requires the child user to adjust the relative rotational positions of each element with respect to gear segment 52 and each other to provide the complete interlocking assembly required to complete the puzzle. It will also be noted that the relationship between animated elements 60 and 61 shown in figure 1 is not the exclusive assembled position. Because of the gear structure used in the coupling some effort must be expended and some further mechanical skill exercised by the young child user to obtain the proper alignment of animated elements 60 and 61 shown in figure 1.

[0033] What has been shown is a novel animated puzzle having interlocking elements which are supported at different distances from an underlying jigsaw puzzle. The inventive puzzle is directed primarily at young children and is fabricated of relatively simple but interesting elements to provide a completed structure which children may utilize to improve their skills in assembling puzzle pieces together with their mechanical skills in obtaining some level of understanding of gears and gear couplings.

[0034] While particular embodiments of the invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects. Therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the scope of the invention.

Claims

1. An animated puzzle comprising:

- a base (11) defining an outer wall (12), an inner wall (83), a generally planar surface (13) therebetween and a recess (82) and an aperture (84) formed within said inner wall (83), said inner wall (83) being formed of first and second arcuate portions resembling a pair of partially

intersecting circles;

- a first post (81) supported within said first arcuate portion and a second post (80) supported within said second arcuate portion, wherein said second post (80) is positioned within said recess (82);
- an actuation means (50), pivotally supported on said base (12) and having gear means (52) extending partially through said aperture (84) formed in said inner wall (83);
- a first animated element (61) having a first gear (62) supported thereon, said first gear (62) defining a first gear aperture (63);
- a second animated element (60) having a second gear (65) supported thereon, said second gear (65) defining a second gear aperture (66); and
- a plurality of interlocking puzzle pieces (30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41) which mutually interlock with other ones of said puzzle,
- said first and second animated elements (61, 60) being constructed to be rotatably assembled to said first and second posts (81, 80) such that said first and second gears (62, 65) engage and said second gear (65) further engages said gear means (52)

characterised in that

- said actuation means is formed by a lever (50) and said gear means is formed by a gear segment (52), wherein one end of the lever (50) supports a knob (51) and another end supports the gear segment (52), and
- said inner wall (83) projects from said planar surface (13) so that certain ones of said puzzle pieces having arcuate edges (48, 49) interlock with portions of said inner wall (83) in an abutting relationship,
- wherein said second animated element (60) is supported spaced above said puzzle pieces and said first animated element (61) is supported above said puzzle pieces and below said second animated element (60).

2. The animated puzzle set forth in claim 1 wherein said first animated element (61) extends partially beneath said second animated element (60).

3. The animated puzzle set forth in claim 2 wherein said base (11) defines a raised portion (20) having a knob recess (22) therein and wherein said knob (51) is positioned within said knob recess (22).

Patentansprüche

1. Animiertes Puzzle, umfassend:

- ein Basiselement (11), das eine Außenwandung (12), eine Innenwandung (83), eine zwischen diesen liegende, im wesentlichen ebene Oberfläche (13) und eine Aussparung (82) sowie eine in der Innenwandung (83) ausgebildete Öffnung (84) aufweist, wobei die Innenwandung (83) aus einem ersten und einem zweiten, bogenförmigen Abschnitt gebildet ist, die einem Paar sich teilweise schneidender Kreise ähneln; 5
- einen ersten Pfosten (81), der innerhalb des ersten bogenförmigen Abschnitts abgestützt ist, und einen zweiten Pfosten (80), der innerhalb des zweiten bogenförmigen Abschnitts abgestützt ist, wobei der zweite Pfosten (80) in der Aussparung (82) angeordnet ist; 10
- eine Betätigungseinrichtung (50), die schwenkbar an dem Basiselement (11) gelagert ist und eine Getriebeeinrichtung (52) aufweist, die sich teilweise durch die in der Innenwandung (83) ausgebildete Öffnung (84) erstreckt; 15
- ein erstes animiertes Element (61) mit einem daran angeordneten, ersten Zahnrad (62), wobei das erste Zahnrad (62) eine erste Zahnradöffnung (63) aufweist; 20
- ein zweites animiertes Element (60) mit einem daran angeordneten zweiten Zahnrad (65), wobei das zweite Zahnrad (65) eine zweite Zahnradöffnung (66) aufweist; und 25
- mehrere ineinandergreifende Puzzleteile (30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41), die gegenseitig mit anderen Teilen des Puzzles ineinandergreifen, 30
- wobei das erste und das zweite animierte Element (61, 60) so gebaut sind, dass sie drehbar derart an dem ersten und dem zweiten Pfosten (81, 80) montiert werden können, dass das erste und das zweite Zahnrad (62, 65) ineinandereingreifen und das zweite Zahnrad (65) des weiteren in die Getriebeeinrichtung (52) eingreift, 35

