Feb. 3, 1970 A. STUBBMANN 3,492,756

TOY BLOCK WITH CHANGEABLE PICTURES

Filed Jan. 18, 1968

FIG. 2

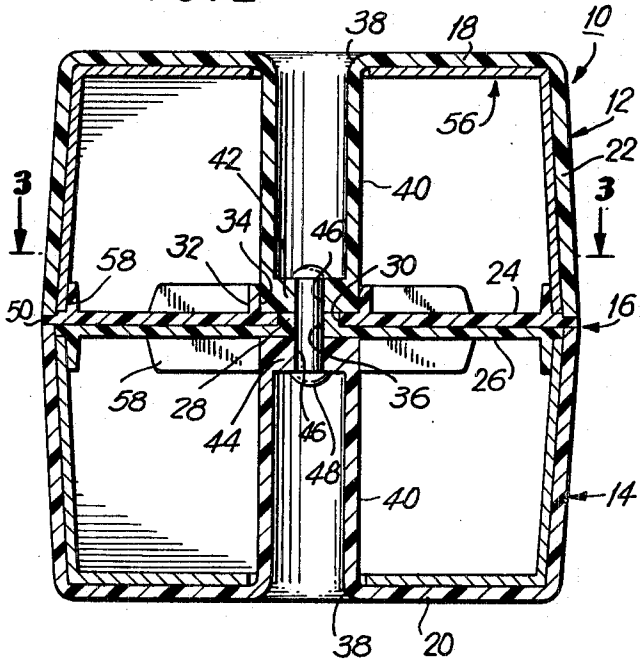
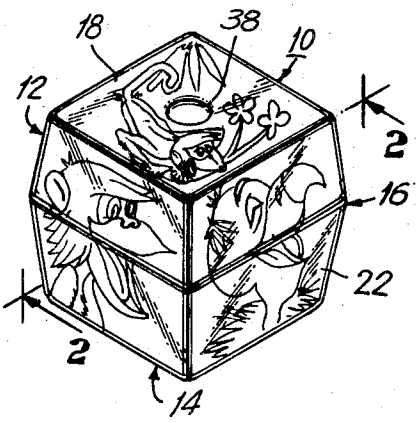


FIG. 1



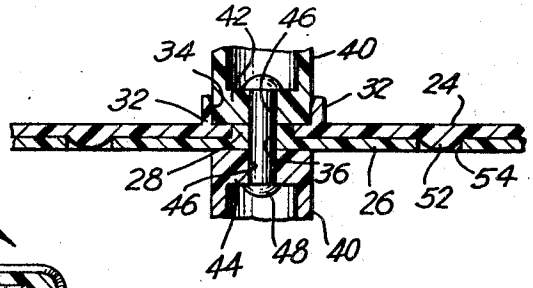
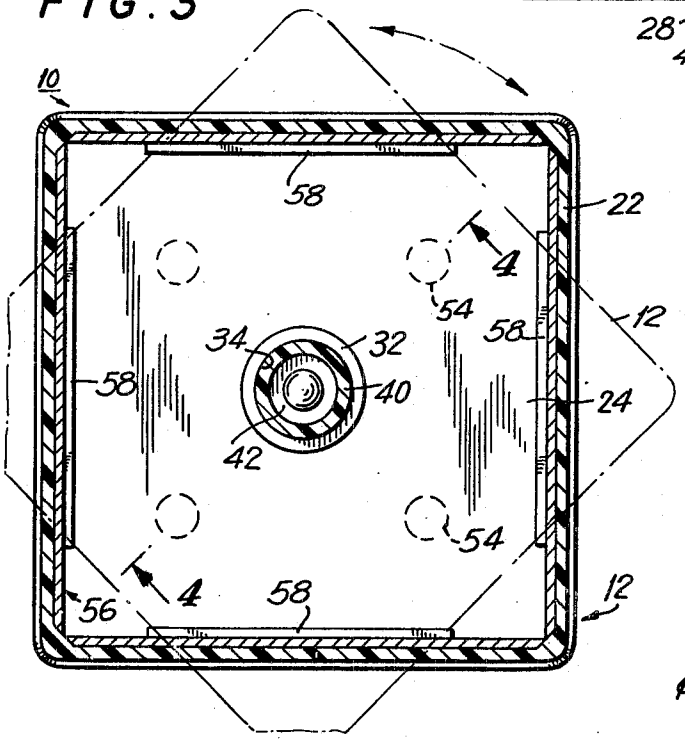


