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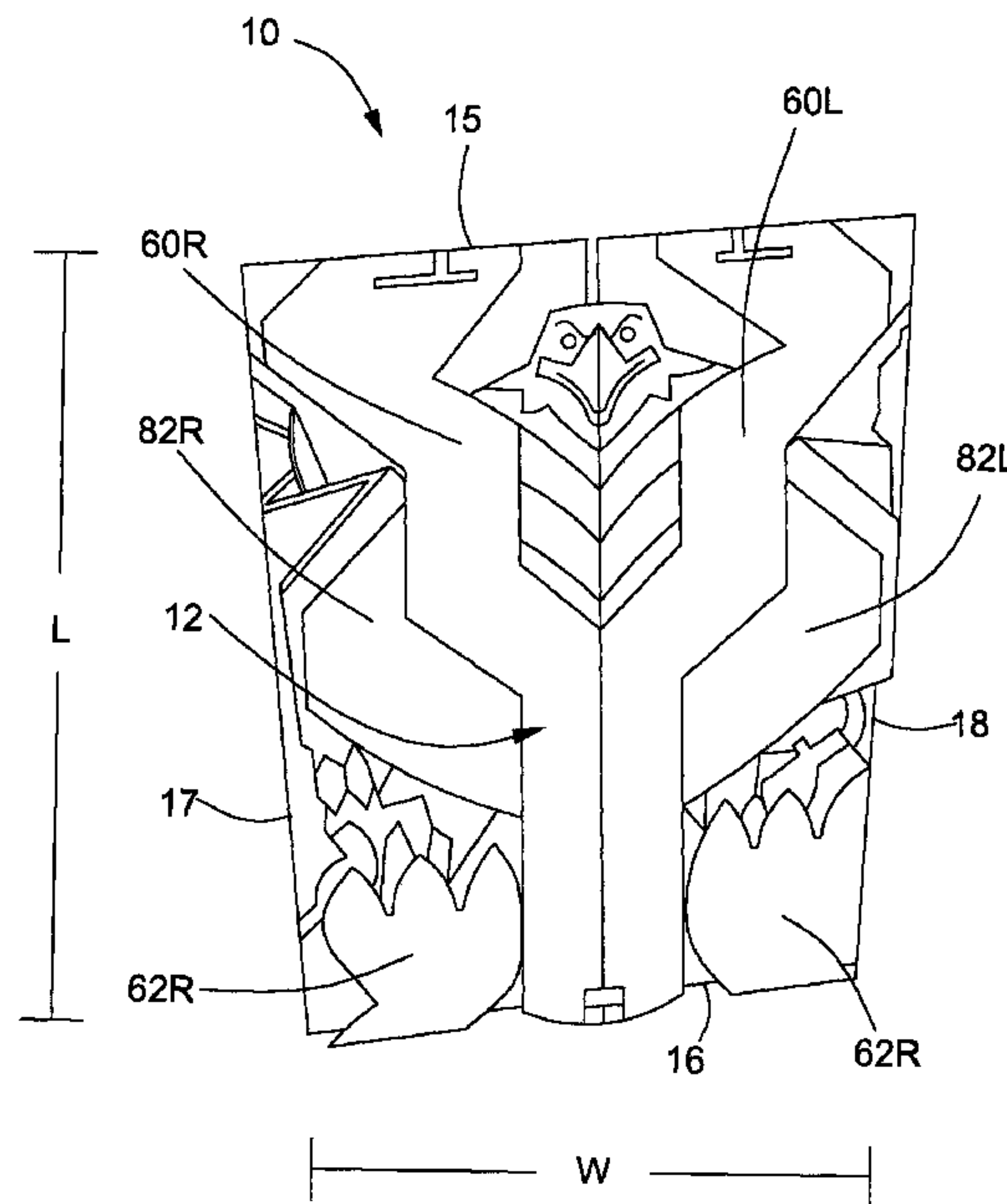
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(54) **Titre : CARTE DE FIGURINE D'ACTION TRANSFORMABLE D'UN ETAT DE DEUX DIMENSIONS A UN ETAT DE TROIS DIMENSIONS**

(54) **Title: ACTION FIGURE CARD TRANSFORMABLE BETWEEN A TWO-DIMENSIONAL STATE AND A THREE-DIMENSIONAL STATE**



(57) **Abrégé/Abstract:**

The invention relates to a toy, referred to as a transformable action figure card, that transforms between a flat state, resembling a playing card, and an expanded state, resembling a three-dimension character.



## **ABSTRACT**

The invention relates to a toy, referred to as a transformable action figure card, that transforms between a flat state, resembling a playing card, and an expanded state, resembling a three-dimension character.

## **ACTION FIGURE CARD TRANSFORMABLE BETWEEN A TWO-DIMENSIONAL STATE AND A THREE-DIMENSIONAL STATE**

### Field of Invention

[0001] The invention relates to the field of toys.

### Background of Invention

[0002] Collectible cards that feature action characters are well known. These cards may simply be collected and/or traded, or may be used to play a type of game, such as a fantasy battle game. The action characters that appear on the cards may come from a game that is played with the cards, or from some other source, such as a popular television show or comic book. In recent years, attempts have been made to enhance the desirability of these cards and their play value. Such attempts have typically involved improving the graphics shown on the cards. However, it would be advantageous to find other means for enhancing the play value and desirability of such cards.

### Summary of Invention

[0003] In one aspect, the invention is directed to a toy, referred to herein as a transformable action figure card, that transforms between a flat state, resembling a collectible card, and an expanded state, resembling a three-dimensional character figure or doll. The transformable action figure card includes a rigid primary backing, preferably constructed from plastic, which features a primary articulation therein and preferably additional articulations therein that run transverse to the primary articulation. The primary backing lies substantially flat when not articulated. A primary biasing mechanism articulates the primary backing along the primary articulation so as to segment the primary backing into planar regions that lie transverse to one another. In the process, each of these planar regions preferably also segments into further parallel and transverse planar regions due to the transverse articulations, thus enhancing the three-dimensional effect of the expanded state.

[0004] Additional rigid planar components are preferably also hinged to the primary backing and in the flat state lie flat against the primary backing. Biasing mechanisms swing the planar components away from the primary backing so as to dispose the planar components along planes that are transverse to the first and second planar regions.

[0005] At least one pliable web portion (e.g., paper) is connected between the planar components and the primary backing and/or between the first and second planar regions of the primary backing. The web portions preferably serve to illustrate the character and preferably combine with the primary backing and the planar components to present limbs of the character.

[0006] A releasable catch keeps the transformable action figure card flat or closed. The catch includes an actuator which, when pressed, allows the biasing mechanisms to pop the card open by articulating the primary backing and the planar components, which consequently spread open the web portions that resemble the character.

[0007] In one particular aspect of the invention a toy is provided that transforms from a flat state to an expanded state. This toy includes a rigid primary backing that has at least a primary articulation therein. A primary biasing mechanism articulates the primary backing along the primary articulation so as to segment the primary backing along at least two planes lying transverse to one another. The primary backing otherwise lies substantially flat when not articulated. At least a first rigid planar component is hinged to the primary backing. The first planar component is capable of lying flat against the primary backing when it is flat. A biasing mechanism swings the at least first planar component away from the primary backing so as to dispose the at least first planar component along a plane transverse to the primary backing. At least one pliable web portion is connected between the at least first planar component and the primary backing. A releasable catch holds the at least first planar component flat against the primary backing. The at least first planar component extends across the primary articulation so as to flatten the primary backing when the at least first planar component lies flat against the primary backing.

[0008] A second planar component is preferably provided and a second biasing mechanism swings the second planar component away from the primary backing so as to dispose the second planar component along a plane transverse to the primary backing. Preferably, when the first and second planar components are flattened against the primary backing, the first and second planar components respectively lie on opposing sides of the primary articulation, and the releasable catch connects the primary backing to the first and second planar components.

[0009] The releasable catch preferably includes an actuator slidably mounted to the primary backing. The actuator preferably includes a hook for engaging catch portions of the first and second planar components, an actuation tab, and a biasing element for biasing the actuation tab to a position where the tab extends past an edge of the primary backing. The toy can pop into its expanded state by pressing the actuation tab to overcome the force of the biasing element and move the hook to a position where the hook is disengaged from the catch portions of the first and second planar components.

[0010] In another particular aspect of the invention a toy is provided that transforms from a flat state to an expanded state. This toy features: a rigid primary backing having at least a primary articulation therein; a primary biasing mechanism for articulating the primary backing along the primary articulation so as to segment the primary backing along at least two planes lying transverse to one another, the primary backing lying substantially flat when not articulated; and at least one pliable web portion connected between the two transverse planes. The primary backing includes at least first and second additional articulations each running transverse to the primary articulation, wherein, in the expanded state, the additional first and second articulations segment the primary backing into first, second and third planar regions, the first and third planar regions being generally parallel to each other and the second planar region being generally transverse to the first and third planar regions, and wherein in the expanded state the at least one pliable web portion is spaced further apart from one of the first and third planar regions than the other of the first and third planar regions.

### Brief Description of Drawings

[0011] The foregoing and other aspects of the invention will be better appreciated by considering the following drawings, wherein:

[0012] Figs. 1A and 1B are front and rear plan views, respectively, of an exemplary transformable action figure card according to a first preferred embodiment in a folded or closed state;

[0013] Fig. 2 is a perspective front view of the transformable action figure card shown in Fig. 1 in a fully expanded or open state;

[0014] Fig. 3 is a perspective side view the transformable action figure card shown in Fig. 1 in the fully expanded state;

[0015] Figs. 4A and 4B are front and rear detail views, respectively, of a clasp mechanism for opening and closing the transformable action figure card shown in Fig. 1;

[0016] Figs. 5A and 5B are front and rear plan views, respectively, of rigid components of an transformable action figure card according to a second preferred embodiment in the folded or closed state;

[0017] Fig. 5C is a magnified sectional view of a portion of a top edge of the card shown in Figs. 5A and 5B;

[0018] Fig. 6 is a perspective front view of the rigid components of the transformable action figure card shown in Figs. 5A, 5B in the fully expanded or open state;

[0019] Fig. 7 is a perspective rear view of the rigid components of the transformable action figure card shown in Figs. 5A, 5B in the fully expanded or open state;

[0020] Fig. 8 is an exploded view of the rigid components of the transformable action figure card shown in Figs. 5A, 5B;

[0021] Figs. 9A, 9B and 9C are plan views of flexible, boustrophedonically folded, web portions of the transformable action figure card shown in Fig. 1;

[0022] Figs 10A-10C are schematic diagrams showing, conceptually, how the transformable action figure card shown in Fig. 1 articulates;

[0023] Figs 11A-11C are schematic diagrams showing, conceptually, how an alternative transformable action figure card articulates;

[0024] Figs 12A-12C are schematic diagrams showing, conceptually, how another alternative transformable action figure card articulates;

[0025] Figs 13A-13C are schematic diagrams showing, conceptually, how yet another alternative transformable action figure card articulates; and

[0026] Fig. 14 shows a leaf spring as a biasing mechanism to bias the card shown in Figures 5a-5c towards an open state.

#### Detailed Description of Preferred Embodiments

[0027] Figs. 1A and 1B show the front and rear respectively of a transformable action figure card 10 according to a first embodiment of the invention, in a flattened, closed state. In the flattened state, the transformable action figure card 10 presents a two dimensional like condition, having a breadth (length L and width W) resembling that of a typical palm-sized playing card (such as a typical baseball card) and a minimal depth D. Depending on the construction, D is less than about 1/2 inch, more preferably less than about 3/8 inch, and most preferably less than 1/4 inch. However, the transformable action figure card 10 can be quickly converted or transformed into an expanded or open state as illustrated for example in the front and side perspective views of Figs. 2 and 3 where the transformable action figure card 10 presents a substantial three-dimensional body that may resemble a character figure. In the expanded state, the depth D' of the transformable action figure card 10 is considerably larger than the depth D of the transformable action figure card 10 in its flattened state, enabling the transformable action figure card 10 to stand in a self-supporting manner.

The transformation or 'coming to life' of the action figure card 10 from the flattened two dimensional state to the expanded three dimensional state is also enhanced by virtue of the fact that not only is the depth of the transformable action figure card 10 greatly enlarged, at least one other dimension of the transformable action figure card 10 is larger in its expanded state in comparison to its flattened state. For instance, the transformable action figure card 10 illustrated in Figs. 1-3 has a length L of about 9.5 cm, a width W of about 7.3 cm, and a depth D of about 3-4 cm in the flattened state, and has a length L' of about 10 cm, a width W' of 12 cm and a depth D' of about 10 cm in the expanded state.

[0028] Figs. 5-8 show a skeleton of the transformable action figure card 10 according to a second embodiment, which is a variant of the first embodiment. As the majority of the components are common in both embodiments, the discussion that follows applies to both variants.

[0029] The major components of the transformable action figure card 10 include rigid interconnected planar components 20 that are shown in isolation in the exploded view in Fig. 8, and flexible, boustrophedonically folded, web components 80 that are shown in isolation in the plan views of Figs. 9A-9C. Figs 5A and 5B show the planar components 20 assembled together in a flattened state in isolation (i.e., without the web portions 80), and Figs. 6 and 7 show the planar components 20 assembled together in an expanded state in isolation. The pliable web components 80 interconnect between various planar components 20 and in the expanded state the web components stand out relative to the underlying rigid planar components 20 as will be noted by comparing Figs. 2 and 3 against Figs. 6 and 7.

[0030] Referring now to the closed state drawings of Figs. 1A, 1B, 5A and 5B as well as the isolated exploded view drawing of Fig. 8, it will be seen that the illustrated transformable action figure card 10 features two primary planes referred to as a front plane 12 (seen best in Fig. 1A, 5A) and a rear plane 14 (seen best in Fig. 1B, 5B). The planes 12, and 14 have top edges 15 and bottom edges 16, and corresponding right edges 17 and left edges 18 (looking frontwards). The terms 'front', 'rear', 'top', 'bottom', 'right' and 'left' are used only for anthropomorphic convenience in relation to the

character figure, and may be arbitrarily selected. In the selected morphology, it will be seen that the distance between the top and bottom edges 15, 16 defines the length L and the distance between the right and left edges 17, 18 defines the width W of the transformable action figure card 10 in the flattened state. The length L and width W are also arbitrarily selected, and in the embodiments shown in the Figures, the length L is larger than the width W, however it will be understood that it need not be. They could be approximately the same, or the width could be larger than the length, in alternative embodiments.

[0031] The rear plane 14 includes a generally primary backing 22, a biasing mechanism 24 and a right and left back portions 26a, 26b of a clamping mechanism 30.

[0032] The primary backing 22 includes a number of articulations, seen best in Fig. 5B. Articulation 22TB runs from the top edge 15 towards the bottom edge 16 and bisects the primary backing 22 right to left along its width. Articulation 22TB is provided by upper and lower living hinges 22TB-U and 22TB-L. The living hinge is provided by a thinner portion of plastic or other material that is preferably formed when a part is manufactured, such as by injection moulding, and joins together two thicker portions of the part. Alternatively, the thinner portion may be bonded to the thicker portions. The thickness of the thin portion is selected to be thin enough to allow for bending, but thick enough to withstand repeated use without tearing. The living hinges 22TB-U and 22TB-L are each formed to bend rearwardly due to the taper of the surrounding thicker portions towards the front. More particularly, referring to the cross-sectional detail of Fig. 5B, the edges f1, f2 at the front face of the thicker portion are disposed quite close to one another whereas the edges r1, r2 of the rear face of the thicker portions are spaced farther apart from one another providing stress relief toward the rear. The thin joining portion j may be located near the front or rear face. The angles of the tapers t1, t2 also sets the rotation angle for the joint.

[0033] Articulation 22TRR runs diagonally towards the top right edge and is formed to bend rearward. Articulation 22TLRU runs diagonally towards the top left edge and is formed to bend rearward. Articulation 22RL runs laterally, interconnects

articulations 22TRR and 22TLR, and is also formed to bend rearward. These joints are all preferably formed by living hinges.

[0034] Articulation 22TRF runs diagonally to the top right corner and is formed to bend forward. Articulation 22TLF runs diagonally to the top left corner and is formed to bend forward. These articulations 22TRF, 22TLF, which are preferably formed by living hinges, converge at a point 23U along the bisecting articulation 22TB.

[0035] Similarly, articulation 22BRR runs diagonally towards the bottom right edge and is formed to bend rearward. Articulation 22BLR runs diagonally towards the bottom left edge and is formed to bend rearward. Articulation 22RLD runs laterally, interconnects articulations 22BRR and 22BLR, and is also formed to bend rearward. These joints are all preferably formed by living hinges.

[0036] Likewise, articulation 22BRF runs diagonally to the bottom right corner and is formed to bend forward. Articulation 22BLF runs diagonally to the bottom left corner and is formed to bend forward. These articulations 22BRF, 22BLF, which are preferably formed by living hinges, converge at a point 23D along the bisecting articulation 22TB.

[0037] As seen best in Fig. 8, the biasing mechanism 24 is formed from right and left parts 24R, 24L that are hinged together via a shaft 32. More specifically, each part 24R, 24L includes one or more swivels 34 that encircle and mount the shaft 32. A coil spring 36 is mounted about the shaft 32 between upper and lower swivels 34. The coil spring 36 features oppositely extending tangs 38a, 38b that seat in respective grooves 40 cut into lands 42 provided in each part 24R, 24L. The coil spring 36 provides a bending moment against the lands 42 of the right and left parts 24R, 24L. The right and left parts 24R, 24L also include tabs 44R, 44L that fit into grooves 46 provided in the primary backing 22 such that the shaft 32 lies along the bisecting articulation 22TB and the biasing mechanism 24 provides a central swivel hinge 22C (see Fig. 5B) that is disposed in a central aperture 48 of the primary backing 22 (see Fig. 8). The biasing mechanism 24 thus provides a bending moment that causes the primary backing 22 to rotate rearward about the primary bisecting articulation 22TB.

