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ABSTRACT

A magnetic toy includes a housing having a first housing wall, a second housing wall spaced from and extending parallel with the first housing wall, and a side housing wall extending between the first and second housing walls. The first housing wall, the second housing wall, and the side housing wall define a housing interior. The magnetic toy includes a magnet pocket at least partially defined by at least one of the first housing wall, the second housing wall, and the side housing wall. The magnet pocket is disposed in the housing interior adjacent the side housing wall, and the magnet pocket extends along a magnet pocket axis. The magnetic toy further includes a magnet disposed in the magnet pocket. The magnetic toy additionally includes a support rib disposed in the magnet pocket. The support rib is configured to support and allow the magnet to rotate.

MAGNETIC TOY

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priority to and all the benefits of U.S. Provisional Patent Appl. No. 63/688,824 filed on August 29, 2024, the entire contents of which are hereby incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] A magnetic toy typically includes a housing having a first housing wall, a second housing wall, and a side housing wall, with the first housing wall, the second housing wall, and the side housing wall defining a housing interior. The magnetic toy typically includes a magnet pocket at least partially defined by at least one of the first housing wall, the second housing wall, and the side housing wall. The magnet pocket is disposed in the housing interior adjacent the side housing wall, and the magnet pocket extends along a magnet pocket axis. The magnetic toy further includes a magnet disposed in the magnet pocket.

[0003] In typical magnetic toys, the magnets disposed in the magnet pocket are either sized to be near to the size of the magnet pocket, or are sized smaller than the magnet pocket such that the magnet is able to move with respect to the housing. However, in current designs, particularly where the magnet is afforded more movability within the magnet pocket, such magnets are unable to rotate smoothly due to the square nature of the magnet pocket, therefore decreasing performance and alignment of the magnet. Even further, magnets will often remain caught in a corner of the magnet pocket, which may cause the polarity of the magnet and a magnet of a corresponding tile to remain unaligned, therefore frustrating a user. To this end,

there remains a need for providing a magnetic toy that directs movement of the magnet within the magnet pocket.

SUMMARY OF THE INVENTION AND ADVANTAGES

[0004] A magnetic toy includes a housing having a first housing wall, a second housing wall spaced from and extending parallel with the first housing wall, and a side housing wall extending between the first and second housing walls. The first housing wall, the second housing wall, and the side housing wall define a housing interior. The magnetic toy includes a magnet pocket at least partially defined by at least one of the first housing wall, the second housing wall, and the side housing wall. The magnet pocket is disposed in the housing interior adjacent the side housing wall, and the magnet pocket extends along a magnet pocket axis. The magnetic toy further includes a magnet disposed in the magnet pocket. The magnetic toy additionally includes a support rib disposed in the magnet pocket. The support rib is configured to support and allow the magnet to rotate with respect to the magnet pocket axis.

[0005] Having the support rib disposed in the magnet pocket and configured to support and allow the magnet to rotate with respect to the magnet pocket axis provides several advantages. First, having the support rib disposed in the magnet pocket increases performance and alignment of the magnet. Second, having the support rib disposed in the magnet pocket allows the magnet to more quickly respond and be able to rotate to align polarities with a corresponding magnet of another magnetic toy, therefore preventing a user from needing to repeatedly having to adjust the magnetic toy to have the magnet move into a proper position to magnetically secure the magnetic toys to one another. Third, having the support rib disposed in

the magnet pocket helps align the magnet with the magnet pocket axis, further enhancing alignment and securing of multiple magnetic toys.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Other advantages of the present disclosure will be readily appreciated, as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings.

[0007] FIG. 1 is a front perspective view of one embodiment of a magnetic toy, with the magnetic toy including a housing comprising a first housing wall, a second housing wall, and a side housing wall, a magnet pocket, a magnet disposed in the magnet pocket, and a support rib disposed in the magnet pocket.

[0008] FIG. 2 is a front view of the magnetic toy of FIG. 1.

[0009] FIG. 3 is a front perspective view of another embodiment of the magnetic toy.

[0010] FIG. 4 is a front view of the magnetic toy of FIG. 3.

[0011] FIG. 5 is a front perspective view of another embodiment of the magnetic toy.

[0012] FIG. 6 is a front view of the magnetic toy of FIG. 5.

[0013] FIG. 7 is a front perspective view of another embodiment of the magnetic toy.

[0014] FIG. 8 is a front view of the magnetic toy of FIG. 7.

[0015] FIG. 9A is a front perspective view of another embodiment of the magnetic toy.

[0016] FIG. 9B is a rear perspective view of the magnetic toy of FIG. 9A.

[0017] FIG. 10 is a front view of the magnetic toy of FIG. 9A and 9B.

[0018] FIG. 11A is a front perspective view of another embodiment of the magnetic toy of FIGS. 7 and 8, with the second housing wall being removed and showing the magnet pocket.

[0019] FIG. 11B is an exploded view of the magnetic toy of FIG. 11A.

[0020] FIG. 12A is a perspective cross-sectional view of the magnet pocket, with the magnet disposed in the magnet pocket.

[0021] FIG. 12B is a side cross-sectional view of the magnet pocket.

[0022] FIG. 12C is a perspective cross-sectional view of the magnet pocket, with the magnet removed.

[0023] FIG. 12D is a side cross-sectional view of the magnet pocket, with the magnet removed.

[0024] FIG. 13A is a top view of the magnet pocket with the magnet disposed in the magnet pocket.

[0025] FIG. 13B is a top view of the magnet pocket with the magnet removed from the magnet pocket.

[0026] FIG. 14 is an exploded view of the magnetic toy of FIGS. 7 and 8.

DETAILED DESCRIPTION OF THE INVENTION

[0027] With reference to the Figures, wherein like numerals indicate like parts throughout the several views, a magnetic toy 30 is generally shown in FIGS. 1-14. The magnetic

toy 30 may be a magnetic tile, as shown in FIGS. 1-8 and 11A-15, or may be a magnetic cube, as shown in FIGS. 9A, 9B, and 10.

[0028] The magnetic toy 30 includes a housing 34 having a first housing wall 36, a second housing wall 38 spaced from and extending parallel with the first housing wall 36, and a side housing wall 40 extending between the first and second housing walls 36, 38. Typically, the first housing wall 36 and the second housing wall 38 are separate components. The first and second housing walls 36, 38 may be transparent. The side housing wall 40 may be integral (i.e., one piece) with one of the first and second housing walls 36, 38, or the side housing wall 40 may be a separate component (i.e., two or more pieces) from the first and second housing walls 36, 38. The first housing wall 36, the second housing wall 38, and the side housing wall 40 define a housing interior 41. To define the housing interior 41, the first housing wall 36 and the second housing wall 38 may be separate components that are coupled to one another.

[0029] The magnetic toy 30 further includes a magnet pocket 44 at least partially defined by at least one of the first housing wall 36, the second housing wall 38, and the side housing wall 40. Typically, the side housing wall 40 is sandwiched between the first housing wall 36 and the second housing wall 38 to at least partially define the magnet pocket 44. The magnet pocket 44 is disposed in the housing interior 41 adjacent the side housing wall 40. The magnet pocket 44 extends along a magnet pocket axis MPA. The magnetic toy 30 further includes a magnet 42 disposed in the magnet pocket 44. The magnet 42 may be rectangular as shown throughout the FIGS., but it is also to be appreciated that the magnet 42 may be any suitable configuration, such as a cylindrical magnet.

[0030] As best shown in FIGS. 13A and 13B, the magnet pocket 44 may be further defined by a first end wall 48 extending transverse from the side housing wall 40 in the

housing interior 41, a second end wall 50 spaced from the first end wall 48 with respect to the magnet pocket axis MPA and extending transverse from the side housing wall 40 in the housing interior 41, and a third end wall 52 extending between the first and second end walls 48, 50. The first and second end walls 48, 50 may define a magnet pocket length MPL between one another along the magnet pocket axis MPA. The third end wall 52 and the side housing wall 40 define a magnet pocket width MPW perpendicular to the magnet pocket axis MPA.

[0031] It is to be appreciated that the description of the magnet pocket 44 and the components therein may equally apply to each embodiment of the magnetic toy 30 shown through FIGS. 1-14. For example, the description of the magnet pocket 44 and the components therein may equally apply to each of the embodiments of the magnet pocket 44 shown in the magnetic toy 30 of FIGS. 1 and 2, FIGS. 3 and 4, FIGS. 5 and 6, FIGS. 7 and 8, and FIGS. 9A, 9B, and 10. Although not explicitly shown in the FIGS., it is also to be appreciated that the description of the magnet pocket 44 and the components therein or around the magnet pocket 44 may apply to any shaped magnetic toy 30 (e.g., magnetic tile), such as variations of a triangle, a square, a rectangle, a pentagon, a hexagon, a heptagon, an octagon, and the like. As described in further detail below and as shown throughout the FIGS., it is also to be appreciated that each magnetic toy 30 may include multiple magnetic pockets 44 and magnets 42.

[0032] With reference to FIGS. 13A and 13B, the magnet 42 has a magnet length ML extending along the magnet pocket axis MPA, and a magnet width MW extending perpendicular to the magnet pocket axis MPA. Typically, the magnet length ML is greater than the magnet width MW. In one embodiment, the magnet length ML is less than the magnet pocket length MPL such that the magnet 42 is moveable within the magnet pocket 44 along the magnet pocket axis MPA. In such embodiments, the magnet width MW is typically less than the

magnet pocket width MPW such that the magnet 42 is rotatable about the magnet pocket axis MPA.

[0033] For example, with respect to FIGS. 1 and 2, the magnet width MW may be 50% to 70% of the magnet pocket width MPW. It is to be appreciated that the magnet width MW may be 52% to 68% of the magnet pocket width MPW, may be 54% to 66% of the magnet pocket width MPW, may be 57% to 63% of the magnet pocket width MPW, or may be 61% to 62% of the magnet pocket width MPW. As another example, with respect to FIGS. 3 and 4, the magnet width MW may be 50% to 70% of the magnet pocket width MPW. It is to be appreciated that the magnet width MW may be 52% to 68% of the magnet pocket width MPW, may be 54% to 66% of the magnet pocket width MPW, may be 57% to 63% of the magnet pocket width MPW, or may be 59% to 60% of the magnet pocket width MPW. As a further example, with respect to FIGS. 5 and 6, the magnet width MW may be 50% to 70% of the magnet pocket width MPW. It is to be appreciated that the magnet width MW may be 52% to 68% of the magnet pocket width MPW, may be 56% to 66% of the magnet pocket width MPW, may be 60% to 64% of the magnet pocket width MPW, or may be 62% to 63% of the magnet pocket width MPW. As a further example, with respect to FIGS. 7 and 8, the magnet width MW may be 50% to 60% of the magnet pocket width MPW. It is to be appreciated that the magnet width MW may be 51% to 58% of the magnet pocket width MPW, may be 52% to 57% of the magnet pocket width MPW, may be 53% to 56% of the magnet pocket width MPW, or may be 54% to 55% of the magnet pocket width MPW. As a further example, the magnet length ML of the magnet 42 in each of the embodiments shown may be 90% to 98% of the magnet pocket length MPL, may be 94% to 98% of the magnet pocket length MPL, or may be 96% to 97% of the magnet pocket length MPL.

[0034] As described above, the magnetic toy 30 may have more than one magnetic pocket 44. In such instances, the magnet pocket 44 may be further defined as a first magnet pocket 62, and the side housing wall 40 may be further defined as a first side housing wall 60, with the magnetic toy 30 further including a second side housing wall 64 extending between the first and second housing walls 36, 38. The second side housing wall 64 is transverse to the first side housing wall 60, or, alternatively, the second side housing wall 64 may be parallel to the first side housing wall 60. In such embodiments, the magnetic toy 30 further includes a second magnet pocket 66 at least partially defined by at least one of the first housing wall 36, the second housing wall 38, and the second side housing wall 64. The magnetic toy 30 may include a second magnet 68 disposed in the second magnet pocket 66, with the second magnet pocket 66 being disposed in the housing interior 41 adjacent the second side housing wall 64.

[0035] The magnetic toy 30 may further include a third side housing wall 70 extending between the first and second housing walls 36, 38, with the third housing wall 70 being transverse to at least one of the first and second side housing walls 60, 64. The magnetic toy 30 may also include a third magnet pocket 72 at least partially defined by at least one of the first housing wall 36, the second housing wall 38, and the third side housing wall 70. The magnetic toy 30 may further include a third magnet 74 disposed in the third magnet pocket 72, with the third magnet pocket 72 being disposed in the housing interior 41 adjacent the third side housing wall 70.

[0036] As shown in FIGS. 7-10, the magnetic toy 30 may further include a fourth side housing wall 76 extending between the first and second housing walls 36, 38, with the fourth housing wall 76 being transverse to at least two of the first, second, and third side housing

walls 60, 64, 70. The magnetic toy 30 may also include a fourth magnet pocket 78 at least partially defined by at least one of the first housing wall 36, the second housing wall 38, and the fourth side housing wall 76, and may include a fourth magnet 80 disposed in the fourth magnet pocket 78, with the fourth magnet pocket 78 being disposed in the housing interior 41 adjacent the fourth side housing wall 76.

