

# US Patent & Trademark Office

## Patent Public Search | Text View

United States Patent Application Publication

20250256216

Kind Code

A1

Publication Date

August 14, 2025

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### ASSEMBLY TOY AND DECORATIVE CONNECTOR FOR AN ASSEMBLY TOY

#### Abstract

A coupling element for releasably connecting two building elements. The coupling element includes two couplers. The first coupler has a mid-flange having a first side and a second side. The first side of the mid-flange includes a coupling portion extending therefrom. The second side of the mid-flange includes at least one protrusion and at least one opening. The second coupler is similar to the first coupler except that it may have a different coupling portion. The protrusions and openings are shaped so that when the two couplers are pressed together, the openings and protrusions form an interference fit to form the coupling element. The coupling element may include a decorative element that is captured between the two couplers when the couplers are pressed together to form the coupling element.

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**Family ID:** 94687100

**Appl. No.:** 18/441880

**Filed:** February 14, 2024

#### Publication Classification

**Int. Cl.:** A63H33/10 (20060101); A63H3/16 (20060101); A63H17/00 (20060101); A63H19/00 (20060101); A63H23/00 (20060101); A63H27/00 (20060101); A63H33/04 (20060101)

**U.S. Cl.:**

**CPC** A63H33/101 (20130101); A63H33/042 (20130101); A63H3/16 (20130101); A63H17/002 (20130101); A63H19/00 (20130101); A63H23/005 (20130101); A63H27/001 (20130101)

## Background/Summary

### BACKGROUND OF THE INVENTION

#### Field of the Invention

[0001] The present disclosure generally relates to building elements for assembly toys. More particularly, the present disclosure relates to improved connectors for coupling various building elements, such as blocks, to form a figurine, a vehicle, or other plaything. Assembly toys are assembled by combining various building elements of a set of compatible toy building elements.

#### Description of Related Art

[0002] Building block toys have been a staple in the toy boxes of children for generations. These toys not only provide hours of entertainment, but they also play a crucial role in a child's development. Building block toys help children develop a wide range of skills, including fine motor skills, spatial awareness, creativity, and problem-solving abilities.

[0003] When children play with building blocks, they use their hands and fingers to grasp, stack, and manipulate the blocks, which helps to develop their fine motor skills. Additionally, building blocks offer children the opportunity to explore concepts such as balance, symmetry and proportion, leading to the development of spatial awareness and mathematical thinking. Moreover, building block toys encourage creativity and imagination as children construct their own unique creations, and they also foster problem-solving abilities as children figure out how to build structures that will not collapse.

[0004] Incorporating felt and other soft fabrics in building blocks for child development can have a positive impact on a child's cognitive and sensory development. Felt is a soft and tactile material that provides a unique sensory experience for young children. By integrating felt into building blocks and other similar toys, children can engage in sensory exploration and tactile play, which can enhance their fine motor skills and hand-eye coordination.

[0005] Additionally, felt can be a versatile material for building blocks, allowing children to practice creative thinking and problem-solving as they construct and manipulate the blocks. The soft nature of felt also makes it safe for young children to handle and play with, reducing the risk of injury compared to traditional hard building materials.

[0006] Toys that are assembled from various components may include connector pieces that removably couple the components together to form recognizable objects, such as animal figurines and vehicles. Known connector pieces may include portions adapted to engage with portions of the building components. It would be an improvement over known connector pieces to include decorative and/or tactile elements as part of the connector pieces.

### SUMMARY OF THE INVENTION

[0007] The present disclosure provides embodiments of coupling elements. In an exemplary embodiment, the coupling element includes two couplers. Each coupler has a mid-flange having a first side and a second side. The first side of the mid-flange includes a coupling portion extending therefrom. In one embodiment, the coupling portion includes at least two flexible extensions having an engagement member on the end of the corresponding extension. In another embodiment, coupling portion may be a functional element such as a rotatable connectable portion. The second side of the mid-flange has at least one protrusion and at least one opening therethrough. According to one embodiment, the opening includes a sleeve that extends from the second side of the mid-flange such that the corresponding opening is lengthened. According to one embodiment, the protrusion and openings are shaped so that when the two couplers are pressed together, the openings and protrusions form an interference fit to form the coupling element.