FIG. 4

FIG. 3



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TOY BLOCK WITH CHANGEABLE PICTURES

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U.S. Cl. 46—24 10 Claims

ABSTRACT OF THE DISCLOSURE

A toy cube split at its equator and thereby subdivided into two matching halves facing one another. Each half cube is made of transparent plastic and the sides thereof are lined with paperboard the surfaces of which that show through the overlying surfaces of the sides of the half cubes being imprinted with halves of pictures. The half pictures are so designed that when any face of a half cube matches any face of the opposite half cube the associated halves of pictures cooperate to form a complete picture. The facing sides of the half cubes are open, being covered by plates which have interengaging nibs and sockets that mesh when the faces of the half cubes are matched. A rivet pivotally joins the two halves.

BACKGROUND OF THE INVENTION

Field of the invention

A toy block equitorially split into two rotatably joined picture carrying halves.

Description of the prior art

It has been proposed heretofore to provide toy blocks with split rotatably joined halves carrying matchable picture halves on the side faces thereof. However, these have never found public favor because their play value was so limited. One of the contributing factors was that it was difficult for a small child to precisely match the picture carrying sides of the half blocks. Another drawback was that the pivotal means joining the half blocks could not be properly adjusted; too tight a pivotal interconnecting means made the half blocks too difficult to manipulate. Too loose a pivotal interconnecting means enable the half blocks to accidentally experience relative rotation. Another drawback was that the blocks were made of pasteboard which could not resist rugged play and which became soft and deformed when a child of tender years, who normally would be given the block to play with, inserted it into his mouth or sucked on it. Still another drawback was that previous blocks of the character described were not susceptible to mass production, particularly not susceptible to mass production with a large variety of pictures thereon.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a toy block of the foregoing general character which, however, is so constructed that it is not subject to any of the foregoing disadvantages.

More specifically, it is an object of the invention to provide a toy block of the character described which is simple and rugged in construction, and is easy to handle, and yet can be fabricated by mass production methods.

It is another object of the invention to provide a toy block of the character described including special means to define mutual registering positions of the two halves of the block, these being positions in which the flat faces of the regular polygonal halves are in precise mutual alignment.

It is another object of the invention to provide a toy block of the character described in which a single type of half cube is so constructed as to admit internal pictures of all kinds which pictures can be seen through the transparent walls of the cube, whereby many differently ornamented toy blocks, these being toy blocks with all different pictures, can be made with the use of only a single type of half cube, thus enabling the manufacturer to produce and stock large numbers of the half cubes and to assemble with such halves as many different pictures as he considers or finds to be popular.

It is another object of the invention to provide a toy block of the character described which includes means to inhibit relative rotation of the two halves of the cube when they are properly mutually positioned to match up picture halves, whereby it is not necessary to include means for creating a substantial friction between the two halves. Thus, the pivotal interconnection between the two halves can be slightly loose and the tightness of the connection no longer constitutes a critical component in the manufacture of the block.

Other objects of the invention in part will be obvious and in part will be pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangements of parts which will be exemplified in the toy block hereinafter described and of which the scope of application will be indicated in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings in which is shown one of the various possible embodiments of the invention:

FIG. 1 is an isometric view of a toy block constructed in accordance with and embodying the present invention;

FIG. 2 is an enlarged vertical central sectional view through said block, the same being taken substantially along the line 2—2 of FIG. 1;

FIG. 3 is a transverse sectional view through the block taken substantially along the line 3—3 of FIG. 2 and showing in dot and dash lines an intermeditae position assumed by the upper half during its rotation between two matched positions; and