[0038] The biasing mechanism 24 also includes a front facing protuberance 50 (see Figs. 5A, 8).

[0039] As seen best in Fig. 8, the right and left back portions 26a, 26b of the clamping mechanism 30 are hinged to the primary backing 22 via a swivel joint comprising shafts 52R, 52L that seat in swivel mounts 54R, 54L and 52C.

[0040] The front plane 12 includes planar members 60R, 60L (resembling arms) that are interconnected via respective hinges 60HR and 60HL (Fig. 5A) to the top edge 15 of the primary planar member 22, and planar members 62R, 62L (resembling feet) that are interconnected via respective hinges 62HR and 62HL (Fig. 5A) to the bottom edge 16 of the primary planar member 22. Each of these hinges 60HR, 60HL, 62HR, 62HL is provided (see Fig. 8) by a swivel hinge having a biasing spring 64 mounted about a shaft 66 for swinging the associated front planar member forward. The swing angle of each of the front planar members 60R, 60L and 62R, 62L is preferably limited by way of an interference (not detailed) at the hinge between the planar member and the primary planar member 22 that inhibits rotation above a predetermined angle. In the illustrated embodiment, the limit angle is preferably ninety degrees, particularly for the feet-like lower planar members 62R, 62L which provide a stand of the transformable action figure card 10.

[0041] One of the arm-like planar members 60R, 60L features a slot 67 for receiving the protuberance 50. (The two components function as an alignment guide.) At the bottom end 16, the arm-like planar members 60R, 60L have respective indentations 68R, 68L and catch tabs 69R 69L that form part of the clamping mechanism 30.

[0042] The feet-like planar members 62R, 62L have small inboard tabs 63R, 63L.

[0043] The clamping mechanism 30 is composed of parts that lie in the front and rear planes 12, 14. The right and left back portions 26a, 26b of the clamping mechanism 30 provide a second hinge 70 (Fig. 5B) formed by (see Fig. 8) upper and lower swivel mounts 70RU, 70RL, 70LU, 70LL which collectively mount a shaft 70S. The shaft 70S and hence the axis of hinge 70 lies along the bisecting articulation 22TB.

[0044] An actuator 72 slides along the shaft 70S in the space between the upper and lower swivel mounts 70RU, 70RL. The actuator 72 has a hook 72H and a projection tab 72T. A biasing spring 74 is also mounted about the shaft 70S, and biases the actuator 72 towards the bottom edge 16.

[0045] To maintain the transformable action figure card 10 in the flattened or closed state, as seen best in Fig. 5A, the actuator hook 72H interacts with the catch tabs 69R 69L of the arm-like planar members 60R, 60L, and the biasing spring 74 biases the actuator hook 72H in this position. In this condition, the arm-like planar members 60R, 60L lie flat against the primary backing 22, compressing the biasing springs 64. In addition, because the arm-like planar members 60R, 60L span the length of the primary backing 22 and the actuator hook 72H engages both catch tabs 69R, 69L along the axis of the bisecting articulation 22TB, the arm-like planar members 60R, 60L also compress the biasing mechanism 24. Furthermore, the arm-like planar members 60R, 60L overlie the inboard tabs 63R, 63L (Fig. 8) of the feet-like planar members 62R, 62L, keeping these members compressed.

[0046] In the closed state, the actuator projecting tab 72T extends below the bottom edge 16. The indentations 68R, 68L in the arm-like planar members 60R, 60L provide space for the actuator hook 72H to disengage from the catch tabs 69R 69L. To open the transformable action figure card 10, the projecting tab 72T is pushed upwards, overcoming the bias of spring 74, allowing the actuator hook 72H to disengage from the catch tabs 69R 69L. In practice, the right and left edges of the transformable action figure card 10 in the closed state may be held between a person's thumb and opposing finger and the bottom of the closed transformable action figure card 10 may be brought to bear against a hard surface, causing the transformable action figure card 10 to actuate to its open or expanded state.

[0047] Upon actuation, the transformable action figure card 10 immediately pops open and expands. Referring additionally to Figs. 6 and 7, the arm-like planar members 60R, 60L and the feet-like planar members 62R, 62L swing forward relative to the primary backing 22. In addition, the biasing mechanism 24 causes the primary backing 22 to bend rearwardly along the bisecting articulation 22TB. This bending moment also

causes the primary backing 22 to bend along the other articulations, frontwardly along articulations 22TRF, 22TLF, rearwardly along articulations 22TRR, 22RLU, and 22TLR, rearwardly along articulations 22BRR, 22RLD, and 22BLR, and frontwardly along articulations 22BRF, 22BLF. The net result as seen best in Figs. 6 and 7 is that the primary backing 22 is segmented in to a number of parallel planar regions interconnected by transverse planar regions, which effect enhances the three-dimensionality of the transformable action figure card 10 by substantially increasing the depth of the primary backing 22 (in addition to the increase in depth provided by the swing out of the arm-like planar components 60R, 60L).

**[0048]** More particularly, looking at the upper half of the transformable action figure card 10, there are two transverse planar regions R1, L1 resulting from articulation 22TB. Planar region TRT, defined by articulations 22TRR and 22TRF, is transverse to planar region R1. Planar region R2, defined by articulation 22TRF, is transverse to planar region TRT and generally parallel to planar region R1. Likewise, planar region TLT, defined by articulations 22TLR and 22TLF, is transverse to planar region L1. Planar region L2, defined by articulation 22TLF, is transverse to planar region TLT and generally parallel to planar region L1. A similar effect can also be seen with respect to the bottom half of the transformable action figure card 10, where planar region R3 is generally parallel to planar region R1 and planar region TRB is generally transverse to planar regions R1 and R3, and where planar region L3 is generally parallel to planar regions L1 and planar region TLB is generally transverse to planar regions L1 and L3.

**[0049]** It should also be appreciated that because the planar regions R1 and L1 are transverse to one another, whereby planar regions R2 and L2 are transverse to one another, the arm-like planar components will also swing out in directions that are transverse to one another thereby increasing the width of the transformable action figure card 10 in comparison to its flattened state.

**[0050]** The pliable web components 80 are interconnected between the various planar components 20 and in the expanded state the web components will stand out relative to the underlying rigid planar components 20. Referring additionally to Figs. 9A-9C, the web portions 80 of the illustrated transformable action figure card 10 include

right and left wings 82R, 82L, an upper torso 84, a lower torso 86 and feet 90R, 90L. The fold lines for each of the pliable web portions are indicated by lines 92.

[0051] Referring additionally to Figs. 2 and 3, the feet 90R, 90L have no fold lines and are simply adhered to the feet-like planar components 62R, 62L.

[0052] The right and left wings 82R and 82L are respectively connected between the primary backing 22 and respective right and left arm-like planar components 60R, 60L. End portions 98R, 98L of the wings are adhered to the right and left arm-like planar components 60R, 60L, and end portions 100R, 100L are adhered to the plane portions R1, L1 of the primary backing 22. The boustrophedonic folds 92 in the wings 82R, 82L enables them to predictably contract and expand between their flattened state and the expanded state as will be seen by comparing Figs 1A and 1B against Figs. 2 and 3.

[0053] The upper torso 84 is adhered at portions 102 to wing portions 104R, 104L. Thus, when the arm-like planar components 60R, 60L swing out to expand the wings 89R, 98L, the arm sections of the upper torso also articulate about the arm fold line 92A. In the expanded state, the upper torso 84 is spaced apart from plane portions R2, L2 of the primary backing 22.

[0054] The lower torso 86 has flaps 106 that adhere to flaps 108R,L (see Fig. 8) in the primary backing 22 and flats 110R, 110L in the right and left back portions 26a, 26b of the clamping mechanism 30. As the right and left back portions 26a, 26b pivot about respective hinges provided by shafts 52R, 52L and swivel mounts 54R, 54L, lower torso is pushed forward relative to the primary backing 22 and will be spaced apart from planes R3 and L3 of the primary backing.

[0055] As will be seen in Fig. 1B, the rear face of the primary backing may be printed to indicate the character embodied by the transformable action figure card 10. On the other side, seen in Fig. 1A, the folded web portions 80 indicate the character.

[0056] It should also be appreciated that the various articulations discussed above can be provided by way of a living hinge or a swivel hinge, and that in most circumstances either type of hinge will suffice. For example, Figs. 1-4 show a variant of

the transformable action figure card where articulations 22TB-U, 22TB-L, 22TRF, 22TLF, 22TRR, 22TLR, 22BRR, 22BLR, 22BRF and 22BLF are provided by hinge joints instead of living hinges as shown in Figs. 5-8. In addition, as shown in Figure 14, the biasing mechanism 24 may incorporate a leaf spring 550, which, being a single band of material (e.g. a metal) has a low profile and can be installed. In alternative embodiments the biasing mechanism may be omitted and the action card may be transformed into its open state by manually squeezing it.

[0057] In addition, it should be appreciated that the pattern of articulations presented in the embodiments of Fig. 1-9 may be varied in other embodiments. For example, Fig. 10 presents a conceptual framework for the pattern of articulations described heretofore. In Fig. 10A, a primary backing 200 is shown lying flat with planar components 202. Fig. 10B shows the results of a first articulation about latitudinal axis 204, whereby the planar components 202 swing out relative to the primary backing. Fig. 10C shows the result of the primary backing 200 bending relative to a primary longitudinal articulation 206, resulting in two planar regions 200A, 200B that lie transverse to one another. Fig. 10C also shows additional articulations 208 that run transverse to the primary articulation 206. These will be effected (the resultant shape is not shown) in accordance with their direction of rotation and angular limits as discussed above.

[0058] Fig. 11 shows the conceptual framework for an alternative embodiment. In Fig. 11A, a primary backing 300 is shown lying flat with one planar component 302. Fig. 11B shows the results of a first articulation about latitudinal axis 304, whereby the planar component 302 swings out relative to the primary backing. Fig. 11C shows the result of the primary backing 300 bending relative to a primary longitudinal articulation 306, resulting in two planar regions 300A, 300B that lie transverse to one another. The primary articulation extends into the planar component 302, resulting in two planar regions 302A, 302B that lie transverse to one another. Fig. 10C also shows additional articulations that run parallel 308 and transverse 310 to the primary articulation 306. These will be effected (the resultant shape is not shown) in accordance with their direction of rotation and angular limits as discussed above.

[0059] Fig. 12 shows the conceptual framework for another alternative embodiment. In Fig. 12A, a primary backing 400 is shown lying flat with planar components 402. Fig. 12B shows the results of a first articulation about two longitudinal axes 404, whereby the planar components 402 swing out horizontally relative to the primary backing 400. Fig. 12C shows the result of the primary backing 400 bending relative to a primary longitudinal articulation 406, resulting in two planar regions 400A, 400B that lie transverse to one another, and each of which lie transverse relative to the immediately adjacent planar component 402. Fig. 12C also shows additional articulations 408 that run transverse to the primary articulation 406. These will be effected (the resultant shape is not shown) in accordance with their direction of rotation and angular limits as discussed above.

[0060] And finally, Fig. 13 shows the conceptual framework for yet another alternative embodiment. In Fig. 13A, a primary backing 500 is shown lying flat with planar components 502. Fig. 13B shows the results of a first articulation about latitudinal axis 404, whereby the planar component 502 swings out vertically relative to the primary backing 500. Fig. 13C shows the result of the primary backing 500 bending relative to a primary latitudinal articulation 406, resulting in two planar regions 500A, 500B that lie transverse to one another, while planar region 500B lies generally parallel to planar component 502. Fig. 13C also shows additional articulations that run transverse 508 and parallel 510 to the primary articulation 506. These will be effected (the resultant shape is not shown) in accordance with their direction of rotation and angular limits as discussed above. (The two planar regions 508A, 508B have similar articulation patterns.)

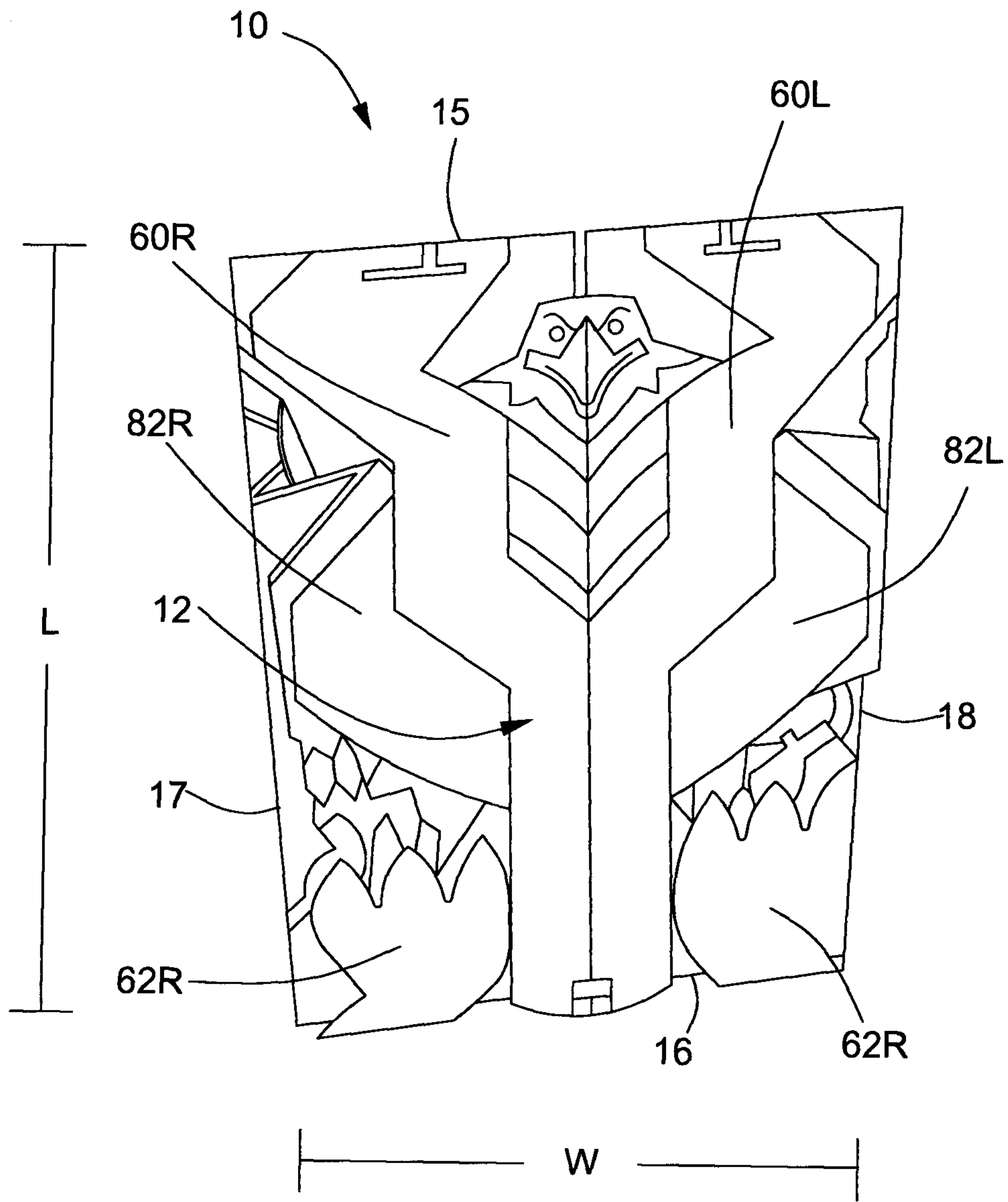
[0061] Those skilled in the art will appreciate that a variety of other alternations and modifications may be made to the embodiments discussed herein without departing from the invention as defined by the attached claims.

