

ASSEMBLY STRUCTURE FOR BUILDING BLOCK PUZZLE, AND BUILDING BLOCK TOYS

TECHNICAL FIELD

5 The present invention relates to a field of building block toys, and specifically relates to an assembly structure for building block puzzle, and building block toys.

BACKGROUND

10 In the field of building block in the art, a building block baseboard (constructing base) is an integrated unmovable single baseboard for building blocks. Owing to its immobility, when a plurality of building block puzzle pieces are assembled on the building block baseboard, there is no gap or a minimal gap between the building blocks. When one building block therein is surrounded by other building blocks, owing to that the building block puzzle pieces are tightly around after assembly, if the building block
15 in the middle is to be disassembled, it is necessary to disassemble the building blocks from the edge position piece by piece to fulfill the disassembly. Besides, such disassembly is inconvenient in use. Before the disclosure of the present application, there's no related teach in the prior art, nor any reports of how to solve such problem. It is a problem that has never been solved in the field of building block, and there's no
20 building block product that solves this problem at home and abroad. By several years of research, the applicant has tried a plurality of solutions but cannot solve the above problem properly, especially with low cost and high efficiency. Whereas, using a complicated structure to solve the problem of disassembly may not require inventive work, but it needs a relatively high cost and is unfavorable to a mass production. Even
25 the complicated structure is unsafe to users, like children, and thus it cannot be popularized. Therefore, the key of the present invention is to creatively solve the problem that has never been solved in the field of building blocks, by a design which is nearly the most simple, the safest and the most reliable, and has the most compatibility. It may seems very simple after the disclosure of the present application, but those
30 skilled in the art hasn't found a good solutions before the disclosure of the present application, including that the applicant didn't figure out an excellent solution before. However, as some inventions that are commonly accepted and complimented by people,

the present invention ingeniously solves the problem that has never been solved before with a solution which is nearly the simplest, the most reliable with least cost.

SUMMARY OF THE INVENTION

5 An objective of the present invention is to overcome the above drawbacks in the prior art, and to provide an assembly structure for building block puzzle, and building block toys.

 The objective of the present invention is realized by at least one of the following technical solutions.

10 An assembly structure for building block puzzle, includes a movable building block constructing piece and a constructing base. and the movable building block constructing piece is supported on the constructing base by an elastic member, the elastic member achieves compression under an effect of an external pressure which acts on the movable building block constructing piece and the constructing base, and makes
15 the movable building block constructing piece and the constructing base move relatively close to each other, and when the external pressure disappears, the elastic member supports the movable building block constructing piece to return to a normal position by a pre-pressure.

 Further, a relationship between the movable building block constructing piece and
20 the constructing base is a one-to-one assembly relationship, a size of one constructing base only satisfies supporting one movable building block constructing piece, and meanwhile a module is made up of the movable building block constructing piece and the constructing base, a bottom surface structure of the constructing base is consistent with that of a building block, so that the module has a function of the building block;
25 and a top surface of the movable building block constructing piece shows a building block pattern or has a structure for plugging a bottom of the building block (a structure consistent with a baseboard of a building block puzzle in the prior art can be used, for example holes and cylinders of building block are provided for assembling the building blocks).

30 Further, a relationship between the movable building block constructing piece and the constructing base is a many-to-one assembly relationship, i.e. a plurality of said movable building block constructing pieces are assembled on said one constructing base,

the constructing base is an integrated structure, each of the movable building block constructing pieces is supported on the constructing base independently by the elastic member, and each of the movable building block constructing pieces moves relatively close to the constructing base under the effect of the external pressure; the plurality of
5 said movable building block constructing pieces are arranged at equal height over said one constructing base, top surfaces of a plurality of said movable building block constructing pieces are arranged as a structure for plugging a plurality of said building blocks to complete the puzzle, and the top surface of the movable building block constructing piece has a structure for plugging a bottom of one building block (a
10 structure consistent with a baseboard of a building block puzzle in the prior art can be used, for example holes and cylinders of building block are provided for assembling the building blocks).

Further, the movable building block constructing piece is provided with an upper limit member, for joining with a lower limit member provided by the constructing base to achieve a snap-fit connection and a limit function, so that the movable building block
15 constructing piece and the constructing base not only can move relatively after the snap-fit but also cannot separate from each other under an effect of the pre-pressure of the elastic member; the upper limit member may be provided on a side wall (an outer side wall or an inner side wall) of the movable building block constructing piece, and
20 may be provided inside the movable building block constructing piece, and the lower limit member may be provided on a side wall (an inner side wall or an outer side wall) of the constructing base, and may be provided inside the constructing base.