FIG. 4 is a fragmentary sectional view taken substantially along the line 4—4 of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now in detail to the drawings, the reference numeral **10** denotes a toy block which embodies the present invention. Said block is composed of an upper half **12** and a lower half **14** which meet along an equatorial plane generally designated by the reference numeral **16**. The two halves are hollow. The upper half is in the form of an inverted cup and the lower half is in the form of an upright cup whose open mouth faces the open mouth of the upper half. The halves are of identical construction, thereby facilitating their manufacture which preferably is by injection molding. The material of the halves is a synthetic plastic, for example, polystyrene. The plastic material employed is clear, so that the halves are transparent, for a purpose soon to be described. Preferably the material is water white, that is to say, colorless, although it is within the scope of the invention to employ a lightly tinted plastic material.

The top wall **18** of the upper half **12** is flat, except for a central opening which will be described later, and the bottom wall **20** of the lower half **14** likewise is flat, except for a corresponding central opening. The two walls **18, 20** are parallel.

The side wall of each of the two halves is in the shape of a regular polygon, that is to say, it consists of a ring of flat panels **22** of equal length. As illustrated, each half has four such walls, so that the transverse cross-sectional configuration thereof (see FIG. 3) is that of a square.

The heights of the panels are substantially equal to one-half the length of a side of the top or bottom wall, so that when the two halves are in registration they conjointly define a three-dimensional body of substantially cubical configuration. The panels **22** are substantially perpendicular to the top and bottom walls. However, for the purpose of enabling the halves to be withdrawn readily from their mold cavities, the panels are inclined at an angle of a few degrees to the walls **18**, **20**, the angle being exaggerated in FIGS. 1 and 2 for the purpose of illustration. In practice, a suitable draft angle is about 2° away from perpendicular. This draft angle also improves the appearance of the completed toy block **10**.

Suitable means, soon to be described, interconnect the two halves **12**, **14** for rotation about a central axis passing through the centers of the top and bottom walls, so as to enable the two halves to experience mutual rotation about the axis of such interconnecting means.

In accordance with the invention, positioning means also is included to tend to retain the two halves in any relative angular position in which said halves are in registration, this being the position in which the four panels of one half matched to the four panels of the other half, so that the two halves form the cube shown in FIG. 1. It will readily be apparent that with a cubical block there are four such positions, i.e., four positions in which any given panel of either half matches any one of the four panels of the other half.

Said positioning means constitutes a detent means which is composed of a pair of plates **24**, **26**, the upper plate **24** being associated with the upper half **12**, and the lower plate **26** being associated with the lower half **14**. Each plate is shaped to be received within the open mouth of its associated half and is dimensioned to be snugly positioned therein. The plates are flat, except for the nibs and sockets soon to be described, and when the two halves are in any matching position the plates are in surface-to-surface contact with one another. The edges of the plates lie against the corresponding inner surfaces of the marginal zones of the panels **22** of their associated halves.

The lower plate **26** is formed with an upwardly extending circular hub **28**. The upper plate **24** is formed with a corresponding matching circular opening **30** in which the hub **28** is rotatable. The hub is received in the opening **30** and may extend up to the top side of the opening, but does not project through that side. Furthermore, the upper plate **24** is formed with an annular collar **32** concentric with the opening **30** and surrounding and spaced from the same. This collar, together with the upper plate **24**, defines a well **34**. The hub **28** includes a central through aperture **36**.

Each half **12**, **14** is provided with a central opening **38**, respectively on the top wall **18** and the bottom wall **20**, from which there extends into such half a long tubular sleeve **40**. The sleeves are in alignment. The tip of the sleeve **40** of the upper half **12** fits snugly in the well **34** and is terminated by a bottom **42**. The tip of the sleeve **40** of the lower half terminates in a bottom **44**. The sleeves and bottoms are so proportioned that when the toy block is assembled, the bottom of the upper sleeve seats fully in the well **34** and the bottom of the lower sleeve seats against the undersurface of the lower plate **26**. The two bottoms are formed with central registered apertures **46**. A rivet **48** has its shank passing through the aperture **36** and the two apertures **46** and has its ends enlarged to form heads that are seated against the external surfaces of the two bottoms **44**.