## Claims

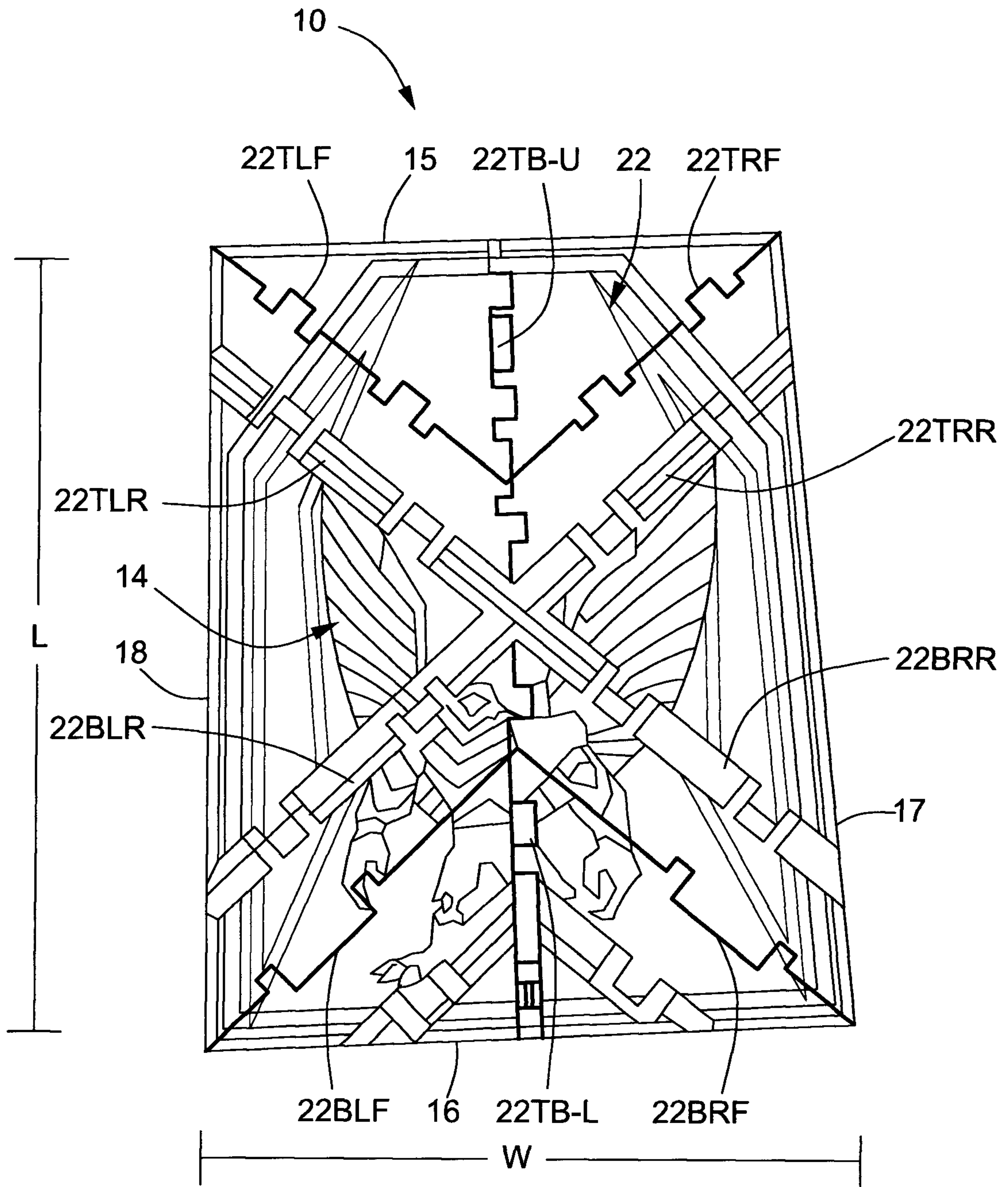
1. A toy transformable from a flat state to an expanded state, the toy comprising:
  - a rigid primary backing, the primary backing having at least a primary articulation therein;
  - a primary biasing mechanism for articulating the primary backing along the primary articulation so as to segment the primary backing along at least two planes lying transverse to one another, the primary backing lying substantially flat when not articulated;
  - at least a first rigid planar component hinged to the primary backing, the first planar component capable of lying flat against the primary backing when it is flat;
  - a first biasing mechanism for swinging the at least first planar component away from the primary backing so as to dispose the at least first planar component along a plane transverse to the primary backing;
  - at least one pliable web portion connected between the at least first planar component and the primary backing; and
  - a releasable catch for holding the at least first planar component flat against the primary backing, wherein the at least first planar component extends across the primary articulation so as to flatten the primary backing when the at least first planar component lies flat against the primary backing.
  
2. A toy according to claim 1, including a second planar component and a second biasing mechanism for swinging the second planar component away from the primary backing so as to dispose the second planar component along a plane transverse to the primary backing, wherein, when the first and second planar components are flattened against the primary backing, the first and second planar components respectively lie on opposing sides of the primary articulation, and the releasable catch connects the primary backing to the first and second planar components.

3. A toy according to claim 2, wherein the releasable catch includes an actuator slidably mounted to the primary backing, the actuator comprising:
- a hook for engaging catch portions of the first and second planar components;
  - an actuation tab;
  - a biasing element for biasing the actuation tab to a position where the tab extends past an edge of the primary backing;
- wherein the toy pops into its expanded state by pressing the actuation tab to overcome the force of the biasing element and move the hook to a position where the hook is disengaged from the catch portions of the first and second planar components.
4. A toy according to any one of claims 1 to 3, wherein the primary biasing element is one of (i) a spring loaded swivel hinge having a shaft installed along the primary articulation and (ii) a leaf spring connected to two portions of the primary backing and spanning the primary articulation.
5. A toy according to any one of claims 1 to 4, wherein the primary backing includes at least first and second additional articulations each running transverse to the primary articulation, wherein, in the expanded state, the additional first and second articulations segment the primary backing into first, second and third planar regions, the first and third planar regions being generally parallel to each other and the second planar region being generally transverse to the first and third planar regions.
6. A toy according to any one of claims 1 to 5, wherein the at least first planar component includes a secondary articulation and at least first and second additional articulations each running transverse to the secondary articulation, wherein, in the expanded state, the additional first and second articulations segment the at least first planar component into first, second and third planar regions, the first and third planar regions being generally parallel to each other and the second planar region being generally transverse to the first and third planar regions.

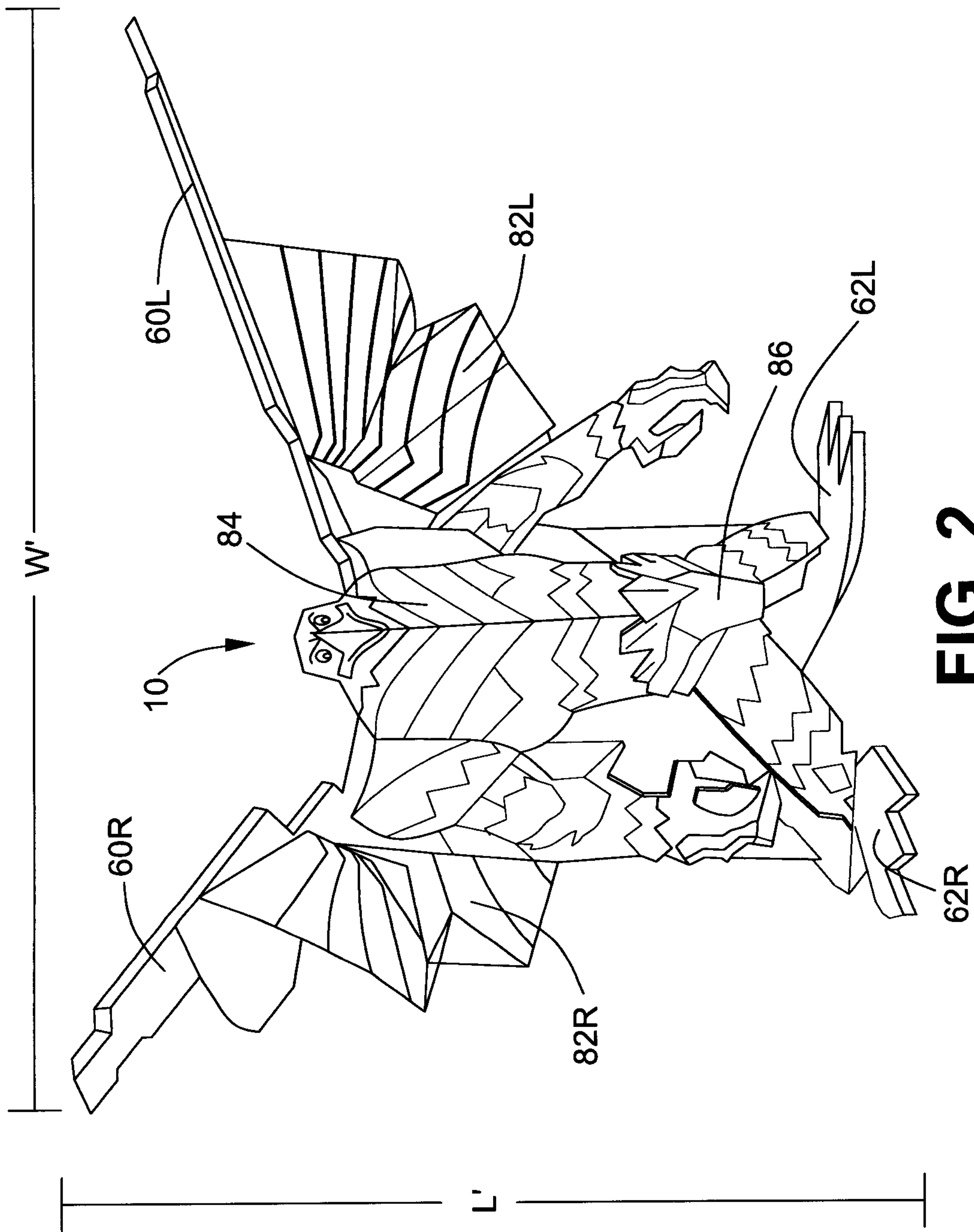
7. A toy according to any one of claims 1 to 6, wherein, in the flattened position, the primary backing has the form factor of a playing card.
8. A toy according to any one of claims 1 to 7, wherein at least one web portion is boustrophedonicly folded.
9. A toy according to any one of claims 1 to 8, wherein at least one web portion resembles a character figure.