[0008] According to another embodiment, the coupling element includes a decorative element. The decorative element includes at least one through hole. The hole is sized and positioned to

accommodate the protrusion and/or the sleeve to extend through the decorative element and join with the corresponding openings and protrusions of the opposite coupler such that the decorative element is captured between the two couplers.

[0009] The present disclosure provides embodiments of assembly toys. In an exemplary embodiment, the assembly toy includes at least one building element and at least one coupling element that releasably couples the building element to each other to form a figurine. Each building element includes at least one aperture that engages the coupling element such that the building elements are releasably coupled together. In an exemplary embodiment, the assembly toy has three building elements: first block, second block, and third block.

[0010] The first block is releasably attached to the second block via two coupling elements. In an exemplary embodiment, the coupling elements used to join the first block to the second block are composed of two couplers joined together without a decorative element. In another embodiment, the coupling elements used to join the first block to the second block are included at least one decorative element. The second block is releasably coupled to the third block via a single coupling element having a decorative element.

[0011] The present disclosure provides embodiments of assembly toys. In an exemplary embodiment, the assembly toy includes at least one building element and at least one coupling element that releasably couples the building element to each other to form a vehicle. Each building element includes at least one aperture that engages the coupling element such that the building elements are releasably coupled together. In one exemplary embodiment, the assembly toy has seven building elements: main block, two front wheels, two rear wheels, a figurine, and a windshield. The two front wheels of this embodiment are releasably coupled to the main block via a coupling element made up of two different couplers that form an axle. The two rear wheels are releasably coupled to the main block via a rear axle element. The rear axle element includes a first and second side flange and a body that connects the first and second side flange. The first and second side flanges include coupling portions that extend away from the first and second side flanges. The body of the rear axle element has a top surface and a bottom surface. The top surface includes a coupling portion extending therefrom. Similarly, the bottom surface includes a coupling portion therefrom.

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## Description

### BRIEF DESCRIPTION OF DRAWINGS

[0012] A more complete appreciation of the present disclosure and many of the attendant advantages thereof will be readily obtained as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings, wherein:

[0013] FIG. 1 is a front perspective view illustrating a coupling element attaching two building elements together according to an embodiment of the disclosure;

[0014] FIG. 2A is an exploded view of the coupling element of FIG. 1 according to an embodiment of the disclosure;

[0015] FIG. 2B is a cross-sectional view of the coupling element of FIG. 1;

[0016] FIG. 3A is a front perspective view of a first coupler forming a component of the coupling element of FIG. 1;

[0017] FIG. 3B is a rear perspective view of the first coupler of FIG. 3A;

[0018] FIG. 4A illustrates other exemplary embodiments of coupler elements according to embodiments of the disclosure;

[0019] FIG. 4B illustrates the assembly of one of the coupler elements of FIG. 4A being formed by two coupler elements according to an embodiment of the disclosure;

[0020] FIG. 4C illustrates the assembly of another one of the coupler elements of FIG. 4A being formed by two coupler elements according to an embodiment of the disclosure;  
[0021] FIG. 5 is a front perspective view of the decorative element shown in FIG. 2;  
[0022] FIG. 6 is a side elevation view of a toy assembly according to an embodiment of the present disclosure;  
[0023] FIG. 7 is a front elevation view of the toy assembly of FIG. 6  
[0024] FIG. 8 is an exploded view of the toy assembly of FIG. 6;  
[0025] FIG. 9 is a perspective view of another toy assembly according to an embodiment of the present disclosure;  
[0026] FIG. 10 is a partial exploded view of the toy assembly of FIG. 9;  
[0027] FIG. 11 is a partial exploded view of the toy assembly of FIG. 9; and  
[0028] FIG. 12 is a front elevation view of a rear axle element of the toy assembly of FIG. 9 according to an embodiment of the present disclosure.

#### DETAILED DESCRIPTION

[0029] Exemplary embodiments of the disclosure will now be described below by reference to the attached Figures. The described exemplary embodiments are intended to assist the understanding of the invention and are not intended to limit the scope of the invention in any way. Like reference numerals refer to similar elements throughout.