The upper limit member may be a protrusion on an outer side face of the movable building block constructing piece, and the lower limit member may be a protrusion on
25 an inner side face of the constructing base. The external pressure acting on the movable building block constructing piece and the constructing base makes two protrusions squeeze over each other to achieve the snap-fit, and prevents separation between the movable building block constructing piece and the constructing base when the elastic member rebounds (the separation according to the present invention referring to the
30 return or return process of a spring makes the movable building block constructing piece separate from the constructing base).

Further, a gap is provided between the upper limit member of the movable building block constructing piece and the side wall of the movable building block constructing piece, i.e. the upper limit member is independently provided on an inner top surface of the movable building block constructing piece; and a gap is provided between the lower
 5 limit member of the constructing base and the side wall of the constructing base, i.e. the lower limit member is independently provided on an inner bottom surface of the constructing base.

Further, the upper limit member provided by an inner side of the movable building block constructing piece is a rectangular side wall provided inside the movable building
 10 block constructing piece independent of the side wall, and the lower limit member provided by an inner side of the constructing base is a rectangular side wall independent of the side wall. When the rectangular side wall provided inside the movable building block constructing piece can be inserted in the rectangular side wall provided inside the constructing base, at least one of the rectangular side wall provided by the movable
 15 building block constructing piece and the rectangular side wall provided by the constructing base at least has one protrusion for achieving the snap-fit connection during insertion and preventing the movable building block constructing piece and the constructing base from separating from each other.

Further, after the upper limit member provided by the movable building block constructing piece and the lower limit member provided by the constructing base
 20 squeeze over each other to achieve the snap-fit, movement between the movable building block constructing piece and the constructing base in a direction parallel to a bottom surface of the constructing base is limited by one or more of the side wall of the movable building block constructing piece, the side wall of the constructing base, the
 25 upper limit member and the lower limit member (i.e. movement cannot be performed in this parallel direction, or movement can only be performed by a small distance in the case that the connection between the building block constructing piece and the constructing base, and proper functioning thereof are not affected. In order to make the joining as stable as possible, the movement in this parallel direction should be
 30 minimized).

Further, a distance by which the movable building block constructing piece and the constructing base move relatively closest to each other is limited by one or more of the

respective side walls, the upper limit member and the lower limit member, or is limited by a press-limit member provided additionally, and the press-limit member is provided inside at least one of the movable building block constructing piece and the constructing base.

5 Further, the elastic member is a spring (it may be any member that rebounds after being compressed, for example, a spring piece and the like), and the spring is prevented from shifting in a non-stretch direction by a member provided inside at least one of the movable building block constructing piece and the constructing base with a height less than a length of the spring (it may be a hollow cylinder located at an outer side or an
10 inner side of the spring), or the spring is prevented from shifting in the non-stretch direction by at least one of the side wall of the movable building block constructing piece and the side wall of the constructing base. The movable building block constructing piece and the constructing base are generally in the shape of rectangle.

The present invention also provides building block toys having the assembly
15 structure for building block puzzle, including the assembly structure for building block puzzle and building blocks, and the building blocks can be assembled on the movable building block constructing piece of the assembly structure for building block puzzle by means of insertion

Compared to the prior art, the present invention has following benefits and
20 technical effects:

The structure according to the present invention is a movable structure for building block. After puzzle pieces for building block (building blocks) are assembled, each puzzle piece moves downward by pressing, automatically rebounds and returns under the effect of the elastic member, enhancing an entertainment effect, and when any one
25 puzzle piece is disassembled, two building blocks adjacent to any puzzle piece for building block can be pressed randomly, exposing opposite edge positions (a finger-position) of the building block to be disassemble, and then the puzzle piece to be disassemble may be pulled out easily, with convenient use. In addition, the movable building block constructing piece and the constructing base make up a module, and a
30 bottom of the constructing base in a single module may be a standard hole structure of building block, not only having an advantage of a movable constructing baseboard, but also matching with a conventional baseboard for building block when in use, without

being limited to the size. Users can assemble puzzles at will as the size they want, and products are given more use possibilities.

In conclusion, the present invention has a simple and ingenious structure which is easy to produce with low cost. The problem that has never been solved in the field of building blocks are creatively solved by a design which is nearly the most simple, the safest and the most reliable, and has the most compatibility. It is very convenient to use and can be assembled at will and simply disassembled, greatly improving playability of the building block toys. As some inventions commonly accepted and complimented by people, the present invention ingeniously solves the problem that has never been solved before with a solution which is nearly the simplest, the most reliable with least cost, and certainly such invention will be promoted extensively.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1a to FIG. 1c show a top view, a front view and a side view of an overall structure in an embodiment of the present invention when movable building block constructing pieces and a constructing base are in a many-to-one relationship.

