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(54) **COUPLING BUILDING ELEMENT FOR A TOY CONSTRUCTION SET**

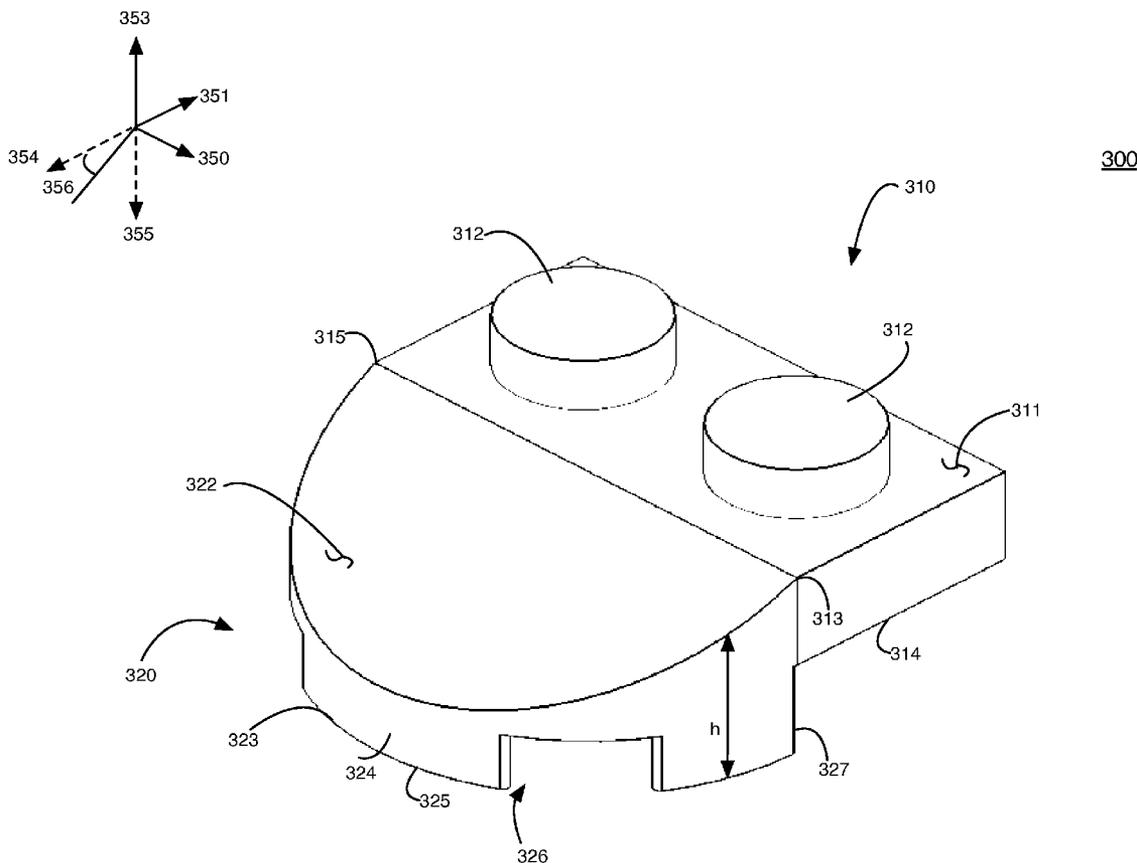
(57) **ABSTRACT**

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A toy construction set includes a first coupling building element defining a surface and a tapered portion that extends from the surface at an angle, the tapered portion of the first coupling building element defining a coupling stud; and a second coupling building element defining a surface and a tapered portion that extends from the surface at an angle, the tapered portion of the second coupling building element defining a recess for receiving the coupling stud. The tapered portions of the first and second coupling building elements are configured to be removably attached to each other by receiving the coupling stud of the first coupling building element in the recess of the second coupling building element, and the surfaces of the first and second coupling building elements define a space configured to hold a construction assembly.

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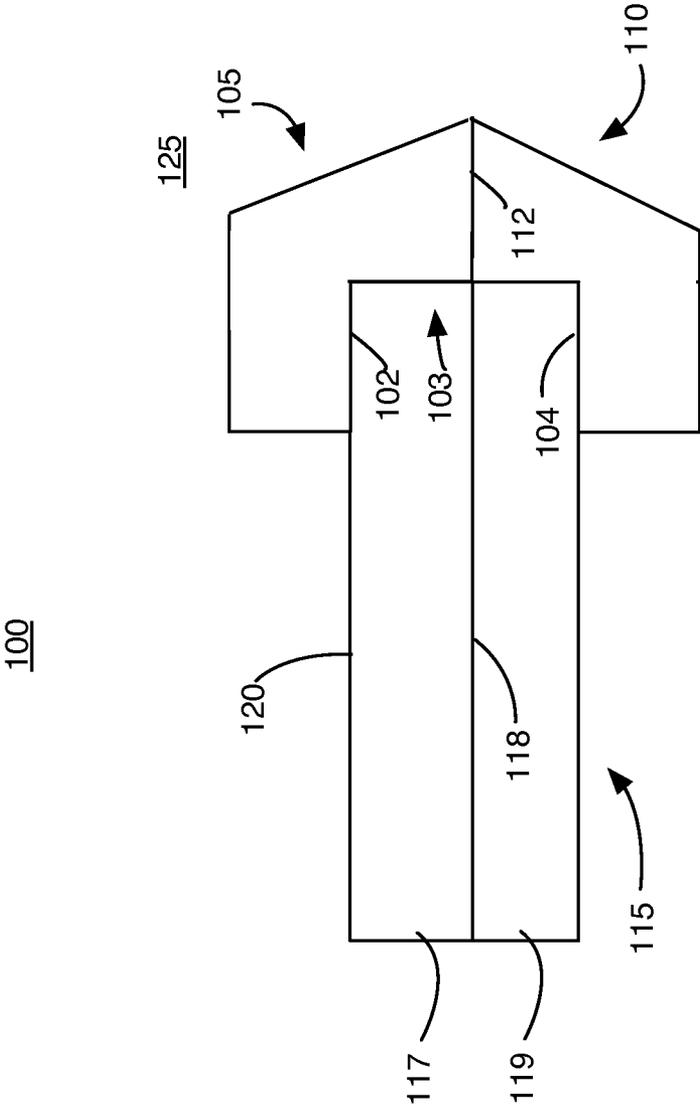