[0030] Referring to FIGS. 1-5, an exemplary embodiment of a coupling element **10** according to the present disclosure is shown. In one embodiment, coupling element **10** includes decorative element **40** disposed between the two couplers **20a**, as shown in FIG. 2A. The decorative element **40** may be composed of plastic, wood, ceramic, cloth material, or any combination thereof. According to a preferred embodiment, decorative element **40** is formed from a soft fabric, such as felt. In another embodiment, coupling element **10a** may include the two couplers **20a** with no decorative element **40** therebetween, as shown in FIG. 8.

[0031] As shown in FIG. 1, coupling element **10** may be used to releasably connect two building elements **12**. Alternatively, coupling element **10** may join building element **12** with other structures, as will be discussed below. According to one embodiment building elements **12** are cube-shaped. The shape of building element **12** is not limited to a cube and includes, but is not limited to rectangular, triangular, pyramidal, spherical, or any other shape polyhedron, non-polyhedron, or a combination of polygonal and curved surfaces. Building element **12** has one or more surfaces **14a**. According to one embodiment, aperture **14** is centrally located on at least one surface **14a**. The building elements **12** can be decorated by silk screen printing, heat transfer printing, painting, and the like.

[0032] Referring now to FIGS. 3A and 3B, coupler **20a** includes a mid-flange **22** having a first side **22a** and a second side **22b**. The first side **22a** of the mid-flange **22** includes a coupling portion **24a** extending therefrom. The coupling portion **24a** includes at least two flexible extensions **25** extending from the first side **22a** of the mid-flange **22**. In the exemplary embodiment shown, the coupling portion **24a** includes three flexible extensions **25** extending from the first side **22a** of the mid-flange **22**. However, it is contemplated that more or fewer flexible extensions may be used. The flexible extensions **25** include an engagement member **26** that engages the building element **12** when inserted into the aperture **14** such that the first coupler **20a** is releasably secured to the building element **12**. More specifically, when the flexible extensions **25** are inserted into aperture **14** of the building element **12**, engagement members **26** contact inside surfaces of apertures **14** causing flexible extensions **25** to flex inward and exert a force on the sides of the aperture **14** such that the engagement members **26** removably connects first coupler **20a** with building element **12**.  
[0033] Continuing to refer to FIGS. 3A and 3B, second side **22b** of mid-flange **22** includes at least one protrusion **28** and at least one opening **27** therethrough. In the exemplary embodiment shown in FIG. 3B, the second side **22b** of the mid-flange **22** includes two protrusions **28** and two openings **27** therethrough. According to one embodiment, opening **27** includes a sleeve **27a** that extends

from the second side **22b** of the mid-flange **22** such that the corresponding opening **27** is lengthened. Sleeve **27a** may be monolithically formed with the mid-flange **22** or may be welded or otherwise fixed to the second side **22b** of the mid-flange **22**. The protrusions **28** are sized and dimensioned to be inserted at least partially through the opening **27** and/or sleeve **27a** of the opposing coupler **20a** as will be described in greater detail below.

[0034] According to one embodiment, coupling element **10** may be composed of two couplers **20a** on either side of a decorative element **40**, as shown in FIGS. **2A** and **2B**. The decorative element **40** includes at least one through hole **47** therethrough. In the exemplary embodiment shown in FIG. **5**, the decorative element includes four through holes **47**. Holes **47** are sized and positioned to accommodate the protrusions **28** and/or the sleeves **27a** to extend through the decorative element **40** and join with corresponding openings **27** and protrusions **28** of the opposite coupler **20a** such that the decorative element is captured between two couplers, as shown in the cross section of FIG. **2B**.

[0035] According to other embodiments, coupling element **10** may be composed of coupler **20a** connected with a selected second coupler. According to one embodiment, second coupler **20b** includes a functional element such as rotatable connectable portions **20b'**, **20c'**. According to one embodiment discussed below with respect to FIGS. **9-12**, rotatable connection portion **20b'** forms an axle that is connected with a wheel to form part of a wheeled vehicle toy. According to another embodiment, elements **20b'** and **20c'** form components of a trailer hitch for a wheeled vehicle toy. For example, as shown in FIGS. **4A-4C**, couplers **20b** and **20c** form male end **20b'** and female end **20c'** of a ball and socket style joint.