FIG. 2 shows a partial section view of an assembly structure for building block puzzle shown in FIG. 1b.

FIG. 3 shows a schematic view of a conversion condition of an assembly structure for building block puzzle in one embodiment.

FIG. 4a and FIG. 4b show a resulting top view and a resulting front view of the assembly structure for building block puzzle with building blocks inserted on in the embodiment.

FIG. 5 shows a schematic view when the building blocks are disassembled from the assembly structure for building block puzzle in the embodiment.

FIG. 6 shows one structural view that a single movable building block constructing piece and a single constructing base make up one module in the embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Specific implementations of the present invention are further described in the following in combination with accompanied drawings and embodiments, but implementation and protection of the present invention are not limited to these.

As shown in FIG. 1a to FIG. 1c, as an embodiment of an assembly structure for building block puzzle, a plurality of movable building block constructing pieces 2 are assembled on a whole piece of constructing base 1. A relationship between the movable building block constructing piece and the constructing base is a many-to-one assembly relationship, and the constructing base is an integrated structure and can be made into different sizes according to different requirements. Each movable building block constructing piece is supported on the constructing base independently by an elastic member, and each movable building block constructing piece moves relatively close to the constructing base under an effect of an external pressure. A plurality of said movable building block constructing pieces are arranged at equal height over said one constructing base, and top surfaces of the plurality of said movable building block constructing pieces are arranged as a structure for plugging building blocks to complete the puzzle. A top surface structure of the movable building block constructing piece is a structure for plugging a bottom of one building block (for example, providing a hole and a cylinder of building block). As one embodiment, the top surface structure can be consistent with a baseboard of a building block puzzle in the prior art, providing holes and cylinders of building block 201 for assembling the building blocks in the art, as shown in FIG. 1a to FIG. 1c.

As shown in FIG. 2 to FIG. 4, the movable building block constructing pieces 2 are supported on the constructing base 1 by the elastic member that can be any member that rebounds after being compressed, such as a spring, a spring piece and the like. In the present embodiment, the spring 3 is selected. The elastic member achieves compression under an effect of an external pressure which acts on the movable building block constructing piece and the constructing base, and makes the movable building block constructing piece and the constructing base move relatively close to each other, and when the external pressure disappears, the elastic member supports the movable building block constructing piece by a pre-pressure.

As one embodiment, the movable building block constructing piece is provided with an upper limit member 4 for joining with a lower limit member 5 provided by the constructing base to achieve a snap-fit connection and a limit function, so that the movable building block constructing piece and the constructing base can not only move relatively after the snap-fit but also cannot separate from each other when the elastic

member rebounds under an effect of the pre-pressure. The upper limit member can be provided on a side wall (an outer side wall or an inner side wall) of the movable building block constructing piece, or inside the movable building block constructing piece (as shown in FIG. 2 and FIG. 3), and the lower limit member can be provided on a side wall (an inner side wall or an outer side wall) of the constructing base, or inside the constructing base. As shown in FIG. 2, the lower limit member is provided on the inner side wall of the constructing base.

The upper limit member can be a protrusion (such protrusion can be hook-shaped) on an outer side face of the movable building block constructing piece, and the lower limit member can be a protrusion (such protrusion can be hook-shaped) on the inner side face of the constructing base. The external pressure acting on the movable building block constructing piece and the constructing base makes two protrusions squeeze over each other to achieve the snap-fit, and prevents separation between the movable building block constructing piece and the constructing base when the elastic member rebounds (as shown in FIG. 3).

As one embodiment, a gap is provided between the upper limit member of the movable building block constructing piece and the side wall of the movable building block constructing piece, i.e. the upper limit member is independently provided on an inner top surface of the movable building block constructing piece (as shown in FIG. 2 and FIG. 3). Similarly, a gap is provided between the lower limit member of the constructing base and the side wall of the constructing base, i.e. the lower limit member is independently provided on an inner bottom surface of the constructing base. These two manners can be performed together or alternatively.