dadurch gekennzeichnet, dass

- die Betätigungseinrichtung von einem Hebel (50) gebildet wird und die Getriebeeinrichtung von einem Zahnradsegment (52) gebildet wird, wobei ein Ende des Hebels (50) einen Knauf (51) und das andere Ende das Zahnradsegment (52) trägt; und 40
- die Innenwandung (83) aus der ebenen Oberfläche (13) hervorsticht, so dass bestimmte Puzzleteile, die bogenförmige Kanten (48, 49) aufweisen, mit Abschnitten der Innenwandung 45

(83) in einer anliegenden Relativlage ineinandergreifen,

- wobei das zweite animierte Element (60) mit Abstand oberhalb der Puzzleteile abgestützt ist und das erste animierte Element (61) oberhalb der Puzzleteile sowie unterhalb des zweiten animierten Elements (60) abgestützt ist.

2. Animiertes Puzzle nach Anspruch 1, wobei sich das erste animierte Element (61) teilweise unterhalb des zweiten animierten Elements (60) erstreckt.

3. Animiertes Puzzle nach Anspruch 2, wobei das Basiselement (11) einen erhabenen Bereich (20) mit einer darin ausgebildeten Knaufaussparung (22) aufweist und wobei der Knauf (51) in der Knaufaussparung (22) angeordnet ist.

Revendications

1. Puzzle animé comprenant :

une base (11) qui définit une paroi extérieure (12), une paroi intérieure (83), une surface sensiblement plane (13) entre ces parois, et un évidement (82) et un trou (84) formés à l'intérieur de la dite paroi intérieure (83), la dite paroi intérieure (83) étant constituée d'une première et d'une deuxième parties courbes ressemblant à deux cercles partiellement en intersection ;
 une première tige verticale (81) supportée à l'intérieur de la dite première partie courbe et une deuxième tige verticale (80) supportée à l'intérieur de la dite deuxième partie courbe, la dite deuxième tige verticale (80) étant placée à l'intérieur du dit évidement (82),
 un moyen de manoeuvre (50) supporté de façon pivotante sur la dite base (12) et comportant un élément d'engrenage (52) qui s'étend partiellement à travers le dit trou (84) formé dans la dite paroi intérieure (83) ;
 un premier élément animé (61) qui supporte un premier engrenage (62), le dit premier engrenage (62) présentant un premier trou d'engrenage (63) ;
 un deuxième élément animé (60) qui supporte un deuxième engrenage (65), le dit deuxième engrenage (65) présentant un deuxième trou d'engrenage (66) ; et
 une pluralité de pièces de puzzle imbriquées (30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41) qui s'imbriquent mutuellement avec les autres pièces du dit puzzle,
 les dits premier et deuxième éléments animés (61, 60) étant construits pour montage tournant sur les dites première et deuxième tiges verticales (81,80) de sorte que les dits premier et

deuxième engrenages (62, 65) soient en prise
et que le dit deuxième engrenage (65) engrène
en outre avec le dit élément d'engrenage (52),

caractérisé en ce que :

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le dit moyen de manoeuvre est formé par un
levier (50) et le dit élément d'engrenage est for-
mé par un segment d'engrenage (52), de sorte
qu'une extrémité du levier (50) supporte un 10
bouton (51) et une autre extrémité supporte le
segment d'engrenage (52), et
la dite paroi intérieure (83) fait saillie par rapport
à la dite surface plane (13) de sorte que certai- 15
nes des dites pièces de puzzle ayant des bords
courbes (48, 49) s'imbriquent avec des parties
de la dite paroi intérieure (83) en relation de bu-
tée,

dans lequel le dit deuxième élément animé 20
(80) est supporté à une certaine distance au-des-
sus des dites pièces de puzzle et le dit premier élé-
ment animé (61) est supporté au-dessus des dites
pièces de puzzle et au-dessous du dit deuxième
élément animé (60) ; 25