The upper plate **24** is formed with a thin peripheral horizontal flange **50** which is interposed between the facing mouths of the two halves and has a configuration corresponding to that of said mouths. Thus, the periphery of the flange **50** in effect constitutes an extension of the outer surface of the upper half **12** and said flange will turn with the upper half, inasmuch as the flange turns with the upper plate **24** which in turn is non-rotatably seated in the mouth of the upper half **12**.

When the ends of the rivets are headed they hold the two halves together sandwiching the two plates **24**, **26** between them. Because detent means is provided, which has not yet been fully described, it is not necessary, when heading the ends of the rivet **48**, to press the two halves and the two plates against one another with substantial force to inhibit accidental rotation thereof when in the hands of a child. Even if the two halves are lightly held together, the detent means will prevent such rotation away from matched positions of the halves. Thus, by employing detent means, the tightness of assembly of the interconnecting rotation means is no longer critical.

Further describing the detent means which thus far has been stated merely to consist of the two plates **24**, **26**, said detent means additionally includes at least one nib on one of the plates and at least a number of equiangularly spaced matching sockets on the other plate equal to the number of sides on the regular polygonal cross-section of the block. Since there are four sides in the block illustrated, there will be four sockets in the detent means.

More particularly, the upper plate **24** is formed with four integral downwardly extending nibs **52**. The nibs are of shallow domed configuration, as shown in FIG. 4. A suitable height for the nibs is approximately the thickness of either of the plates, the two thicknesses being substantially the same. The four nibs are equiangularly spaced, in other words, they are 90° apart from one another, and are at a common distance from the rivet **48**, the longitudinal axis of which constitutes the axis of relative rotation of the two halves **12**, **14**.

The other plate, i.e., the lower plate **26**, is fashioned with four sockets **54**, these, as illustrated, constituting through openings in such plate. The nibs are of round profile, as viewed in plan (see FIG. 3), and the sockets **54** likewise are round and are of the same dimensions in plan, so that each socket will fully receive one nib. The four sockets **44** are equiangularly spaced from one another and are spaced equally from the rivet **48**, this spacing corresponding to the radial spacing of the nibs **52**.

The nibs and sockets are so disposed that when the two halves are in registration, as shown in FIG. 1, the four nibs are received in the four sockets. When the halves are mutually rotated away from their registered position, as illustrated, for instance, by the dot and dash line shown in FIG. 3, the nibs will cam out of their sockets and ride along the top surface of the bottom plate **26**. As the rotation is continued, another matching position will be reached and at this time all the nibs will snap into the then newly registered sockets. The sockets will be those 90° from the sockets that received the same nibs in the previous registered position. Thus, the nibs and sockets will register every 90° and their mutually registered positions will correspond to mutually registered positions of the two halves of the block.

The plates **24**, **26** are fabricated from a resilient material to enable the nibs to cam out of their sockets when the blocks are relatively turned a few degress away from matched position, and the plates at this time will be slightly bowed away from one another, being spaced by the heights of the nibs. However, when the nibs and sockets once again reach a fresh registered position the stresses built up in the plates by the flexing (bowing) action will snap the nibs back into the freshly registered sockets. Conveniently the plates are fabricated from a thermoplastic resin having resilient properties in the thicknesses employed. One resin which functions satisfactorily for this purpose is polyethylene. Another is polyvinyl chloride. Polyethylene is particularly desirable because, in addition to its resiliency, it provides a surface having a low coefficient of friction, or, in other words, a high coefficient of slipperiness, so that the plates may be ro-

tated with respect to one another upon the deliberate application of force and yet the force required is not of a high order of magnitude so as to be beyond the easy manipulation of a young child. It will be observed that the slight height of the nibs and their doming, as shown in FIG. 4, facilitates the camming action and enables the nibs to ride out of their sockets upon the application of opposite torques applied to the two halves.