As shown in FIG. 2 and FIG. 3, the upper limit member provided by the inner side of the movable building block constructing piece is a rectangular side wall provided inside the movable building block constructing piece independent of the side wall. Similarly, the lower limit member provided by the inner side of the constructing base can also be a rectangular side wall independent of the side wall. When the rectangular side wall provided inside the movable building block constructing piece can be inserted in the rectangular side wall provided inside the constructing base, at least one of the rectangular side wall provided by the movable building block constructing piece and the rectangular side wall provided by the constructing base at least has one protrusion for

achieving the snap-fit connection during insertion and preventing the movable building block constructing piece and the constructing base from separating from each other. As an embodiment, for example, the rectangular side wall provided by the movable building block constructing piece can be provided with a protrusion, while the rectangular side wall provided by the constructing base is provided with a protrusion or a groove at the corresponding position, for joining to achieve the snap-fit connection and limitation. After the upper limit member provided by the movable building block constructing piece and the lower limit member provided by the constructing base squeeze over each other to achieve the snap-fit (as shown in FIG. 3), movement between the movable building block constructing piece and the constructing base in a direction parallel to the bottom surface of the constructing base is limited by one or more of the side wall of the movable building block constructing piece, the side wall of the constructing base, the upper limit member and the lower limit member. In the present embodiment, as shown in the figures, movement in said parallel direction is limited by the upper limit member and the side wall of the constructing base, so that movement cannot be performed in this parallel direction, or movement can only be performed by a small distance in the case that the connection between the building block constructing piece and the constructing base, and proper functioning thereof are not affected. In order to make the joining as stable as possible, the movement in this parallel direction should be minimized.

In a further implementation, a distance by which the movable building block constructing piece and the constructing base move relatively closest to each other is limited by one or more of the respective side walls, the upper limit member and the lower limit member, or is limited by a press-limit member provided additionally, and the press-limit member is provided inside at least one of the movable building block constructing piece and the constructing base. As shown in FIG. 3, the upper limit member is used in the present embodiment to limit said distance by which the movable building block constructing piece and the constructing base move relatively closest to each other.

As shown in FIG. 2 and FIG. 3, a spring limit member 6 is provided inside at least one of the movable building block constructing piece and the constructing base, with a height less than a length of the spring, for preventing the spring from shifting in a

non-stretch direction (the spring limit member 6 may be a hollow cylinder located at an outer side or an inner side of the spring, and the former one is used in the present embodiment), or the spring is prevented from shifting in the non-stretch direction by at least one of the side wall of the movable building block constructing piece and the side wall of the constructing base (in this case, a diameter of the spring is relatively large). The movable building block constructing piece and the constructing base are generally in the shape of rectangle, and thus the hollow cylinder located at the outer side or the inner side of the spring is generally used as the spring limit member 6.

FIG. 4 is a resulting view after inserting building blocks 401. As for a conventional building block insertion base, owing to that building block puzzle pieces are assembled tightly around, there's no handle for taking any one building block puzzle piece from the middle or other positions, and therefore a special tool is required if any one building block therein is desired to be disassembled. However, after applying the technical solution of the present invention, as shown in FIG. 5 which is a schematic view of a press manner and direction when a building block in the middle is disassembled, as long as the adjacent building blocks at two sides are pressed, it is convenient to pull out the building block to be disassembled by clamping two sides of the building block. The spring of the present embodiment can be gentle enough to only support the building block and the movable building block constructing piece. It is easy and convenient, even for children, to assemble the building block and the movable building block constructing piece.

As another typical embodiment, as shown in FIG. 6, a relationship between the movable building block constructing piece and the constructing base is a one-to-one assembly relationship. A size of one constructing base only satisfies supporting one movable building block constructing piece, meanwhile a module is made up of the movable building block constructing piece and the constructing base, and a bottom surface structure 101 of the constructing base is consistent with a bottom of the building block, so that the module has a function of the building block; and a top surface of the movable building block constructing piece shows a building block pattern or has a structure for plugging the bottom of the building block (a structure consistent with a baseboard of a building block puzzle in the prior art can be used, for example holes and cylinders of building block are provided for assembling the building blocks). Such

structure can be used at will with a general building block constructing baseboard or products related to building blocks. The bottom of the constructing base in a single module can be a standard hole structure of building block, not only having an advantage of a movable constructing baseboard, but also matching with a conventional baseboard
5 for building block when in use, without being limited to the size. Users can assemble puzzles at will as the size they want, and products are given more use possibilities.

According to the solution disclosed by the present application, those skilled in the art can also alter and modify the above-mentioned implementations, such as adjusting a position of the limit member. Therefore, protection of the present invention is not
10 limited to specific implementation disclosed and described above. Solutions of replacement or simple increase-decrease made to the present invention without inventive work should also be within the protection scope of claims of the present invention.