FIG. 1

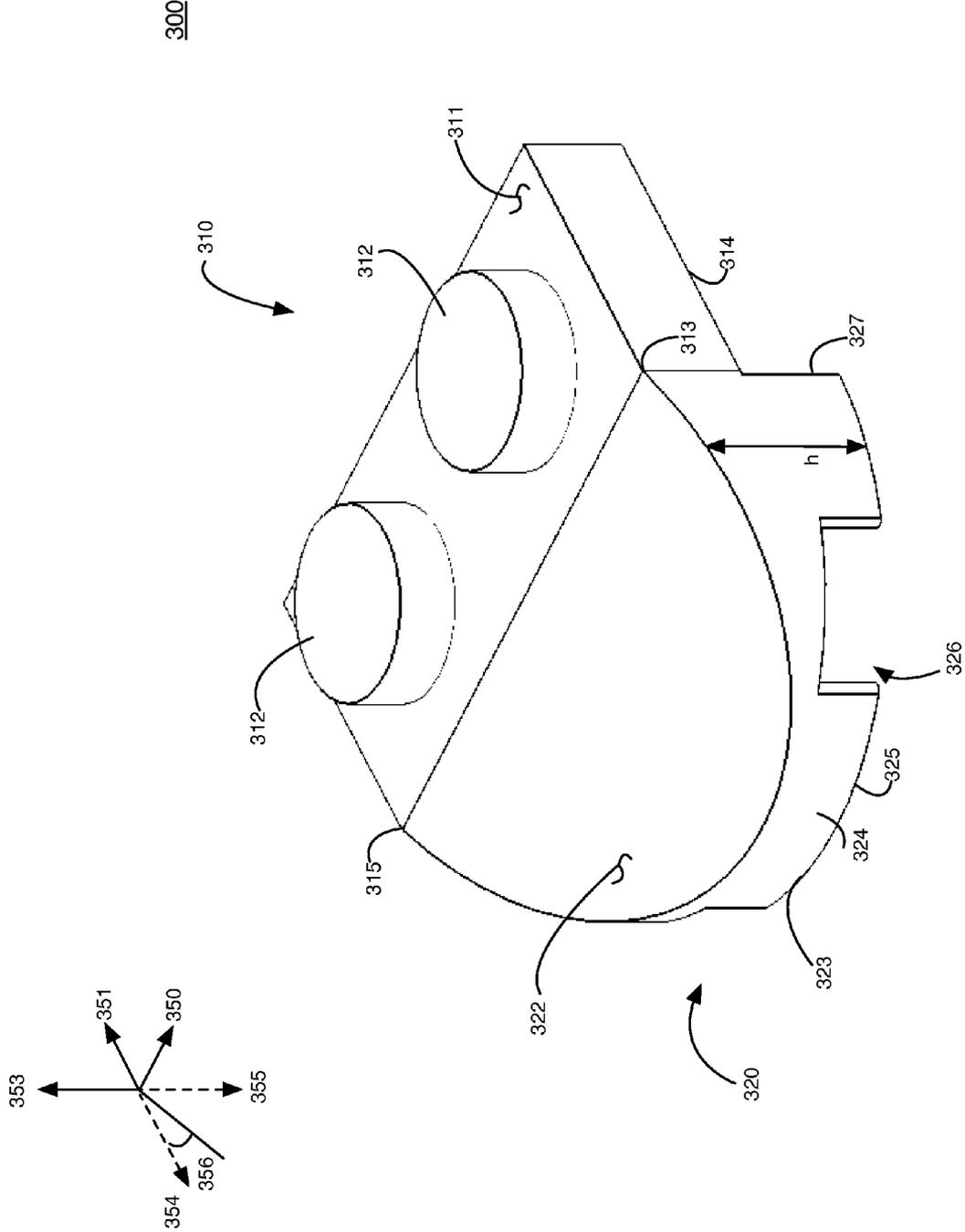


FIG. 3A

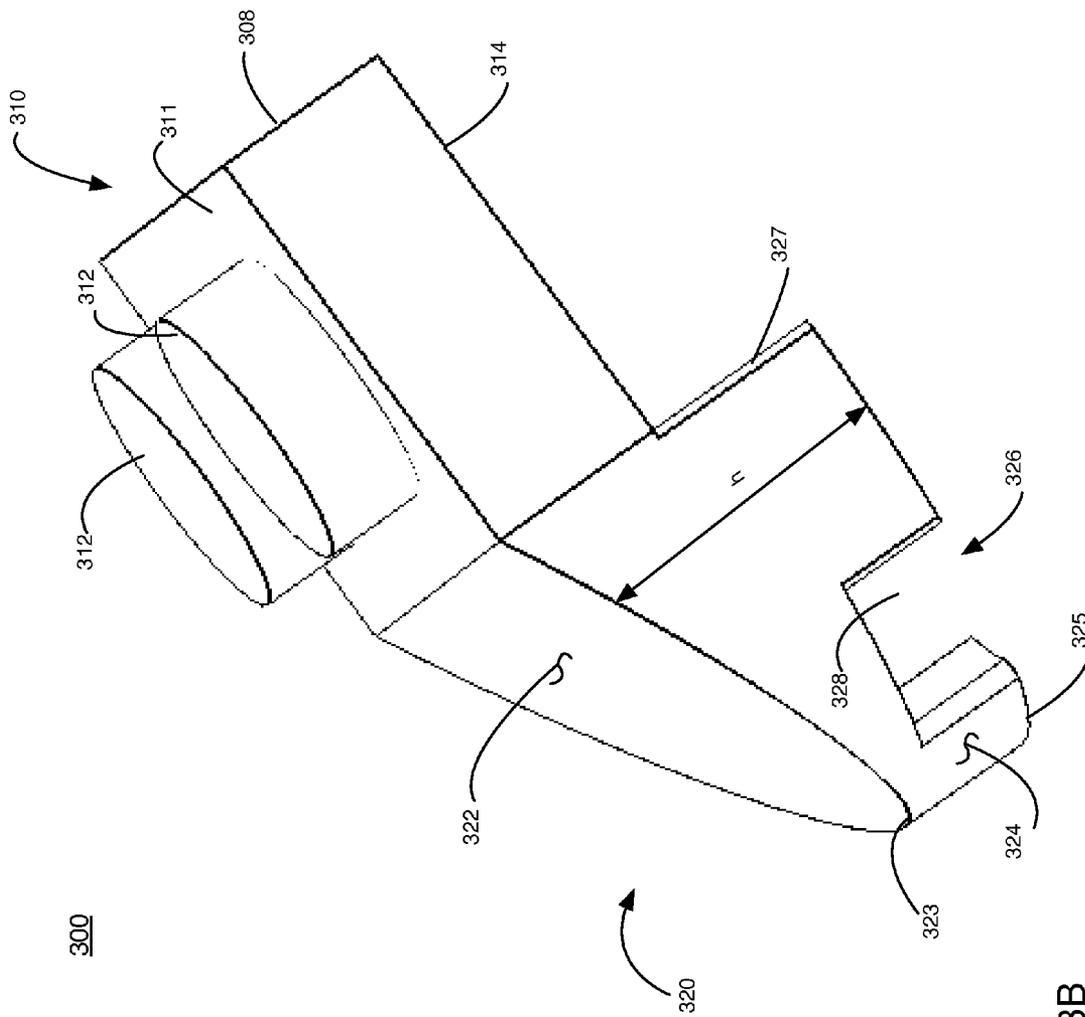


FIG. 3B

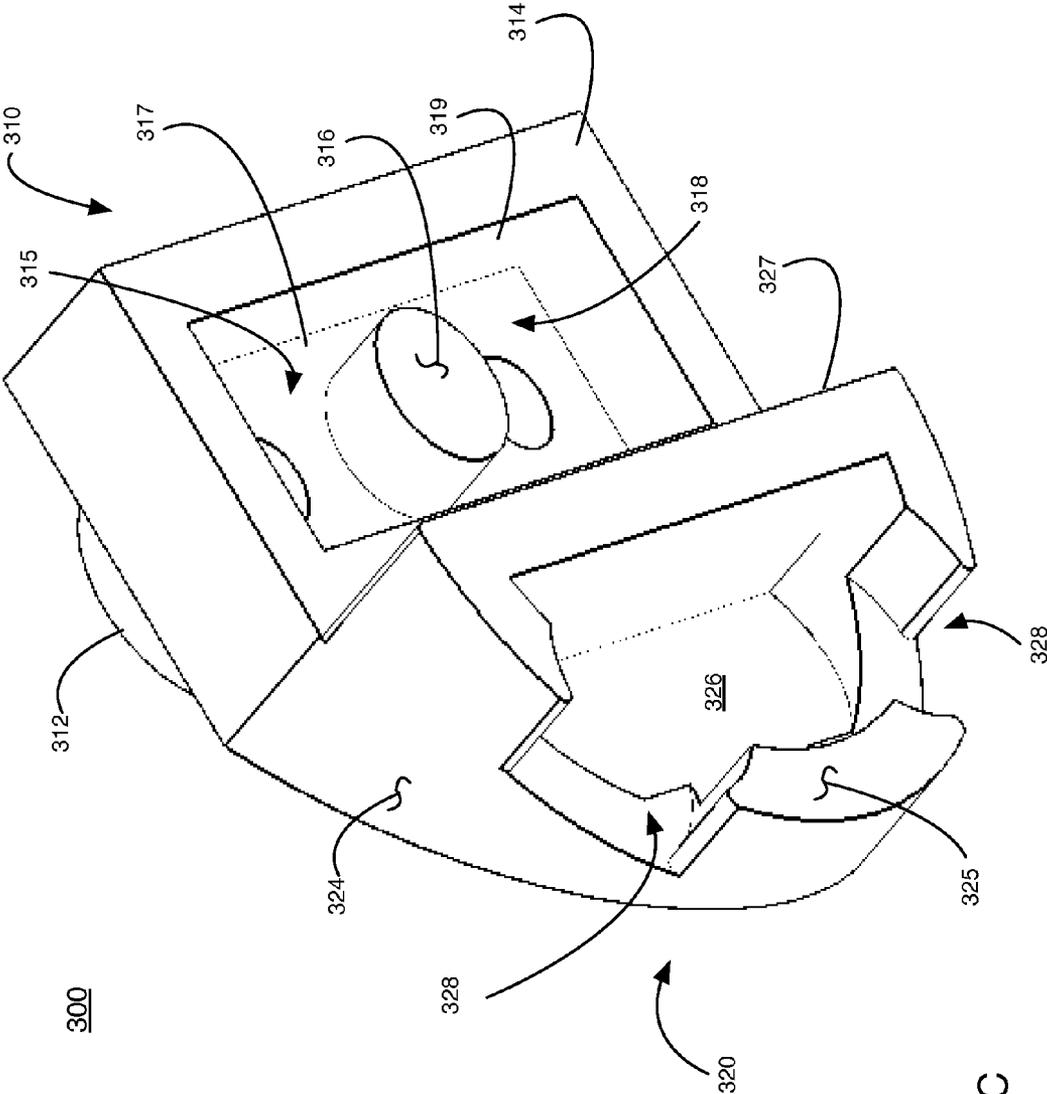


FIG. 3C

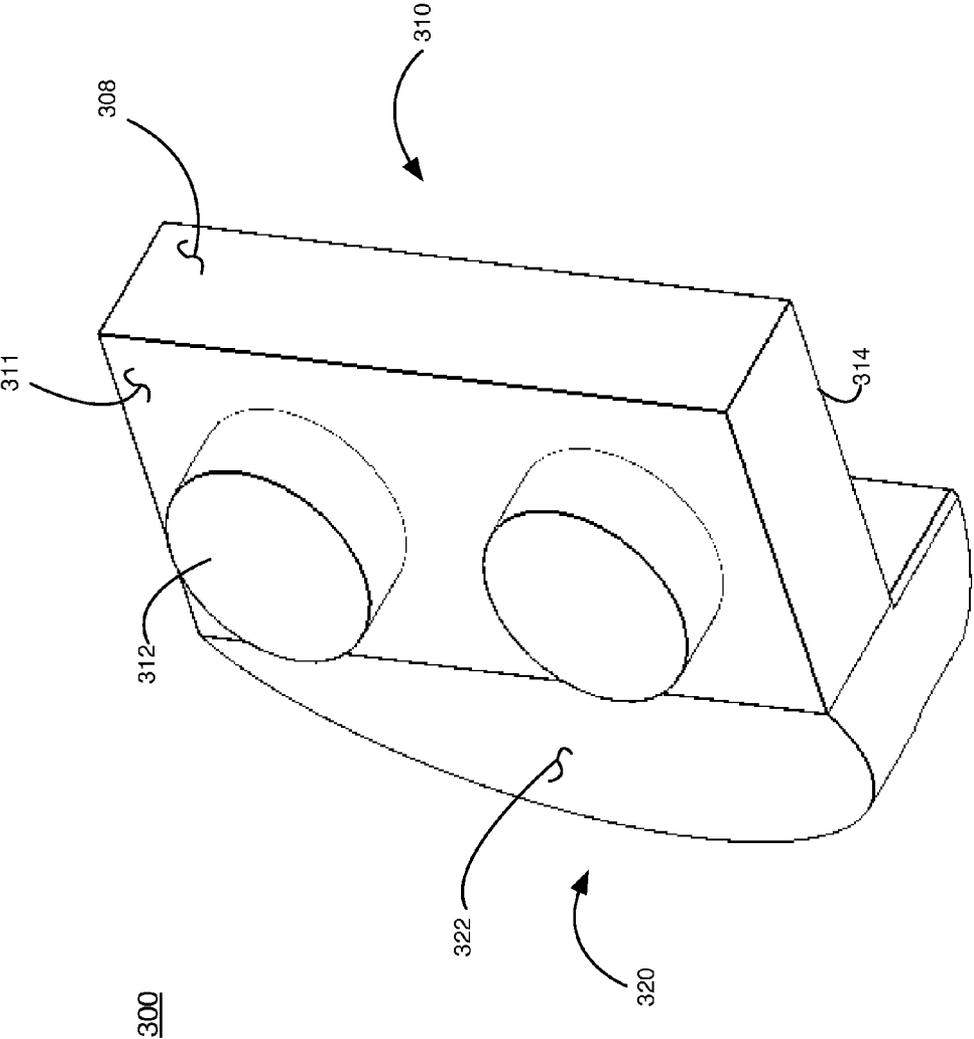


FIG. 3D

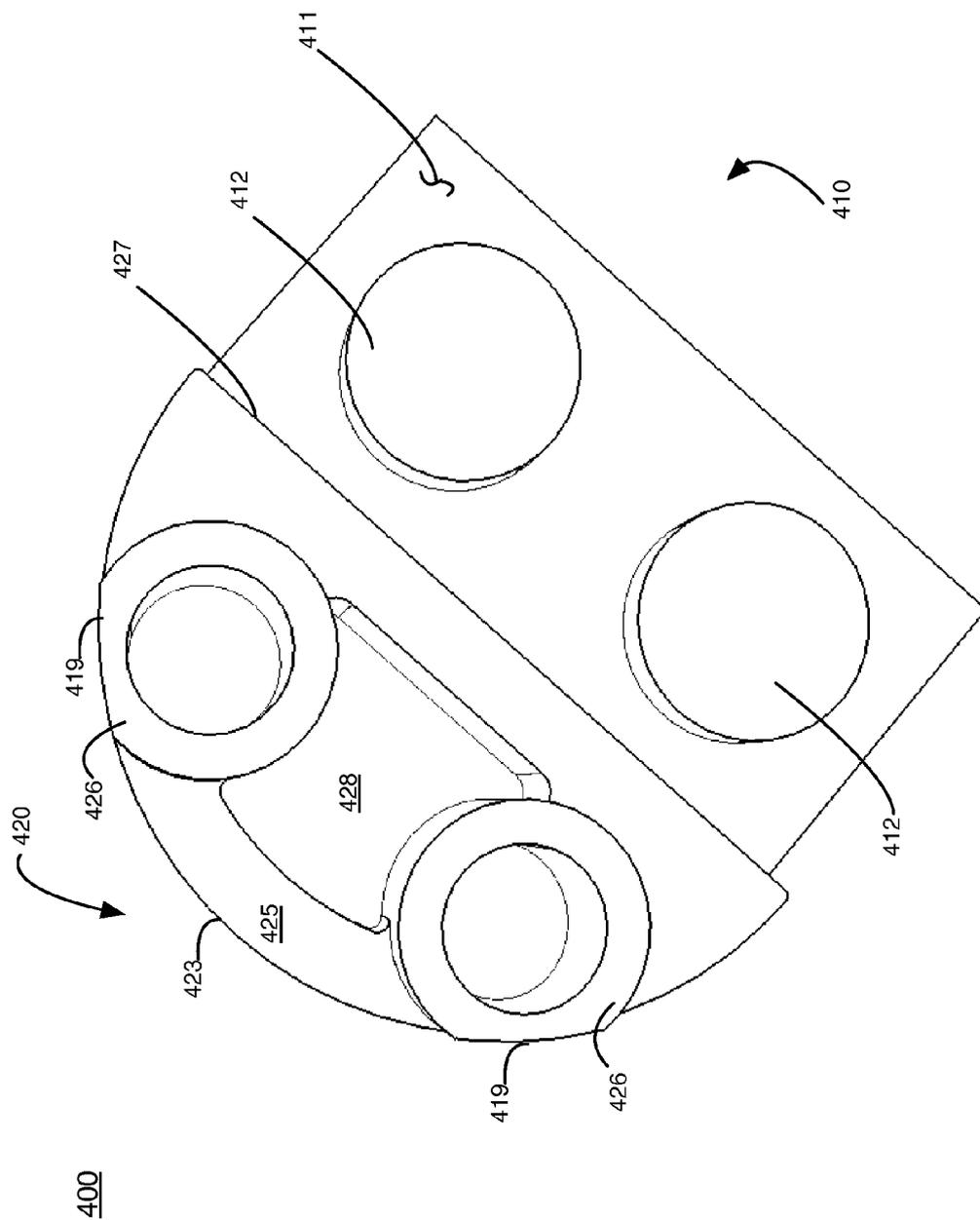


FIG. 4B

400

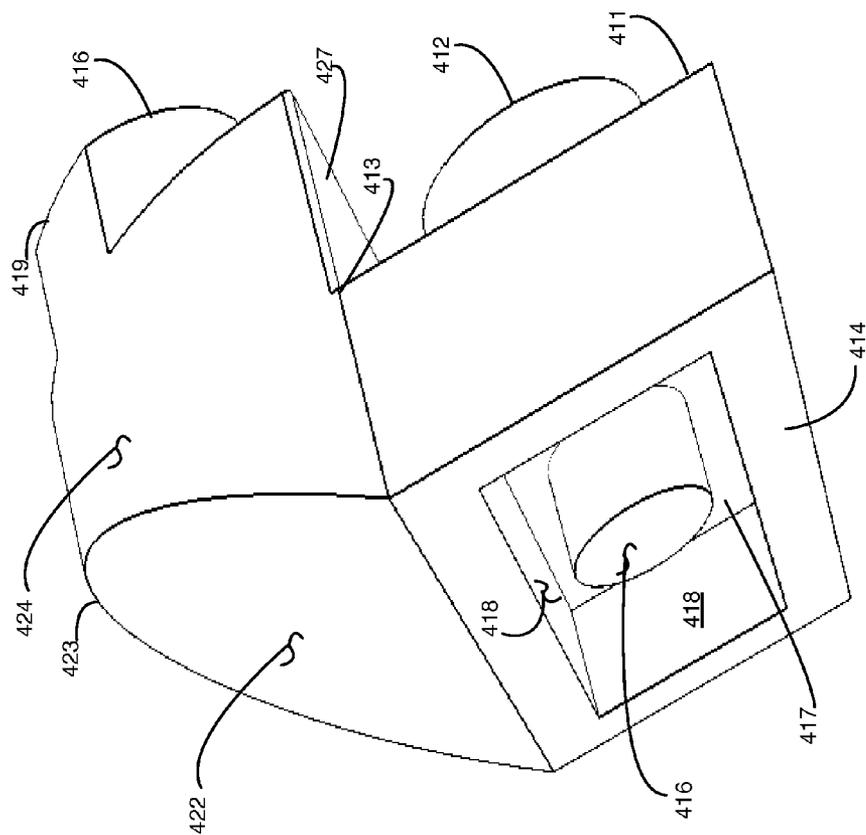


FIG. 4C

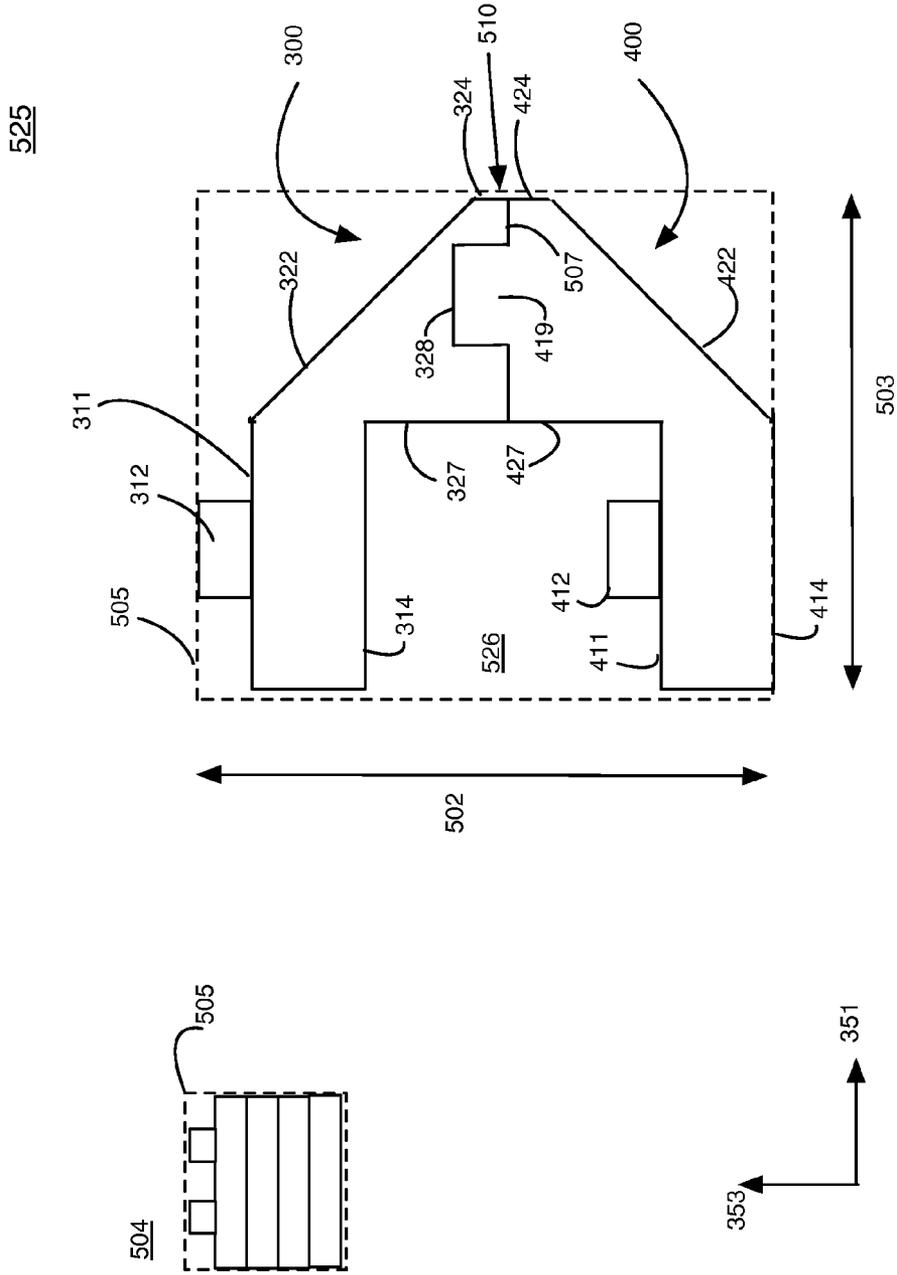


FIG. 5

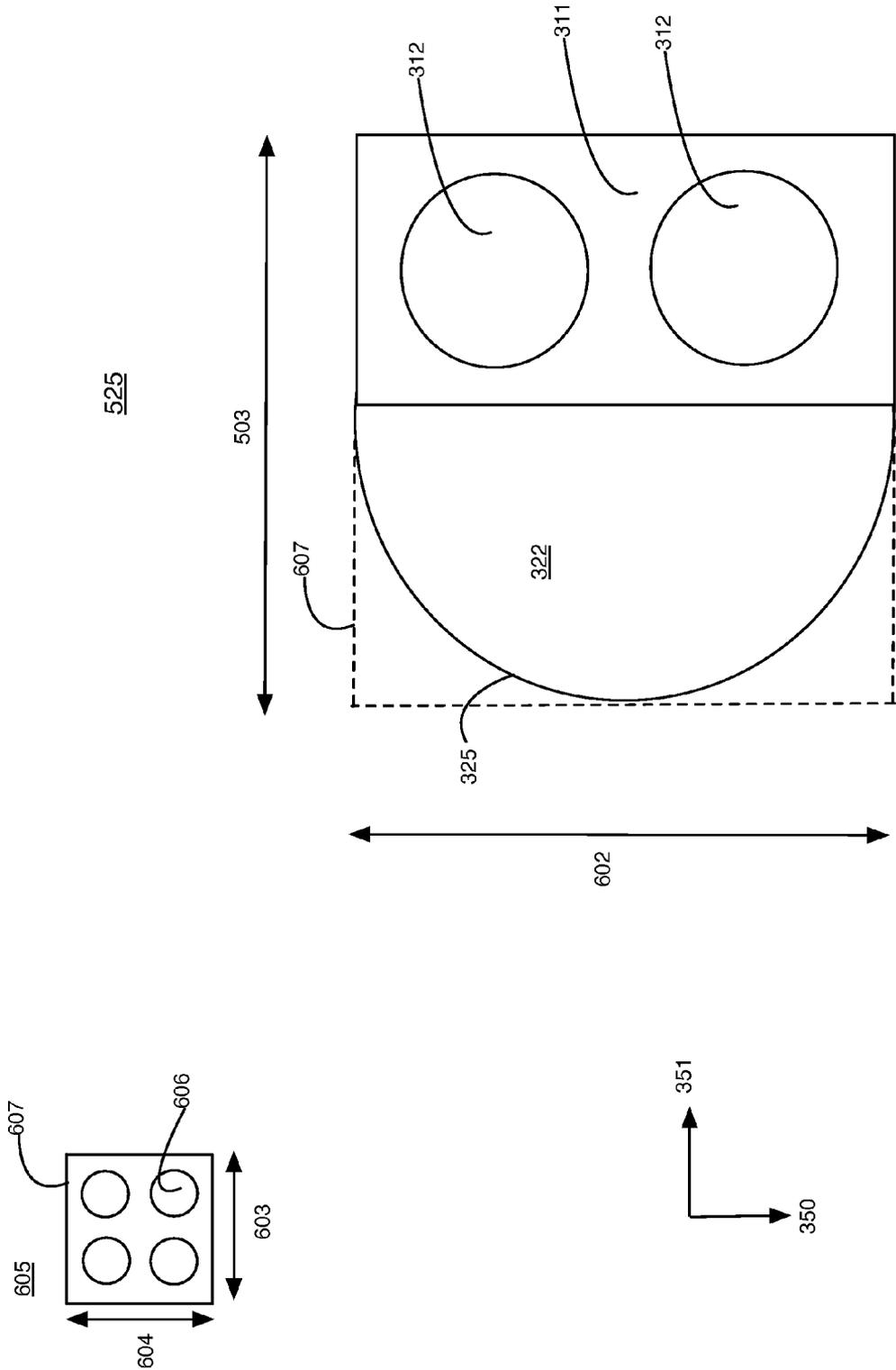


FIG. 6

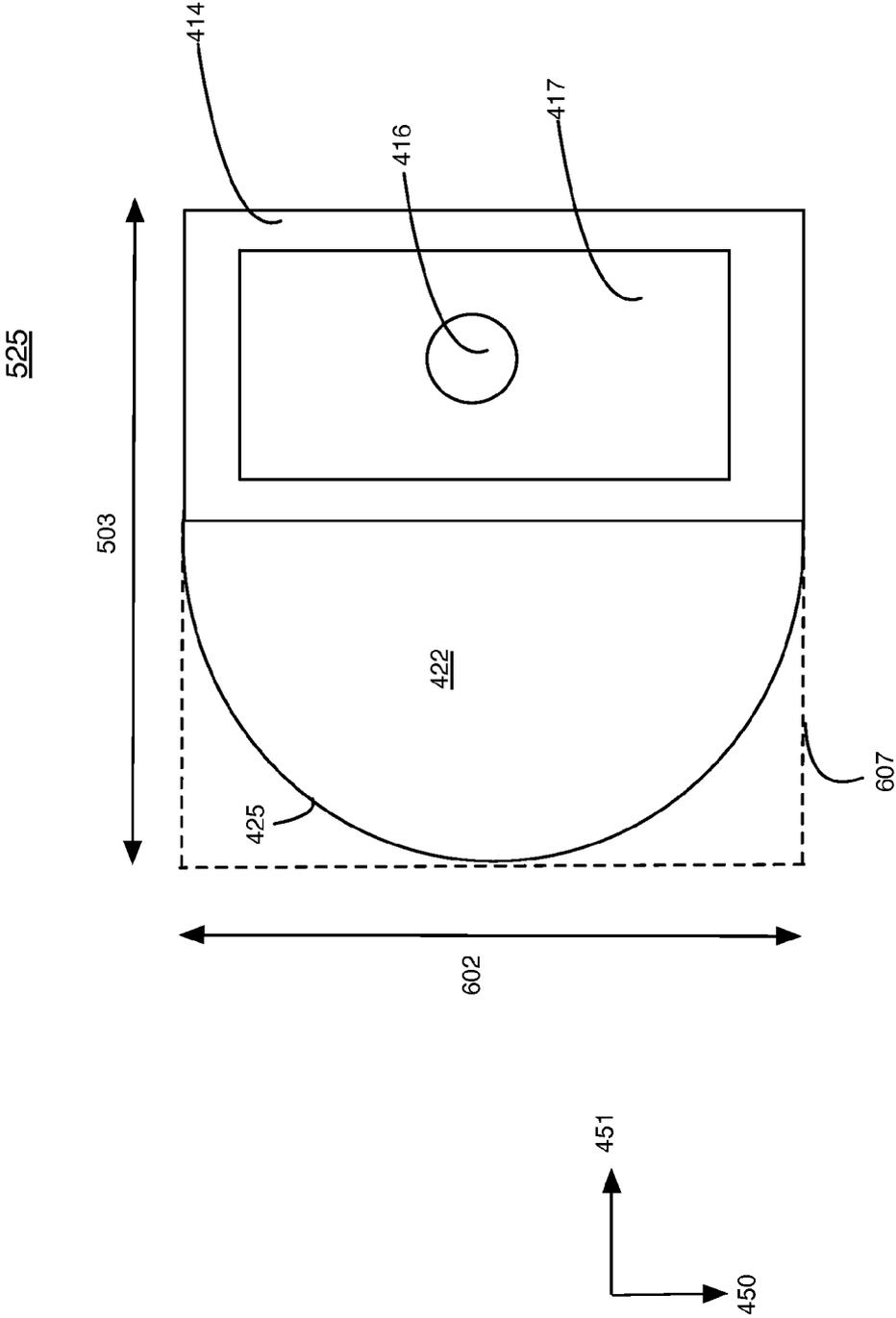


FIG. 7

800

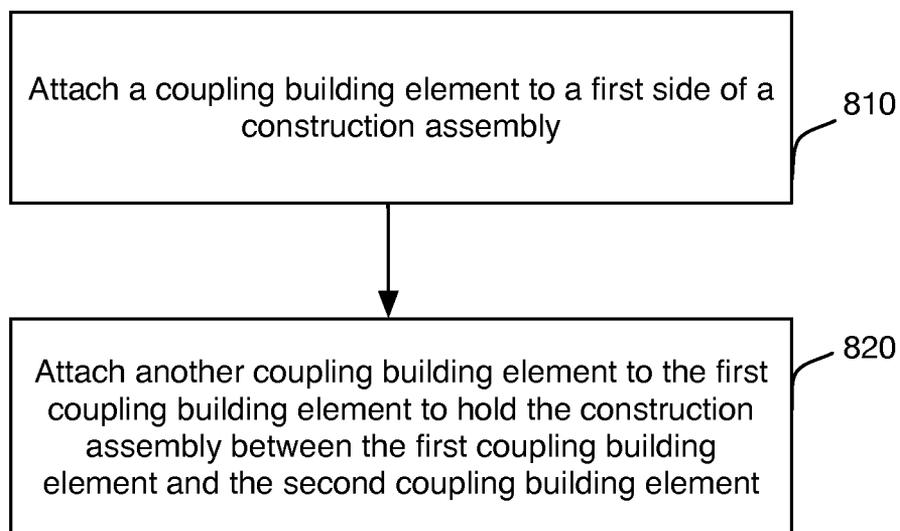


FIG. 8

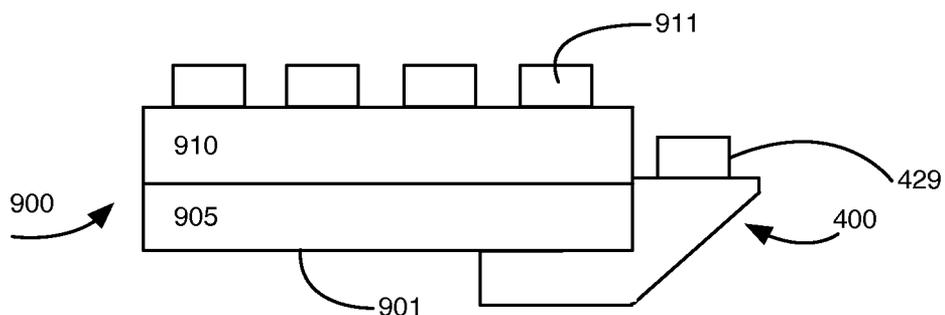


FIG. 9A

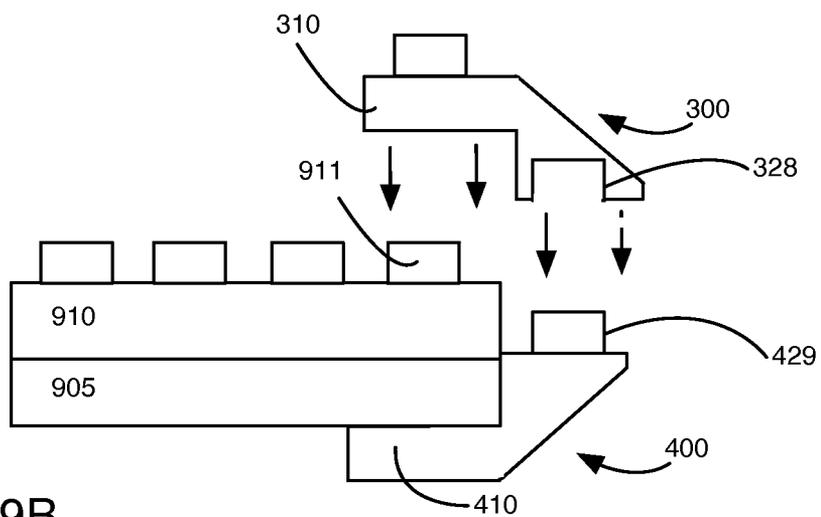


FIG. 9B

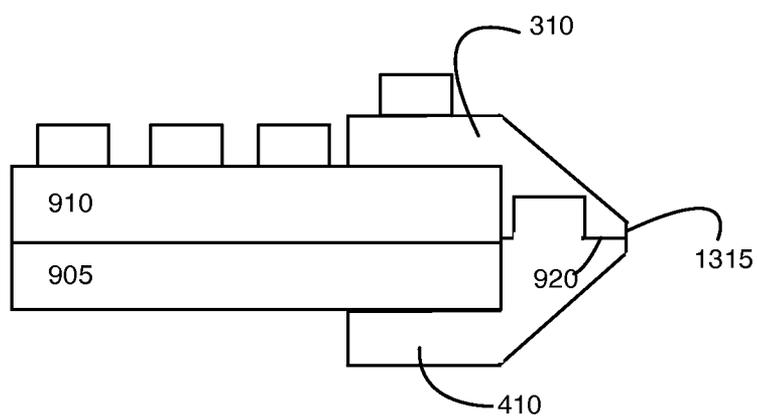


FIG. 9C

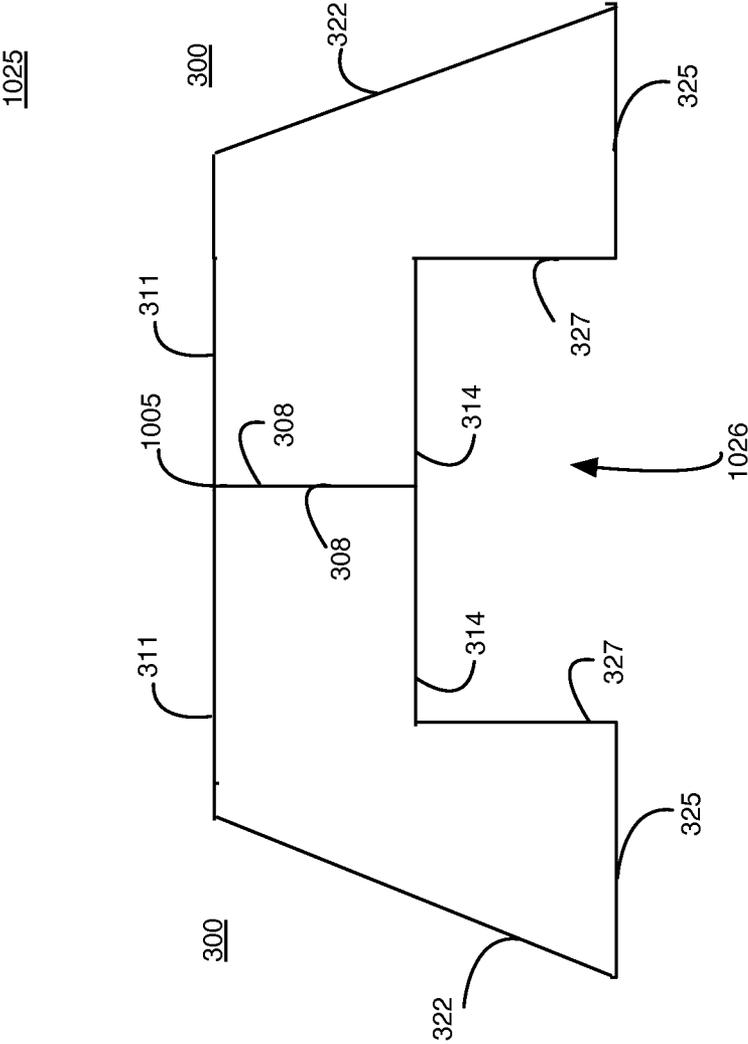


FIG. 10

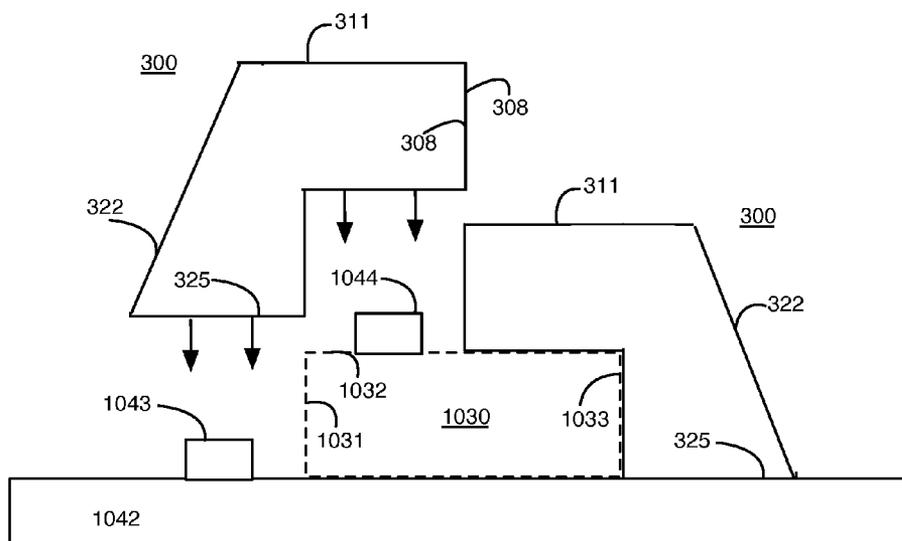


FIG. 11A

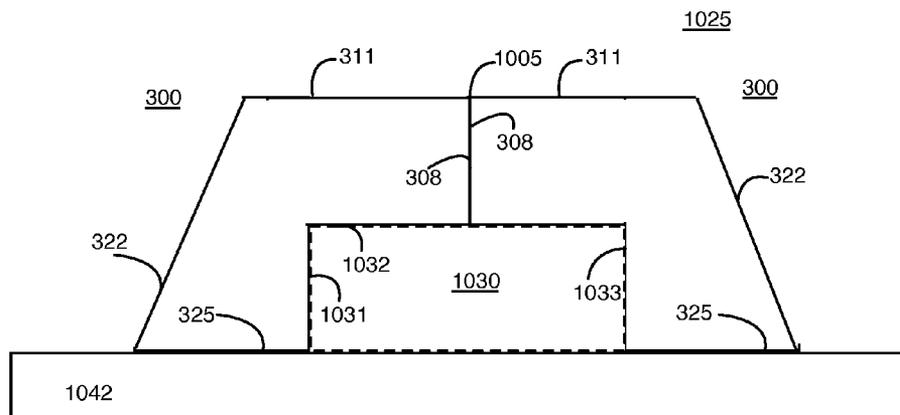


FIG. 11B

COUPLING BUILDING ELEMENT FOR A TOY CONSTRUCTION SET

TECHNICAL FIELD

[0001] This disclosure relates to a coupling building element for use in a toy construction set.

BACKGROUND

[0002] Children enjoy playing and interacting with toys and building elements. Toy construction sets are made up of a plurality of building elements, which include coupling mechanisms such as studs or recesses of specific heights and placement to enable interconnection with other building elements.

SUMMARY

[0003] In one general aspect, a toy construction set includes a first coupling building element defining a surface and a tapered portion that extends from the surface at an angle, the tapered portion of the first coupling building element defining a coupling stud; and a second coupling building element defining a surface and a tapered portion that extends from the surface at an angle, the tapered portion of