Attention is drawn to the fact that by employing a plurality of nibs rather than a single nib, the action of the toy block when its halves are mutually rotated is more even (level) than it would be if only a single nib were used. It also is observed that the thin flange **50** stabilizes the two plates so as to prevent their being cocked during relative rotation of the two halves as they might if the flange were omitted and the two plates were fully received within the open mouths of the two halves, so that the mouths themselves could directly contact one another. It will be seen that during relative rotation the two halves do not move apart from one another. The only axial movement that occurs is a toroidal flexing of the two plates radially inwardly and radially outwardly of the nibs. It is because of this construction that tightness of assembly of the two halves with the rivet is not highly critical, as has already been observed.

It will be apparent that if the block has more or less than four side faces, the number of nibs and sockets will be increased or decreased to match.

Aside from its play value, the purpose of enabling the two halves of the block to experience relative rotation and to be brought to and held in one after another set of matching positions is to enable halves of pictures carried by the panels **22** to be matched so as to form different combinations resulting in different complete pictures. This matching of different halves of pictures to form different whole pictures is well known and no claim to the specific novelty of such feature is here made. However, the block, as hereinafter described, is uniquely well designed to enable this matching to be carried out with ease by a child.

The different halves of pictures can be provided in any suitable manner. For instance, the different halves of pictures can be applied to the external surfaces of the panels **22**. However, this would not take full advantage of the constructional attributes of the block, to wit, the fact that the halves are made of clear plastic. Applying the pictures externally of the blocks would enable them to be worn off or to accumulate dirt or marks. Therefore, in accordance with the present invention the halves of pictures are located internally of the halves **12, 14**. Such internal halves of pictures can be in the form of embossings or engravings on the inner surfaces of the panels and thus can provide interesting visual effects. However, the incorporation of picture halves in this fashion is comparatively expensive and it therefore is preferred to provide the picture halves by inserting into the halves **12, 14** a paper sheet on which the halves of the picture are imprinted. To avoid the necessity of cementing such paper sheets in place because the cementing operation represents an added cost in manufacture and further because the cementing operation may cloud the block or distort the picture halves, it is desirable to employ a paper sheet of a semi-stiff or stiff character, this being a paper sheet which is self-form-maintaining. A suitable paper sheet is a sheet of paperboard.

In particular, the picture halves are provided by inserting in each cube half **12, 14** a piece of paperboard **56** in the form of a cross the center of which lies flat against the center inner surface of the top wall or bottom wall **18, 20** as the case may be, and the four arms of which are bent to lie flat against the inner surfaces of the four associated panels **22**. In order to more firmly anchor the paperboard arms in place, each plate **24, 26** is fashioned with four protruding flanges **58**. Each such flange runs parallel to a side edge of its associated plate for a substantial portion of the length of said side edge. Each flange is close to, but slightly spaced from its corresponding side edge, as can be seen quite clearly in FIG. 2, thereby leaving a thin space between the outer surface of the flange and the nearby inner surface of the panel **22**. The tip of the corresponding arm of the paperboard cross is caught in this space. The thickness of the space and of the paperboard **56** has been somewhat exaggerated in FIG. 2 for the purpose of illustration. The length of each of the arms is substantially equal to the height of the panels, so that the paperboard cross with its arms bent, as shown, is firmly held in place in each of the associated halves **12, 14**. The paperboard cross thus is protected from external factors which might tend to mark, mutilate or distort the same, the protection being afforded by the panels **24, 26** and the halves **12, 14** which act as casings for the crosses.

Each of the arms of the crosses is formed in the well known manner with one half of a picture, two such pairs of half pictures being illustrated in FIG. 1. The pictures are of any type whatsoever, for example, scenes, objects, animals, persons, cartoons, heads and torsos, or, as shown, heads alone. The two halves of the picture are so depicted as to be of the same dimensions at the equatorial zones when the two halves of the blocks are matched, so that the two halves, so to speak, "fit together," whereby the two halves together will represent a complete picture. With the four sets of pictures shown, the child thus is able to obtain sixteen pictures, creating four different sets of pictures in each of the four different matched positions of the two halves of the die block.