What is claimed:

1. An assembly structure for building block puzzle, characterized in that, the assembly structure comprises a movable building block constructing piece and a constructing base, the movable building block constructing piece being supported on the constructing base by an elastic member, the elastic member achieving compression under an effect of an external pressure which acts on the movable building block constructing piece and the constructing base, and making the movable building block constructing piece and the constructing base move relatively close to each other, and when the external pressure disappears, the elastic member supports the movable building block constructing piece to return to a normal position by a pre-pressure.
2. The assembly structure for building block puzzle according to claim 1, wherein a relationship between the movable building block constructing piece and the constructing base is a one-to-one assembly relationship, a size of one constructing base only satisfies supporting one movable building block constructing piece, meanwhile a module is made up of the movable building block constructing piece and the constructing base, a bottom surface structure of the constructing base is consistent with that of a building block, so that the module has a function of the building block; and a top surface of the movable building block constructing piece shows a building block pattern or has a structure for plugging a bottom of the building block.
3. The assembly structure for building block puzzle according to claim 1, wherein a relationship between the movable building block constructing piece and the constructing base is a many-to-one assembly relationship, a plurality of said movable building block constructing pieces are assembled on said one constructing base, the constructing base is an integrated structure, each of the movable building block constructing pieces is supported on the constructing base independently by the elastic member, and each of the movable building block constructing pieces moves relatively close to the constructing base under the effect of the external pressure, the plurality of said movable building block constructing pieces are arranged at equal height over said one constructing base, a top surface of the movable building block constructing piece has a structure for plugging a bottom of one building block, and the top surfaces of a plurality of said movable building block constructing pieces are arranged as a

structure for plugging a plurality of said building blocks to complete the puzzle.

4. The assembly structure for building block puzzle according to claim 1, wherein the movable building block constructing piece is provided with an upper limit member,
5 for joining with a lower limit member provided by the constructing base to achieve a snap-fit connection and a limit function, so that the movable building block constructing piece and the constructing base are not only capable of moving relatively after the snap-fit but also not separating from each other when the elastic member returns under an effect of the pre-pressure, the upper limit member is provided on a
10 side wall of the movable building block constructing piece or inside the movable building block constructing piece, and the lower limit member is provided on a side wall of the constructing base or inside the constructing base.

5. The assembly structure for building block puzzle according to claim 4, wherein a
15 gap is provided between the upper limit member of the movable building block constructing piece and the side wall of the movable building block constructing piece, the upper limit member is independently provided on an inner top surface of the movable building block constructing piece, and a gap is provided between the lower limit member of the constructing base and the side wall of the constructing base, the
20 lower limit member is independently provided on an inner bottom surface of the constructing base.

6. The assembly structure for building block puzzle according to claim 5, wherein the upper limit member is a rectangular side wall provided inside the movable building
25 block constructing piece and independent of the side wall of the movable building block constructing piece, the lower limit member is a rectangular side wall independent of the side wall of the constructing base, and when the rectangular side wall provided inside the movable building block constructing piece is capable of being inserted in the rectangular side wall provided inside the constructing base, at
30 least one of the rectangular side wall provided by the movable building block constructing piece and the rectangular side wall provided by the constructing base at least has one protrusion thereon for achieving the snap-fit connection during insertion and preventing the movable building block constructing piece and the constructing

base from separating from each other.

7. The assembly structure for building block puzzle according to claim 4, wherein after the upper limit member and the lower limit member squeeze over each other to achieve the snap-fit, movement between the movable building block constructing piece and the constructing base in a direction parallel to a bottom surface of the constructing base is limited by one or more of the side wall of the movable building block constructing piece, the side wall of the constructing base, the upper limit member and the lower limit member.

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8. The assembly structure for building block puzzle according to claim 1, wherein a distance by which the movable building block constructing piece and the constructing base move relatively closest to each other is limited by one or more of a side wall of the movable building block constructing piece, a side wall of the constructing base, an upper limit member and a lower limit member, or is limited by a press-limit member provided additionally, and the press-limit member is provided inside at least one of the movable building block constructing piece and the constructing base.

9. The assembly structure for building block puzzle according to claim 1, wherein the elastic member is a spring, and the spring is prevented from shifting in a non-stretch direction by a member provided inside at least one of the movable building block constructing piece and the constructing base with a height less than a length of the spring, or the spring is prevented from shifting in the non-stretch direction by at least one of a side wall of the movable building block constructing piece and a side wall of the constructing base.

10. Building block toys having the assembly structure for building block puzzle of any one of claims 1-9, wherein the building block toys comprise the assembly structure for building block puzzle, and building blocks, and the building blocks is capable of being assembled on the movable building block constructing piece of the assembly structure for building block puzzle by means of insertion.