the second coupling building element defining a recess for receiving the coupling stud. The tapered portions of the first and second coupling building elements are configured to be removably attached to each other by receiving the coupling stud of the first coupling building element in the recess of the second coupling building element, and the surfaces of the first and second coupling building elements define a space configured to hold a construction assembly.

[0004] Implementations can include one or more of the following features.

[0005] The space can be defined by first, second, and third sides, the first side defined by the surface of the first coupling building element, the second side defined by the surface of the second coupling building element, and the third side defined by a part of the tapered portion of the first coupling building element and a part of the tapered portion of the second coupling building element. The surface of the first coupling building element can define a coupling stud that extends into the space, and the surface of the second coupling building element can define a recess that opens to the space.

[0006] In some implementations, when the coupling stud of the first coupling building element is received in the recess of the second coupling building element, a spatial extent of the removably attached first and second coupling building elements can be in a direction parallel to the third side is equivalent to a spatial extent of four building elements.

[0007] When the coupling stud of the first coupling building element is received in the recess of the second coupling building element, a spatial extent of the assembled coupling building element in a direction parallel to the first side can be equivalent to a spatial extent of a building element with four coupling studs, the centers of which form a square.

[0008] The tapered portion of the first coupling building element can have planar surface on a side of the tapered portion opposite to a side that defines the coupling stud, the planar surface can define a rounded edge from which a first rounded wall that defines a first curved lip extends; the tapered portion of the second coupling building element can have a planar surface on a side of the tapered portion opposite to a side that defines the recess for receiving the coupling stud,

the planar surface can define a rounded edge from which a second rounded wall that defines a second curved lip extends, and at least a portion of the first curved lip can make physical contact with at least a portion of the second curved lip to form a smooth, curved surface between the rounded edge of the first coupling building element and the rounded edge of the second coupling building element. The rounded edge of the tapered portions of each of the first coupling building element and the second coupling building elements can be a curve that is a circumference of a portion of a circle. The portion can be a half of a circle.

[0009] In another general aspect, a toy construction set includes a first coupling building element defining a surface and a tapered portion extending from the surface at an angle; and a second coupling building element defining a surface and a tapered portion extending from the surface at an angle. The portion extending from the surface of the first coupling building element and the portion extending from the surface of the second coupling building element removably attach to each other to hold a construction assembly including at least one building element directly between the surface of the first coupling building element and the surface of the second coupling building element without using any other building elements.

[0010] Implementations can include one or more of the following features.

[0011] Each of the tapered portions extending from the surfaces of the first and second coupling building elements can be a tapered planar surface, and the tapered planar surfaces can slant towards each other when the first coupling building element and the second coupling building element are removably attached to each other.

[0012] The construction assembly can include more than one building element.

[0013] In another general aspect, a toy construction set includes a first rigid, single-piece coupling building element that defines a planar surface and a tapered portion extending from the planar surface; a second rigid, single-piece coupling building element that defines a planar surface and a tapered portion extending from the planar surface, the second coupling building element being removably coupled to the first coupling building element; and a construction assembly including one or more building elements. A first side of the construction assembly is removably attached to the surface of the first coupling building element, a second side of the construction assembly is removably attached to the surface of the second building element, and the construction assembly is held, at three outwardly facing sides of the construction element, between the surface of the first coupling building element and the surface of the second coupling building element.

[0014] Implementations can include one or more of the following features.