[0037] With particular reference to FIGS. 9A and 9B, when the magnetic toy 30 has a cube configuration, the magnetic toy 30 may also include the first housing 34 having the first housing wall 36, the second housing wall 38 spaced from and extending parallel with the first housing wall 36, and the side housing wall 40 extending between the first and second housing walls 36, 38. The first housing wall 36, the second housing wall 38, and the side housing wall 40 define the housing interior 41. The magnetic toy 30 shown in FIG. 9A and 9B also includes a second housing 82 spaced from the housing 34 along the housing axis HA and having a first housing wall 84, the second housing wall 86 spaced from and extending parallel with the first housing wall 84 of the second housing 82, and a second side housing wall 88 extending between the first and second housing walls 84, 86 of the second housing 82. The first housing wall 84 of the second housing 84, the second housing wall 86 of the second housing 82, and the second side housing wall 88 of the second housing 82 define a second housing interior 92. The magnetic toy 30 as shown in FIGS. 9A and 9B includes a connecting housing 92 disposed between the housing 34 and the second housing 82 with respect to the housing axis HA. The connecting housing 92 connects the housing 34 and the second housing 82 to one another. The magnetic toy 30 may include a first magnet 90 disposed in the housing interior 41, and a second magnet disposed 92 in the second housing interior 96. Again, as described throughout

the specification, the description of the magnet pocket 44 equally applies to the magnet pockets shown in the embodiment of FIGS. 9A-10.

[0038] As shown throughout the FIGS., and with particular reference to FIGS. 12A-12D, the magnetic toy 30 also includes a support rib 46 disposed in the magnet pocket 44. The support rib 46 is configured to support and allow the magnet 42 to rotate with respect to the magnet pocket axis MPA.

[0039] Having the support rib 46 disposed in the magnet pocket 44 and configured to support and allow the magnet 42 to rotate with respect to the magnet pocket axis MPA provides several advantages. First, having the support rib 46 disposed in the magnet pocket 44 increases performance and alignment of the magnet 42. Second, having the support rib 46 disposed in the magnet pocket 44 allows the magnet 42 to more quickly respond and be able to rotate to align polarities with a corresponding magnet of another magnetic toy, therefore preventing a user, particularly a user of younger age, from repeatedly having to adjust the magnetic toy 30 to have the magnet 42 move and properly align. Third, having the support rib 46 disposed in the magnet pocket 44 helps align the magnet 42 with the magnet pocket axis MPA. Having the magnet 42 aligned with the magnet pocket axis MPA allows for better stacking of multiple magnetic toys 30 because the magnet of the magnetic toy 30 will be aligned with a corresponding magnet of another magnetic toy. To further help align the magnet 42 within the magnet pocket 44, the support rib 46 may protrude from either or both of the first housing wall 36 and the side housing wall 40 such that the magnet 44 is spaced from the first housing wall 36 and/or the side housing wall 40.

[0040] The support rib 46 may be adjacent to any suitable housing wall. For example, the support rib 46 may be adjacent to the first housing wall 36, or may be adjacent to the second housing wall 38.

[0041] It is to be appreciated that the support rib 46 may have any suitable configuration to support the magnet 42 and to allow the magnet 42 to rotate with respect to the magnet pocket axis MPA. For example, the support rib 46 may have a curved configuration about magnet pocket axis MPA, such as a U-shaped configuration or an arcuate configuration. The curved configuration of the support rib 46 may be circular with respect to the magnet pocket axis MPA. With particular reference to FIGS. 12A-12D, the support rib 46 may include a support rib base 100 adjacent at least one of the first housing wall 36 and the side housing wall 40, and an inner support rib surface 102 spaced from the support rib base 100 and disposed between the magnet pocket axis MPA and the support rib base 100, and with the inner support rib surface 102 being configured to support and allow the magnet 42 to rotate with respect to the magnet pocket axis MPA. As shown in FIGS. 12A-12D, the support rib base 100 may be adjacent to the first housing wall 36 and the side housing wall 40. However, in other instances, the support rib base 100 may be adjacent to just one of the first housing wall 36 and the side housing wall 40. The support rib base 100 may extend from both the first housing wall 36 and the side housing wall 40. It is to be appreciated that the support rib base 100 may be integral (i.e., one piece) with the first housing wall 36 and the side housing wall 40, or the support rib base 100 may be integral with just one of the first housing wall 36 and the side housing wall 40. Alternatively, the support rib base 100 may be a separate (i.e., two or more pieces) component from the first housing wall 36 and the side housing wall 40.

[0042] The inner support rib surface 102 may have a radius RAD that is 10% to 20% of the magnet length ML. It is to be appreciated that the inner support rib surface 102 may have a radius RAD that is 11% to 15% of the magnet length ML, or that is 11% to 13% of the magnet length ML. Additionally, the inner support rib surface 102 may have an arc measurement AR, as shown in FIG. 12D, between 45 degrees and 90 degrees about the magnet pocket axis MPA. It is to be appreciated that the inner support rib surface 102 may have the arc measurement AR between 45 to 70 degrees, may have the arc measurement AR between 50 and 65 degrees, may have the arc measurement AR between 53 and 60 degrees, or may have the arc measurement AR between 80 and 90 degrees.

[0043] In some instances, the support rib 46 may have an elongated configuration such that the support rib 46 extends along magnet pocket axis MPA in the magnet pocket 44. In other embodiments, the magnetic toy 30 may include more than one support rib 46. In one embodiment, the support rib 46 extends from the third end wall 52 toward the side housing wall 40. The support rib 46 may extend the entire magnet pocket width MPW between the third end wall 52 and the side housing wall 40. The support rib 46 may be further defined as a first support rib 54, and the magnetic toy 30 may include a second support rib 56 spaced from the first support rib 54 along the magnet pocket axis MPA and disposed in the magnet pocket 44. When present, the first and second support ribs 54, 56 are configured to support and allow the magnet 42 to rotate with respect to the magnet axis MA. The magnetic toy 30 may further include a third support rib 58 spaced from and disposed between the first and second support ribs 54, 56 with respect to the magnet pocket axis MPA and disposed in the magnet pocket 44. The first, second, and third support ribs 54, 56, 58 may be equidistant from one another with respect to the magnet pocket axis MPA. The support rib 46 / first support rib 54 may be integral with the

housing 34 and, more specifically, may be integral with the first housing wall 36, the second housing wall 38, and/or the third end wall 52 (i.e., one piece) or the support rib 46 / first support rib 54 may be a separate component from the first housing wall 36, the second housing wall 38, and the third end wall 52. It should be appreciated that the magnetic toy 30 may include any suitable number of support ribs in each corresponding magnet pocket 44. For example, in the instance of FIGS. 7 and 8, the magnetic toy 30 includes a total 12 support ribs, with three support ribs being in each of the first magnet pocket 62, the second magnet pocket 68, the third magnet pocket 72, and the fourth magnet pocket 78. However, in other instances, the magnetic toy 30 may include more than or less than 12 support ribs, such as four support ribs, eight support ribs, or 16 support ribs.

[0044] In one embodiment, as illustrated in FIGS. 12A-12D and 14, the support rib 46 / first support rib 54 may be further defined as a top support rib 55 (see FIG. 14), with the top support rib 55 being adjacent the first housing wall 36 and the side housing wall 40 / first side housing wall 60. The magnetic toy 30 may further include a bottom support rib 53 adjacent the second housing wall 38 and the side housing wall 40 / first side housing wall 60. In such embodiments, the magnet 42 is disposed between the top support rib 55 and the bottom support rib 53.

[0045] In another embodiment, the top support rib 55 is further defined as a first top support rib 55, and with the second support rib 56 being further defined as a second top support rib 57 spaced from the first top support rib 55 along the magnet pocket axis MPA and disposed in the magnet pocket 44. The bottom support rib 53 may be further defined as a first bottom support rib 53, and the magnetic toy 30 may further include a second bottom support rib 61 spaced from the first bottom support rib 53 along the magnet pocket axis MPA and disposed

in the magnet pocket 44. The first and second top support ribs 55, 57 and the first and second bottom support ribs 53, 61 sandwich the magnet 42 therebetween and are configured to support and allow the magnet 42 to rotate with respect to the magnet pocket axis MPA. The first top support rib 55 corresponds with the first bottom support rib 53 to sandwich the magnet 42 therebetween. Similarly, when present, the second top support rib 57 corresponds to the second bottom support rib 61 to sandwich the magnet 42 therebetween. The first top support rib 55 and the first bottom support rib 53 may collectively have a U-shaped configuration with respect to the magnet pocket axis MPA and the magnet 42. Similarly, the second top support rib 57 and the second bottom support rib 61 may collectively have a U-shaped configuration with respect to the magnet pocket axis MPA and the magnet 42.

[0046] The first and second top support ribs 55, 57 may form a top row of support ribs R1 and the first and second bottom support ribs 53, 61 may form a bottom row of support ribs R2. The top row of support ribs R1 may include additional top support ribs, such as a third top support rib 59, and the bottom row of support ribs R2 may include additional bottom support ribs, such as a third bottom support rib 63. In such embodiments, each support rib of the top row of support ribs R1 may extend from the third end wall 52 toward the side housing wall 40, from the side housing wall 40 toward the third end wall, and/or may extend the entire magnet pocket width MPW between the third end wall 52 and the side housing wall. Similarly, each support rib of the bottom row of support ribs R2 may extend from the side housing wall 40 toward the third end wall 52, from the third end wall 52 toward the side housing wall 40, and/or may extend the entire magnet pocket width MPW.

[0047] As illustrated in FIG. 12B and 14, the top row of support ribs R1 may have a top row tip 104 associated with each support rib of the top row of support ribs R1, and the

bottom row of support ribs R2 may have a bottom row tip 106 associated with each support rib of the bottom row of support ribs R2, with the top row tip 104 and the bottom row tip 106 defining a distance D1 there between. Typically, the distance D1 is less than the magnet width MW, which facilitates better rotation and alignment of the magnet 42. On the other hand, on a side opposite the top row of support ribs R1 and bottom row of support ribs R2 in the magnet pocket 44, the first housing wall 36 and the side housing wall 40 define a first corner, and the second housing wall 38 and the side housing wall define a second corner. The magnet 42 may be disposable in either of the first corner or the second corner such that the first corner or the second corner squares the magnet 42 therein. When disposed in the first corner or the second corner, the magnet width MW of the magnet 42 may be configured such that the magnet 42 is not engaged with any of the support ribs, which can help align the magnet 42 with a corresponding magnet of another magnetic toy. Then, when a user moves the magnetic toy 30 to magnetically couple to another magnetic toy, the support rib 46 and, when present, the top row of support ribs R1 and the bottom row of support ribs R2, help facilitate quick rotation of the magnet 42 to align the polarities of the magnet 42 and a corresponding magnet of another magnetic toy.

[0048] The support ribs 46 may be suitably spaced apart from one another. For example, referring to FIG. 13B, a support rib distance SRD may be defined between the first support rib 54 and the second support rib 56 along the magnet pocket axis MPA. The support rib distance SRD may be any suitable length. For example, the support rib distance SRD may be based on a number of support ribs 46 disposed within the magnet pocket 44. The support rib distance SRD may be selected to facilitate supporting and allowing the magnet 42 to rotate with respect to the magnet pocket axis MPA. In one such instance, the support rib distance SRD is

20% to 40% of the magnet pocket length MPL. The support rib distance SRD may be 23% to 37% of the magnet pocket length MPL, may be 25% to 34% of the magnet pocket length MPL, may be 27% to 32% of the magnet pocket length MPL, or may be 28% to 30% of the magnet pocket length MPL.

[0049] It is to be appreciated that the description of the magnet pocket 44, magnet 42, support rib 46, and the like equally applies to any magnet pocket, magnet, support rib, and the like shown throughout the FIGS. For example, the magnetic toy 30 may have one magnet pocket 44, two magnet pockets, three magnet pockets, four magnet pockets, or more magnet pockets, and the description of the magnet pocket 44 equally applies to each additional magnet pocket in the magnetic toy 30. As another example, the description of each support rib of the top row of support ribs R1 equally applies to each support rib of the bottom row of support ribs R2.

[0050] With respect to FIGS. 9A-10, the housing 34, the second housing 82, and the connecting housing 94 collectively define a cube housing 98 having a cube configuration. The housing 34 may be further defined as a first tile, and the second housing 82 may be further defined as a second tile.

[0051] Embodiment 1: A magnetic toy comprising:

a housing comprising a first housing wall, a second housing wall spaced from and extending parallel with said first housing wall, and a side housing wall extending between said first and second housing walls, wherein said first housing wall, said second housing wall, and said side housing wall define a housing interior;

a magnet pocket at least partially defined by at least one of said first housing wall, said second housing wall, and said side housing wall, wherein said magnet pocket is disposed in said

housing interior adjacent said side housing wall, and wherein said magnet pocket extends along a magnet pocket axis;

a magnet disposed in said magnet pocket; and

a support rib disposed in said magnet pocket;

wherein said support rib is configured to support and allow said magnet to rotate with respect to said magnet pocket axis.

[0052] Embodiment 2: The magnetic toy as set forth in embodiment 1, wherein said magnet pocket is further defined by a first end wall extending transverse from said side housing wall in said housing interior, a second end wall spaced from said first end wall with respect to said magnet pocket axis and extending transverse from said side housing wall in said housing interior, and a third end wall extending between said first and second end walls, wherein said first and second end walls define a magnet pocket length between one another along said magnet pocket axis, and wherein said third end wall and said housing side wall define a magnet pocket width perpendicular to said magnet pocket axis.

