

PATENT SPECIFICATION

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(54) EDUCATIONAL TOY

(71) We, HSING-CHING LIU and LAN-DIH LIU, both citizens of Taiwan, residing together at 3F, No. 213, Chung Ching N. Road, Sec. 4, Taipei, Taiwan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to an educational toy.

The educational toy according to the present invention comprises a base carrying a stack of three circular plates each located by a central spindle on the base passing through a respective central hole in the plate, the top plate being non-rotatably located by a non-circular head portion on the spindle and the intermediate and lower plates being rotatably located by a stem portion of the spindle, the intermediate and lower plates on their mutually opposed surfaces each having a respective arcuate groove, said grooves being curved in opposite senses so that a cross-over region defined between said grooves moves relative to both said plates as one or other of them is rotated, a first magnet located in said cross-over region, and an indicator member containing a second magnet and adapted to be manually placed on the top plate and influenced by said first magnet, the top plate being provided on its upper surface with an educational design requiring the user to make appropriate movements of the indicator member, the intermediate plate, and/or the lower plate.

The invention will be further described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a top view of first embodiment of the invention;

Figure 2 is a cross-sectional view taken along the line II—II in Figure 1, with an indicator member shown partly broken away;

Figure 3 is a top view of a second embodiment of the invention;

Figure 4 is a sectional view of a top plate

of the second embodiment with magnets embedded therein and an outer layer attached at one side of said plate;

Figure 5 is a sectional view of the second embodiment illustrating a condition where a magnet located inside a cross-over region defined between intermediate and lower plates attracts an indicator member;

Figure 6 is a similar sectional view but illustrating a condition where said magnet departs from the indicator member.

Referring to Figures 1 and 2, the illustrated educational toy comprises a base 1, a lower plate 2, an intermediate plate 3, a top plate 4 and an indicator member 5. The base 1 has a rim defining a circular cavity in the centre of which is provided a spindle 11. The spindle 11 consists of a cylindrical stem portion 12 and a non-circular head portion 13 which is preferably in the shape of a trapezium.

The lower plate 2 is placed over said base 1 by passing a hole at the center of said board 2 over said spindle 11 and is located by said stem portion 12. On the top surface of said lower board 2 is provided an arcuate groove 21. The lower board 2 at its periphery carries an operating handle 22 which serves to turn the board 2 about the spindle 11 relative to said base 1 and upper board 3.

The intermediate plate board 3 is placed over said lower board 2 by passing a hole at the center of said board 3 over the spindle 11 is also located by said stem portion 12. Therefore, the height of said stem portion 12 is equal to the total thickness of the lower and intermediate plates 2 and 3. On the bottom surface of said upper board 3 is provided an arcuate groove 31. Said groove 31 is curved in the sense opposite to that of groove 21 in the lower plate 2, as best shown in Figure 1, in such way that a cross-over region 6 is formed by said two grooves 21 and 31. The upper board 3 at its periphery carries has a raised protrusion 32 which serves as means for setting the board 3 at a predetermined angular position relative to the top plate 4, as will be

24 APR 1981

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described hereinafter. On the top surface of the board 3 is a recess 33 for facilitating insertion and removal of said plate 4 by hand.

5 The top plate 4 is printed with a desired quiz-and-answer representation. The plate 4 at the center thereof is punched to form a non-circular cross-section hole 41 in the shape corresponding to that of said head portion 13 of the spindle 11, so that the plate 4 can be located on the spindle 11 and angularly fixed by the head portion 13. The top plate 4 has a notch 42 to match with the protrusion 32 of the intermediate plate 3, so that the angular position of said plate 3 and accordingly of said groove 31 will be set in accordance with the position of the notch 42 on the plate 4. Different plates 4 may be provided with notches 42 at different angular positions. The plate 4 has an opening 43 at a location corresponding to said recess 33 on the upper board 3 for facilitating removal of said plate 4 for substitution by another plate.

25 A magnet 61 is located within said cross-over region 6 formed by the two grooves 21 and 31, as shown in Figure 2. The magnet 61 is freely movable along the path taken by said cross-over region 6 as the lower plate 2 is rotated, and preferably has a cylindrical shape with a height greater than the individual depths of grooves 21 or 31 but less than the total depth of grooves 21 and 31.

35 The indicator member 5 contains a magnet 51 and can be moved by hand as desired over the top plate 4. The indicator member 5 is preferably in such shape, for example, oval shape, than when the indicator 5 is moved to meet the point where the cross-over region 6 is located, and the magnet 51 in the indicator 5 is attracted by the magnet 61 located within said crossover region 6, the indicator 5 may be caused to stand on its end. If the hand used to move said indicator member 5 releases said member at any other point, the member 5 will fall down due to lack of attraction between the magnets 51 and 61.

50 With the constructions mentioned above the present invention can be operated by turning the operating handle 22 to rotate the plate 2 and thus change the position of said cross-over region 6, i.e. the relative position between two grooves 21 and 31. Since the upper plate 3 is fixedly set by matching the protrusion 32 thereof with the notch 42 provided on the periphery of said plate 4, the groove 31 is also fixed. But the position of the groove 21 can be varied by turning said operating handle 22. In this way, the cross-over 6 will follow a path defined by the groove 31.