[0036] As shown in FIG. **4B**, couplers **20b**, **20c** have one or more protrusions **28** and openings **27** on a side opposite from functional elements **20b'**, **20c'**. According to one embodiment, these openings and protrusions are positioned and sized to engage with corresponding protrusions and openings on coupler **20a**, as discussed in the previous embodiment.

[0037] According to one embodiment, protrusions **28** and openings **27** are shaped so that when couplers **20a**, **20b**, **20c** are mechanically pressed together the openings and protrusions form an interference fit to form coupling element **10**. The interference fit may also include a snap-fit feature to removably or permanently connect the couplers. According to a further embodiment, couplers **20a**, **20b**, **20c** joined by such an interference or snap fit are then permanently connected with one another, for example, by ultrasonic welding, by an adhesive, or by other methods for joining known to those of ordinary skill in the field of the disclosure. The ability to assemble the couplings **10** using a variety of couplers may benefit manufacturability, for example, by facilitating production of a wide variety of coupling elements **10** with fewer different tooling setups. This may allow greater flexibility and efficiency in the production process, leading to potential cost savings and increased productivity. As previously mentioned, the various couplers **20a**, **20b**, and **20c** may be mixed and matched when assembling the coupling element **10**.

[0038] As shown in FIG. **1**, coupling element **10** includes a decorative element **40**. For case of description, the following will refer to the assembly of a coupling element **10** composed of two couplers **20a** with a decorative element **40** therebetween, however, it will be appreciated that any combination of couplers **20a**, **20b**, and **20c** may be used. To assemble the coupling element **10**, the protrusions **28** and sleeves **27a** of a first coupler **20a** are inserted through the corresponding holes **47** of the decorative element **40**. Then the second side **22b** of a second coupler **20a** is pressed against the second side **22b** of the first coupler **20a** such that the protrusions **28** of the second coupler **20a** engage the sleeves **27a** of the first coupler **20a** and the protrusions **28** of the first coupler **20a** engage the sleeves **27a** of the second coupler **20a**. Typically, an interference fit, press fit, and/or friction fit may be provided between the protrusions **28** and sleeves **27a** when the protrusion **28** is inserted into the opening **27**. In one embodiment, the couplers **20a** are secured together via friction force. In another embodiment, the couplers are secured together via a sonic weld or an adhesive.

[0039] The present disclosure provides embodiments of assembly toys. Assembly toys are assembled by coupling a variety of building elements, such as blocks, together using a variety of coupling elements. The assembly toy may use more or fewer building elements, building elements of different sizes, dimensions, and colors, and different types of coupling elements to assemble the building elements to form a variety of different toys. For illustrative purposes, the assembly toy shown is one that resembles a lion. However, the assembly toy may be assembled into a wide variety of toy types, including but not limited to figurines or vehicles. Non-limiting examples of a figurine may include a monkey, a zebra, an alligator, an elephant, a giraffe, or a lion. Non-limiting examples of a vehicle may include a truck, a train, a tractor, a sailboat, an airplane, or a car.

[0040] Referring now to FIGS. 6-8, an exemplary embodiment of an assembly toy **1000** according to the present disclosure is shown. The assembly toy **1000** includes at least one building element **12** and at least one coupling element **10** that releasably couples the building elements **12** to each other to form a figurine, e.g., a lion. The building elements **12** may be wooden blocks having a variety of shapes. However, a person having ordinary skill in the art will appreciate there are a variety of materials the building elements **12** may be composed of. Each building element **12** includes at least one aperture **14** that engages with a coupling element **10** such that the building elements **12** may be releasably coupled together. In the exemplary embodiment shown in FIGS. 6-7, the assembly toy **1000** has three building elements: first block **1010**, second block **1020**, and third block **1030**. The three building elements are coupled together by three coupling elements **10**, **10a** as will be described in more detail below.

[0041] Referring to FIG. 8, the first block **1010** is releasably attached to the second block **1020** via two coupling elements **10a**. The coupling elements **10a** used to connect the first block **1010** and second block **1020** are composed of two couplers **20a** joined together without a decorative element. It will be appreciated that more or fewer coupling elements may be used to releasably attach first block **1010** to second block **1020** and that one or more decorative elements may be provided on coupling elements joining blocks **1010**, **1020**.