[0053] Embodiment 3: The magnetic toy as set forth in any one of the preceding embodiments, wherein said support rib has a curved configuration about said magnet pocket axis.

[0054] Embodiment 4: The magnetic toy as set forth in embodiment 3, wherein said support rib includes a support rib base adjacent at least one of said first housing wall and said side housing wall, and an inner support rib surface spaced from said support rib base and disposed between said magnet pocket axis and said support rib base, and wherein said inner support rib surface is configured to support and allow said magnet to rotate with respect to said magnet pocket axis.

[0055] Embodiment 5: The magnetic toy as set forth in any one of the preceding embodiments, wherein said magnet has a magnet length extending along said magnet pocket axis, and a magnet width extending perpendicular to said magnet pocket axis, wherein said magnet length is greater than said magnet width.

[0056] Embodiment 6: The magnetic toy as set forth in embodiment 5, wherein said magnet length is less than said magnet pocket length such that said magnet is moveable within said magnet pocket along said magnet pocket axis, and wherein said magnet width is less than said magnet pocket width such that said magnet is rotatable about said magnet pocket axis.

[0057] Embodiment 7: The magnetic toy as set forth in any one of embodiments 2-6, wherein said support rib extends from said third end wall toward said side housing wall.

[0058] Embodiment 8: The magnetic toy as set forth in any one of the preceding embodiments, wherein said support rib is further defined as a first support rib, and further comprising a second support rib spaced from said first support rib along said magnet pocket axis and disposed in said magnet pocket, and wherein said first and second support ribs are configured to support and allow said magnet to rotate with respect to said magnet axis.

[0059] Embodiment 9: The magnetic toy as set forth in embodiment 8, further comprising a third support rib spaced from and disposed between said first and second support ribs with respect to said magnet pocket axis and disposed in said magnet pocket.

[0060] Embodiment 10: The magnetic toy as set forth in embodiment 9, wherein said first, second, and third support ribs are equidistant from one another with respect to said magnet pocket axis.

[0061] Embodiment 11: The magnetic toy as set forth in any one of the preceding embodiments, wherein said magnet pocket is further defined as a first magnet pocket, wherein

said side housing wall is further defined as a first side housing wall, and further comprising a second side housing wall extending between said first and second housing walls, wherein said second side housing wall is transverse to said first side housing wall, and further comprising a second magnet pocket at least partially defined by at least one of said first housing wall, said second housing wall, and said second side housing wall, and a second magnet disposed in said second magnet pocket, and wherein said second magnet pocket is disposed in said housing interior adjacent said second side housing wall.

[0062] Embodiment 12: The magnetic toy as set forth in embodiment 11, further comprising a third side housing wall extending between said first and second housing walls, wherein said third housing wall is transverse to at least one of said first and second side housing walls, and further comprising a third magnet pocket at least partially defined by at least one of said first housing wall, said second housing wall, and said third side housing wall, and further comprising a third magnet disposed in said third magnet pocket, and wherein said third magnet pocket is disposed in said housing interior adjacent said third side housing wall.

[0063] Embodiment 13: The magnetic toy as set forth in embodiment 12, further comprising a fourth side housing wall extending between said first and second housing walls, wherein said fourth housing wall is transverse to at least two of said first, second, and third side housing walls, and further comprising a fourth magnet pocket at least partially defined by at least one of said first housing wall, said second housing wall, and said fourth side housing wall, and further comprising a fourth magnet disposed in said fourth magnet pocket, and wherein said fourth magnet pocket is disposed in said housing interior adjacent said fourth side housing wall.

[0064] Embodiment 14: The magnetic toy as set forth in any one of the preceding embodiments, wherein said first housing wall and said second housing wall are separate components.

[0065] Embodiment 15: The magnetic toy as set forth in any one of the preceding embodiments, wherein said support rib is further defined as a top support rib, wherein said top support rib is adjacent said first housing wall and said side housing wall, and further comprising a bottom support rib adjacent said second housing wall and said side housing wall, and wherein said magnet is disposed between said top support rib and said bottom support rib.

[0066] Embodiment 16: The magnetic toy as set forth in embodiment 15, wherein said top support rib is further defined as a first top support rib, and further comprising a second top support rib spaced from said first top support rib along said magnet pocket axis and disposed in said magnet pocket, wherein said first and second top support ribs are configured to support and allow said magnet to rotate with respect to said magnet axis, wherein said bottom support rib is further defined as a first bottom support rib, and further comprising a second bottom support rib spaced from said first bottom support rib along said magnet pocket axis and disposed in said magnet pocket, wherein said first and second top support ribs and said first and second bottom support ribs sandwich said magnet therebetween and are configured to support and allow said magnet to rotate with respect to said magnet pocket axis.

[0067] Embodiment 17: The magnetic toy as set forth in any one of the preceding embodiments, wherein said support rib is further defined as a top support rib, wherein said top support rib is adjacent said first housing wall and said side housing wall, and further comprising a bottom support rib adjacent said second housing wall and said side housing wall, wherein said magnet is disposed between said top support rib and said bottom support rib, wherein said top

support rib has a top row tip and said bottom support rib has a bottom row tip, wherein said top row tip and said bottom row tip define a distance therebetween that is less than said magnet width.

[0068] Embodiment 18: A magnetic toy comprising:

a housing having a first housing wall, a second housing wall spaced from and extending parallel with said first housing wall, and a side housing wall extending between said first and second housing walls, wherein said first housing wall, said second housing wall, and said side housing wall define a housing interior;

a second housing spaced from said housing along a housing axis and having a first housing wall, a second housing wall spaced from and extending parallel with said first housing wall of said second housing, and a second side housing wall extending between said first and second housing walls of said second housing, wherein said first housing wall of said second housing, said second housing wall of said second housing, and said second side housing wall define a second housing interior;

a connecting housing disposed between said housing and said second housing with respect to said housing axis;

a first magnet disposed in said first housing interior; and

a second magnet disposed in said second housing interior.

[0069] Embodiment 19: The magnetic toy as set forth in embodiment 18, wherein said housing, said second housing, and said connecting housing collectively define a cube housing having a cube configuration.

[0070] Embodiment 20: The magnetic toy as set forth in any one of embodiment 18 and 19, wherein said housing is further defined as a first tile, and said second housing is further defined as a second tile.

CLAIMS

What is claimed is:

1. A magnetic toy comprising:

a housing comprising a first housing wall, a second housing wall spaced from and extending parallel with said first housing wall, and a side housing wall extending between said first and second housing walls, wherein said first housing wall, said second housing wall, and said side housing wall define a housing interior;

a magnet pocket at least partially defined by at least one of said first housing wall, said second housing wall, and said side housing wall, wherein said magnet pocket is disposed in said housing interior adjacent said side housing wall, and wherein said magnet pocket extends along a magnet pocket axis;

a magnet disposed in said magnet pocket; and

a support rib disposed in said magnet pocket;

wherein said support rib is configured to support and allow said magnet to rotate with respect to said magnet pocket axis.

2. The magnetic toy as set forth in claim 1, wherein said magnet pocket is further defined by a first end wall extending transverse from said side housing wall in said housing interior, a second end wall spaced from said first end wall with respect to said magnet pocket axis and extending transverse from said side housing wall in said housing interior, and a third end wall extending between said first and second end walls, wherein said first and second end walls define a magnet pocket length between one another along said magnet pocket axis, and wherein said third end wall and said housing side wall define a magnet pocket width perpendicular to said magnet pocket axis.

3. The magnetic toy as set forth in claim 1, wherein said support rib has a curved configuration about said magnet pocket axis.

4. The magnetic toy as set forth in claim 3, wherein said support rib includes a support rib base adjacent at least one of said first housing wall and said side housing wall, and an inner support rib surface spaced from said support rib base and disposed between said magnet pocket axis and said support rib base, and wherein said inner support rib surface is configured to support and allow said magnet to rotate with respect to said magnet pocket axis.

5. The magnetic toy as set forth in claim 1, wherein said magnet has a magnet length extending along said magnet pocket axis, and a magnet width extending perpendicular to said magnet pocket axis, wherein said magnet length is greater than said magnet width.

6. The magnetic toy as set forth in claim 5, wherein said magnet length is less than said magnet pocket length such that said magnet is moveable within said magnet pocket along said magnet pocket axis, and wherein said magnet width is less than said magnet pocket width such that said magnet is rotatable about said magnet pocket axis.

7. The magnetic toy as set forth in claim 2, wherein said support rib extends from said third end wall toward said side housing wall.

8. The magnetic toy as set forth in claim 1, wherein said support rib is further defined as a first support rib, and further comprising a second support rib spaced from said first support rib along said magnet pocket axis and disposed in said magnet pocket, and wherein said first and second support ribs are configured to support and allow said magnet to rotate with respect to said magnet axis.

9. The magnetic toy as set forth in claim 8, further comprising a third support rib spaced from and disposed between said first and second support ribs with respect to said magnet pocket axis and disposed in said magnet pocket.

10. The magnetic toy as set forth in claim 9, wherein said first, second, and third support ribs are equidistant from one another with respect to said magnet pocket axis.

11. The magnetic toy as set forth in claim 1, wherein said magnet pocket is further defined as a first magnet pocket, wherein said side housing wall is further defined as a first side housing wall, and further comprising a second side housing wall extending between said first and second housing walls, wherein said second side housing wall is transverse to said first side housing wall, and further comprising a second magnet pocket at least partially defined by at least one of said first housing wall, said second housing wall, and said second side housing wall, and a second magnet disposed in said second magnet pocket, and wherein said second magnet pocket is disposed in said housing interior adjacent said second side housing wall.

12. The magnetic toy as set forth in claim 11, further comprising a third side housing wall extending between said first and second housing walls, wherein said third housing wall is transverse to at least one of said first and second side housing walls, and further comprising a third magnet pocket at least partially defined by at least one of said first housing wall, said second housing wall, and said third side housing wall, and further comprising a third magnet disposed in said third magnet pocket, and wherein said third magnet pocket is disposed in said housing interior adjacent said third side housing wall.

13. The magnetic toy as set forth in claim 12, further comprising a fourth side housing wall extending between said first and second housing walls, wherein said fourth housing wall is transverse to at least two of said first, second, and third side housing walls, and further

comprising a fourth magnet pocket at least partially defined by at least one of said first housing wall, said second housing wall, and said fourth side housing wall, and further comprising a fourth magnet disposed in said fourth magnet pocket, and wherein said fourth magnet pocket is disposed in said housing interior adjacent said fourth side housing wall.

14. The magnetic toy as set forth in claim 1, wherein said first housing wall and said second housing wall are separate components.

15. The magnetic toy as set forth in claim 1, wherein said support rib is further defined as a top support rib, wherein said top support rib is adjacent said first housing wall and said side housing wall, and further comprising a bottom support rib adjacent said second housing wall and said side housing wall, and wherein said magnet is disposed between said top support rib and said bottom support rib.

16. The magnetic toy as set forth in claim 15, wherein said top support rib is further defined as a first top support rib, and further comprising a second top support rib spaced from said first top support rib along said magnet pocket axis and disposed in said magnet pocket, wherein said first and second top support ribs are configured to support and allow said magnet to rotate with respect to said magnet axis, wherein said bottom support rib is further defined as a first bottom support rib, and further comprising a second bottom support rib spaced from said first bottom support rib along said magnet pocket axis and disposed in said magnet pocket, wherein said first and second top support ribs and said first and second bottom support ribs sandwich said magnet therebetween and are configured to support and allow said magnet to rotate with respect to said magnet pocket axis.

17. The magnetic toy as set forth in claim 2, wherein said support rib is further defined as a top support rib, wherein said top support rib is adjacent said first housing wall and said side

housing wall, and further comprising a bottom support rib adjacent said second housing wall and said side housing wall, wherein said magnet is disposed between said top support rib and said bottom support rib, wherein said top support rib has a top row tip and said bottom support rib has a bottom row tip, wherein said top row tip and said bottom row tip define a distance therebetween that is less than said magnet width.

18. A magnetic toy comprising:

a housing having a first housing wall, a second housing wall spaced from and extending parallel with said first housing wall, and a side housing wall extending between said first and second housing walls, wherein said first housing wall, said second housing wall, and said side housing wall define a housing interior;

a second housing spaced from said housing along a housing axis and having a first housing wall, a second housing wall spaced from and extending parallel with said first housing wall of said second housing, and a second side housing wall extending between said first and second housing walls of said second housing, wherein said first housing wall of said second housing, said second housing wall of said second housing, and said second side housing wall define a second housing interior;

a connecting housing disposed between said housing and said second housing with respect to said housing axis;

a first magnet disposed in said first housing interior; and

a second magnet disposed in said second housing interior.

19. The magnetic toy as set forth in claim 18, wherein said housing, said second housing, and said connecting housing collectively define a cube housing having a cube configuration.

20. The magnetic toy as set forth in claim 19, wherein said housing is further defined as a first tile, and said second housing is further defined as a second tile.