65 With the top plate 4 as shown in Figure 1, for example, there are depicted various

fruits including banana, apple, peach and strawberry in different quantities for counting, but the fruits depicted within respective circles adjacent to the circumference of said plate 4 are for indication of the question to be answered. There are also numeral selective answers "1" "2" "3" and "4" depicted on the plate 4 just above the hidden path of said cross-over region 6, namely, the path of the groove 31. The additional numbers "5" and "6" located out of the orbit are always incorrect answers.

If for example the operating handle 22 is turned to the position marked in solid lines with 22 in Figure 1, and directed to the illustration of a banana in circle, this asks the question: "how many bananas are shown?". The groove 21 is in the position as shown in Figure 1, and the cross-over 6 together with the magnet 61 therein is in a location beneath the depicted numeral "2". If the child places the indicator member 5 on the answer "2", then the magnet 51 will be attracted by the magnet 61, so that the indicator member 5 will stand on its end, which means that the answer is correct. If he places the indicator 5 on any other numeral answer, the indicator 5 will fall down. If the operating means 22 is then turned to the position marked 22', 22" and 22''' and shown in broken lines in order, then the groove 21 will be moved to the positions as indicated by 21', 21" and 21''', respectively. The locations of said cross-over region 6 are changed to that beneath the selective answer "1" "3" and "4", respectively, corresponding to the respective numbers of the other fruits depicted on the plate 4. The plate 4 may subsequently be replaced by a plate with a different design, so different questions and answers can be made.

In a second embodiment of the invention shown in Figures 3 to 6, the top plate 4 has no notch on its periphery, so that the protrusion 32 is free to turn in the same way as the operating handle 22. Under this condition, the cross-over region 6 can be moved to any point by turning both operating handle 22 and protrusion 32, without having any fixed path.

In this embodiment, the plate 4 has a plurality of magnets 44 embedded therein, see Figure 3. If necessary, an outer layer 45 of printed material may be attached on either side or both sides of said plate 4 to retain said magnets 44. The plate 4 has for example the illustrated representation in which the player must find the right way to go home for the boy 46 shown in Figure 3. The magnets 44 embedded in the plate 4 are arranged to block the wrong ways that the boy 46 should not take.

At the beginning, both the operating

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handle 22 and protrusion 32 are set at the start points as shown. The cross-over region 6 is located at the place that the boy 46 stands, and the indicator member 5 is placed on its end thereon. Then, the player turns the handle 22 and protrusion 32 freely to move plates 2 and 3 and guide by means of the attraction between both magnet 51 and 61 as shown in Figure 5 the indicator member 5 (representing the boy 46) on the right way according to the judgement of said player. He should avoid the indicator member 5 meeting any one of the invisible magnets 44, since as soon as the indicator member 5 comes to any place where a magnet 44 embedded, as shown in Figure 6, which means that he goes the wrong way, then the magnet 51 inside the indicator member 5 will turn upside down under attraction by the magnet 44.

When the player continues to turn either one or both plates 2 and 3, since the attraction between magnets 51 and 61 has been interrupted, the indicator 5 stands still under attraction of magnet 44 and is not moved with the magnet 61 (Figure 6). Under this condition, the player has failed, so he must turn both handle 22 and protrusion 32 to their original start positions and take the indicator member 5 back to the place where the boy 46 stands, then start again.

The base 1, plates 2 and 3 and indicator 5 can be made of plastics and plate 4 made of printable material, such as cardboard, or of a paper layer and a substrate.

The arrangement of the components of the toy can be varied; for example, the lower plate 2 may be provided with a sleeve (not shown) at the centre thereof, said sleeve being supported over said spindle 11. In turn, the intermediate plate boards 3 is located with its central hole over said sleeve. And on the top end of said sleeve may be formed at least one protrusion to match with an opening or openings (not shown) punched adjacent the non-circular central hole on the top plate 4.

WHAT WE CLAIM IS:—

1. An educational toy comprising a base carrying a stack of three circular plates each located by a central spindle on the base passing through a respective central hole in the plate, the top plate being non-rotatably located by a non-circular head

portion on the spindle and the intermediate and lower plates being rotatably located by a stem portion of the spindle, the intermediate and lower plates on their mutually opposed surfaces each having a respective arcuate groove, said grooves being curved in opposite senses so that a cross-over region defined between said grooves moves relative to both said plates as one or other of them is rotated, a first magnet located in said cross-over region, and an indicator member containing a second magnet and adapted to be manually placed on the top plate and influenced by said first magnet, the top plate being provided on its upper surface with an educational design requiring the user to make appropriate movements of the indicator member, the intermediate plate, and/or the lower plate.

2. A toy according to Claim 1, wherein the lower plate carries on its periphery an operating handle for manually rotation thereof.

3. A toy according to Claim 1 or 2, wherein the intermediate plate has means for setting its angular position relative to the top plate.

4. A toy according to Claim 3, wherein said means comprise a protrusion on the periphery of the intermediate plate and a corresponding notch in the periphery of the top plate.

5. A toy according to any preceding claim, wherein the top plate is interchangeable with other top plates to provide different educational designs.

6. A toy according to any preceding claim, wherein one or more further magnets are embedded in the top plate.

7. A toy according to any preceding claim, wherein the indicator member is oval and is adapted to stand on one end by virtue of attraction between said first and second magnets.

8. An educational toy substantially as herein described with reference to and as shown in Figures 1 and 2 and Figures 3, 4 and 5 of the accompanying drawings.

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