[0042] The second block **1020** is releasably attached to the third block **1030** via a single coupling element **10** having a decorative element **40**. The coupling element **10** used to connect the second block **1020** to the third block **1030** is composed of two couplers **20a** joined together with the decorative element **40** captured between the two couplers **20a**. The decorative element **40** resembles a lion's mane.

[0043] Referring now to FIGS. 9-12, an exemplary embodiment of an assembly toy **2000** according to the present disclosure is shown. The assembly toy **2000** includes at least one building element **2010**, **2020**, **2030** and at least one coupling element **10** that releasably couples the building elements to each other to form a vehicle, e.g., a tractor. The building elements may include one or more wooden blocks **2010** having a variety of shapes. However, a person having ordinary skill in the art will appreciate there are a variety of materials the building elements may be composed of. Each building element includes at least one aperture **14** that engages with a coupling element such that the building elements may be releasably coupled together. In the exemplary embodiment shown in FIGS. 9-12, the assembly toy **2000** has seven building elements **12**: main block **2010**, two front wheels **2020a**, two rear wheels **2020b**, a figurine **2030**, and a windshield **2040**. The seven building elements are coupled together by a variety of coupling elements as will be described in more detail below.

[0044] Referring to FIG. 10, the main block **2010** is rectangular shaped and has a number of apertures **14**. In the exemplary embodiment shown, the main block **2010** is made of wood or a wood derivative. In other embodiments, the main block **2010** may be made of wood, plastic, metal, or a combination thereof. In one embodiment, the apertures **14** are all the same size and dimension. In another embodiment, the apertures **14** may vary in size such that there are at least two different sized apertures **14**.

[0045] Continuing to refer to FIG. 10, two front wheels **2020a** are releasably coupled to the main

block **2010** via a coupling elements **10a** made up of coupler **20a** and coupler **20b**, as shown in FIG. 4A, such that functional elements **20b'** form axles to allow the front wheels to rotate. The two rear wheels **2020b** are releasably coupled to the main block **2010** via rear axle element **2050** that include axle functional elements **20b'** positioned to hold rear wheels **2020b**. As shown in FIG. 12, rear axle element **2050** includes a first and second side flange **2052**, **2054** and a body **2053** that connects the first and second side flange **2052**, **2054**. In one embodiment, the side flanges **2052**, **2054** may be monolithically formed from the body **2053**. In another embodiment, the side flanges **2052**, **2054** may be coupled to the body **2053** via adhesives or welds. The first and second side flanges **2052**, **2054** each include a coupling portion **2052a**, **2054a** that extends away from the first and second side flanges **2052**, **2054**. According to one embodiment, coupling portions **2052a**, **2054a** are axle functional elements **20b'**. The body **2053** includes a top surface **2053a** and a bottom surface **2053b**. The top surface **2053a** includes a coupling portion **2056** extending therefrom. Similarly, the bottom surface **2053b** includes a coupling portion **2057** extending therefrom. Coupling portions **2056**, **2057** may include the same flexible extensions **25** and engagement members **26** as coupler **20a**. According to further embodiments couplers **20a** are provided to attached other structures such as a figurine **2030** and a windshield **2040** to main block **2010**. [0046] As shown in FIG. 9, components within the scope of the disclosure can be assembled to create a wheeled vehicle, such as a farm tractor **2000**. According to further embodiments, additional couplers **20b**, **20c** discussed above can be added to apertures not occupied by other couplers. For example, one of coupler **20b**, **20c** could be added to tractor **2000** to create a trailer hitch connection to another wheeled vehicle toy.

As shown throughout the drawings, like reference numerals designate like or corresponding parts. While illustrative embodiments of the present disclosure have been described and illustrated above, it should be understood that these are exemplary of the disclosure and are not to be considered as limiting. Additions, deletions, substitutions, and other modifications can be made without departing from the spirit or scope of the present disclosure. Accordingly, the present disclosure is not to be considered as limited by the foregoing description.