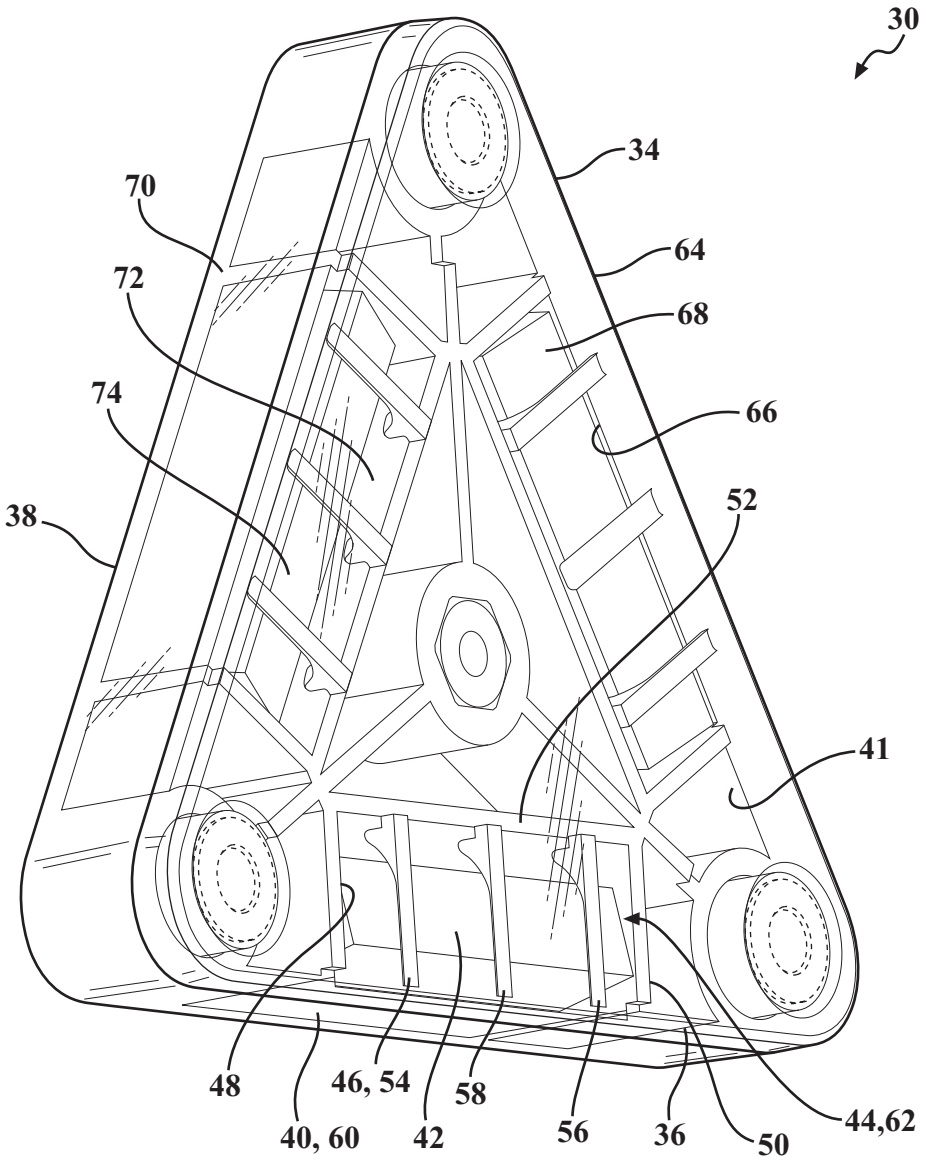

FIG. 1

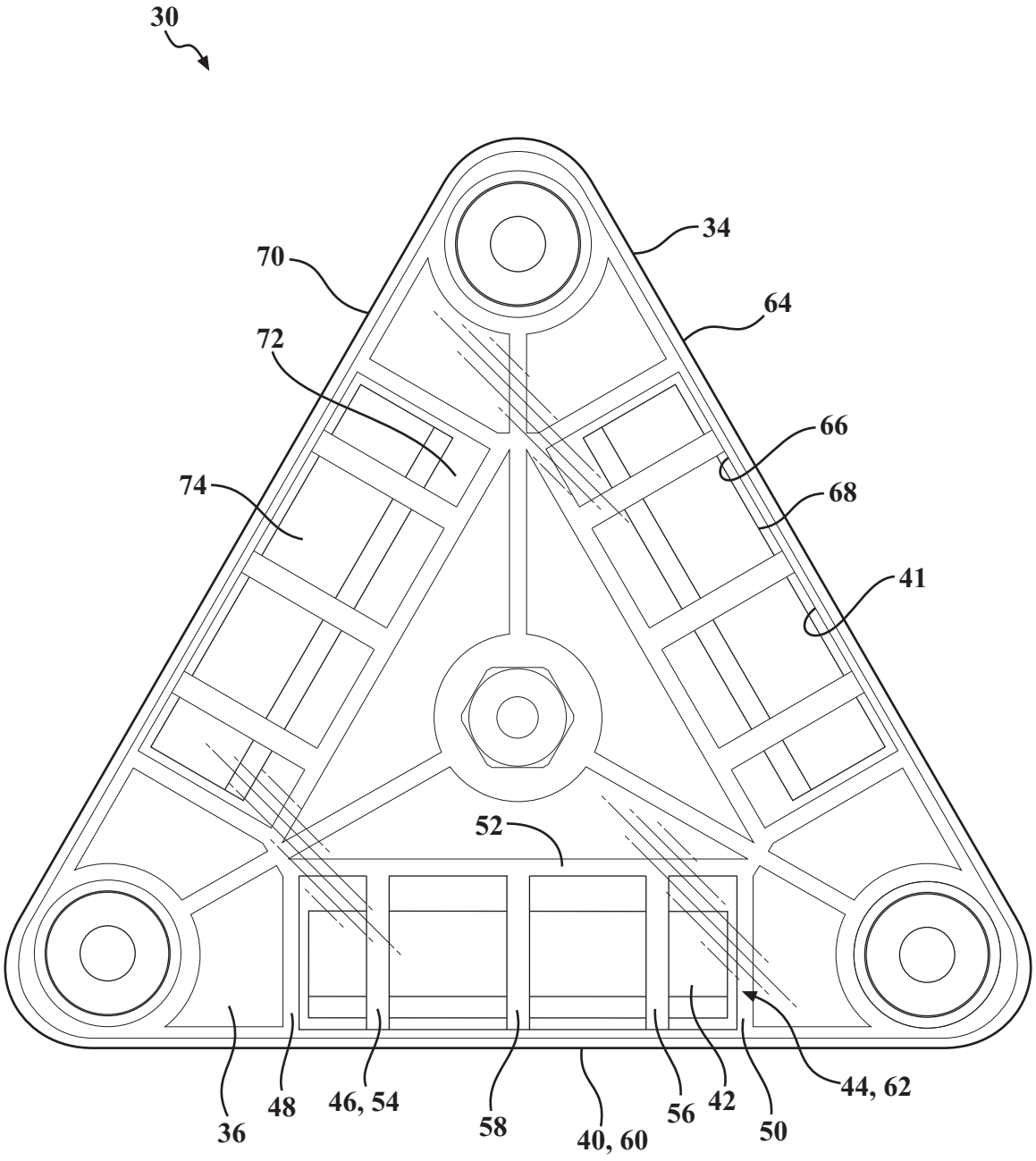

FIG. 2

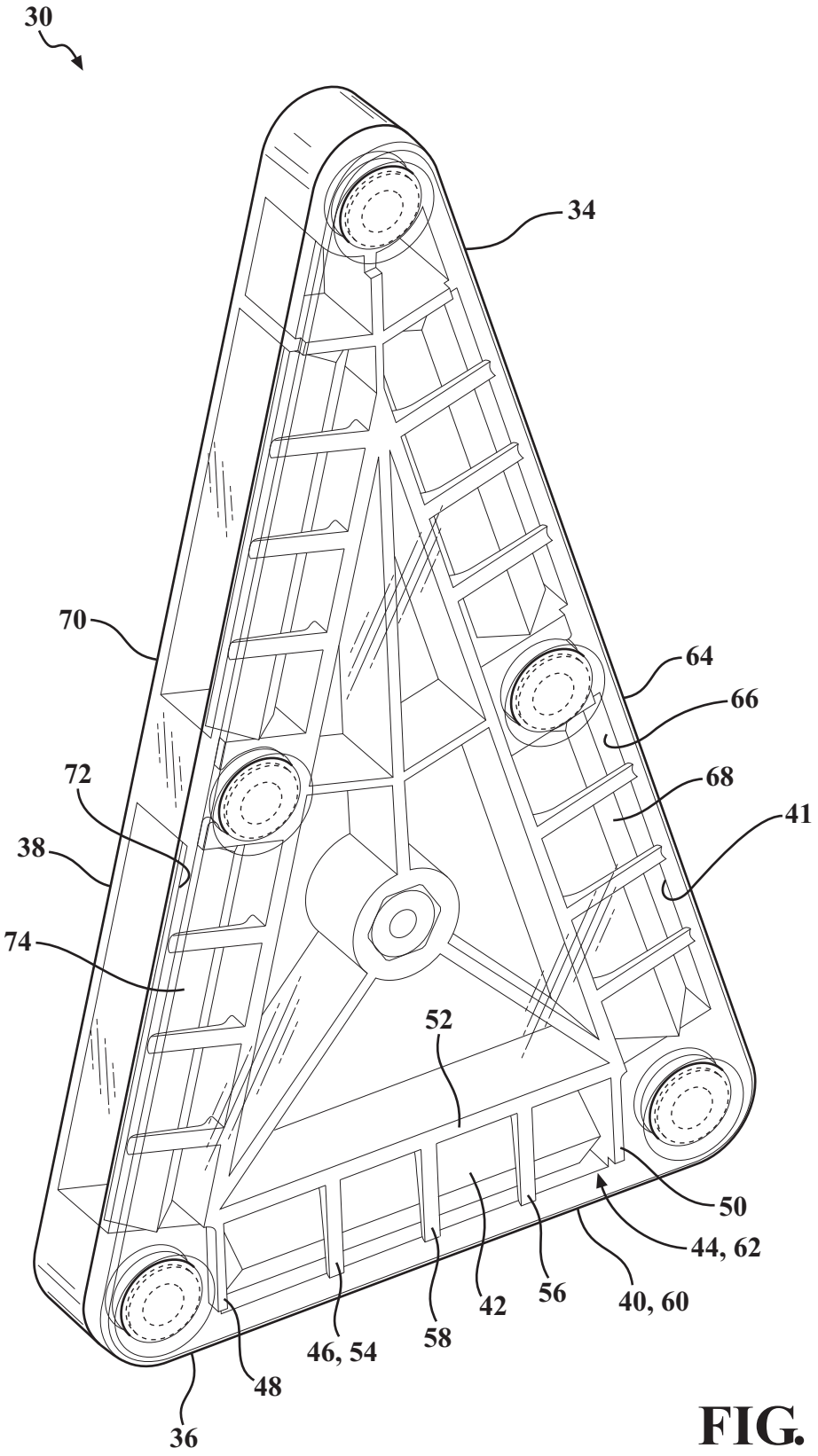

FIG. 3

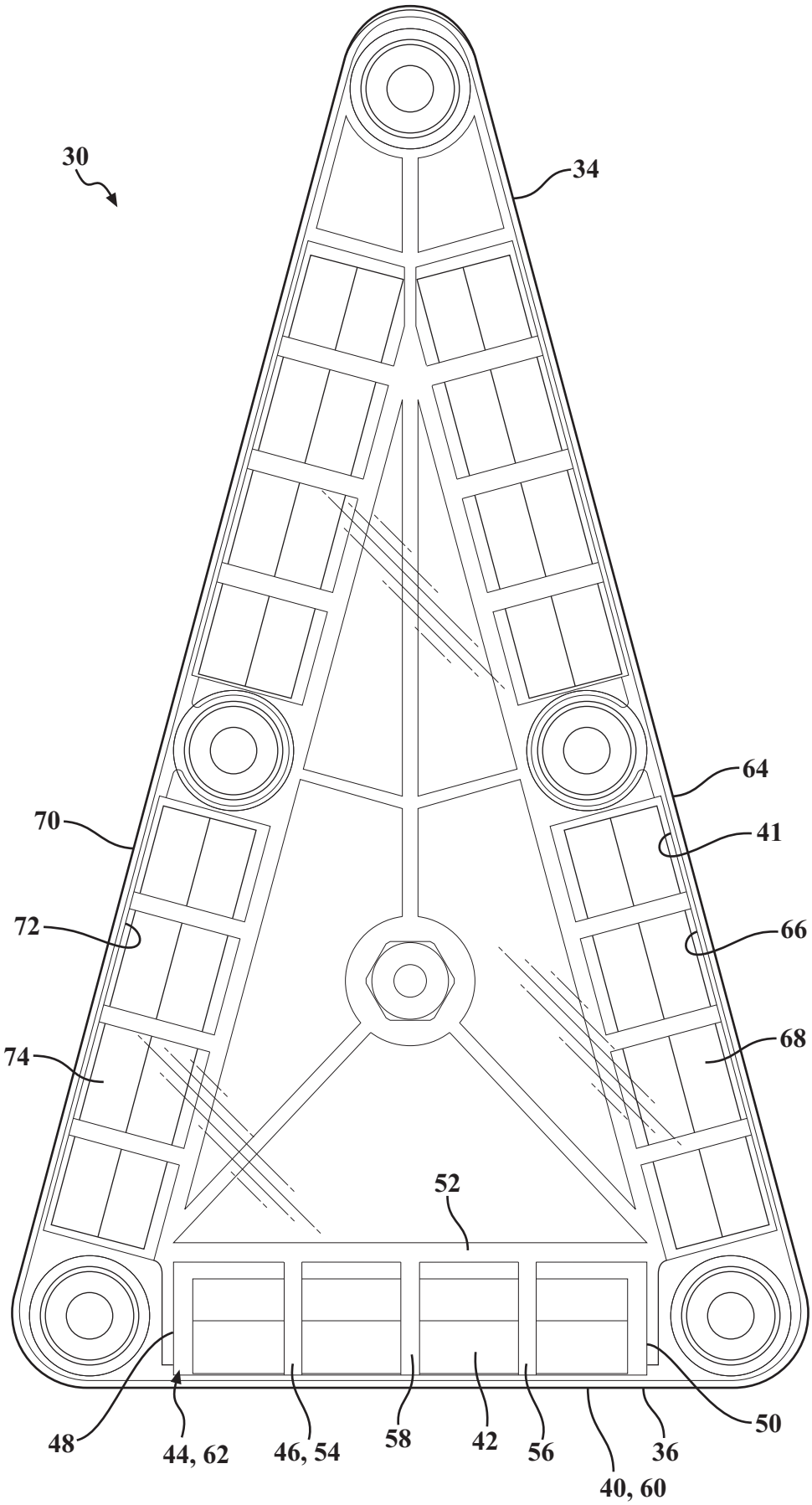

FIG. 4