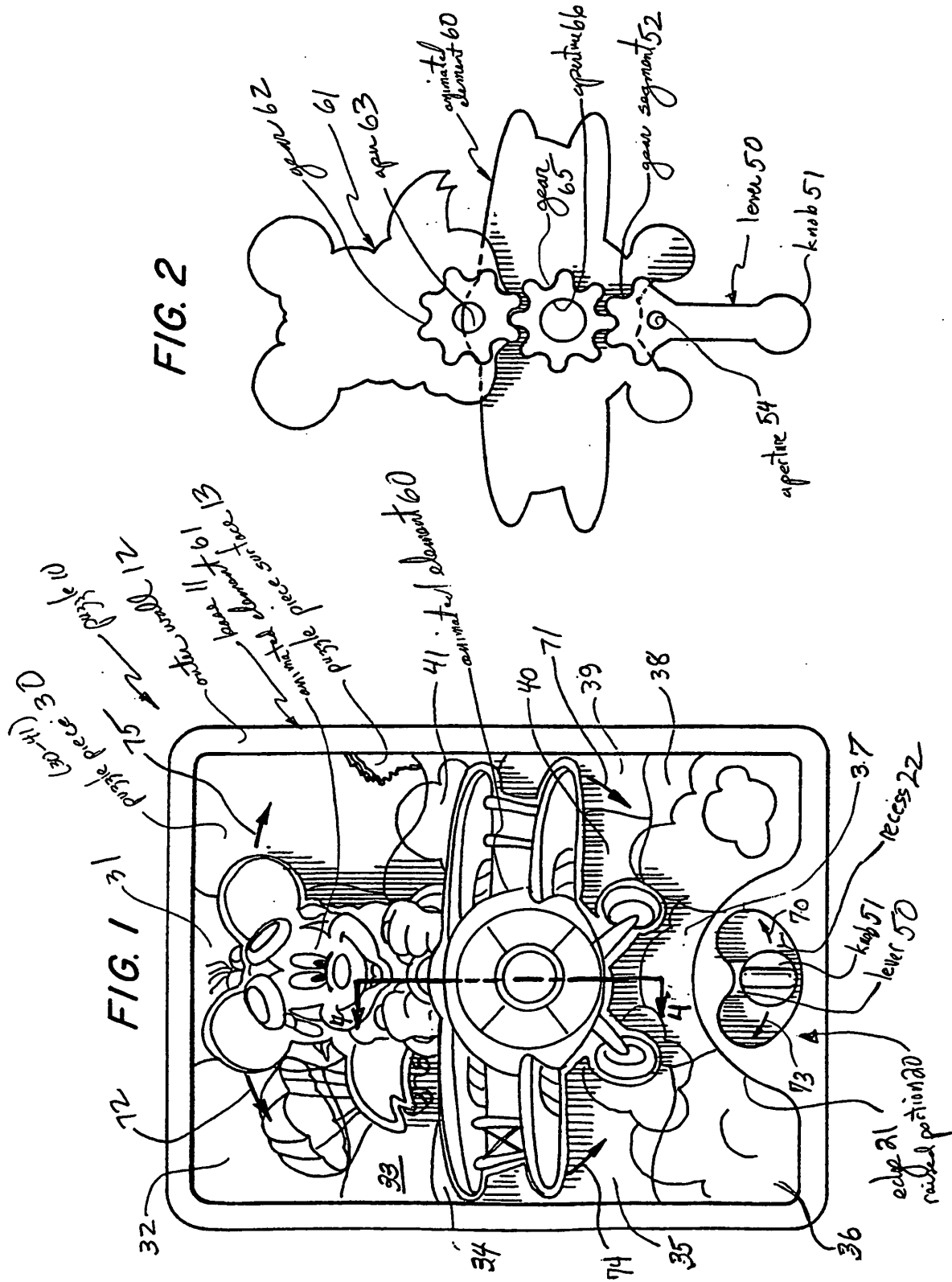
2. Puzzle animé selon la revendication 1, dans lequel
le dit premier élément animé (61) s'étend partielle-
ment au-dessous du dit deuxième élément animé
(60). 30
3. Puzzle animé selon la revendication 2, dans lequel
la dite base (11) définit une partie surélevée (20)
comportant un logement de bouton (22), et dans le-
quel le dit bouton (51) est placé dans le dit logement 35
de bouton (22).