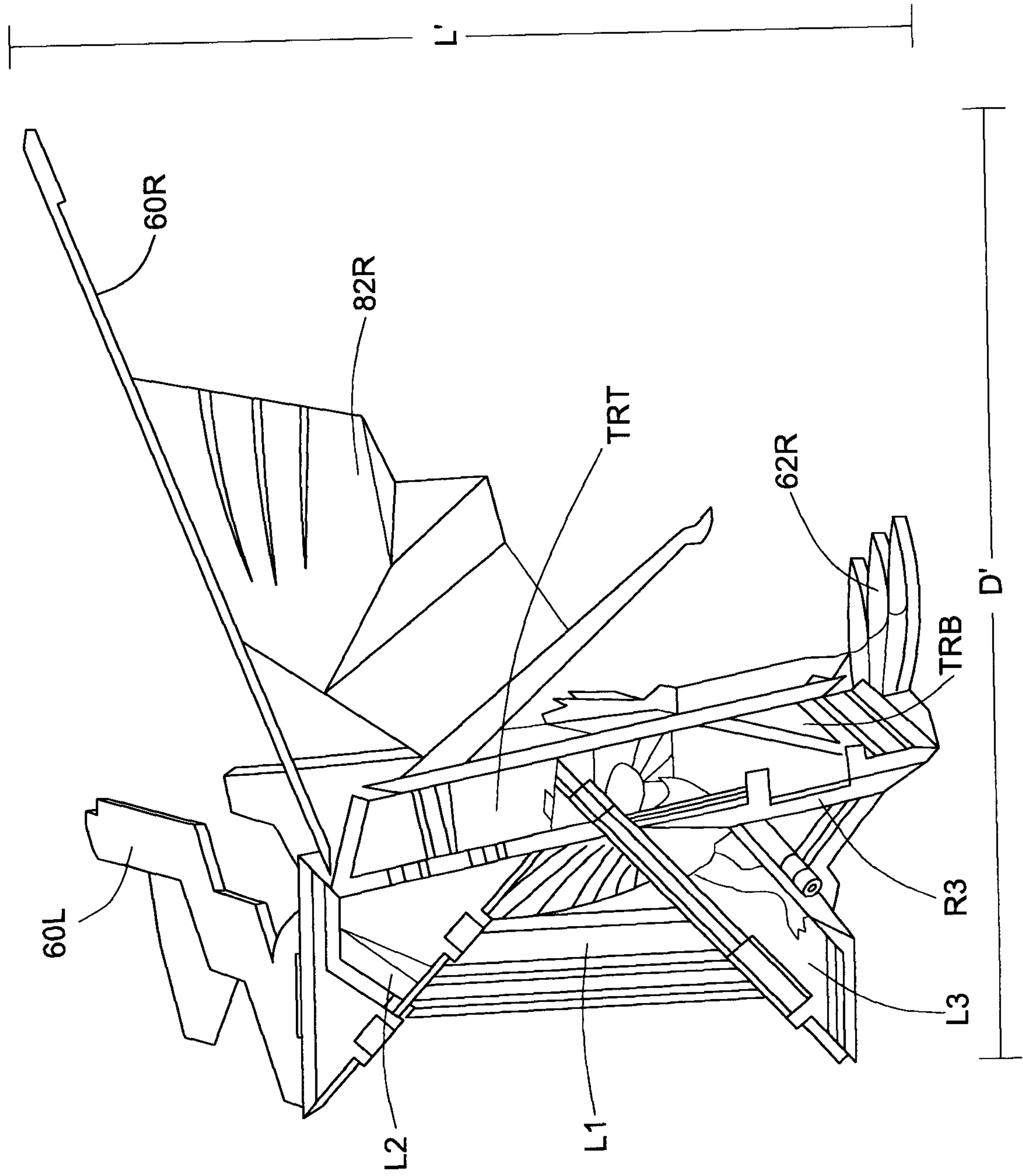
**FIG. 1A**



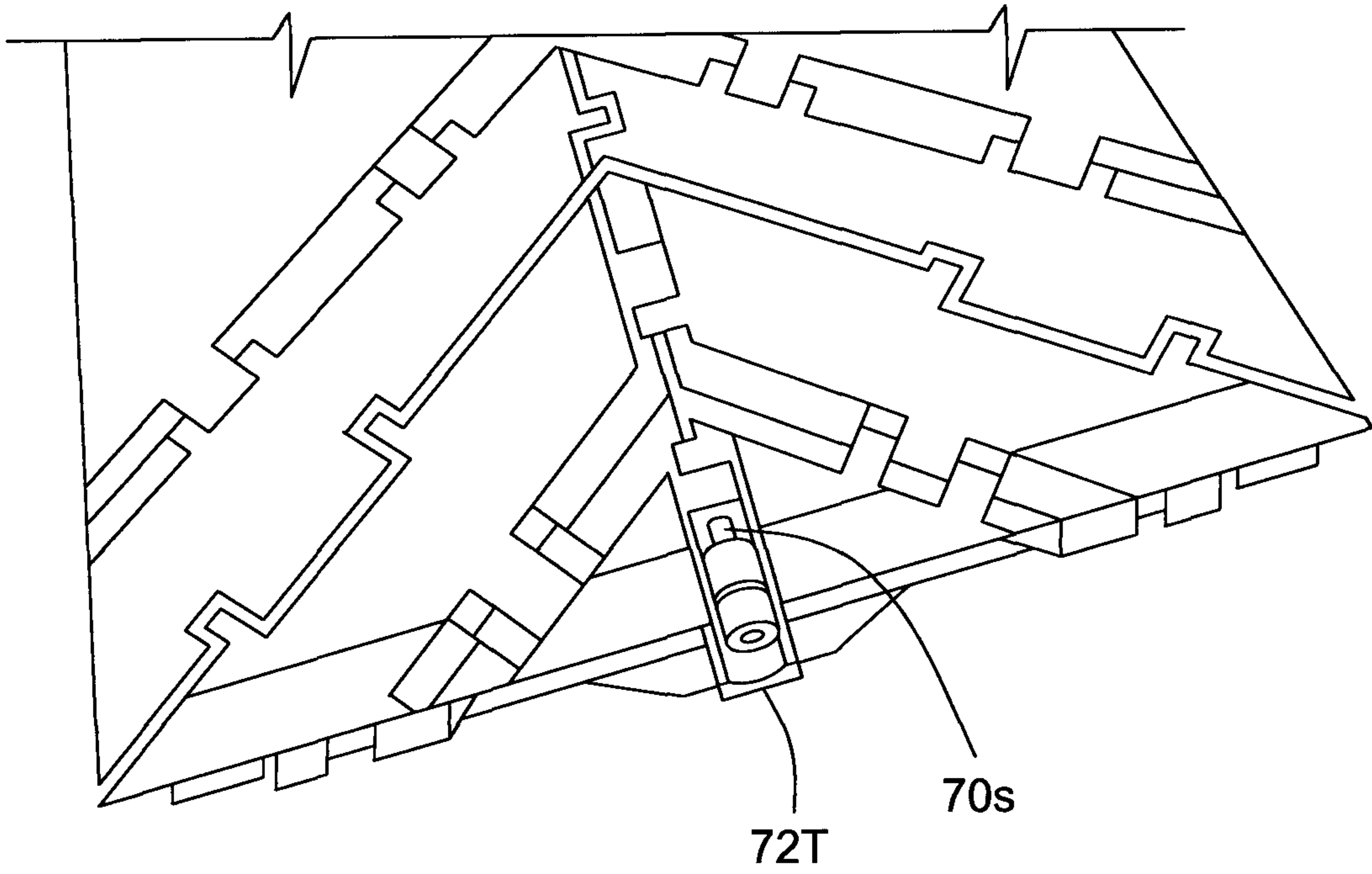
**FIG. 1B**



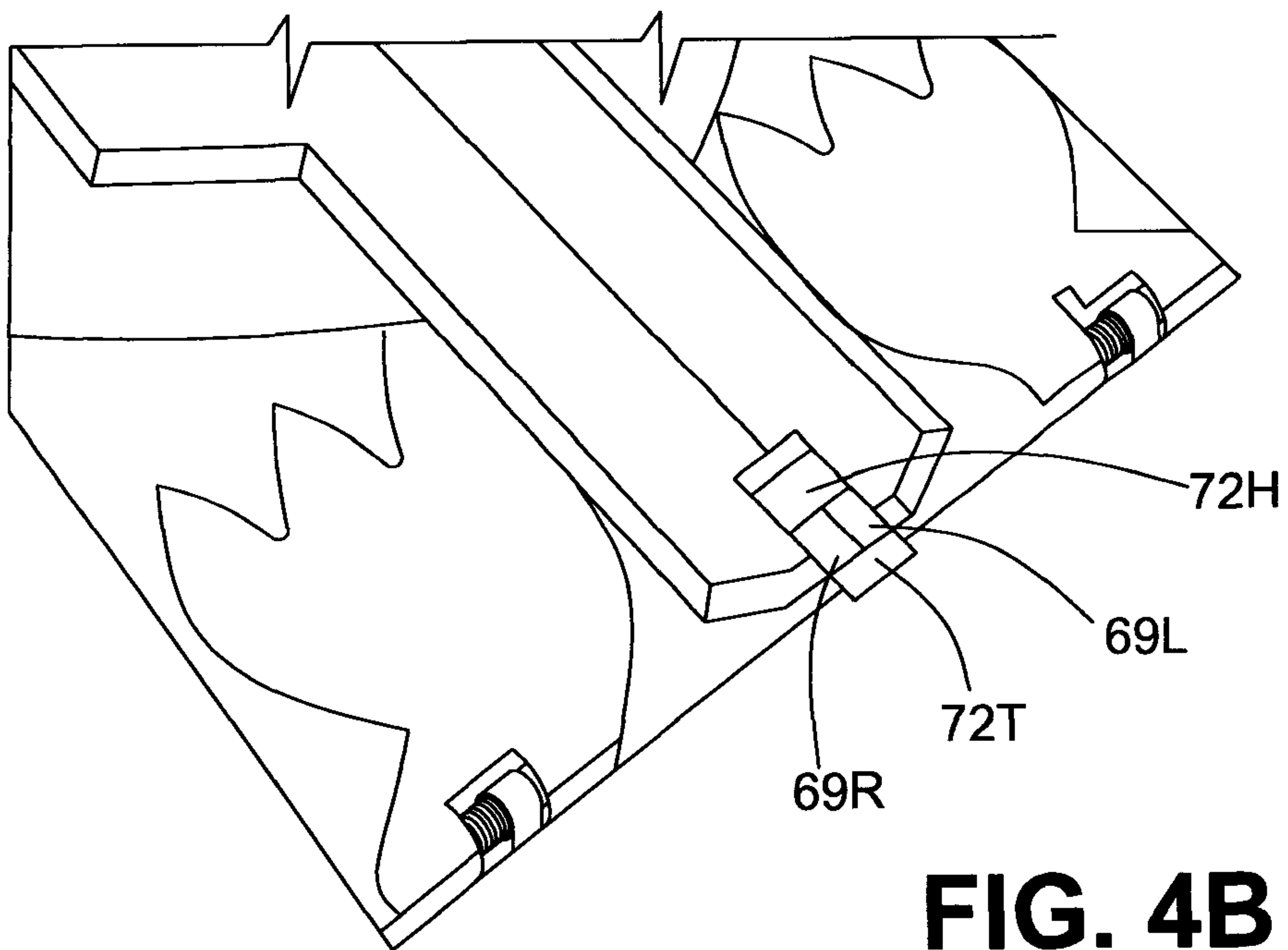
**FIG. 2**



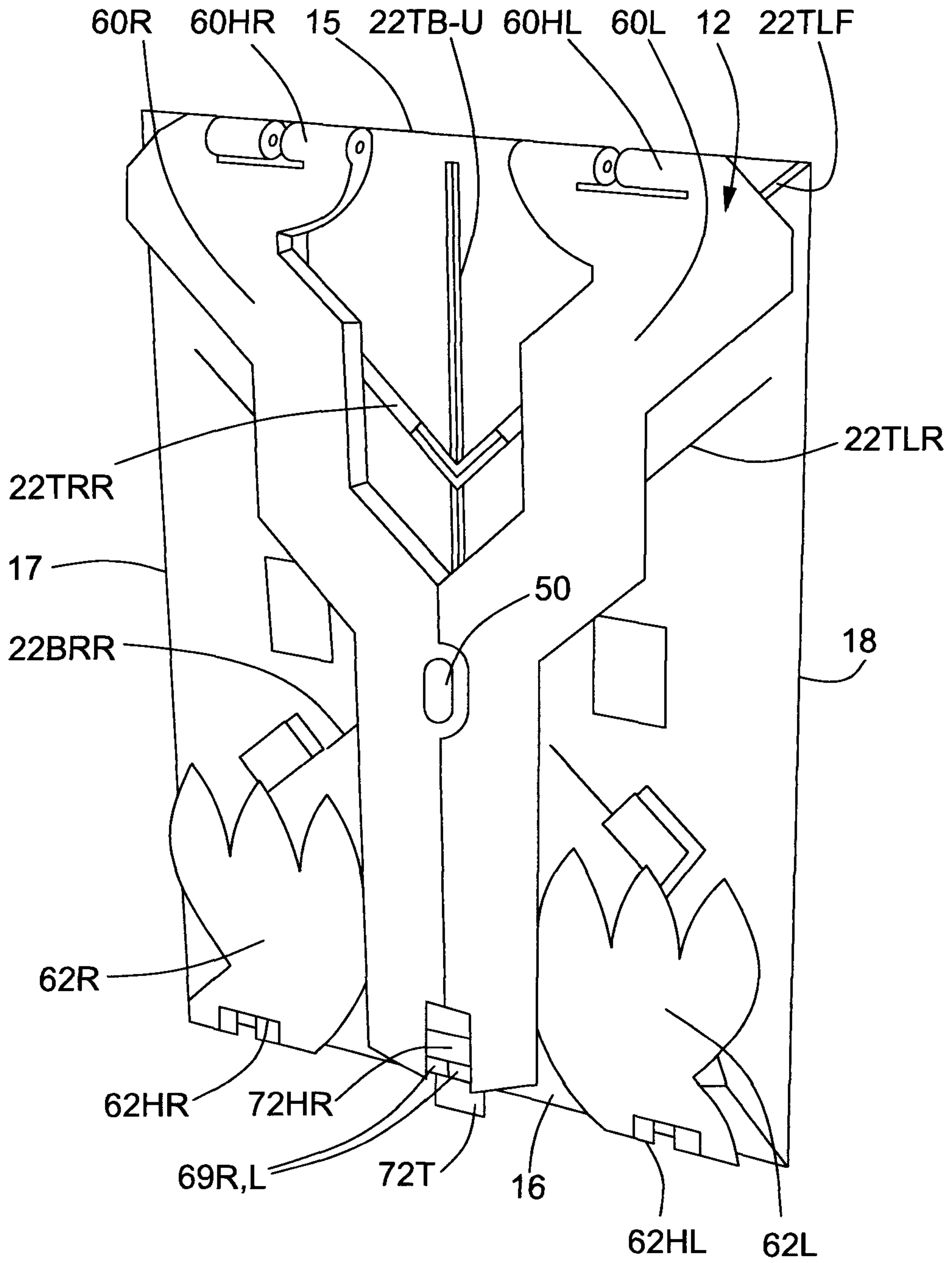
**FIG. 3**



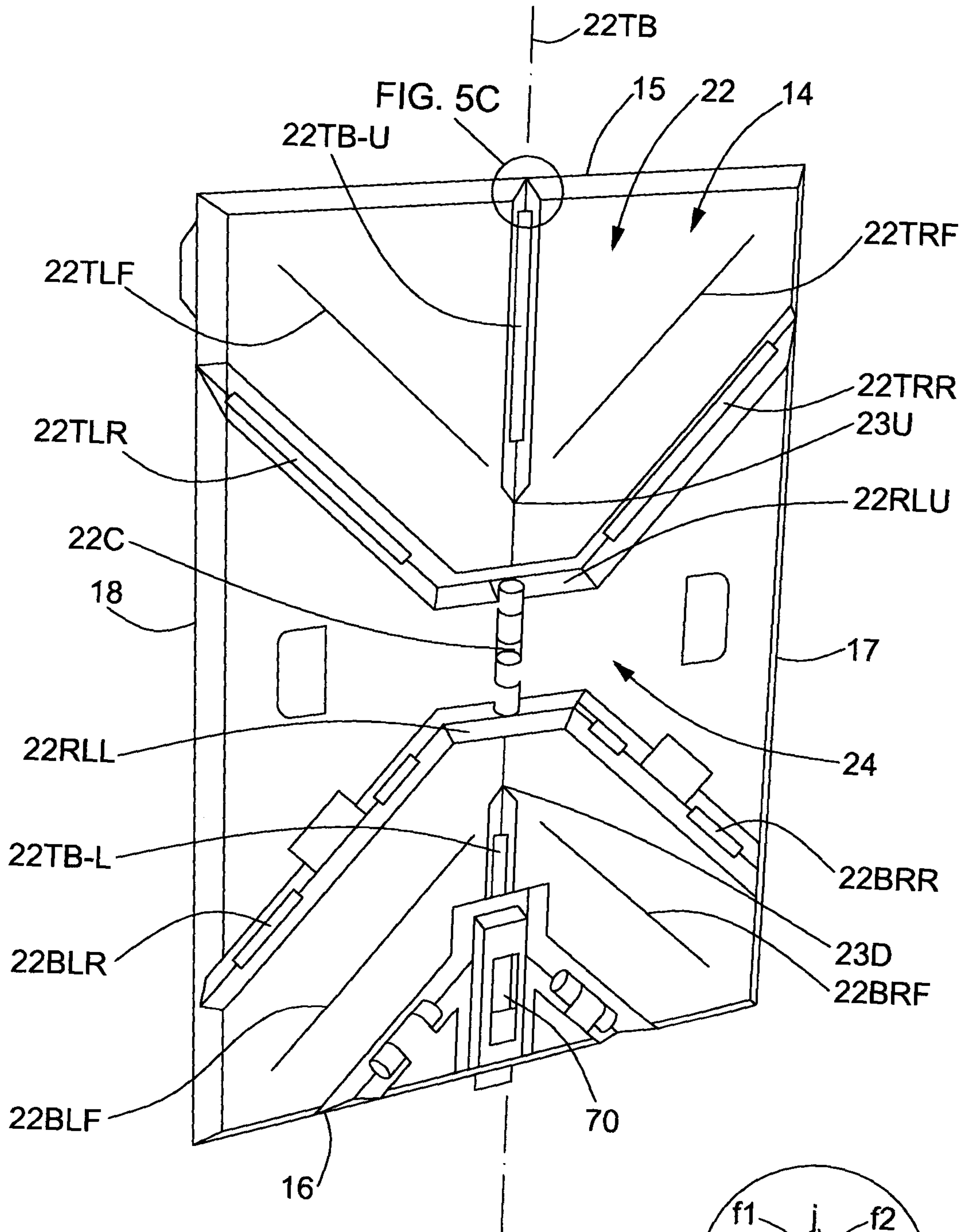
**FIG. 4A**



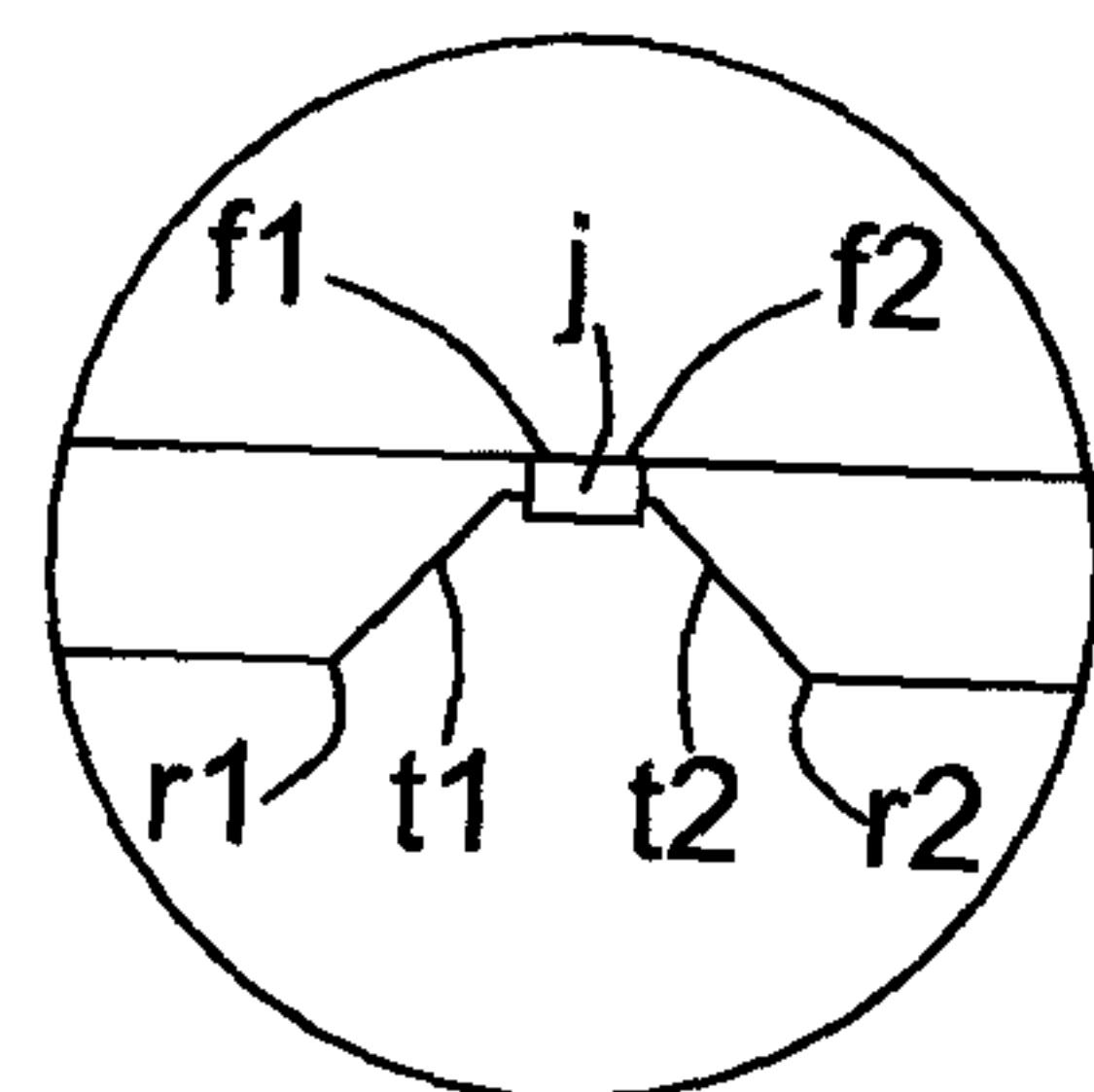