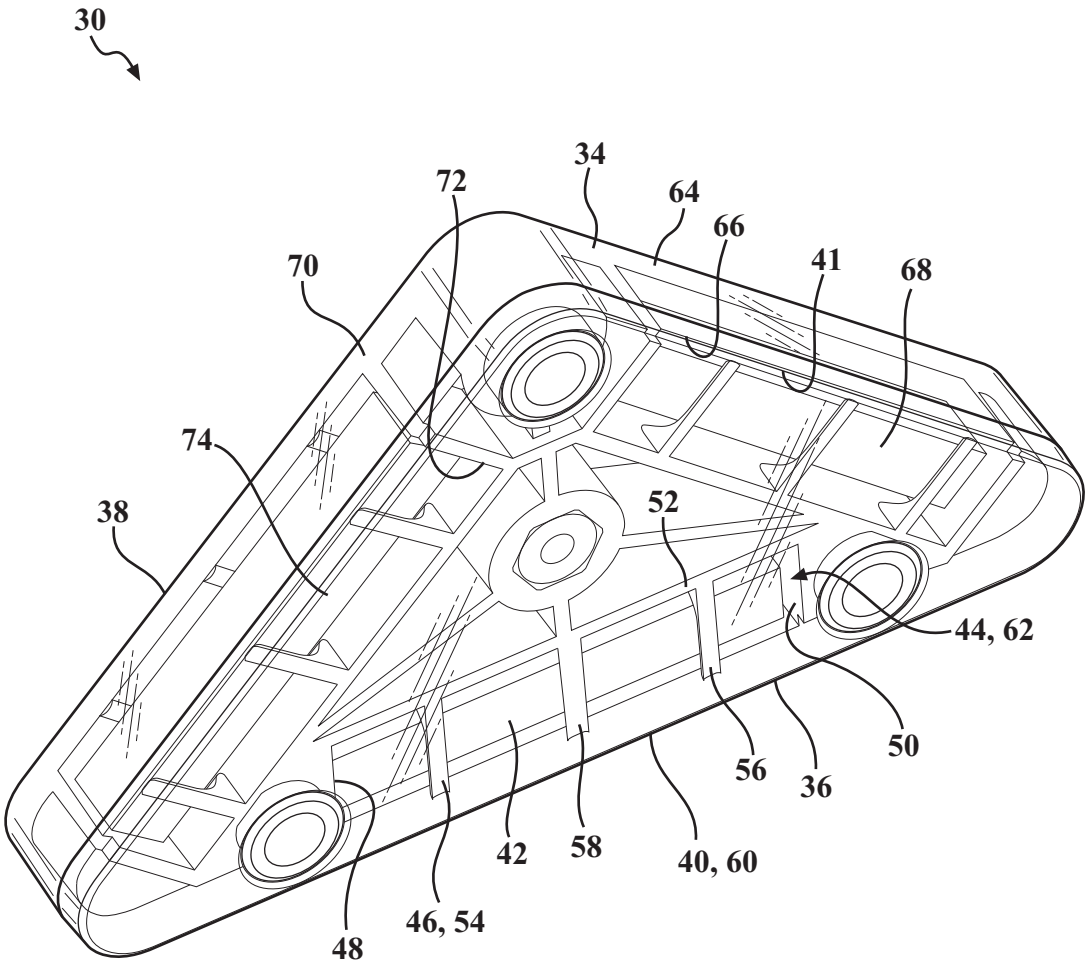

FIG. 5

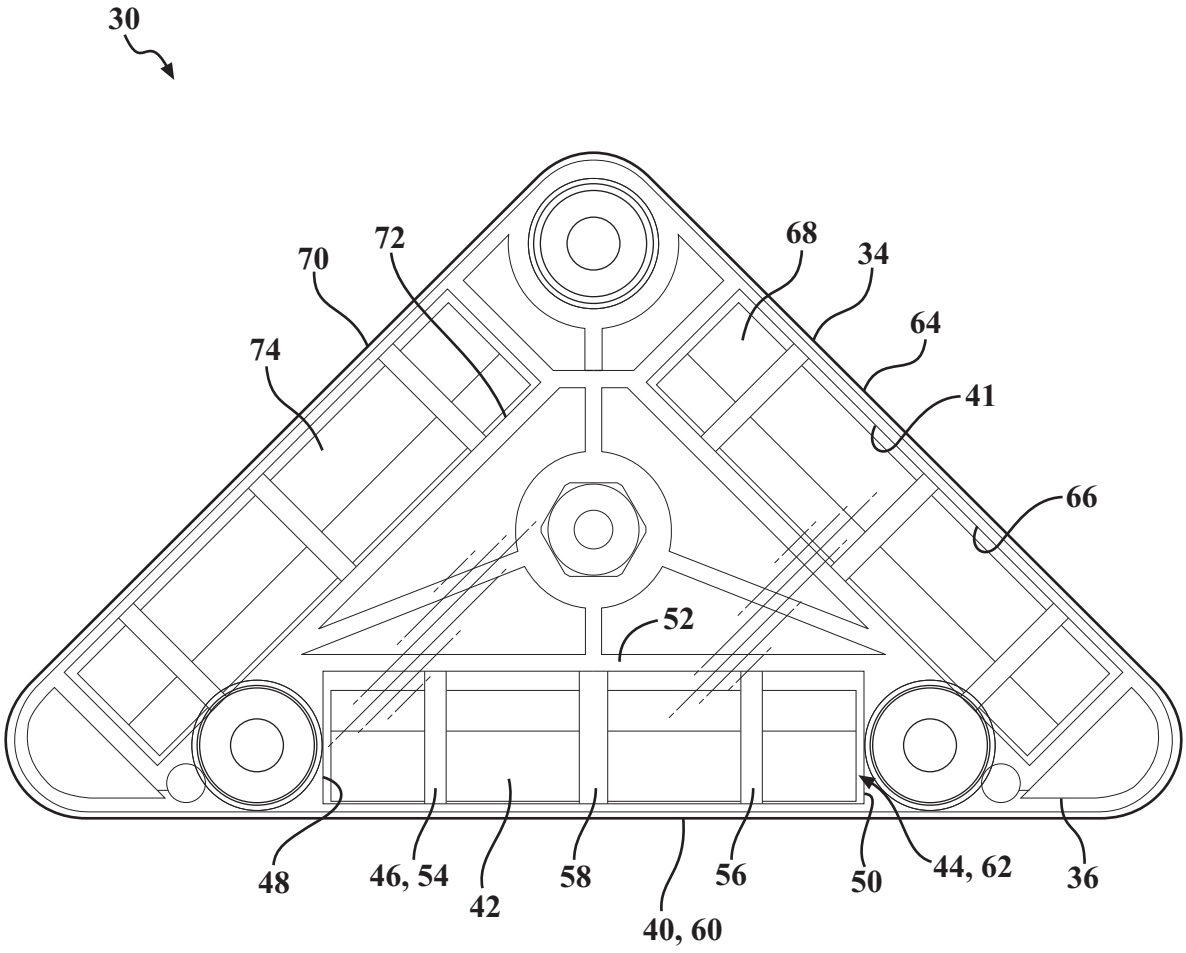

FIG. 6

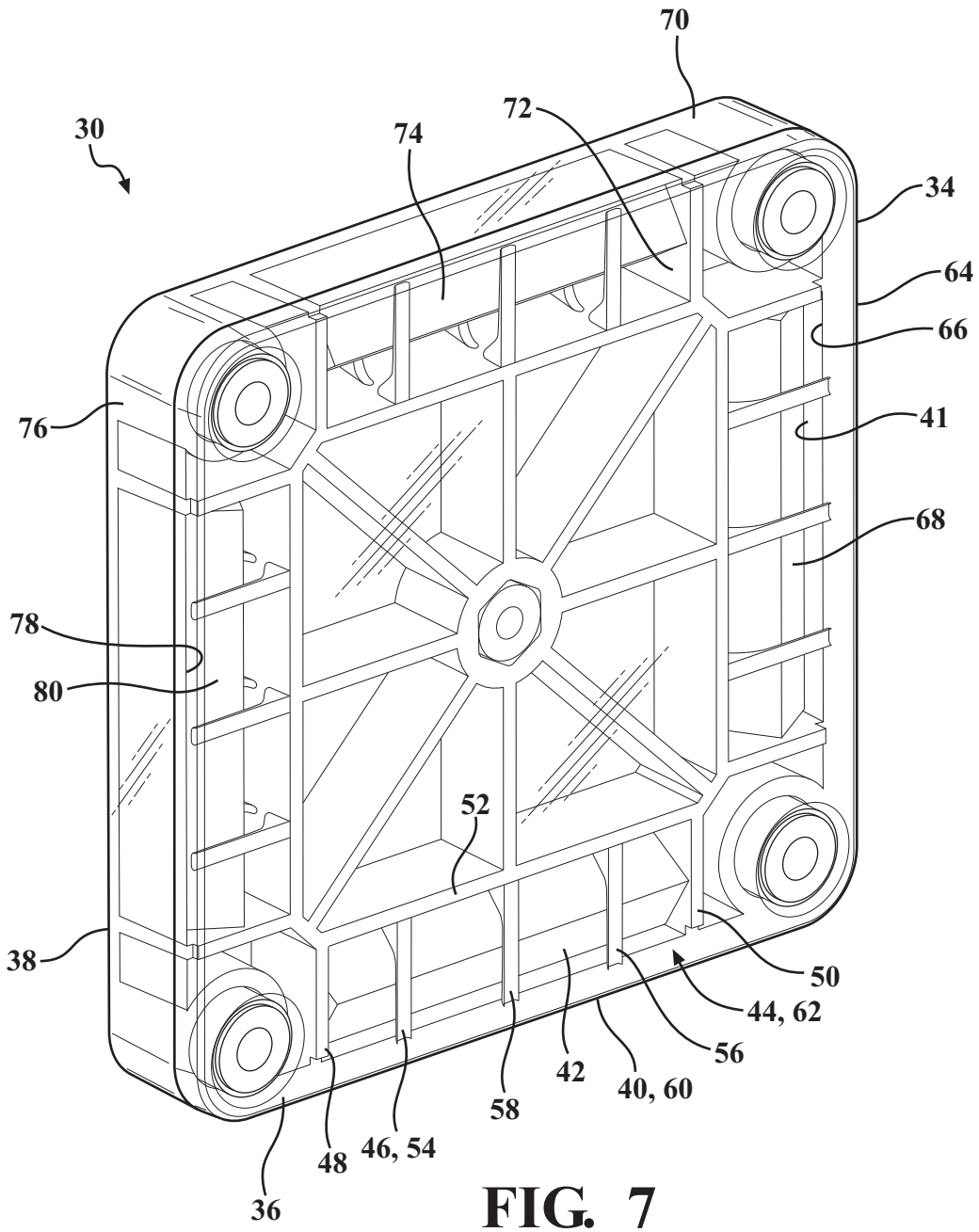
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FIG. 7