## Claims

1. An assembly toy comprising: a building element having an aperture; and at least one coupling element comprising: a first coupler including a first mid-flange having a first side with a coupling portion extending therefrom and a second side with at least one protrusion extending away from the body; a second coupler including a second mid-flange having at least one opening, the second mid-flange having a first side with a coupling portion extending therefrom and a second side; and a decorative element disposed between the second sides of the first and second couplers, the decorative element including at least one hole therethrough; wherein the at least one protrusion of the first coupler extends through the at least one hole of the decorative element and into the at least one opening of the second coupler such that the decorative element remains captured between the first coupler and the second coupler, wherein the coupling portion of the first or second coupler is adapted to engage the aperture to releasably connect the coupling element with the building element.
2. The assembly toy of claim 1, wherein the coupling portion on the first coupler is the same as the coupling portion on the second coupler.
3. The assembly toy of claim 1, wherein the building element comprises a first building element and a second building element, wherein the coupling portion on the first coupler is adapted to engage with and releasably connect with the first building element, wherein the coupling portion of the second coupler is adapted to engage with and releasably connect with the second building element, and wherein the first and second building elements are releasably connected with one another.

- 4.** The assembly of claim 1, wherein the second coupler includes a sleeve aligned with the at least one opening, wherein the sleeve receives at least a portion of the protrusion.
  - 5.** The assembly toy of claim 1, further comprising a plurality of building elements, wherein the at least one coupling element joins two of the building elements, wherein the decorative element is positioned between the building elements and extends outward of the building elements.
  - 6.** The assembly toy of claim 5, further comprising one or more second coupling elements, the second coupling elements each comprising: a third coupler including a third mid-flange having a first side with a coupling portion extending therefrom and a second side with at least one protrusion extending away from the body; and a fourth coupler including a fourth mid-flange having at least one opening, the fourth mid-flange having a first side with a coupling portion extending therefrom and a second side, wherein the plurality of building elements are joined together with the first and second coupling elements to form a toy.
  - 7.** The assembly toy of claim 6, wherein the toy forms an animal or a vehicle.
  - 8.** The assembly toy of claim 7, wherein the animal is a lion, wherein the decorative element forms a mane of the lion.
  - 9.** The assembly toy of claim 7, wherein the vehicle is a truck, a train, a tractor, a sailboat, an airplane, or a car.
  - 10.** A coupling for a toy comprising: a first coupler including a mid-flange having a first side with a coupling portion extending therefrom and a second side with at least one protrusion extending away from the body; a second coupler including a mid-flange having at least one opening, the mid-flange having a first side with a coupling portion extending therefrom and a second side; and a decorative element disposed between the second sides of the first and second couplers, the decorative element including at least one hole therethrough; wherein the at least one protrusion of the first coupler extends through the at least one hole of the decorative element and into the at least one opening of the second coupler such that the decorative element remains captured therebetween the first coupler and the second coupler.
  - 11.** The coupling of claim 10, wherein the coupling portion on the first coupler is to the same as the coupling portion on the second coupler.
  - 12.** The coupling of claim 10, wherein the coupling portion on the first coupler is adapted to engage an aperture of a building element and the second coupler comprises an axle adapted to rotatably connect a wheel with the building element.
  - 13.** The coupling of claim 10, wherein the second coupler includes a sleeve aligned with the at least one opening, wherein the sleeve receives at least a portion of the protrusion.
  - 14.** A coupling for a toy comprising: a first coupler including a mid-flange having a first side with a coupling portion extending therefrom and a second side with at least one protrusion extending away from the mid-flange; and a second coupler including a mid-flange, the mid-flange having a first side with a coupling portion extending therefrom and a second side having at least one opening; wherein the at least one protrusion of the first coupler extends into the at least one opening of the second coupler such that the first and second coupler are coupled together.
  - 15.** The coupling of claim 14, further comprising a decorative element, including at least one hole therethrough, wherein the at least one protrusion of the first coupler extends through the at least one hole of the decorative element and into the at least one opening of the second coupler such that the decorative element is captured between the first coupler and second coupler.
  - 16.** The coupling of claim 14, wherein the coupling portion on the first coupler is the same as the coupling portion on the second coupler.
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