**FIG. 4B**



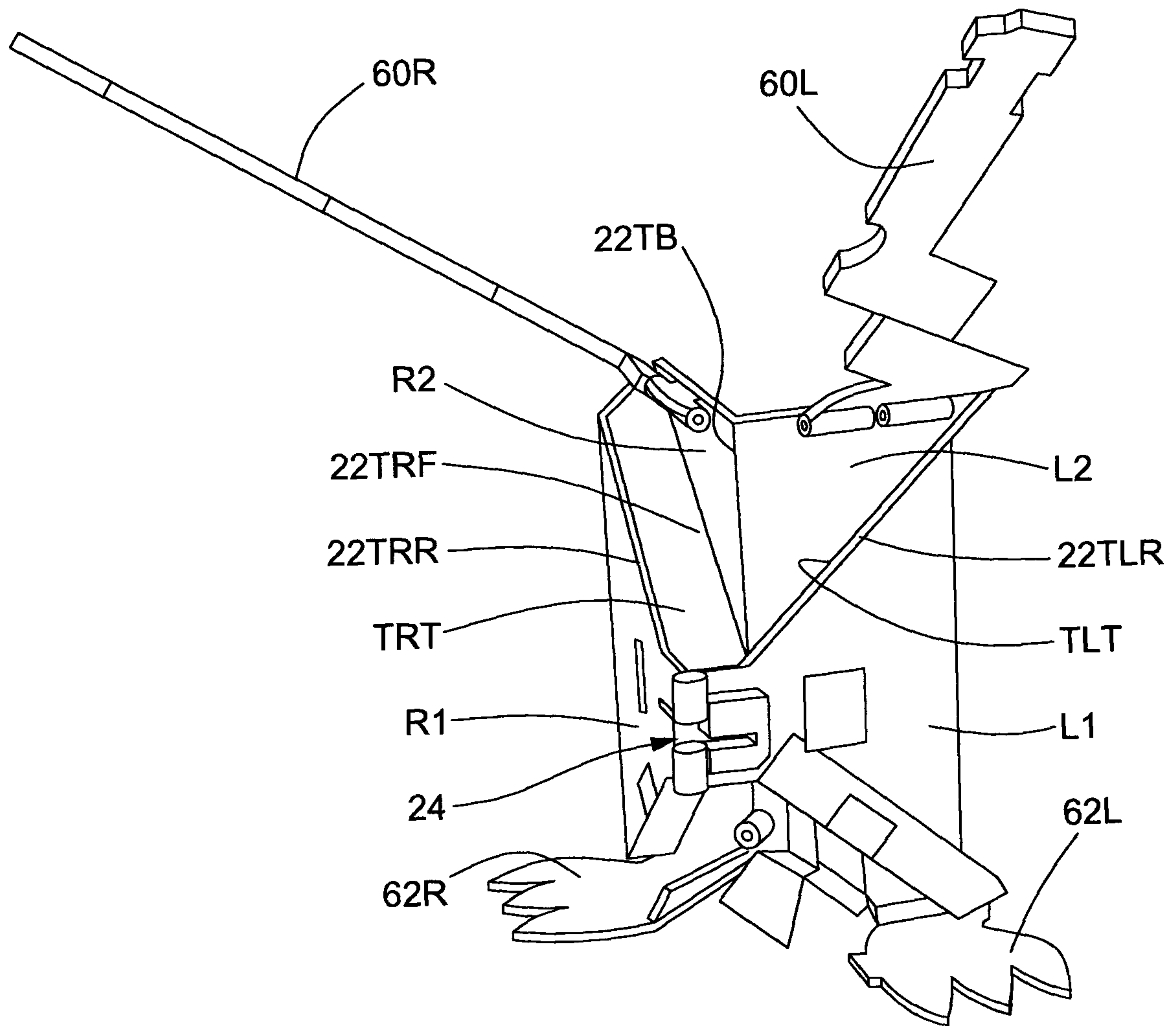
**FIG. 5A**



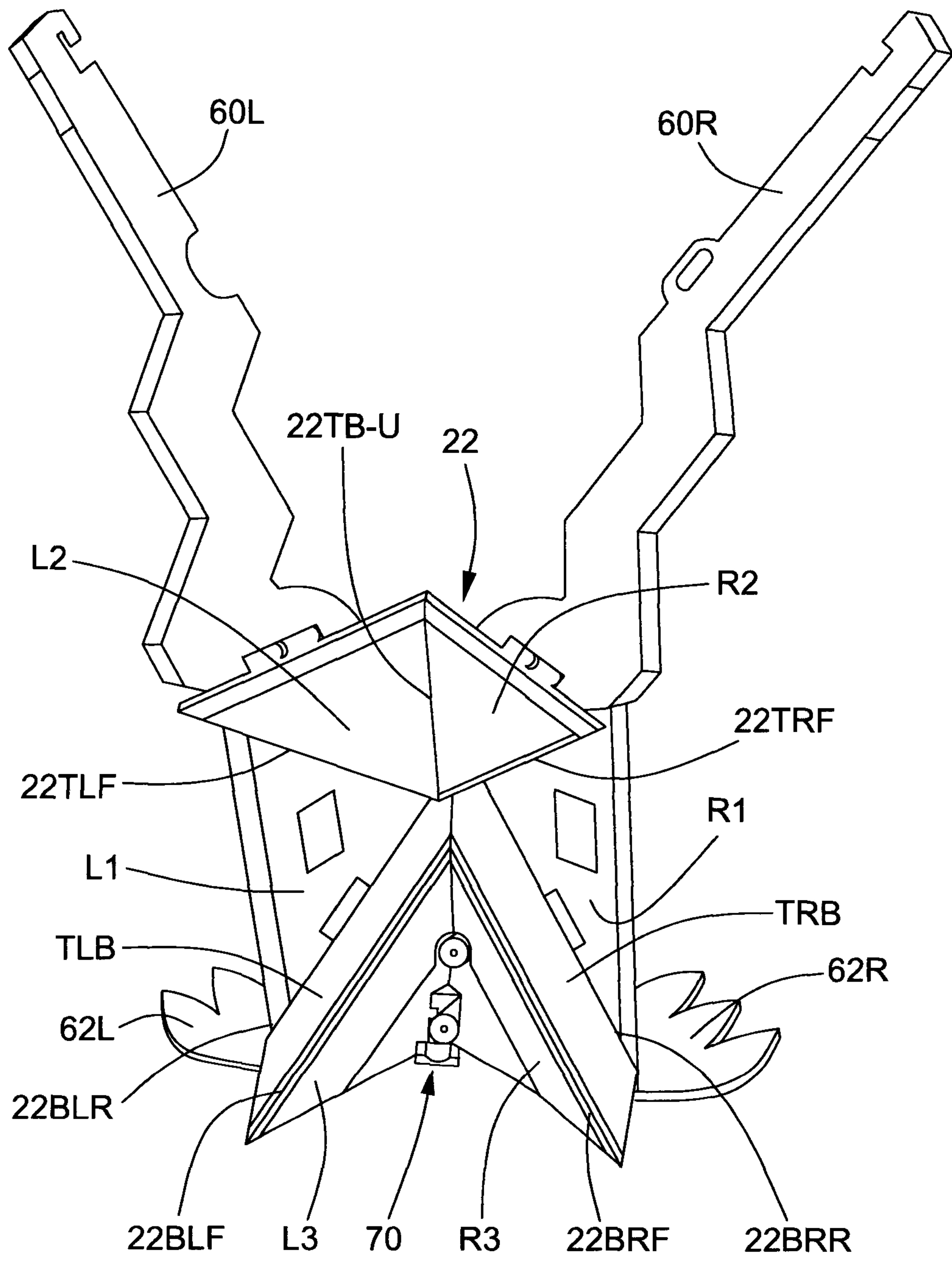
**FIG. 5B**



**FIG. 5C**



**FIG. 6**



**FIG. 7**

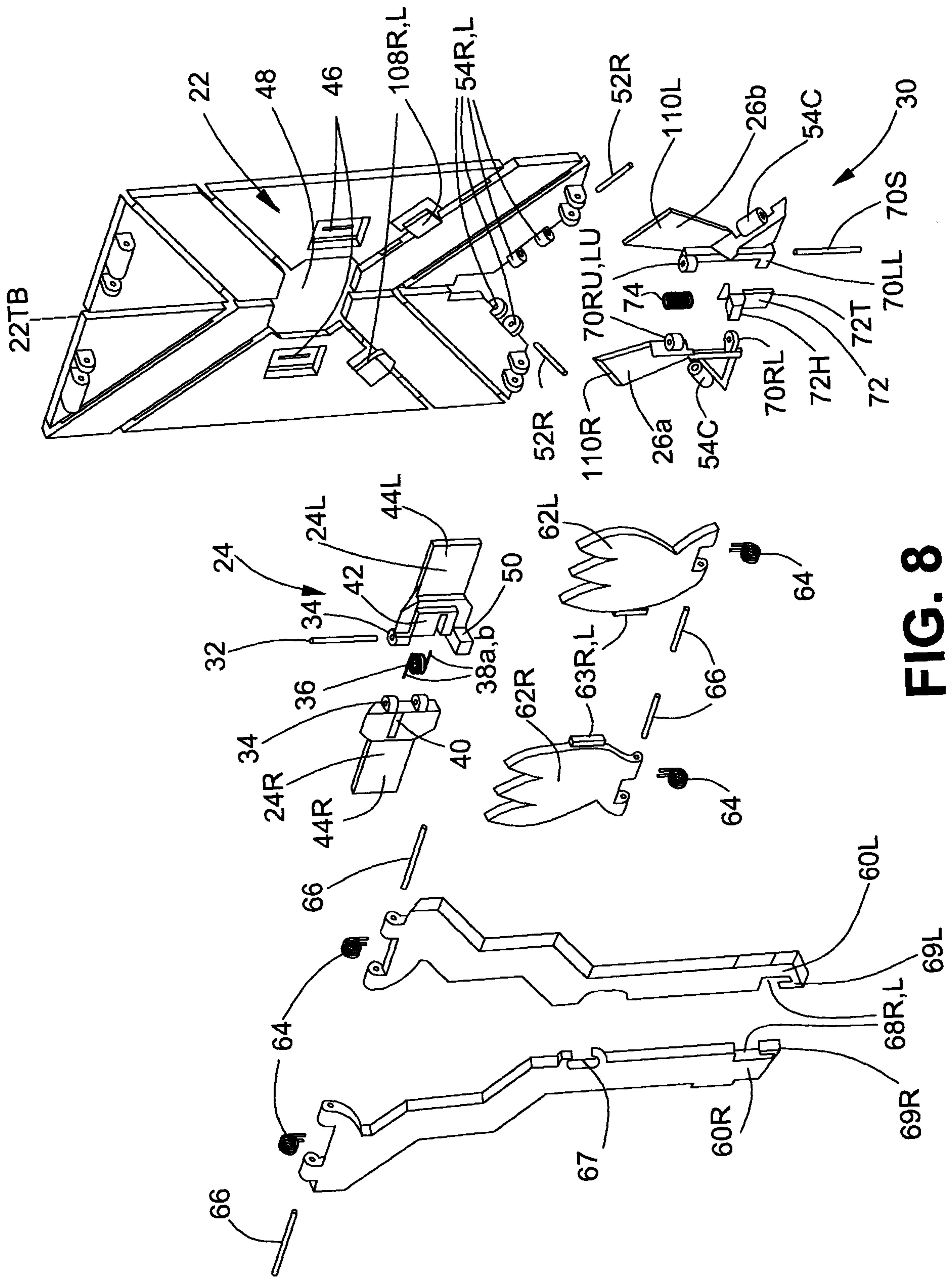
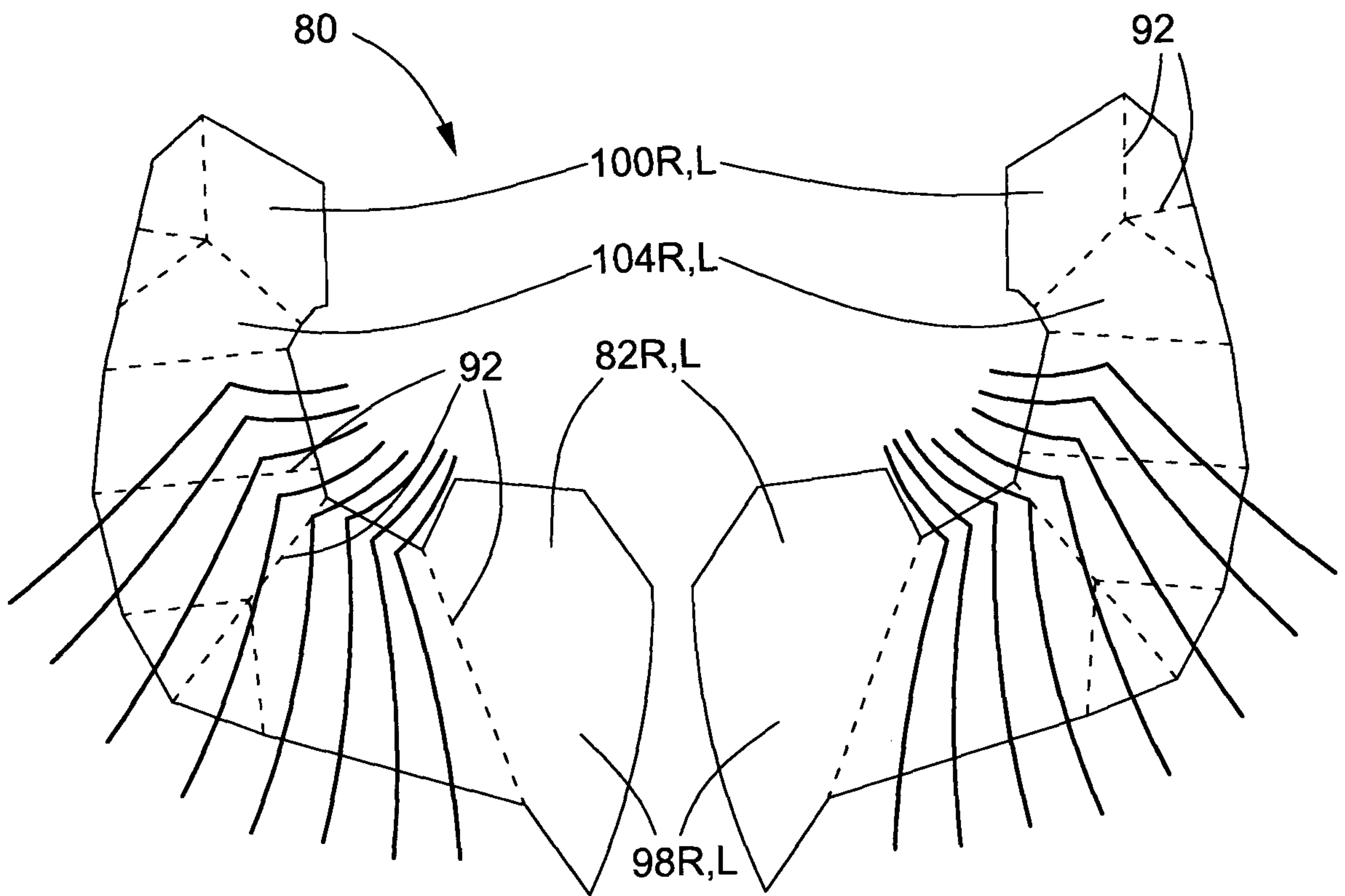
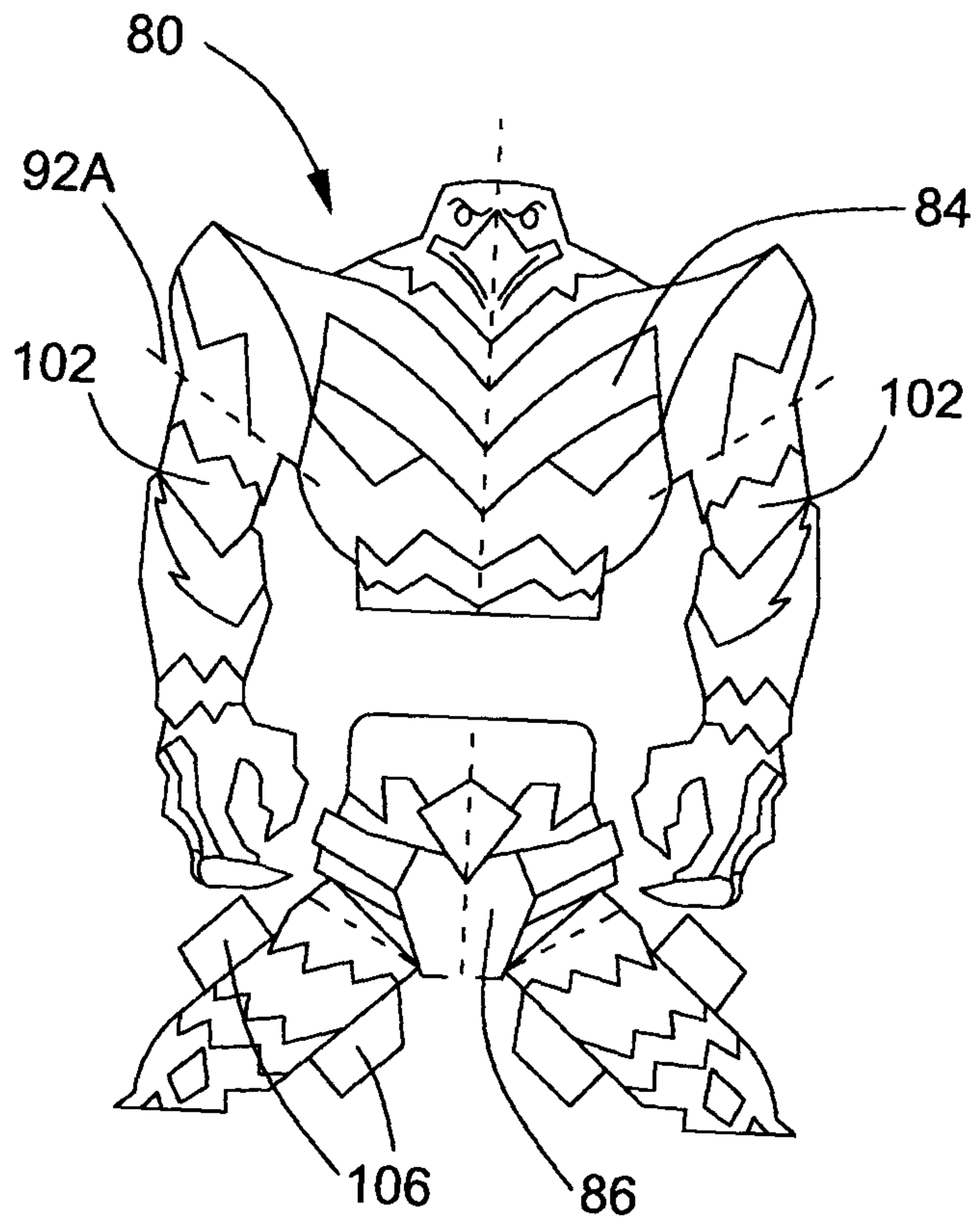