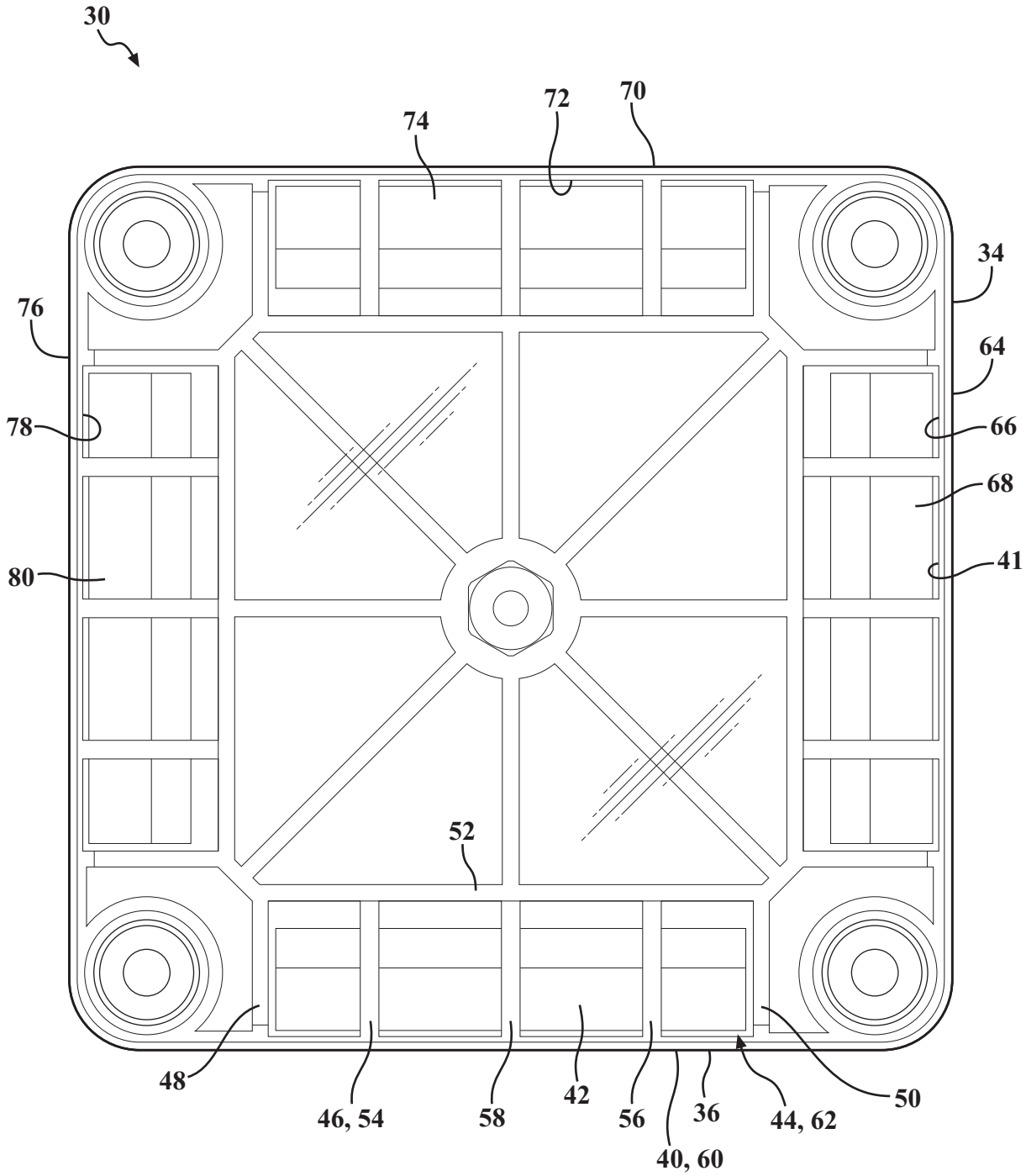
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FIG. 8

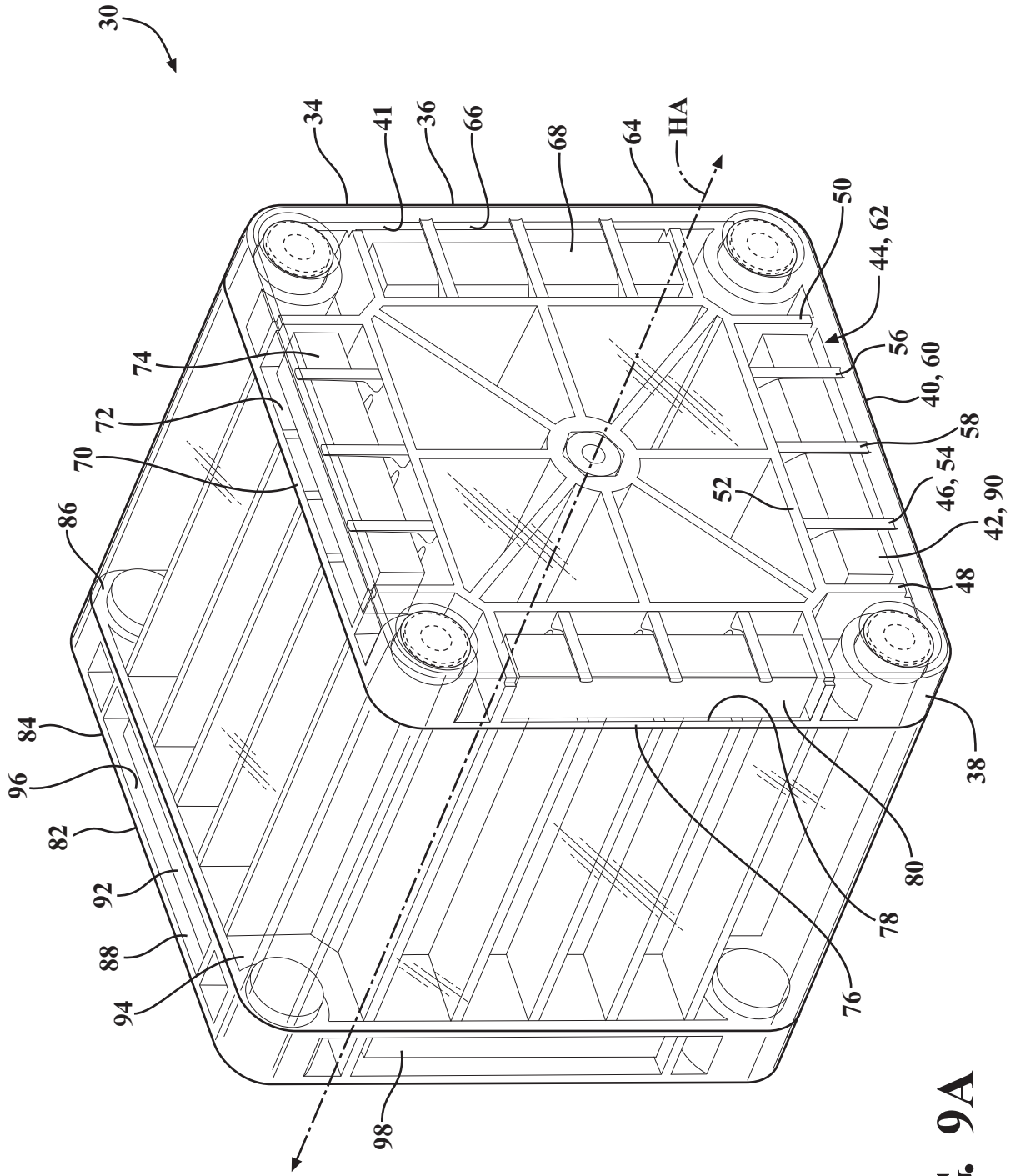
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FIG. 9A

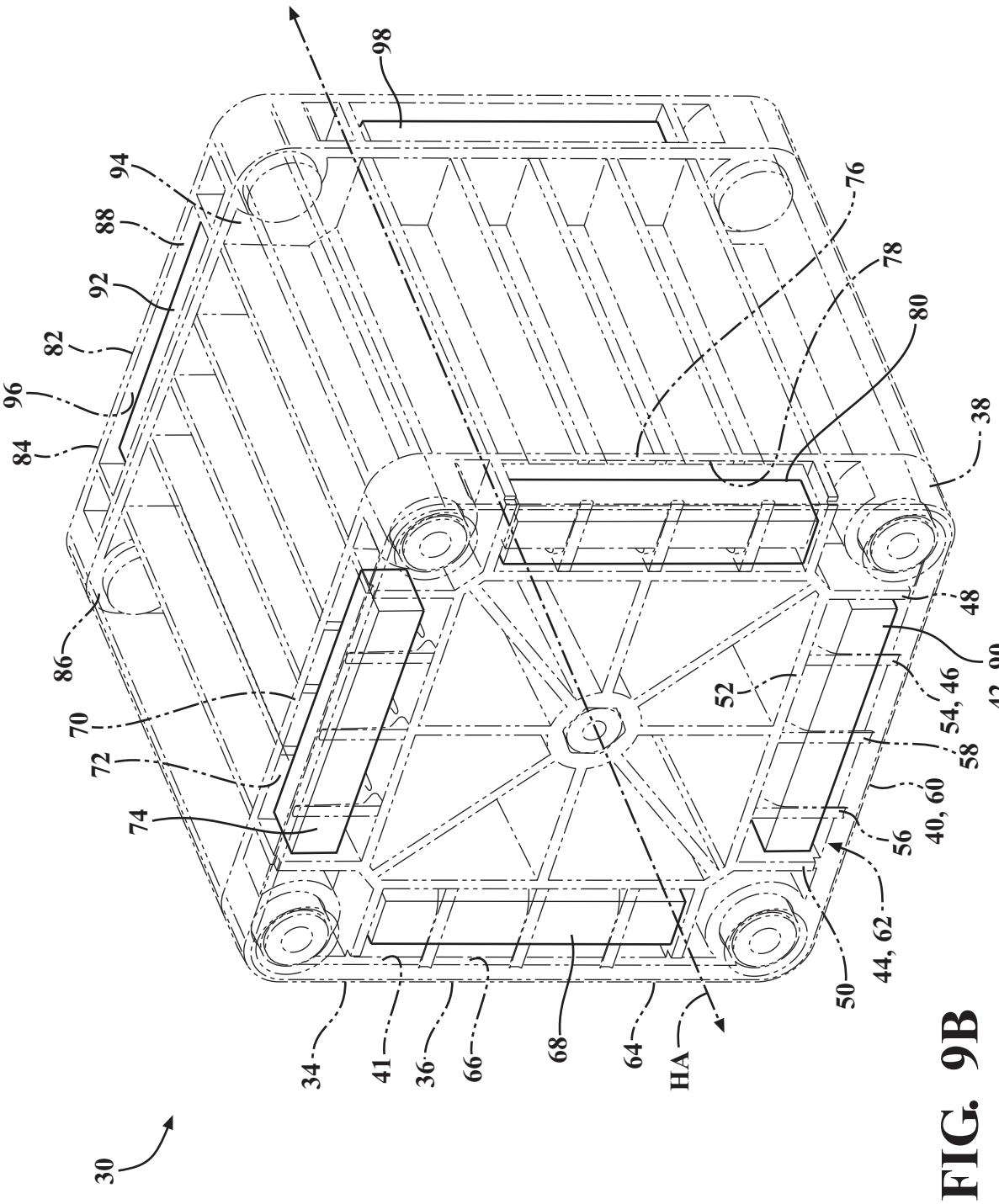
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FIG. 9B

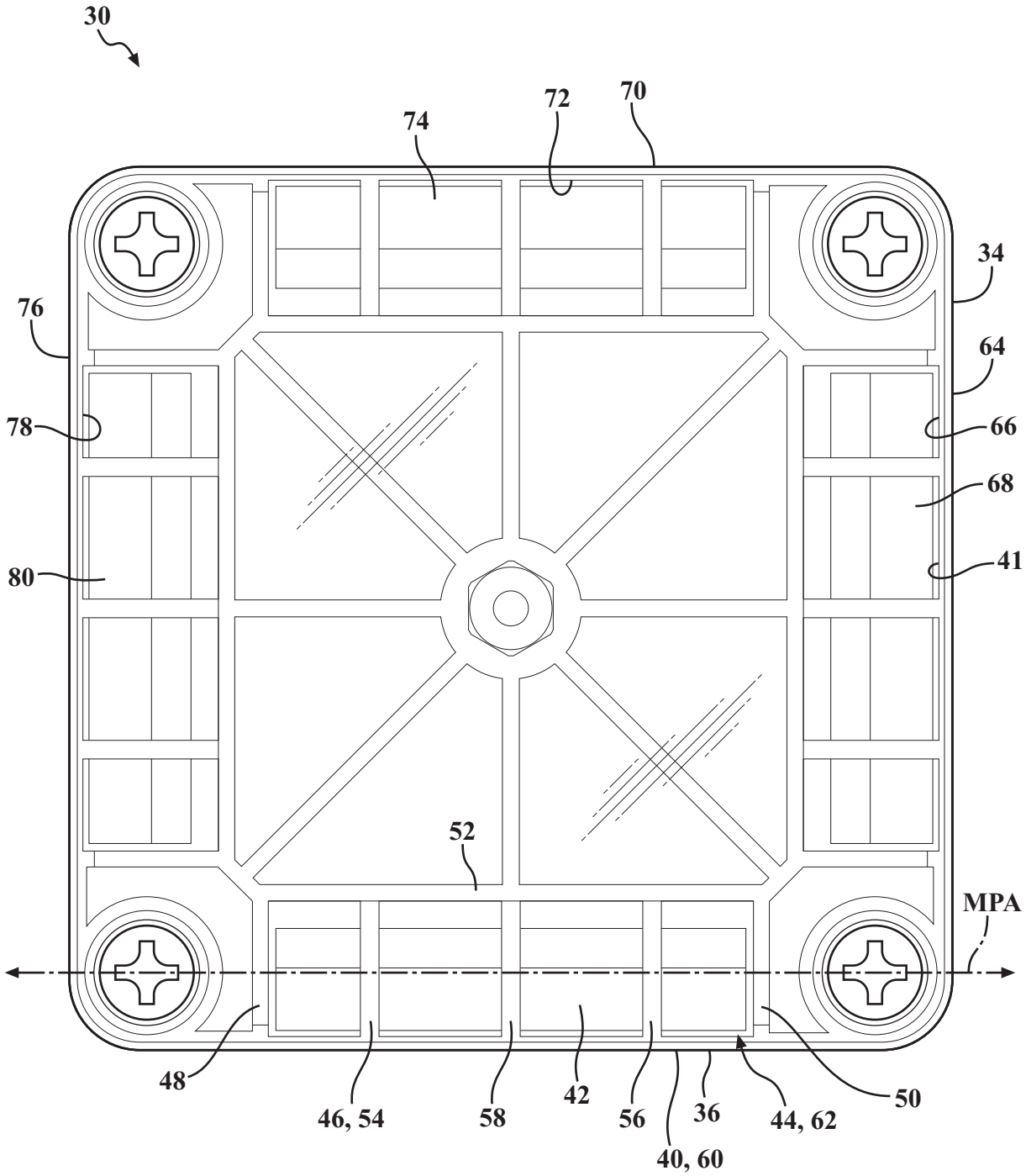
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FIG. 10