[0015] The planar surface of the first coupling building element can define an external coupling stud that extends in a direction away from the construction assembly. The toy construction set can include at least one additional building element, the at least one additional building element defining a coupling recess configured for connection to the external coupling stud.

[0016] The first coupling building element and the second coupling building element can be identical.

[0017] The construction assembly can be held using only the first coupling building element and the second coupling building element.

[0018] The construction assembly can include two building elements, each of the two building elements having a planar surface that defines at least one coupling stud on one side and at least one coupling recess on an opposing side.

[0019] In another general aspect, a pair of complementary coupling building elements for a toy construction set includes a first coupling building element that defines a tapered surface; and a second coupling building element that defines a tapered surface. The first coupling building element defines a first coupling mechanism that interconnects with a complementary coupling mechanism on the second coupling building element to removably connect the first coupling building element to the second coupling building element and to form a connected pair of coupling building elements, the connected pair of coupling building elements defining a space configured to hold a construction assembly, on three outwardly facing sides of the construction assembly, directly between the first coupling building element and the second building element.

[0020] Implementations can include one or more of the following features.

[0021] The construction assembly can be held on three sides with only the first coupling building element and the second coupling building element. The three sides of the construction assembly can be slideably received in a space defined by the connected pair of coupling building elements.

[0022] Each of the first and second coupling building elements can define a planar tapered surface.

[0023] The first coupling mechanism can include a coupling stud, and complementary coupling mechanism on the second coupling building element can define a recess that receives the coupling stud and holds the coupling stud in frictional engagement.

[0024] The construction assembly can include multiple building elements.

[0025] In another general aspect, a first coupling building element is configured for connection to a second coupling building element to hold a construction assembly therebetween. The first coupling building element defines a tapered surface and a first coupling mechanism that interconnects with a complementary coupling mechanism on the second coupling building element to removably connect the first coupling building element to the second coupling building element and to form a connected pair of coupling building elements that, when connected, define a space for holding a construction assembly on three outwardly facing sides directly between the first coupling building element and the second coupling building element.

[0026] Implementations can include the follow feature, or other features. The construction assembly can be held on three sides with only the first coupling building element and the second coupling building element.

[0027] Implementations of any of the techniques described above can include a coupling building element, a set of two or more coupling building elements packaged together with or without other building elements, a toy assembly, a kit for a toy assembly, a toy construction set or system, a system that includes a toy assembly, a device, and/or a method or process for using a toy assembly. The details of one or more implementations are set forth in the accompanying drawings and the description below. Other features will be apparent from the description and drawings, and from the claims.

DRAWING DESCRIPTION

[0028] FIG. 1 is a side view of an exemplary toy construction set that includes a pair of connected coupling building elements.

[0029] FIG. 2 is a side view of the pair of connected coupling building elements of FIG. 1.

[0030] FIG. 3A is a perspective view of an exemplary coupling building element.

[0031] FIG. 3B is a side perspective view of the coupling building element of FIG. 3A.

[0032] FIG. 3C is a bottom perspective view of the coupling building element of FIG. 3A.

[0033] FIG. 3D is a top-side perspective view of the coupling building element of FIG. 3A.

[0034] FIG. 4A is a perspective view of another exemplary coupling building element.

[0035] FIG. 4B is a top perspective view of the coupling building element of FIG. 4A.

[0036] FIG. 4C is a partial side and bottom perspective view of the coupling building element of FIG. 4A.

[0037] FIG. 5 is a side view of the coupling building elements of FIGS. 3A and 4A connected to each other as a connected pair.

[0038] FIG. 6 is a top plan view of the connected pair of FIG. 5.

[0039] FIG. 7 is a bottom plan view of the connected pair of FIG. 5.

[0040] FIG. 8 is a flow chart of an exemplary process for holding a construction assembly with two coupling building elements.

[0041] FIGS. 9A-9C show an example of capturing and holding a construction assembly between two coupling building elements.

[0042] FIG. 10 shows a side view of another exemplary connected pair of coupling building elements.

[0043] FIGS. 11A and 11B show the connected pair of FIG. 10 in an exemplary configuration that holds a construction assembly.

DESCRIPTION

[0044] A coupling building element for a toy construction set is disclosed. Two connected coupling building elements capture and hold a construction assembly. The construction assembly includes one or more building elements and is separate and distinct from the coupling building elements. The pair of connected coupling building elements can hold a construction assembly using only the two coupling building elements.

[0045] The coupling building element can have a tapered surface with a curved edge such that, when two coupling building elements are connected together to form a pair of connected coupling building elements, the connected pair has a smooth, rounded outer surface. Thus, when the connected pair holds a construction assembly that has non-rounded edges and corners, the connected pair provides the construction assembly with a rounded, smooth, and/or blended edge. The interconnection of the two coupling building elements also can provide additional strength to the construction assembly and/or a model built with the construction assembly.

[0046] The coupling building elements are compatible with and similarly sized with other building elements in a toy construction set. The coupling building elements can replace

and/or be added to an assembled collection of building elements with minimal or no adjustment to the assembled collection.

[0047] FIG. 1 shows a side view of an exemplary toy construction set 100. The toy construction set 100 includes a pair 125 of coupling building elements that includes a first coupling building element 105 and a second coupling building element 110. The first coupling building element 105 and the second coupling building element 110 make physical contact and are removably attached to each other at an interface 112.

[0048] The coupling building elements 105, 110 can be removably attached to each other by a complementary inter-connection mechanism such as a coupling stud that is received in a coupling recess (not shown) and held in the coupling recess with an interference fit. In some implementations, the coupling building elements 105, 110 are removably attached to each other by a physical contact that does not create an interference fit or other temporary fixation between the first coupling building element 105 and the second coupling building element 110. For example, a portion of the coupling building element 105 can touch or rest on a portion of the coupling building element 110.

[0049] When connected, the first coupling building element 105 and the second coupling building element 110 hold a construction assembly 115 on three external or outwardly facing sides 102, 103, and 104 of the construction assembly 115. The construction assembly 115 is held directly between the first coupling building element 105 and the second coupling building element 110 without using any other elements. In this manner, the first coupling building element 105 and the second coupling building element 110, when used together as shown in FIG. 1, wrap around a portion of the outside of the construction assembly 115.

[0050] In the example of FIG. 1, the construction assembly 115 includes plates 117 and 119 that are stacked together. The plate 117 includes a planar surface 120 that defines a coupling mechanism (shown and described with reference to specific details below and with reference to, for example, FIGS. 9A-9C) that allows the plate 117 to connect to the first coupling building element 105. The coupling mechanism can be, for example, coupling studs that extend outward from the surface 120, a coupling recess defined in the surface 120, a pin that extends from the surface 120, or any other connector. The plate 119 also includes one or more coupling mechanisms defined by a planar surface 118. The coupling mechanisms allow the plate 119 to connect to the plate 117 and/or the coupling building elements 105 and 110. One or both of the plates 117 and 119 can be building elements that are connectable to building elements other than those shown in FIG. 1.

[0051] Referring to FIG. 2, a side view of the first coupling building element 105 connected to the second coupling building element 110 to form the connected pair 125 is shown. The example of FIG. 2 shows the connected pair 125 without a separate construction assembly that can be held by the connected pair 125. The connected pair 125 defines a space 126 in which a construction assembly, such as the construction assembly 115 (FIG. 1), can be held.

[0052] The first coupling building element 105 includes a shelf 127 and a portion 130 that extends away from the shelf 127. The shelf 127 includes an outer surface 128. The outer surface 128 can define a coupling mechanism, such as a coupling stud or recess, that allows the first coupling building element 105 to be connected to one or more building elements in a construction set 136.

[0053] The shelf 127 also defines an inner surface 129. The inner surface 129 is on an opposite side of the shelf 127 than the outer surface 128, and the inner surface 129 faces into the space 126. The inner surface 129 defines a coupling mechanism that is accessible from the space 126. The coupling mechanism can be used to connect the first coupling building element 105 to a coupling stud, post, recess, or other connection mechanism on a building element in a construction set 136.

[0054] In the example shown, the portion 130 has a tapered surface 135 that extends away from the surface 128 at an angle 149. The angle 149 can be any angle that is between a direction 140 and a direction 142. The direction 140 is parallel to the surface 128 and extends toward the portion 130. The direction 142 is parallel to a normal of the surface 129. The portion 130 also defines a wall 134 that faces the space 126.

[0055] The second coupling building element 110 defines a shelf 145 and a portion 150 that extends away from the shelf 145. The shelf 145 includes an outer surface 146 and an inner surface 147. The outer surface 146 can define a coupling mechanism that allows the second coupling building element 110 to connect to a building element in the construction set 136. The inner surface 147 faces the space 126 and defines a coupling mechanism that is accessible from the space 126. For example, the coupling mechanism can be a coupling stud that protrudes into the space 126 or a recess that is formed in the inner surface 147 and is open to the space 126.

[0056] In the example shown, the portion 150 has a tapered surface 155 that extends away from the surface at the angle 148 that is between the direction 140 and a direction 143. The direction 143 is a direction that is parallel to a normal of the inner surface 147. The portion 150 also defines a wall 154 that faces the space 126. The angles 148 and 149 can be the same or different. The angles 148 and/or 149 can be, for example, 45 degrees.

[0057] The space 126 can hold a construction assembly between the shelves 127 and 145. The space 126 is bound on three sides by the inner surface 147, the walls 154 and 134, and the inner surface 129.

[0058] FIGS. 3A and 4A show perspective views of exemplary coupling building elements that can be connected to each other to form a connected pair of coupling building elements. FIG. 3A shows a perspective view of a first coupling building element 300, and FIG. 4A shows a perspective view of a second coupling building element 400. When connected together, the first coupling building element 300 and the second coupling building element 400 form a connected pair of building elements that can hold a construction assembly.

[0059] Referring to FIG. 3A, the first coupling building element 300 includes a shelf 310 and a tapered portion 320 that is integral with and extends from the shelf 310. The first coupling building element 300 is a rigid, single-piece element. The shelf 310 includes a surface 311 that defines coupling studs 312. The coupling studs 312 allow the first coupling building element 300 to connect with a recess of a building element in the construction set 136. The shelf 310 also includes a surface 314 on a side of the shelf 310 that is opposite to the surface 311.

[0060] The tapered portion 320 includes a planar surface 322 that slopes away from the surface 311 at an angle 356 that can be any angle that falls between a direction 354 and a direction 355. The direction 354 is parallel to the surface 311 and extends from the surface 311 toward the portion 320. The

direction 355 is parallel to a normal of the surface 314. The planar surface 322 is a flat surface that defines a curved or rounded edge 323 that extends between an end 313 and an end 315 of the shelf 310. In some implementations, the rounded edge 323 is a curve with a length and shape of a portion of a circumference of a circle. For example, the rounded edge can be a curve that is the length and shape of the circumference of half of a circle.