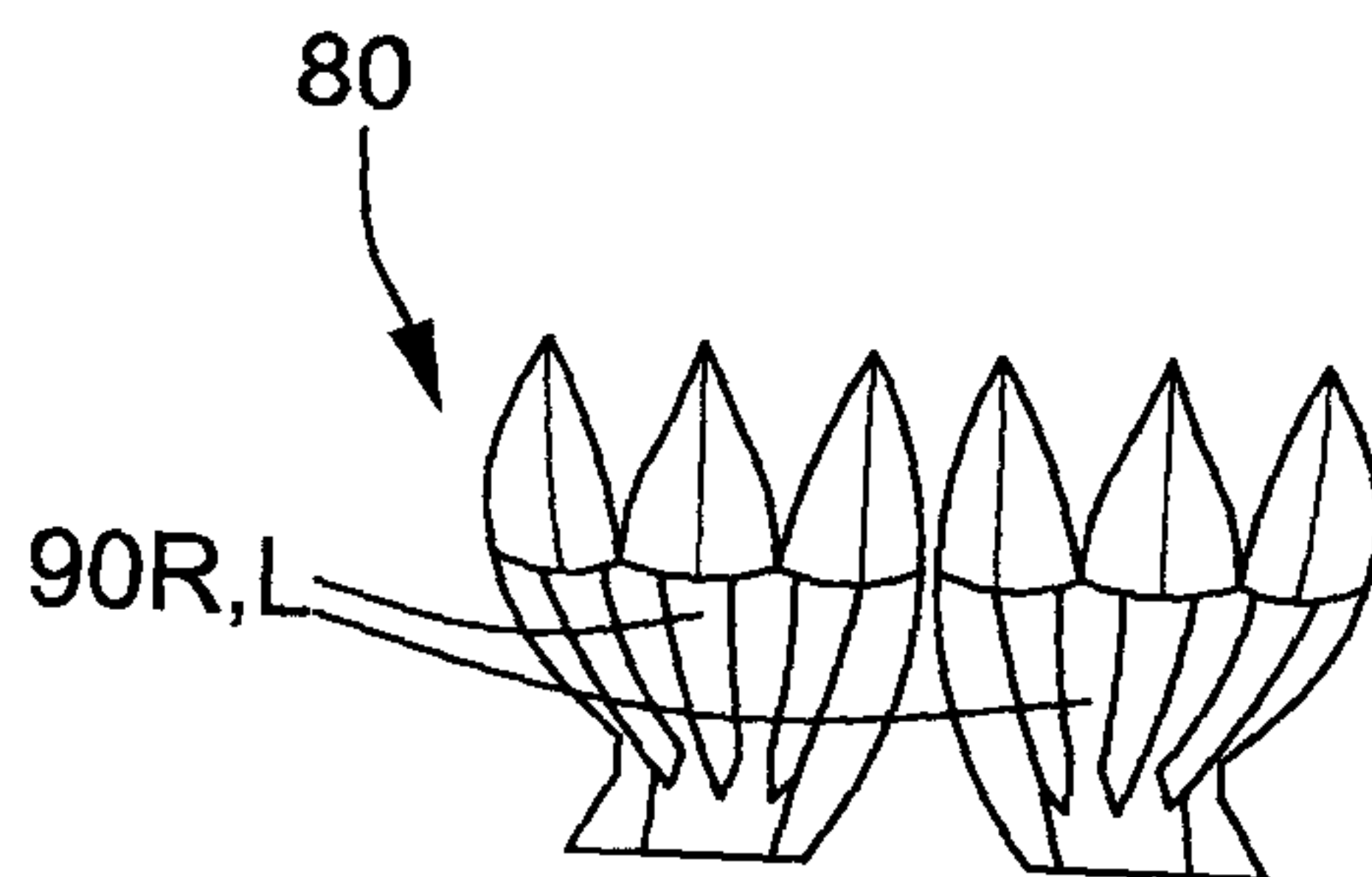
FIG. 8



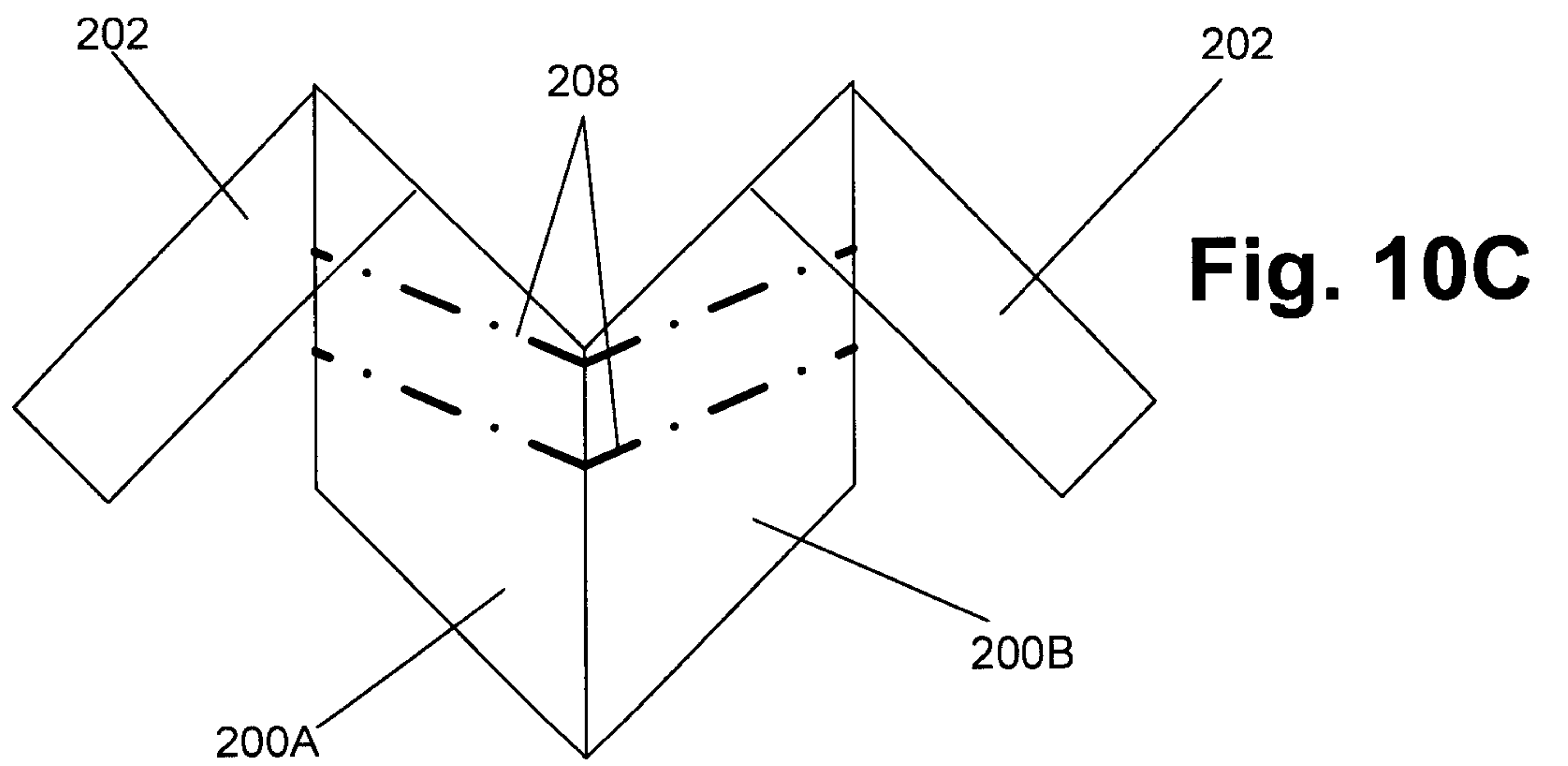
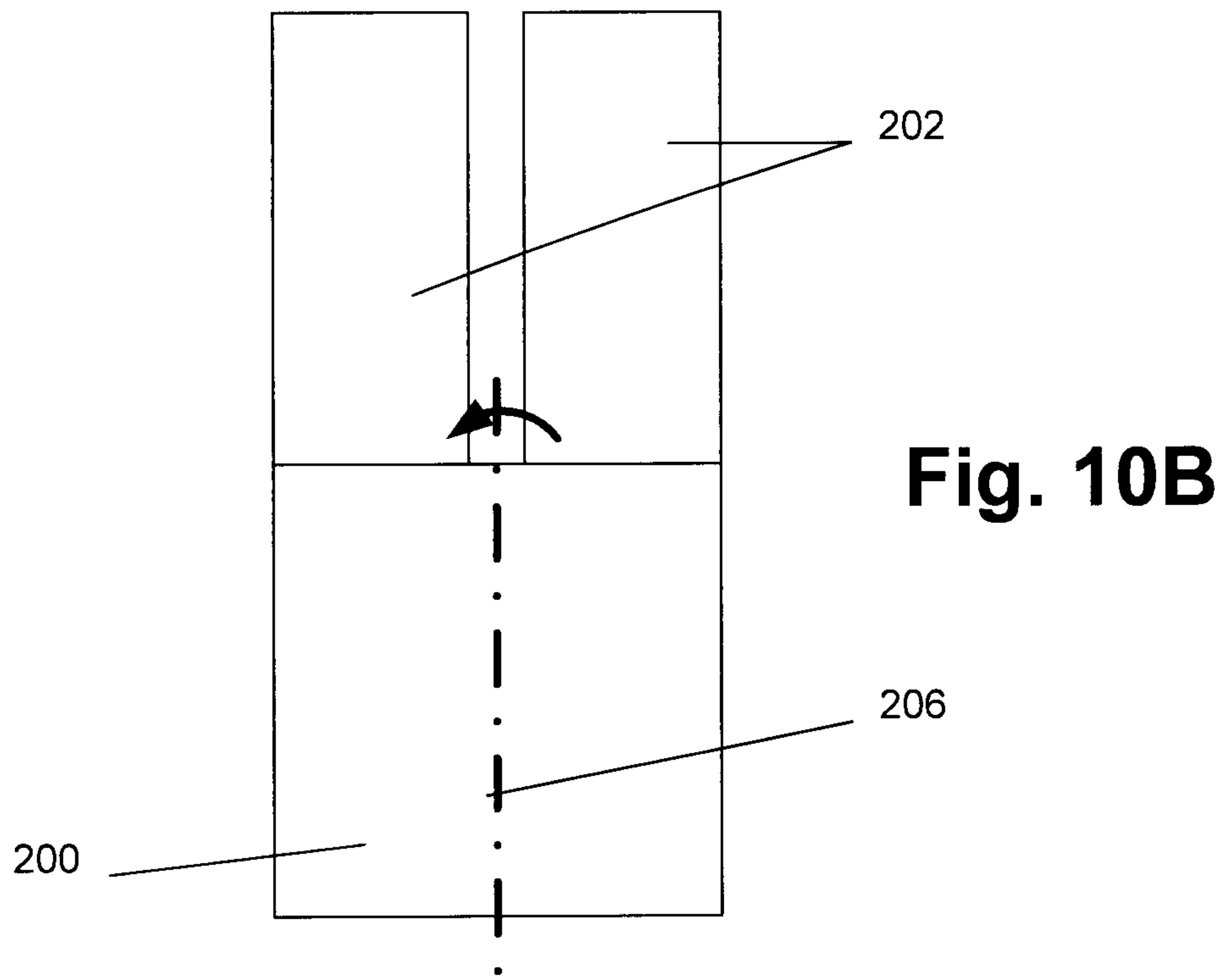
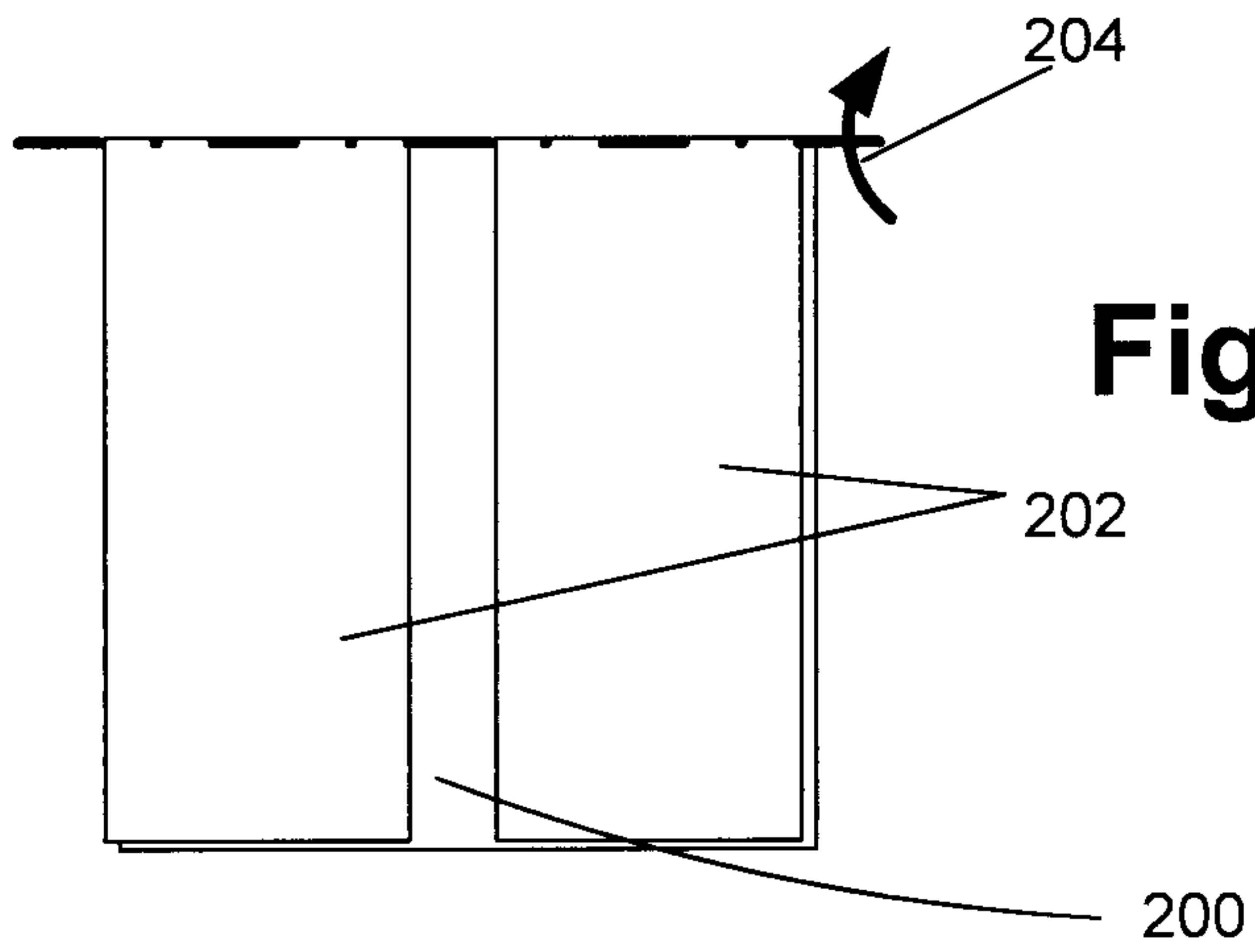
**FIG. 9A**