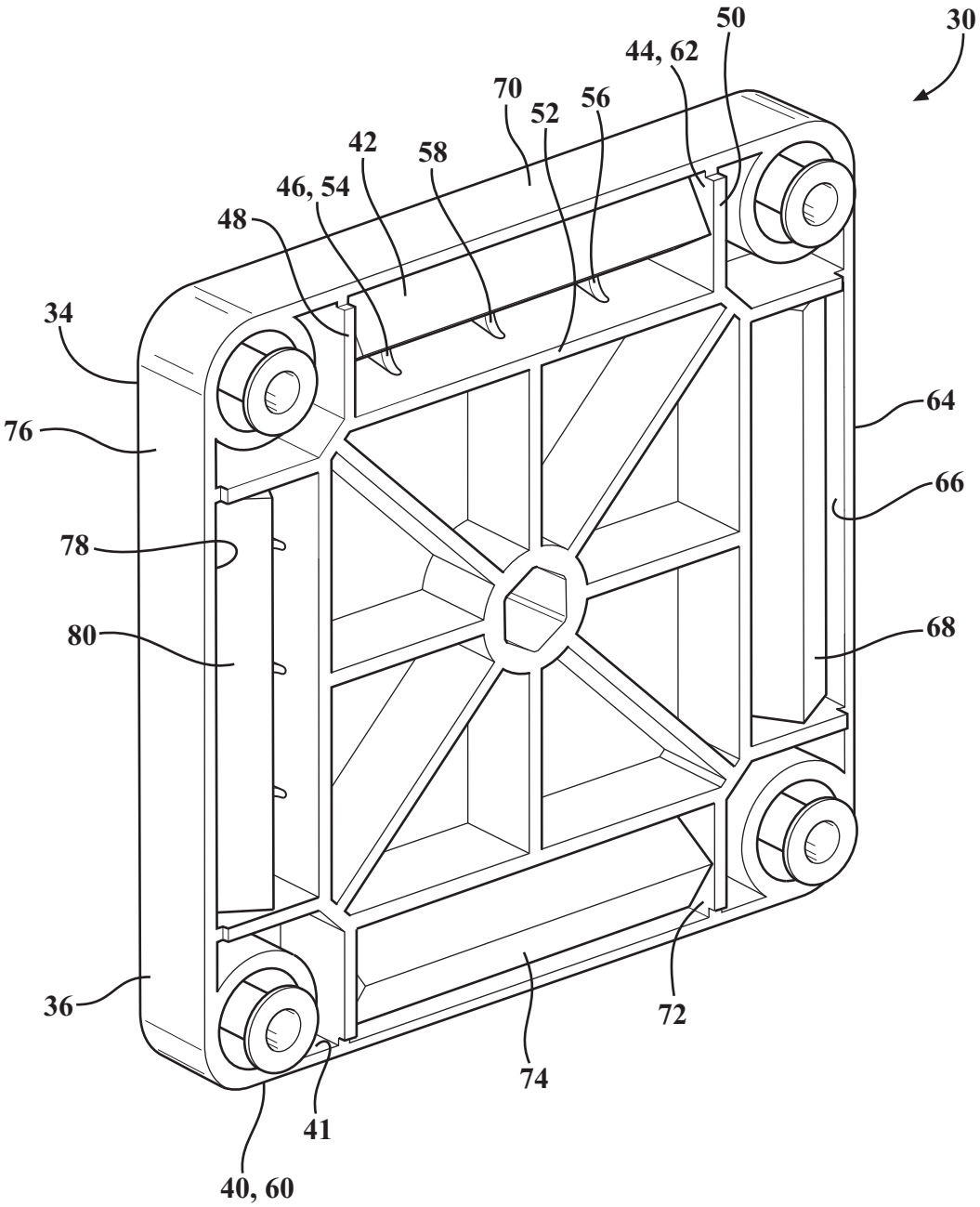
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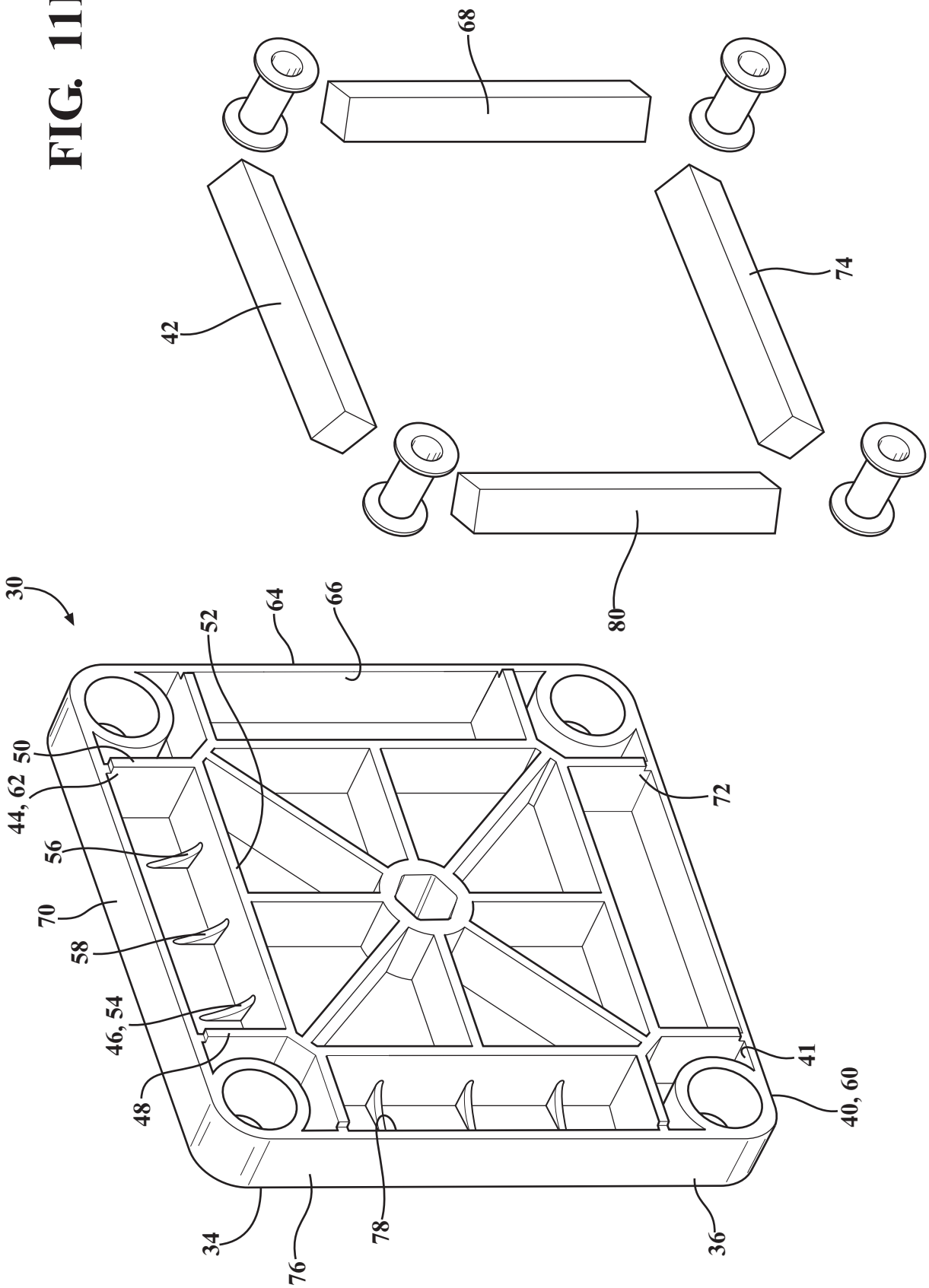
FIG. 11A

FIG. 11B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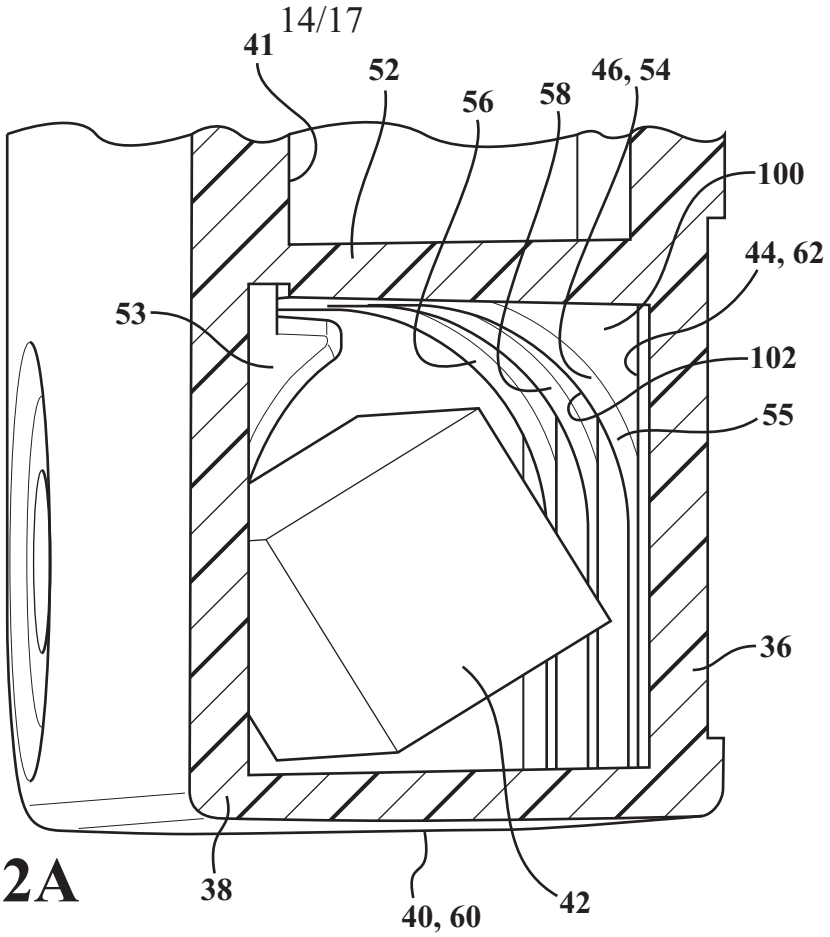