As various possible embodiments might be made of the above invention and as various changes might be made in the embodiments set forth, it is to be understood that all matter herein described or shown in the accompanying drawings is to be interpreted as illustrative and not a limiting sense.

Having thus described the invention, there is claimed as new and desired to be secured by Letters Patent:

1. A toy block comprising two halves of the same shape meeting at an equatorial plane, each half including a wall remote from the plane, said walls being parallel to one another, each half further including a ring of side walls defining a regular polygon, means interconnecting said halves for mutual rotation about an axis passing through the centers of the two parallel walls whereby said halves are mutually rotated between successive matching positions in which the side wall walls thereof are matched, matching picture halves carried by the side walls and detent means operative to restrain relative rotation of the two halves away from all matching positions of said halves.

2. A toy block as set forth in claim **1** wherein each parallel wall is formed with a central opening, wherein a sleeve extends inwardly from each central opening, said sleeves being aligned and having bottoms, and wherein the means interconnecting said halves for mutual rotation constitutes an element rotatably interconnecting said bottoms.

3. A toy block as set forth in claim **2** wherein the element is a rivet and wherein the bottoms are provided with registered openings through which the shank of the rivet passes.

4. A toy block as set forth in claim **1** wherein the detent means comprises a pair of face-to-face resilient plates located at said equatorial plane, each plate being associated and rotatable with a different half, one of said plates having at least one nib facing the other plate and the other of said plates having a series of equiangularly spaced sockets similarly radially spaced from the axis of rotation of the two halves, said nib conforming to said sockets, said nib and sockets being so mutually positioned that the nib enters a different socket in each different matching position of the two halves, and said nib bowing the plates apart between such matching positions, the tip

of the nib providing a camming surface for easing disengagement of the nib from a matching socket.

5. A toy block as set forth in claim 4 wherein at least one of the plates has an outwardly extending flange interposed between the facing sides of the two halves and having a configuration matching the configuration of said facing halves.

6. A toy block as set forth in claim 4 wherein a number of nibs is provided equal to the number of sockets and wherein the spacing and arrangement of the nibs corresponds to the spacing and arrangement of the sockets.

7. A toy block as set forth in claim 6 wherein the plates are fabricated from a synthetic plastic material having a low surface coefficient of friction.

8. A toy block as set forth in claim 1 wherein the two halves are hollow and transparent, and wherein a sheet of paper material is disposed in each half with the central portion of the sheet flat against the inner surface of the parallel well and with arms of the sheet flat against the inner surfaces of the side walls, the exterior surfaces of the arms bearing halves of pictures, the halves of pictures of one half of the block matching the halves of pictures on the other half of the block.

9. A toy block as set forth in claim 8 wherein the detent means comprises a pair of face-to-face resilient plates located at said equatorial plane, each plate being associated and rotatable with a different half, one of said plates having at least one nib facing the other plate and the other of said plates having a series of equiangularly spaced sockets similarly radially spaced from the axis of rotation of the two halves, said nib conforming to said sockets, said nib and sockets being so mutually positioned that the nib enters a different socket in each different matching position of the two halves, and said nib bowing the plates apart between such matching positions, the tip of the nib providing a camming surface for easing

disengagement of the nib from a matching socket, and wherein the plates have flanges extending toward their associated parallel walls and holding the tips of the arms of the sheet against the inner surfaces of the side walls of the halves.

10. A toy block comprising two hollow transparent halves of the same shape meeting at an equatorial plane, each half including a wall remote from the plane, said walls being parallel to one another, each half further including a ring of side walls defining a regular polygon, means interconnecting said halves for mutual rotation about an axis passing through the centers of the two parallel walls whereby said halves are mutually rotated between successive matching positions in which the side walls thereof are matched, and a sheet of paper material disposed in each half with the central portion of the sheet flat against the inner surface of the parallel wall and with arms of the sheet flat against the inner surfaces of the side walls, the exterior surfaces of the arms bearing halves of pictures visible through the transparent side walls, the halves of pictures of one half of the block matching the halves of pictures on the other half of the block.

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