[0061] Referring also to FIG. 3B, which shows a side perspective view of the first coupling building element 300, the rounded edge 323 is an edge of a curved wall 324. The curved wall 324 extends from the rounded edge 323 in the direction 355. The curved wall 324 follows the taper of the planar surface 322 and, thus, has a variable extent “h” in the direction 355. Referring also to FIG. 3C, which shows a bottom perspective view of the first coupling building element 300, the curved wall 324 has a rounded lip 325 on a side of the wall 324 opposite the side where the curved wall 324 meets the planar surface 322. Because the curved wall 324 follows the taper of the planar surface 322, the rounded lip 325 is in a plane that is parallel to a plane 350-351, which is a plane that contains the surface 311. The ends of the curved wall 324 are integral with a wall 327 that forms a planar surface extending between the ends 313 and 315 of the shelf 310.

[0062] The shelf 310 includes the surface 314 that is on an opposite side of the shelf 310 relative to the surface 311. In the example shown, the surface 314 has a rectangular shaped perimeter that defines a recess 315. In the recess 315 is a post 316 that divides the recess 315 into portions 317 and 318, each of which can receive a coupling stud of a building element and hold the coupling stud through a frictional engagement between the coupling stud, the post 316 and a wall 319 of the recess 315. As shown in FIG. 3D, which is a top perspective view of the first coupling building element 300, the shelf 310 also includes a back wall 308 that extends perpendicularly from the surface 311 and is between the surfaces 311 and 314.

[0063] Referring to FIG. 4A, a perspective view of the second coupling building element 400 is shown. The second coupling building element 400 is a rigid, single-piece element that includes a shelf 410 and a portion 420 that extends from the shelf 410. The shelf 410 has a planar surface 411 that defines coupling studs 412 that extend away from the planar surface 411 in a direction 453 that is parallel to a normal of the surface 411. The shelf 410 also has a surface 414 on a side that is opposite to the surface 411. Extending between the surfaces 411 and the surface 413 is a wall 408. The wall 408 extends perpendicularly to the surfaces 411 and 413.

[0064] Referring also to FIGS. 4B and 4C, the portion 420 defines a wall 427 that extends between ends 413 and 415 of the shelf 410. The portion 420 also includes a curved wall 424 having ends that abut the wall 427. The curved wall 424 has a varying extent “h” in the direction 453, with the greatest extent being at the ends of the curved wall 424 that abut the shelf 410. The curved wall 424 defines a lip 425 with a curved edge 423. Because of the variable extent “h” of the curved wall 424, the lip 325 is located in a plane 450-451, which is a plane that is parallel to a plane that contains the surface 411. The lip 425 and the wall 427 define a recess 428 from which coupling studs 426 extend in the direction 453. The coupling studs 426 have an outer wall 429. In the example shown, the outer wall 429 forms part of the curved edge 423.

[0065] The portion 420 also includes a planar surface 422 that extends from the surface 414 of the shelf 410 at an angle

456 that is between the direction 453 and a direction 454, which is a direction that is parallel to the surface 411 and extends toward the portion 420. Because the planar surface 422 extends from the surface 414 at the angle 456, the surface 422 can be considered to be a tapered planar surface.

[0066] The shelf 410 also defines a recess 417 on a side of the shelf that is opposite to the surface 411. The recess 417 has an outer edge that is bounded by the surface 414, and the recess 417 includes walls 418 on an inner portion. Extending into the recess 417 is a post 416. The post 416 divides the recess 417 into two regions, each of which receive a coupling stud. The received coupling stud is held in frictional engagement between the coupling stud, the post 416, and the walls 418.

[0067] Referring again to FIGS. 3A and 4A, the coupling building elements 300 and 400 can be connected together by inserting the coupling studs 426 into the recess 326 of the first coupling building element 300. The recess 326 holds the coupling studs 426 in frictional engagement.

[0068] Referring to FIG. 5, a side view of an exemplary connected pair 525, which is formed from coupling building elements 300, 400, is shown. Connecting the first coupling building element 300 to the second coupling building element 400 forms the connected pair 525. The connected pair 525 has a height 502 and a width 503 that are the same as the height and width of an assembled stack 504 of four planar building elements. The assembled stack 504 has a rectangular or square cross-section that is represented by the bounding box 505. The connected pair 525 conforms to the same bounding box 505. In other words, the connected pair 525 has a cross-section that is no larger than the cross-section of the assembled stack 504.

[0069] As such, the connected pair 525 has a size that is compatible with other building elements, and the connected pair 525 can be used in a construction set that includes other building elements, as a replacement for existing pieces and/or as an additional piece, and with minimal adjustment to a collection of assembled building elements. Furthermore, in some dimensions and at some aspects, the cross-section of the connected pair 525 is smaller than the cross-section of the assembled stack 504. Therefore, the connected pair 525 is compatible with other building elements while also taking up less space than a typical building element.

[0070] The first coupling building element 300 and the second coupling building element 400 are connected at a connection interface 507. The coupling stud 426 (FIG. 4A) of the second coupling building element 400 is received in the recess 326 (FIG. 3A) of the first coupling building element 300. The outer wall 429 of the coupling stud 426 is received in the opening 328, and the outer wall 429 is flush with the curved wall 324. As a result, the lip 325 of the curved wall 324 of the first coupling building element 300 and the lip 425 of the curved wall 424 of the second coupling building element 400 make physical contact at the interface 507 and, together, the curved walls 324 and 424 form a smooth, curved surface 510.

[0071] When the connected pair 525 is used to hold a construction assembly, the curved surface 510 and/or the tapered planar surfaces 322 and 422 provides a smooth outer surface for the construction assembly, even if the construction assembly does not have a smooth or curved edge. The connected pair 525 wraps around a portion of the external surfaces of the construction assembly. In this manner, when holding a con-

struction assembly, the connected pair **525** can be considered to blend non-smooth edges and/or surfaces of the construction assembly.

[0072] The connected pair **525** also defines a space **526**. The space **515** has three sides, a first side defined by the surface **314**, a second side defined by the walls **327** and **427**, and a third side defined by the surface **411**. When the connected pair **525** is used to hold a construction assembly (not shown), the connected pair **525** holds the construction assembly on three external or outwardly facing sides of the construction assembly, and the connected pair **525** holds the construction assembly in the space **526**.

[0073] Referring to FIG. 6, a top plan view of the connected pair **525** is shown. Referring also to FIG. 7, a bottom plan view of the connected pair **525** is shown. At its greatest spatial extent, the connected pair **525** has the width **503** and a depth **602**. The width **503** and the depth **602** are the same as a width **1003** and a depth **604** of a building element **605**. The building element **1005** has four coupling studs **606**, the centers of which are arranged to form a square or a rectangle, and a perimeter **607**. The connected pair **525** fits within the perimeter **607**, as illustrated by the dotted bounding box. Thus, the connected pair **525** has a cross-section in the **350-351** plane that is the same as, no more than, or smaller than the cross-section of the building element **605** in a corresponding plane.

[0074] Referring to FIG. 8, an exemplary process **800** for holding a construction assembly with only two coupling building elements is shown. Referring also to FIGS. 9A-9C, an illustration of the process **800** with the first coupling building element **300** (FIG. 3A) and the second coupling building element **400** (FIG. 4A) is shown.

[0075] A coupling building element is attached to a first side of a construction assembly (**810**). For example, and referring to FIG. 9A, the second coupling building element **400** can be attached to a bottom side **901** of a construction assembly **900**. In the example shown, the construction assembly **900** is an assembled building element formed by connecting two plates **905** and **910** together. Both of the plates **905** and **910** define coupling studs on a top surface (such as the coupling stud **911**) and corresponding coupling recesses on a bottom surface that allow the plates **905** and **910** to connect to each other and to other building elements.

[0076] The bottom side **901** can define a recess (not shown) that receives the coupling studs **412** of the second coupling building element **400**. The recess holds the coupling building element **400** to the side **901** through a frictional engagement such that the coupling building element **400** is attached to the bottom side **901** of the construction assembly **900**.

[0077] In the example shown in FIGS. 9A-9C, the coupling building element **400** is removably attached to the construction assembly **900** because the coupling building element **400** can be removed from the construction assembly **900**, without damaging either element, by pulling on either or both of the coupling building element **400** or the construction assembly **900** with a force sufficient to overcome the frictional engagement. However, two coupling building elements can be removably attached to each other by any type of direct or indirect physical contact that allows the coupling building elements to be separated from each other without damaging either coupling building element, regardless of whether there is a frictional engagement between the two coupling building elements.

[0078] Another coupling building element is attached to the coupling building element (**820**). Attaching the other cou-

pling building element to the coupling building element forms a connected pair of coupling building elements that holds the construction assembly **900** on three sides. For example, as shown in FIGS. 9B and 9C, the first coupling building element **300** can be attached to the second coupling building element **400**, which is already attached to the construction assembly **900** at the side **901**. The first coupling building element **300** attaches to the second coupling building element by inserting the coupling studs **426** into the recess **326**. The outer wall **429** of the coupling stud **426** is received in the opening **328** to form a smooth, curved surface **915** at an interface **920**.

[0079] In addition to the coupling stud **426** being received in the recess **326**, the coupling stud **312** can be received and held by the recess **315** (FIG. 3C). The example discussed above shows the second coupling building element **400** being attached to the assembled building element before the first coupling building element **300** is attached to the second coupling building element **400**. However, in other examples, the first coupling building element **300** is attached to the construction assembly **900** first, and the second coupling building element **400** is then attached to the first coupling building element **300** and/or the construction assembly **900**. In other implementations, the first and second coupling building elements are attached to the coupling building element **400** and to each other at the same time.

[0080] In the example discussed above, the construction assembly **900** is two plates **905** and **910** that each includes coupling studs and coupling recesses and that attached to each other with the coupling studs and recesses. However, the construction assembly **900** can take other forms. For example, the construction assembly **900** can be a collection of toy construction building elements that are not attached to each other but are held in place and held together by being sandwiched between the shelves **310** and **410** of the coupling building elements **300** and **400**. The construction assembly **900** can be a single building element that is not assembled from multiple components.