FIG. 12A

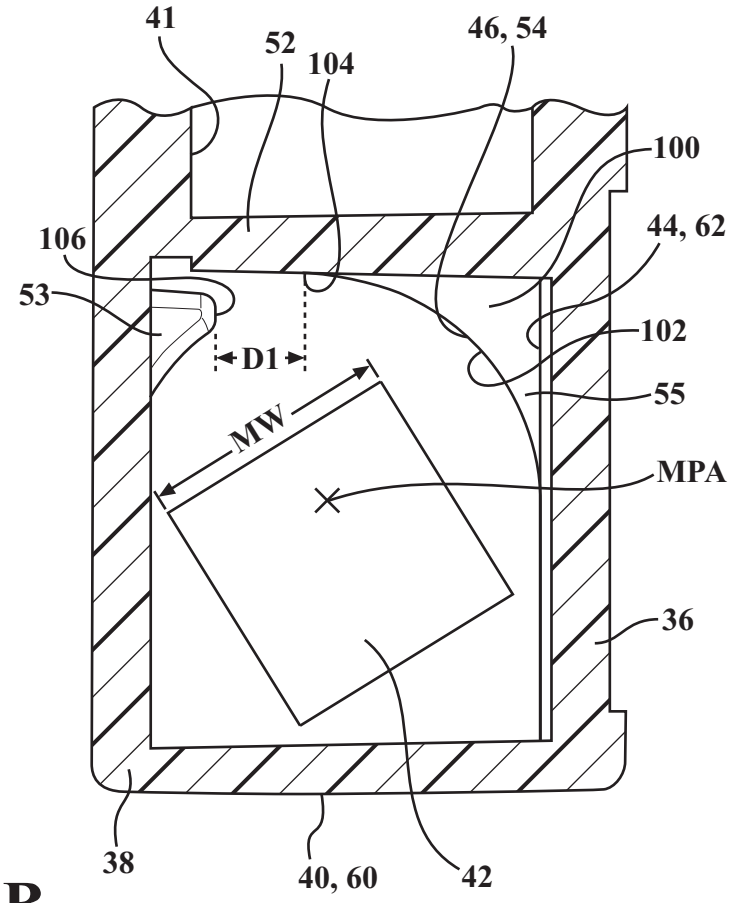


FIG. 12B

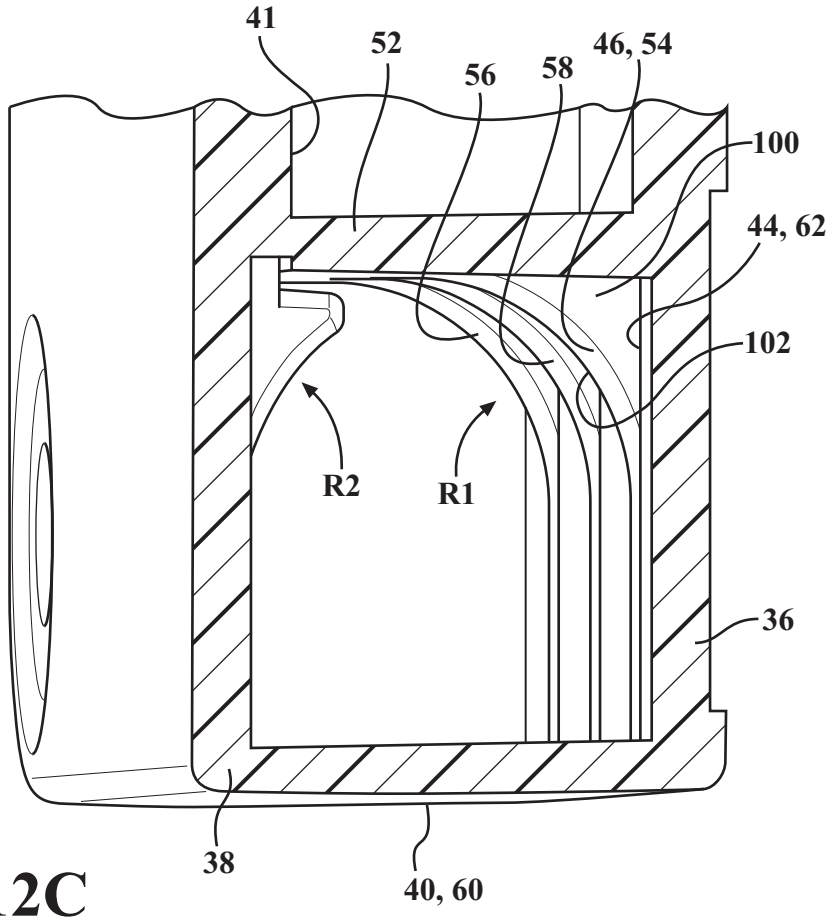


FIG. 12C

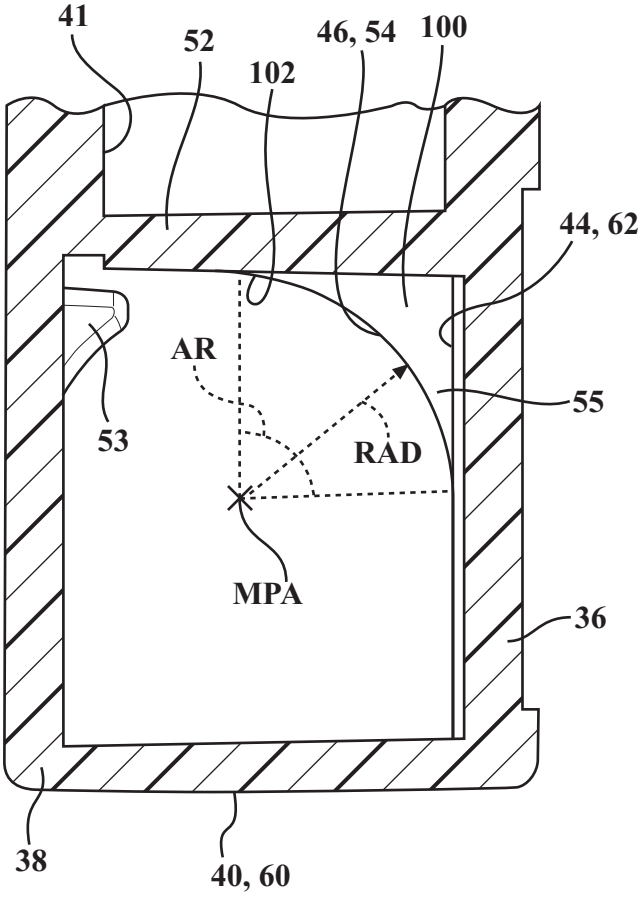


FIG. 12D

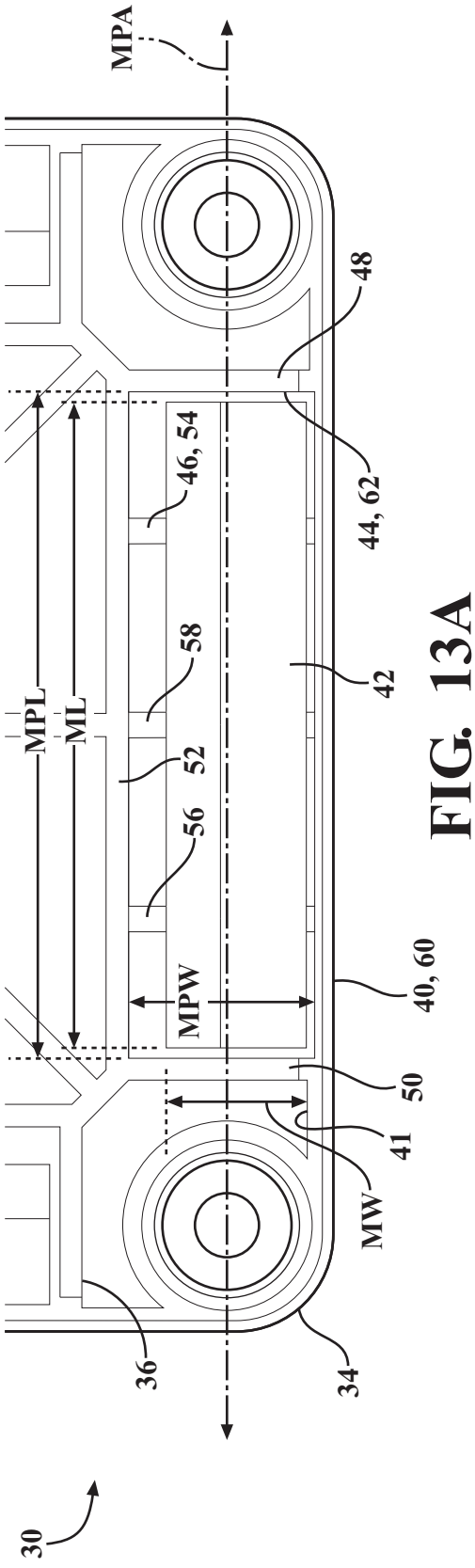


FIG. 13A

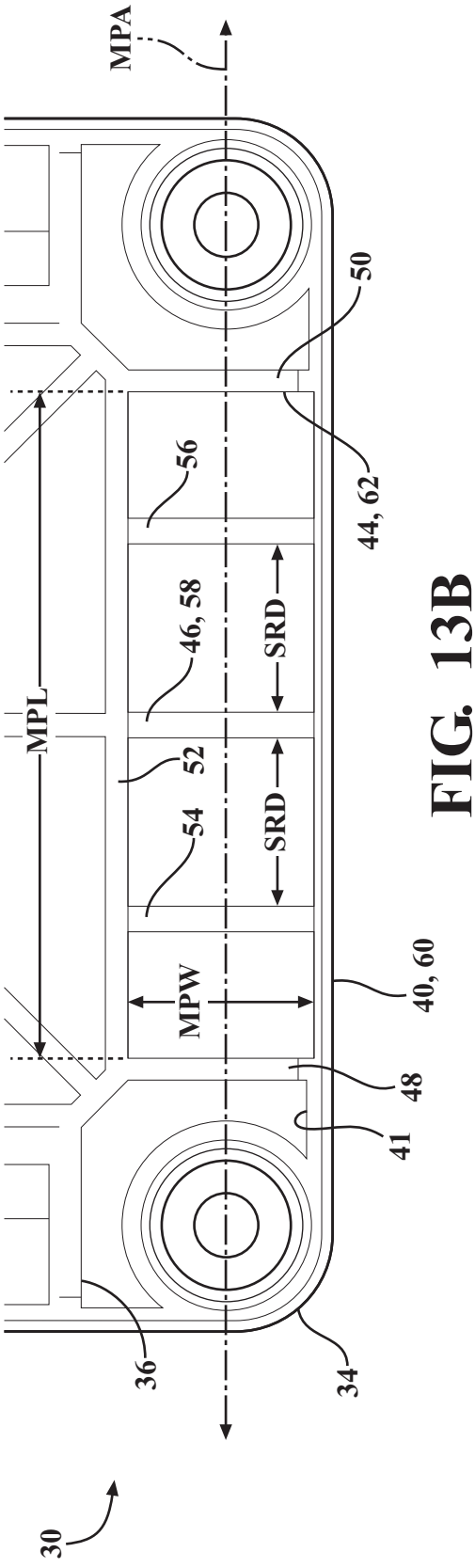
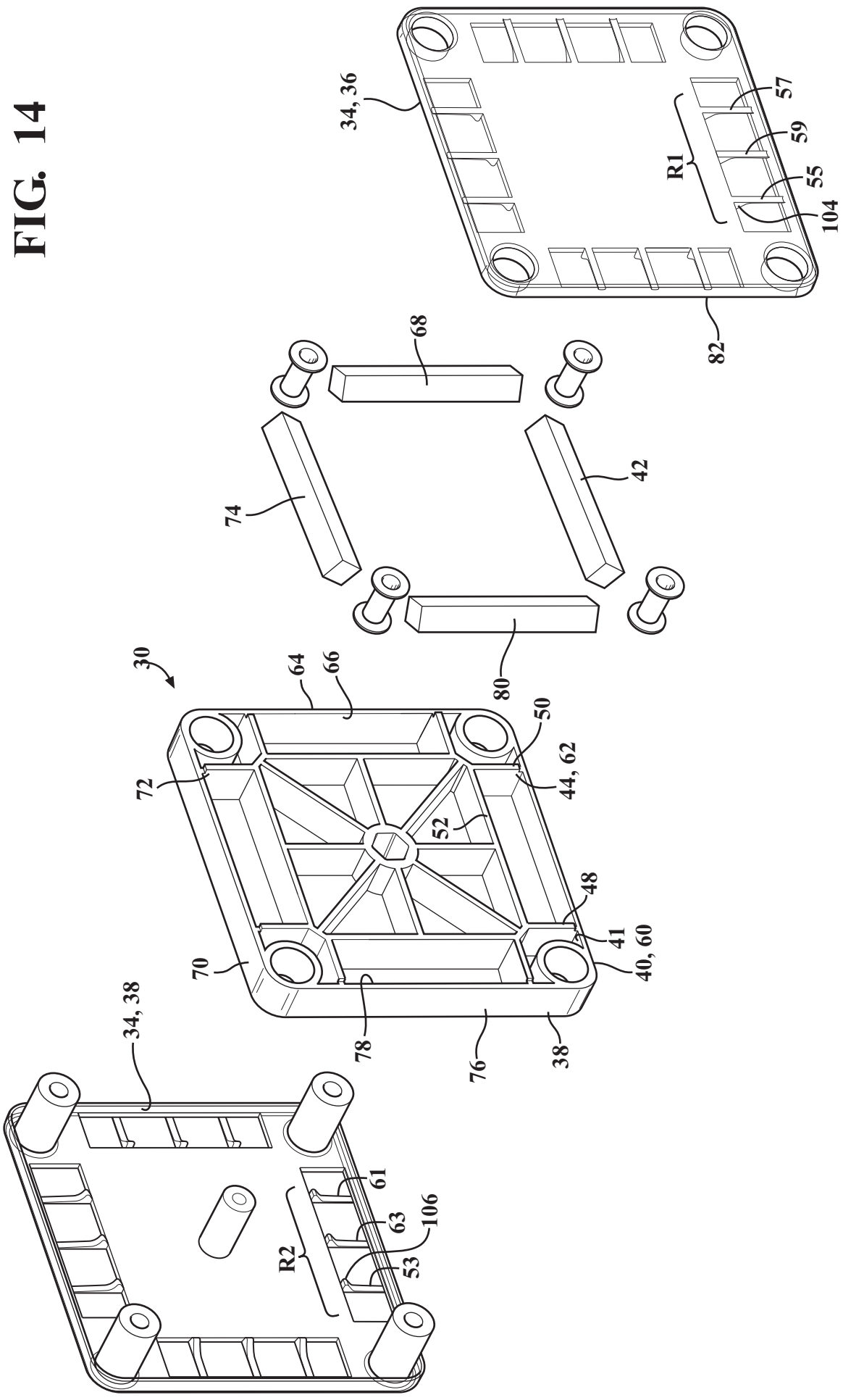


FIG. 13B

FIG. 14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