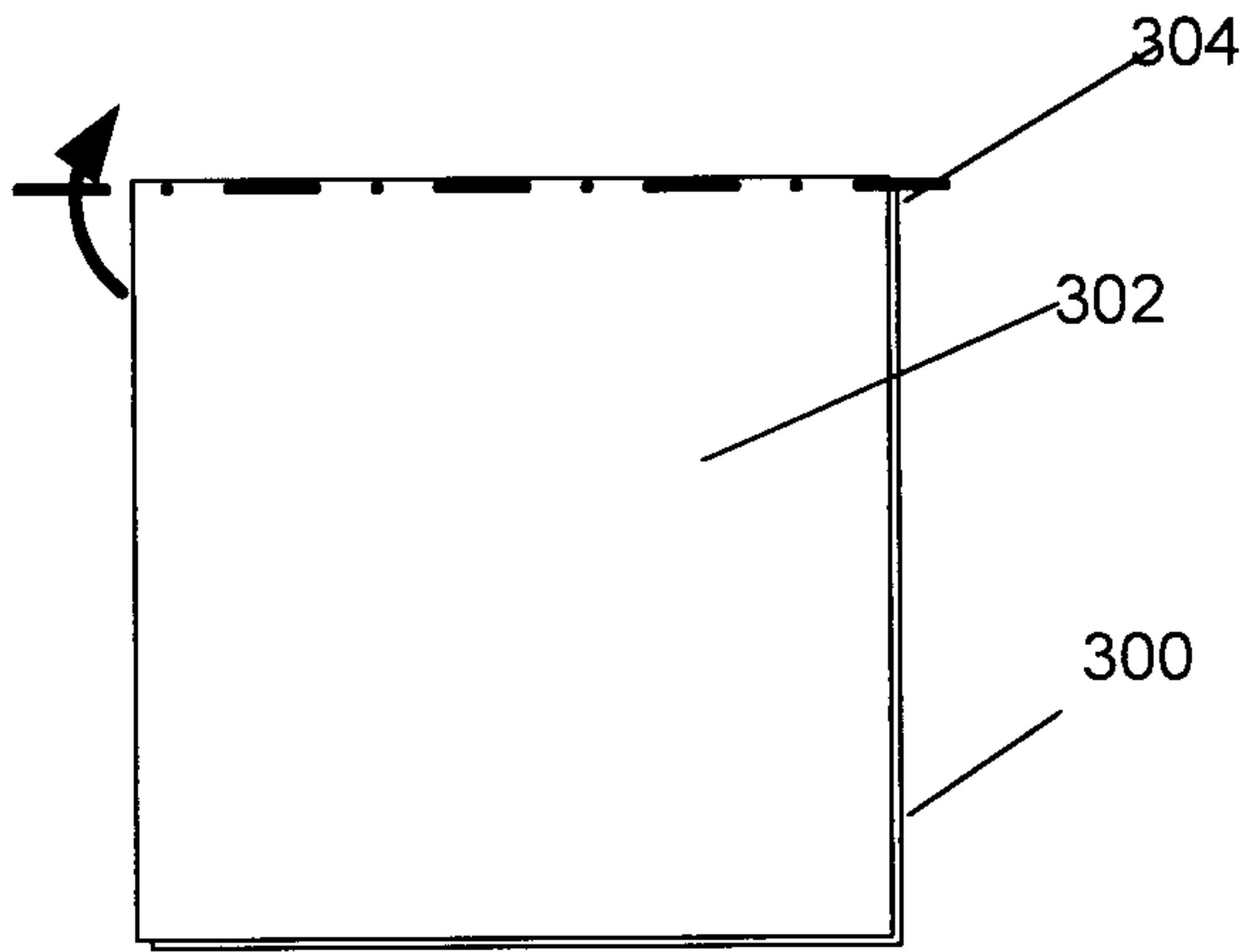


**FIG. 9B**

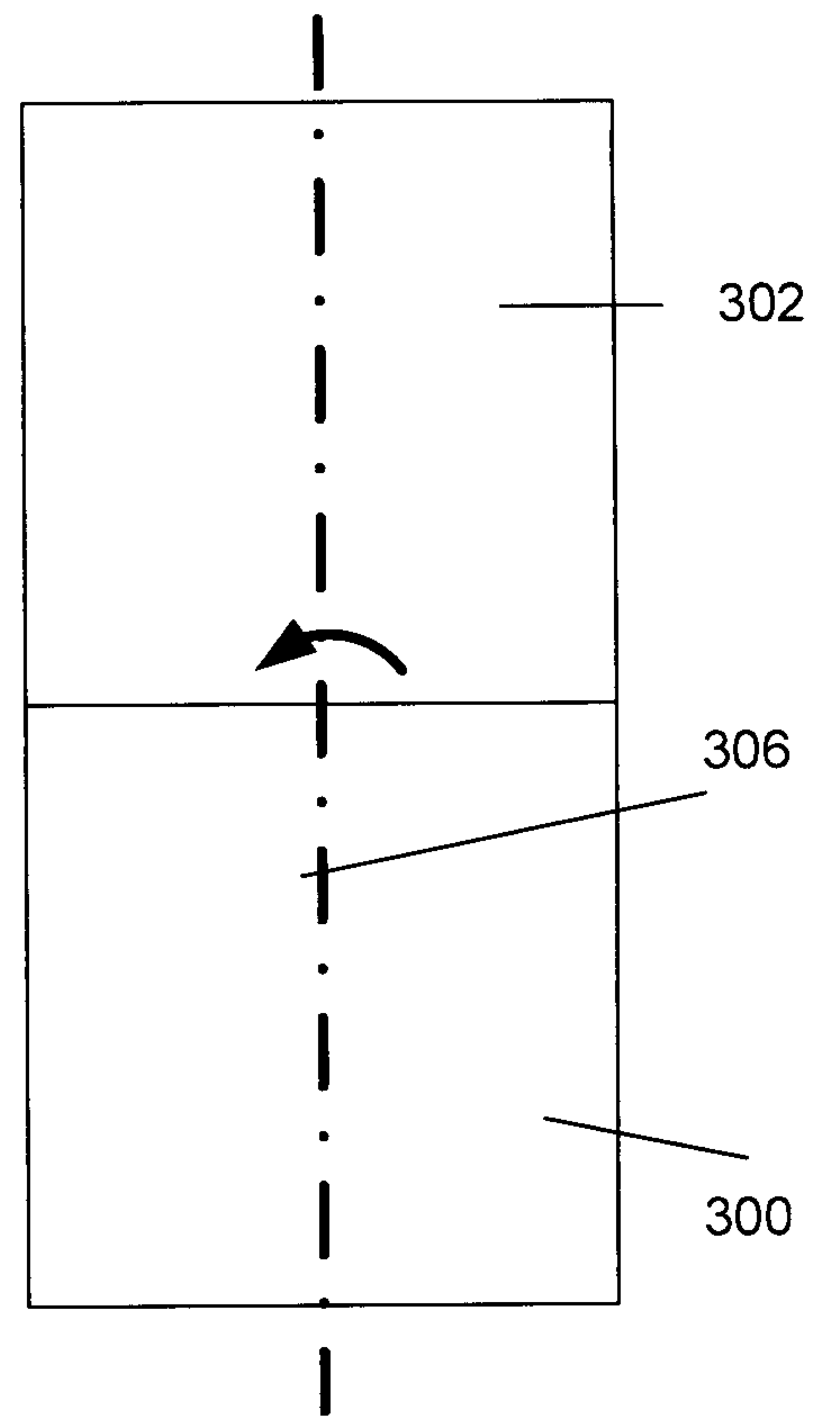


**FIG. 9C**

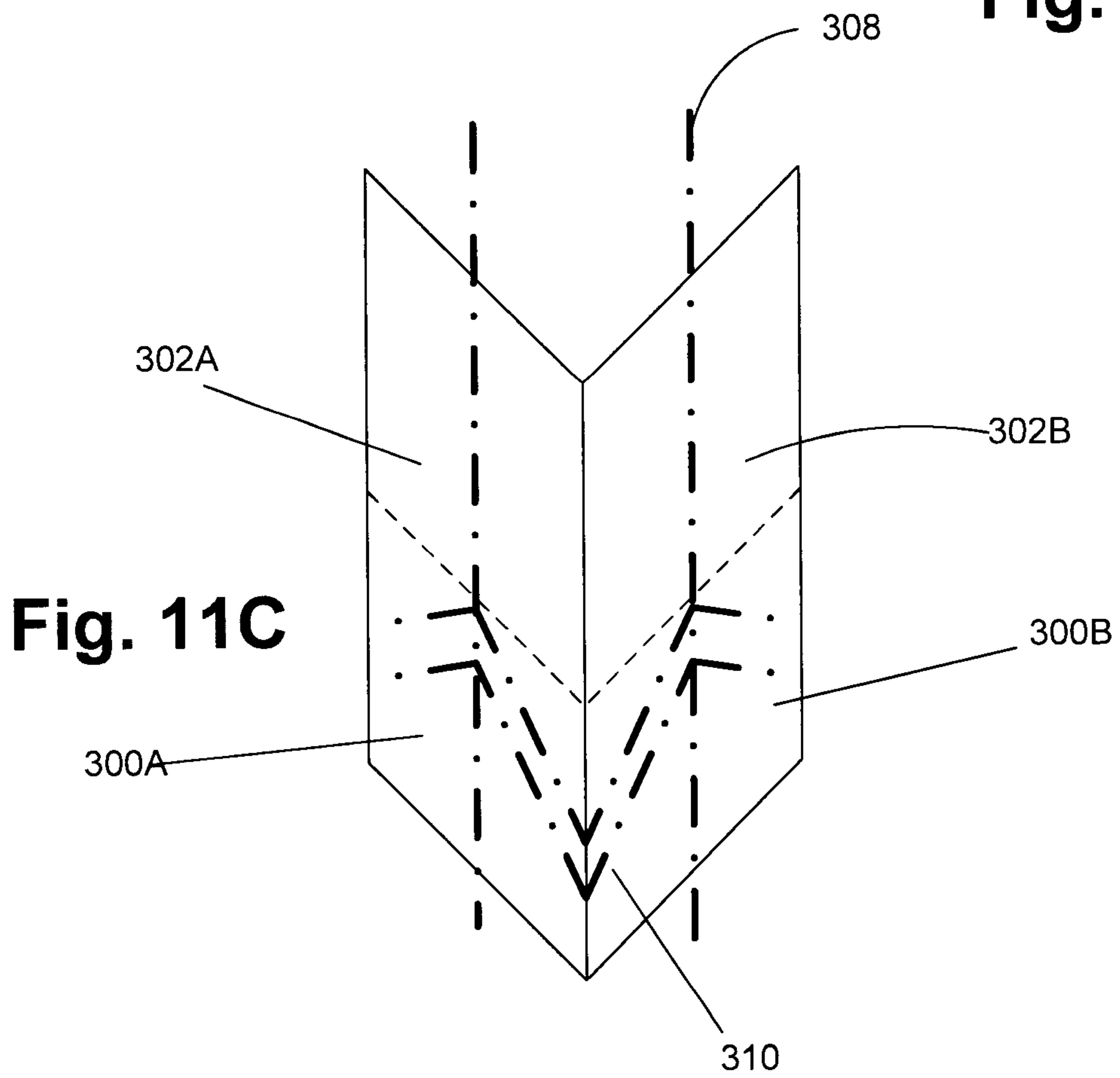




**Fig. 11A**

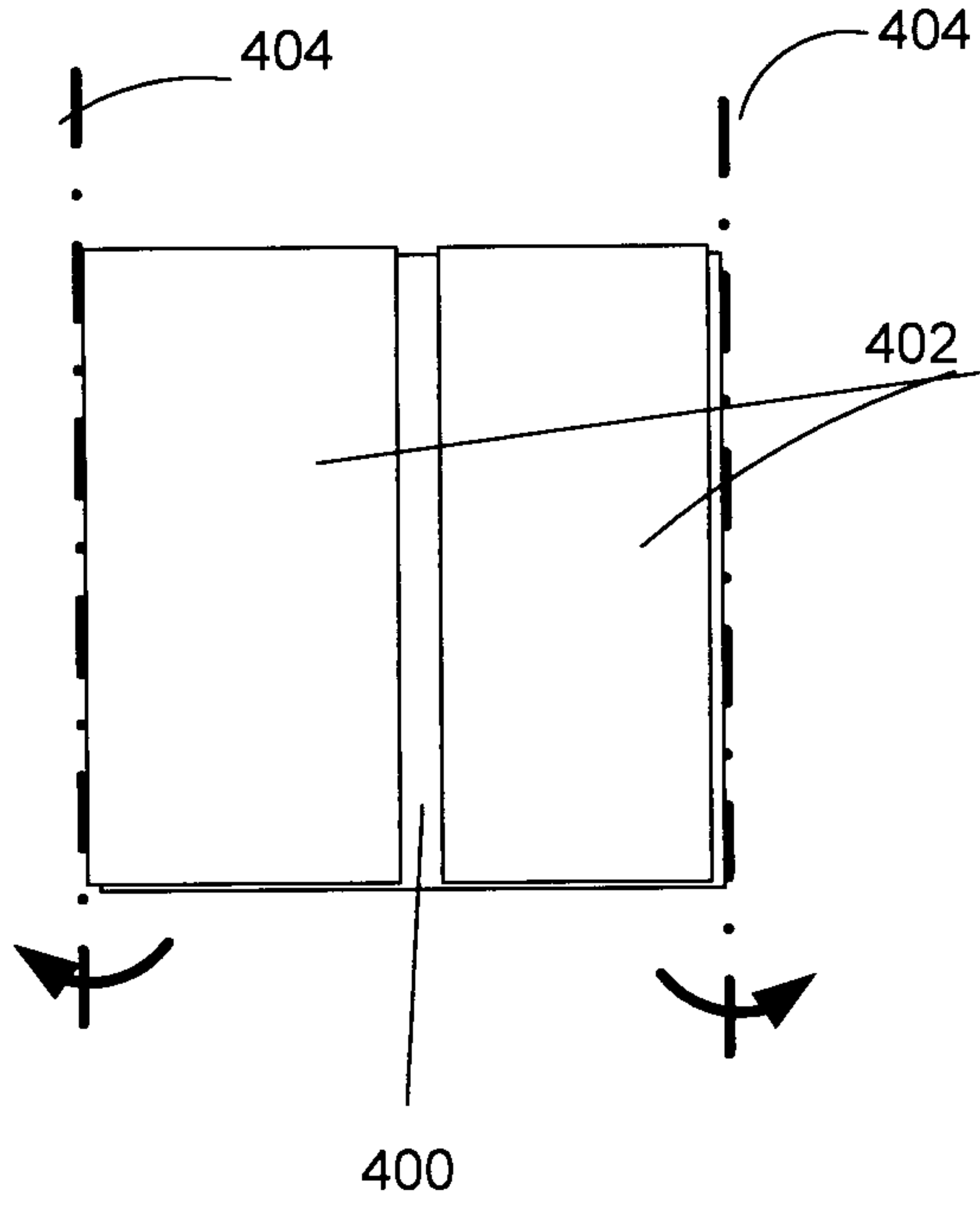


**Fig. 11B**

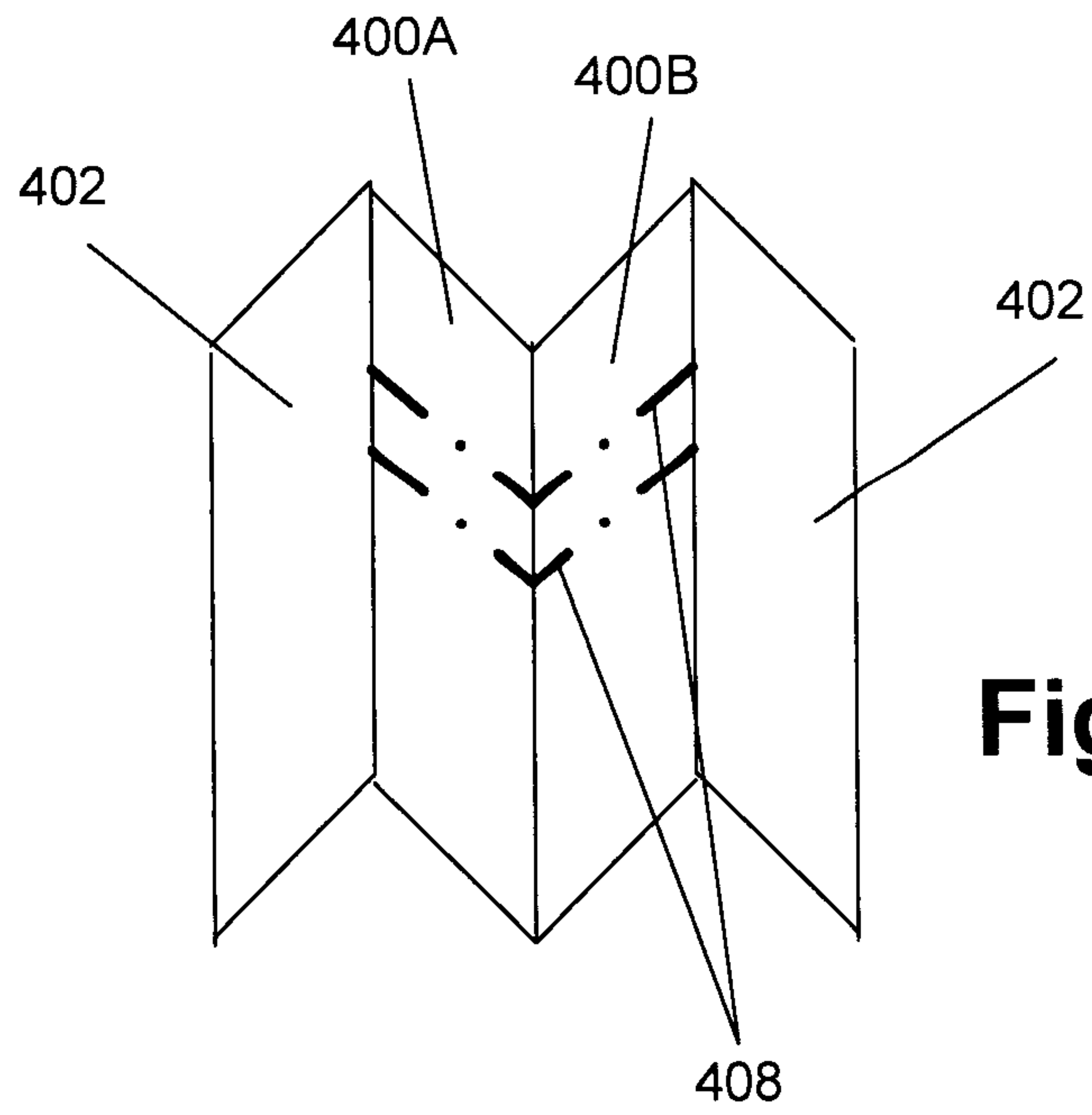
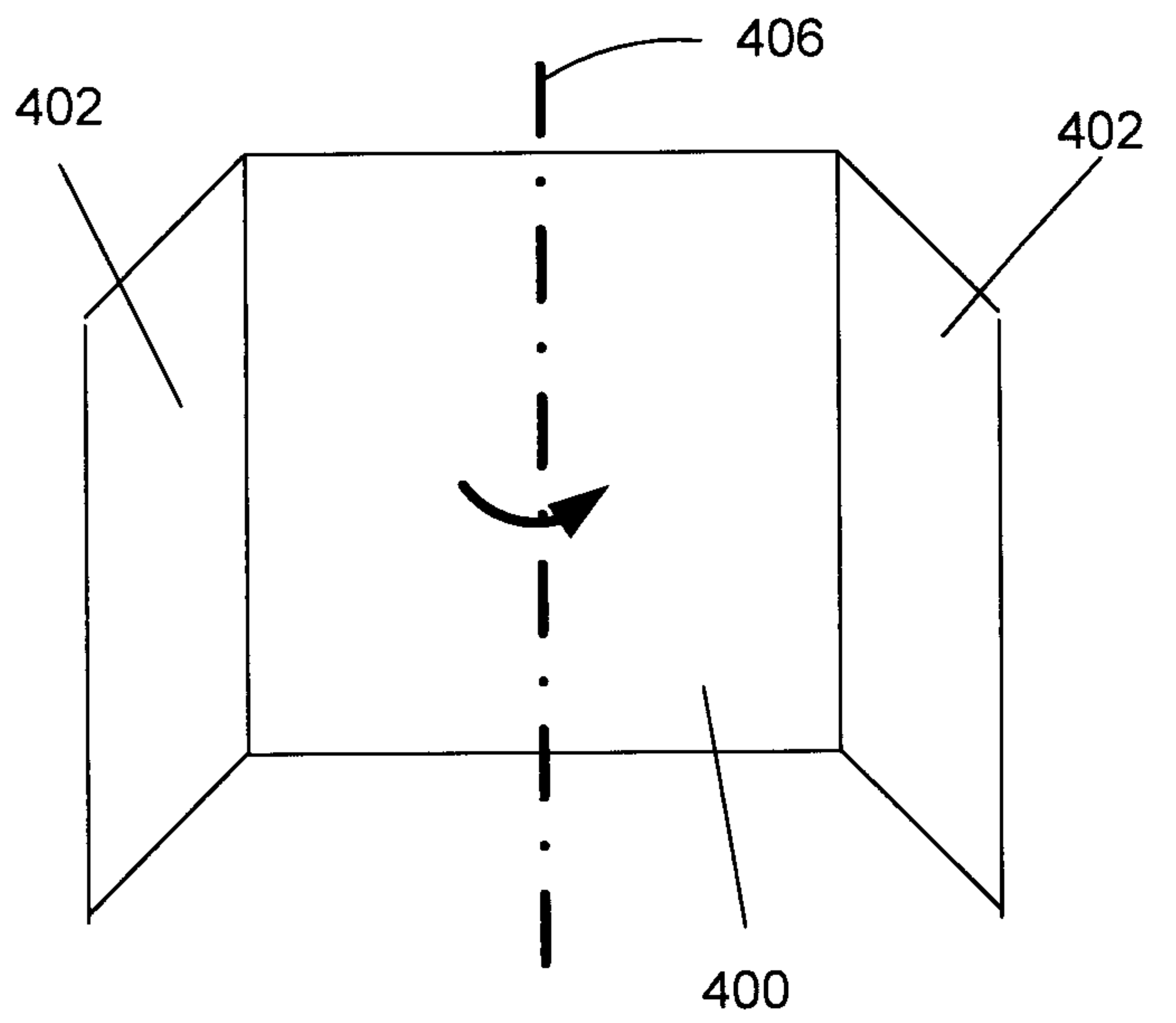