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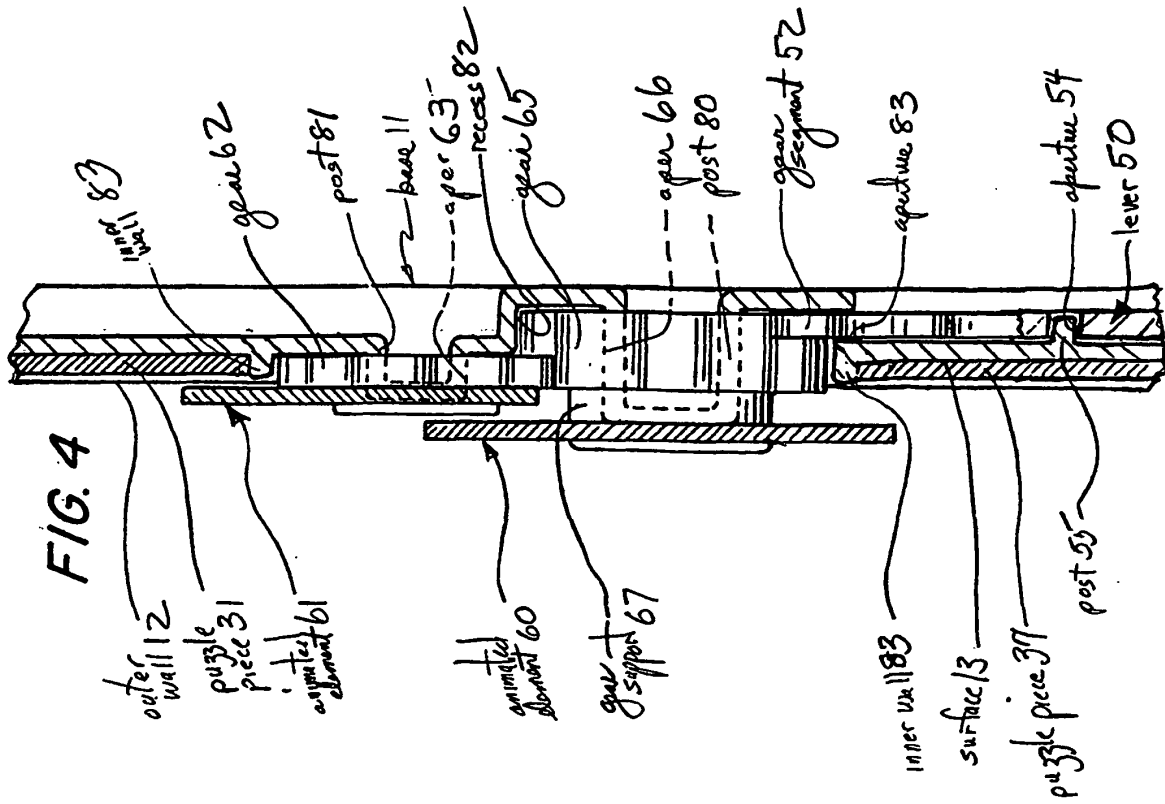
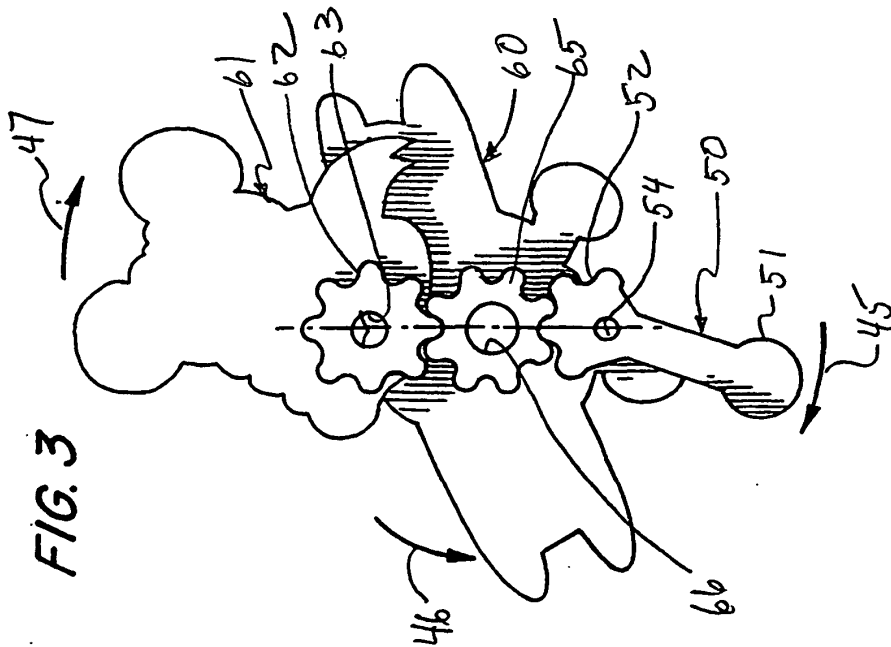


FIG. 5