[0081] Referring to FIG. 10, a side view of another exemplary connected pair **1025** of coupling building elements is shown. The connected pair **1025** includes two of the first coupling building elements **300** (FIGS. 3A-3D). The connected pair **1025** is formed by contacting the wall **308** of one of the first coupling building elements **300** to the wall **308** of the other of the first coupling building element **300** at an interface **1005**. In the example of FIG. 11, the connected pair of coupling building elements are removably attached to each other by one of the walls **308** touching the other of the walls **308**, without a temporary fixation (such as an interference fit) at the interface **1005**.

[0082] The connected pair **1025** defines a space **1026**, the sides of which are formed by the walls **327** and **314** of each of the first coupling building element **300**. The space **1026** is three-sided and can hold a construction assembly on three of the external or outwardly facing sides of the construction assembly.

[0083] Referring to FIGS. 11A and 11B, the connected pair **1025** is shown with a base plate **1042** and a construction assembly **1030**. FIG. 11A shows the base plate **1042** and the construction assembly **1030**, with one of the first coupling building elements **300** connected to the construction assembly **1030** and the base plate **1042**. The construction assembly **1030** can include one or more building elements stacked in a

vertical direction. In the example shown, the construction assembly **1030** includes just one building element.

[0084] The construction assembly **1030** and the first coupling building element **300** can be connected to the base plate **1042** with a frictional engagement between a coupling stud on the base plate (such as a coupling stud **1043**) and a coupling recess on the construction assembly **1030** and/or the first coupling building element **300**. The single coupling building element **300** and the base plate **1042** hold the construction assembly **1030**. Thus, in this implementation, the construction assembly **1030** can be held with just one coupling building element **300**.

[0085] Referring to FIG. 11B, the other of the coupling building elements **300** is placed on the construction assembly **1030** and the base plate **1042**. The other of the coupling building elements **300** is attached to the base plate **1142** by an interference fit formed between the recess **326** (FIG. 3C) in the coupling building element and the coupling stud **1043** and an interference fit formed between the recess **317** (FIG. 3C) and the coupling stud **1044**. The walls **308** of the two coupling building elements **300** make contact at the interface **1005** to form the connected pair **1025**. The connected pair **1025** holds the construction assembly **1030** on three outwardly facing or external sides **1031**, **1032**, **1033** of the construction assembly **1030**. The connected pair **1025** wraps around a portion of the exterior surface of the construction assembly **1030**. The coupling building elements **300** are in direct physical contact and are removably attached to each other at the interface **1005**. The coupling building elements **300** are also indirectly attached to each other by virtue of both coupling building elements **300** being in frictional engagement with the base plate **1042**.

[0086] Other implementations are within the scope of the following claims. For example, the connected pair **525** of coupling building elements can have a spatial extent that is greater than four building elements in height and width and/or greater than a 4x4 building element in width and depth. The connected pair **525** of coupling building elements can have a spatial extent that is equivalent to any number of stacked bricks and any size of building element. The connected pair **525** of coupling building elements can have a spatial extent that is different from the spatial extent of stacked bricks or a standard building element.

[0087] Connection and attachment of building elements (including coupling building elements) can be through any complementary coupling mechanism. For example, a coupling stud and corresponding recess can removably attach two building elements in frictional engagement. Other coupling mechanisms can be used. In some implementations, a post and a corresponding hole can hold to building elements in frictional engagement. In another example, building elements can be removably attached with a snap connection that makes an audible sound upon connection and/or disconnection. The connection directly between two coupling building elements can be physical contact without a frictional engagement directly between the two coupling building elements.

[0088] In some implementations, the first and second coupling building elements **105** and **110** or **300** and **400** can be connected to each other before either of the first or second coupling building elements is attached to a construction assembly that is to be held. In this implementation, the construction assembly is received in a space (such as the spaces **126**, **526**, or **1026**) and held by the surfaces that define the space (such as the surface **314**, the walls **327** and **427**, and the

surface **411** of FIG. 5). For example, the construction assembly can be slideably received in the space and held in frictional engagement on three sides at external or outwardly facing surfaces of the construction assembly by one or more of the surfaces that define the space. In these implementations, the construction assembly can be formed with or without coupling studs.

[0089] Any two of the first coupling building element **105**, **300** and the second coupling building element **110**, **400** can form a connected pair of coupling building elements. For example, a connected pair of coupling building elements can include two of the coupling building elements **300** (as shown in FIGS. 11A and 11B), two of the coupling building elements **400**, or one of each of the coupling building element **300** and the coupling building element **400**.

[0090] The surfaces **135**, **155**, **322**, and/or **422** can be non-planar. For example, the tapered surfaces **322** and **422** can include dimples, bumps, and/or ridges or any other type of non-flat or non-planar surface.

What is claimed is:

1. A toy construction set comprising:

a first coupling building element defining a surface and a tapered portion that extends from the surface at an angle, the tapered portion of the first coupling building element defining a coupling stud; and

a second coupling building element defining a surface and a tapered portion that extends from the surface at an angle, the tapered portion of the second coupling building element defining a recess for receiving the coupling stud, wherein,

the tapered portions of the first and second coupling building elements are configured to be removably attached to each other by receiving the coupling stud of the first coupling building element in the recess of the second coupling building element, and

the surfaces of the first and second coupling building elements define a space configured to hold a construction assembly.

2. The toy construction set of claim 1, wherein the space is defined by first, second, and third sides, the first side defined by the surface of the first coupling building element, the second side defined by the surface of the second coupling building element, and the third side defined by a part of the tapered portion of the first coupling building element and a part of the tapered portion of the second coupling building element.

3. The toy construction set of claim 2, wherein the surface of the first coupling building element defines a coupling stud that extends into the space, and the surface of the second coupling building element defines a recess that opens to the space.

4. The toy construction set of claim 1, wherein:

the tapered portion of the first coupling building element has planar surface on a side of the tapered portion opposite to a side that defines the coupling stud, the planar surface defining a rounded edge from which a first rounded wall that defines a first curved lip extends;

the tapered portion of the second coupling building element has planar surface on a side of the tapered portion opposite to a side that defines the recess for receiving the coupling stud, the planar surface defining a rounded edge from which a second rounded wall that defines a second curved lip extends, and

at least a portion of the first curved lip makes physical contact with at least a portion of the second curved lip to form a smooth, curved surface between the rounded edge of the first coupling building element and the rounded edge of the second coupling building element.

5. The toy construction set of claim **4**, wherein the rounded edge of the tapered portions of each of the first coupling building element and the second coupling building elements is a curve that is a circumference of a portion of a circle.

6. The toy construction set of claim **5**, wherein the portion is a half of a circle.

7. The toy construction set of claim **2**, wherein, when the coupling stud of the first coupling building element is received in the recess of the second coupling building element, a spatial extent of the removably attached first and second coupling building elements in a direction parallel to the third side is equivalent to a spatial extent of four building elements.

8. The toy construction set of claim **2**, wherein, when the coupling stud of the first coupling building element is received in the recess of the second coupling building element, a spatial extent of the assembled coupling building element in a direction parallel to the first side is equivalent to a spatial extent of a building element with four coupling studs, the centers of which form a square.

9. A toy construction set comprising:

a first coupling building element defining a surface and a tapered portion extending from the surface at an angle; and

a second coupling building element defining a surface and a tapered portion extending from the surface at an angle, wherein

the portion extending from the surface of the first coupling building element and the portion extending from the surface of the second coupling building element removably attach to each other to hold a construction assembly comprising at least one building element directly between the surface of the first coupling building element and the surface of the second coupling building element without using any other building elements.

10. The toy construction set of claim **9**, wherein each of the tapered portions extending from the surfaces of the first and second coupling building elements is a tapered planar surface, and the tapered planar surfaces slant towards each other when the first coupling building element and the second coupling building element are removably attached to each other.

11. The toy constructions set of claim **9**, wherein the construction assembly comprises more than one building element.

12. A toy construction set comprising:

a first rigid, single-piece coupling building element that defines a planar surface and a tapered portion extending from the planar surface;

a second rigid, single-piece coupling building element that defines a planar surface and a tapered portion extending from the planar surface, the second coupling building element being removably coupled to the first coupling building element; and

a construction assembly comprising one or more building elements, wherein

a first side of the construction assembly is removeably attached to the surface of the first coupling building element,

a second side of the construction assembly is removably attached to the surface of the second coupling building element, and

the construction assembly is held, at three outwardly facing sides of the construction assembly, between the surface of the first coupling building element and the surface of the second coupling building element.

13. The toy construction set of claim **12**, wherein the planar surface of the first coupling building element defines an external coupling stud that extends in a direction away from the construction assembly.

14. The toy construction set of claim **13** further comprising at least one additional building element, the at least one additional building element defining a coupling recess configured for connection to the external coupling stud.

15. The toy construction set of claim **12**, wherein the first coupling building element and the second coupling building element are identical.

16. The toy construction set of claim **12**, wherein the construction assembly comprises two building elements, each of the two building elements having a planar surface that defines at least one coupling stud on one side and at least one coupling recess on an opposing side.

17. A pair of complementary coupling building elements for a toy construction set, the pair comprising:

a first coupling building element that defines a tapered surface; and

a second coupling building element that defines a tapered surface, wherein the first coupling building element defines a first coupling mechanism that interconnects with a complementary coupling mechanism on the second coupling building element to removably connect the first coupling building element to the second coupling building element and to form a connected pair of coupling building elements, the connected pair of coupling building elements defining a space configured to hold a construction assembly, on three outwardly facing sides of the construction assembly, directly between the first coupling building element and the second building element.

18. The pair of complementary coupling building elements of claim **17**, wherein the construction assembly is held on three sides with only the first coupling building element and the second coupling building element.

19. The pair of complementary coupling building elements of claim **17**, wherein each of the first and second coupling building elements defines a planar tapered surface.

20. The pair of complementary coupling building elements of claim **17**, wherein the first coupling mechanism comprises a coupling stud, and complementary coupling mechanism on the second coupling building element defines a recess that receives the coupling stud and holds the coupling stud in frictional engagement.

21. The pair of complementary coupling building elements of claim **17**, wherein the construction assembly comprises multiple building elements.

22. The pair of complementary coupling building elements of claim **18**, wherein the three sides of the construction assembly are slideably received in a space defined by the connected pair of coupling building elements.

23. A first coupling building element configured for connection to a second coupling building element to hold a construction assembly therebetween, wherein

the first coupling building element defines a tapered surface and a first coupling mechanism that interconnects with a complementary coupling mechanism on the second coupling building element to removably connect the first coupling building element to the second coupling building element and to form a connected pair of coupling building elements that, when connected, define a space for holding a construction assembly on three outwardly facing sides directly between the first coupling building element and the second coupling building element.

24. The first building element of claim **23**, wherein the construction assembly is held on three sides with only the first coupling building element and the second coupling building element.

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