**Fig. 11C**

**Fig. 12A**

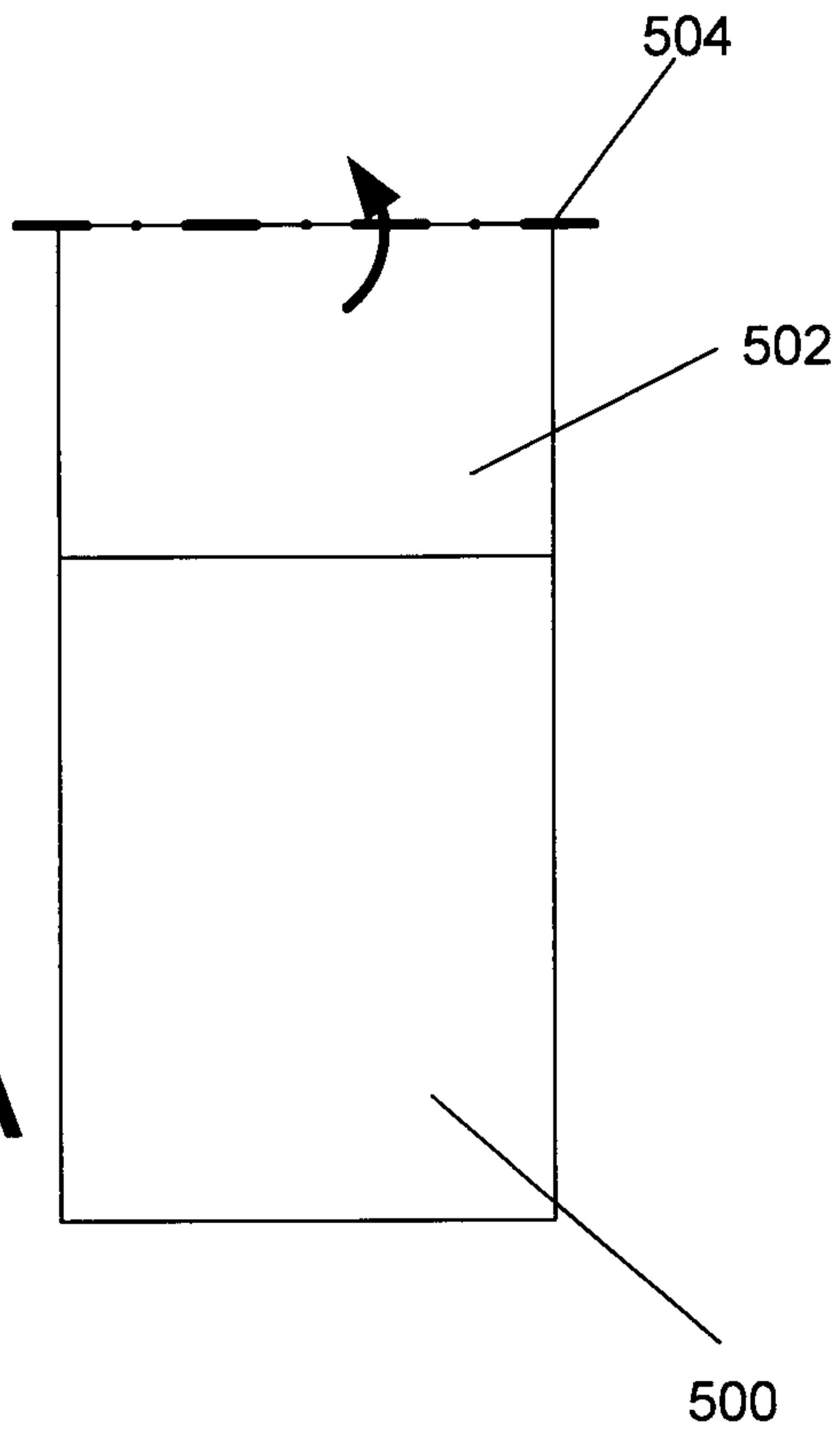


**Fig. 12B**

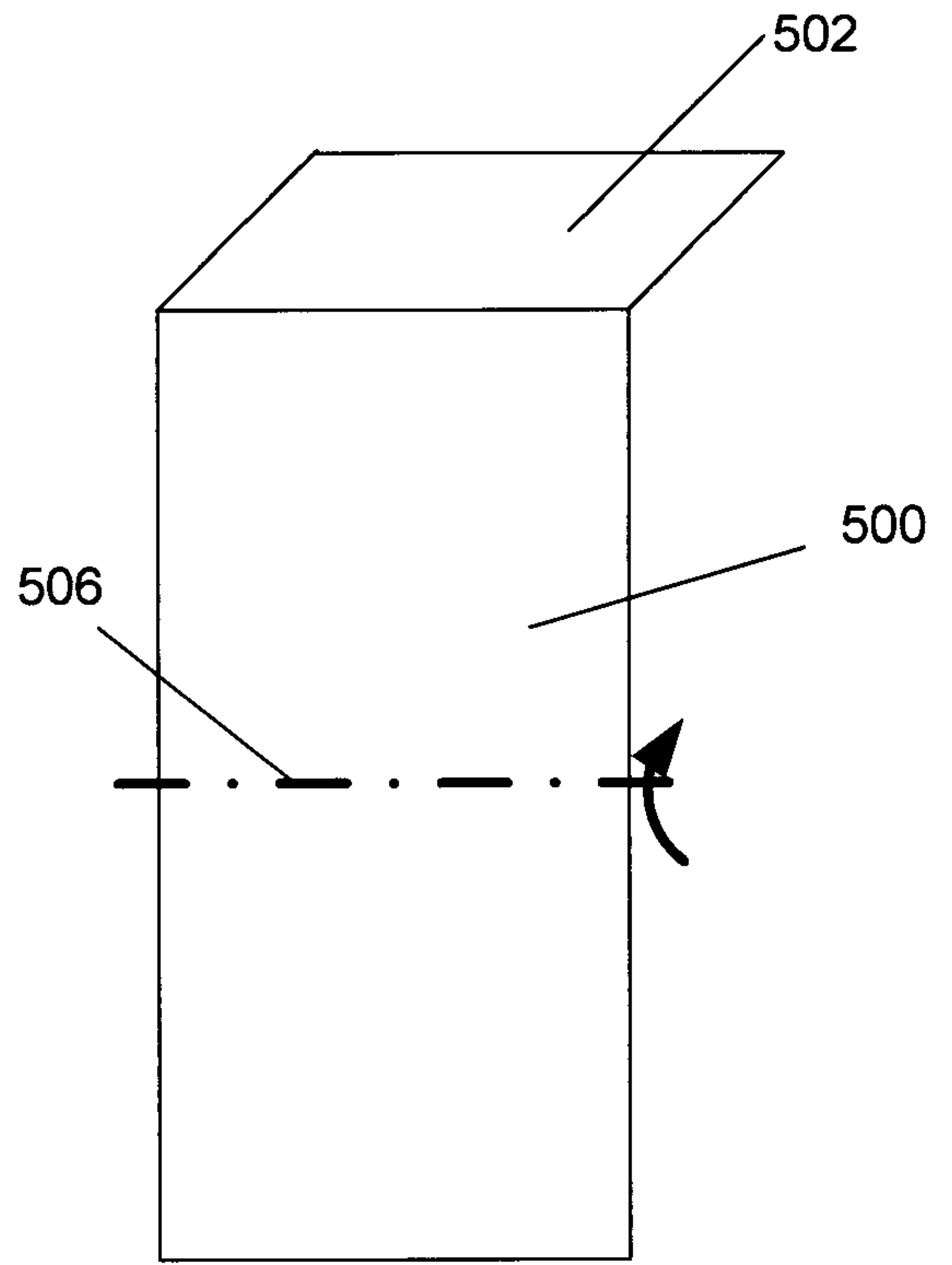


**Fig. 12C**

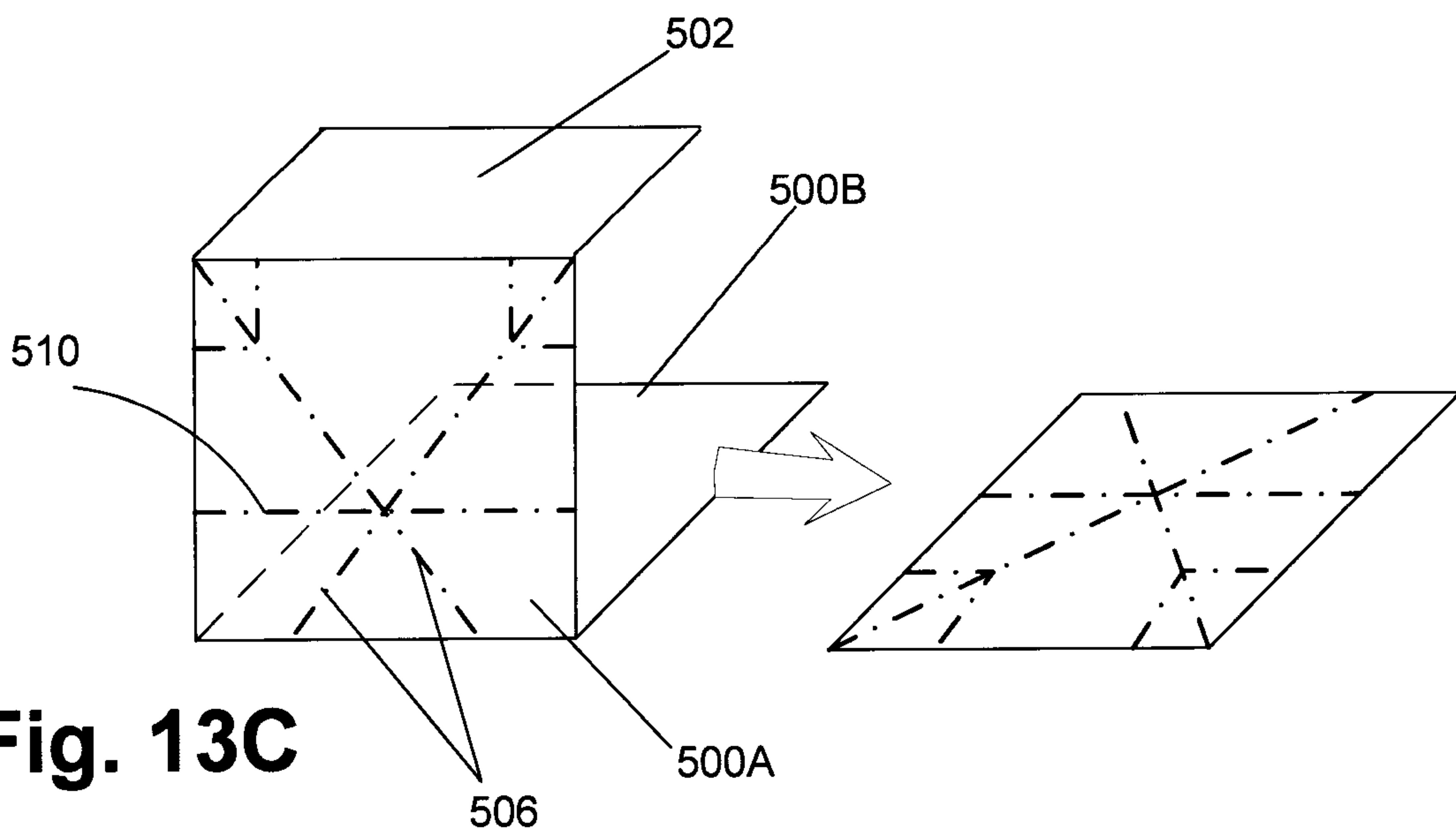
**Fig. 13A**

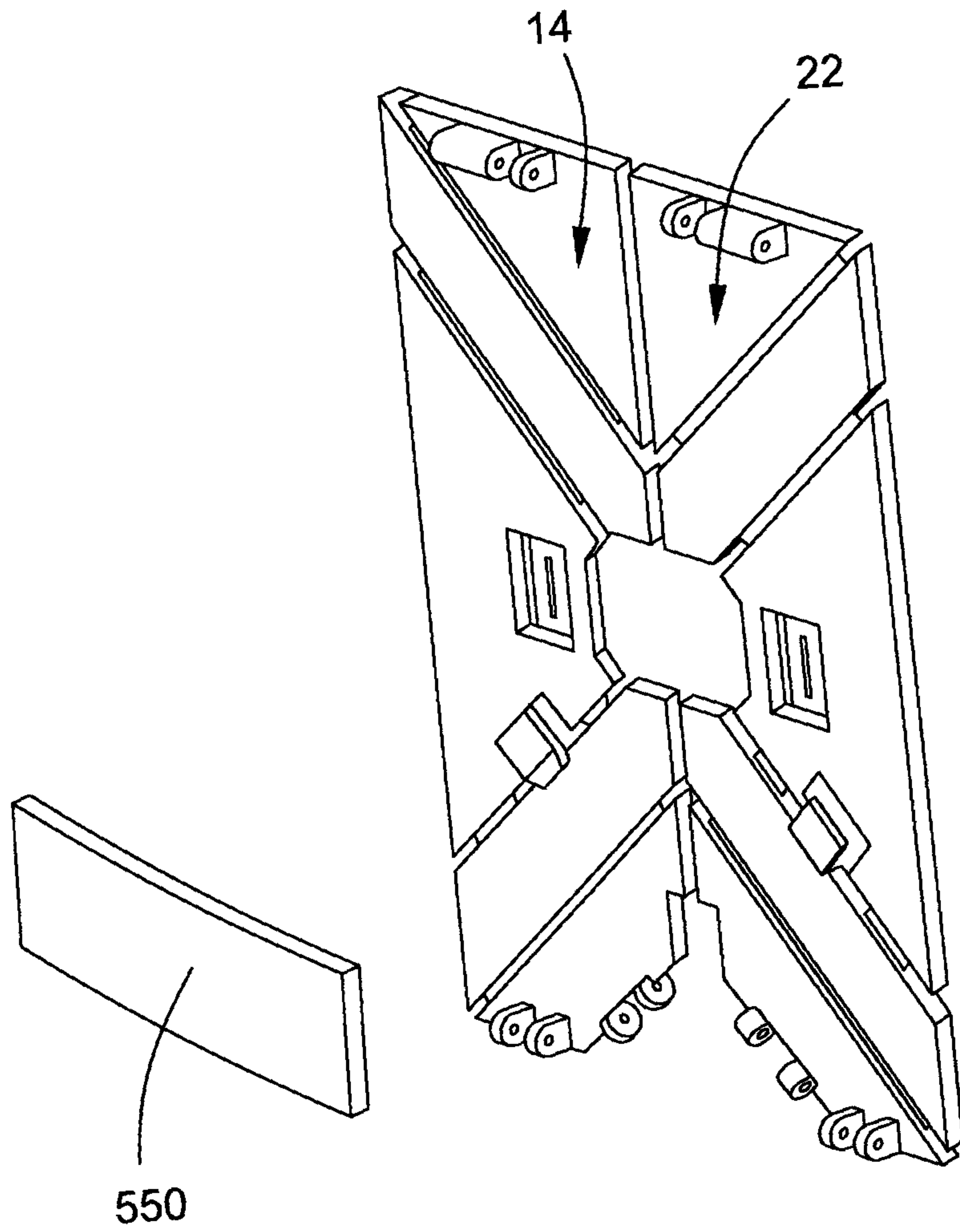


**Fig. 13B**



**Fig. 13C**





**FIG. 14**

