(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
29 June 2023 (29.06.2023)

WIPO | PCT

(10) International Publication Number
WO 2023/122686 A1

(51) International Patent Classification:
A63H 3/46 (2006.01) *A63H 3/16* (2006.01)
A63H 3/48 (2006.01) *A63H 33/04* (2006.01)
A63H 3/00 (2006.01) *A63H 33/06* (2006.01)
A63H 3/36 (2006.01) *A63H 33/08* (2006.01)

(21) International Application Number:
PCT/US2022/082172

(22) International Filing Date:
21 December 2022 (21.12.2022)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
63/292,739 22 December 2021 (22.12.2021) US

(72) Inventor; and
(71) Applicant: **GRIMES, Brad** [US/US]; 25 Highland Park Village 100-235, Dallas, Texas 75205 (US).

(74) Agent: **PERDOK, Monique M.** et al.; P.O. Box 2938, Minneapolis, Minnesota 55402 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report (Art. 21(3))*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(54) Title: ACTION FIGURES AND BUILDING BLOCKS

(57) Abstract: One or more implementations can include action figures comprised of biodegradable materials, such as wood or bamboo. The action figures can include an internal connector system that enables components of the action figures, such as arm members, leg members, torso members, and head members to have a range of motion and perform a number of movements. Additionally, building blocks are described herein that are painted and comprised of biodegradable materials. The building blocks including coupling regions that enable multiple building blocks to be coupled together and/or to be coupled to one or more action figures. Processes are described herein for making painted building blocks comprised of biodegradable materials.

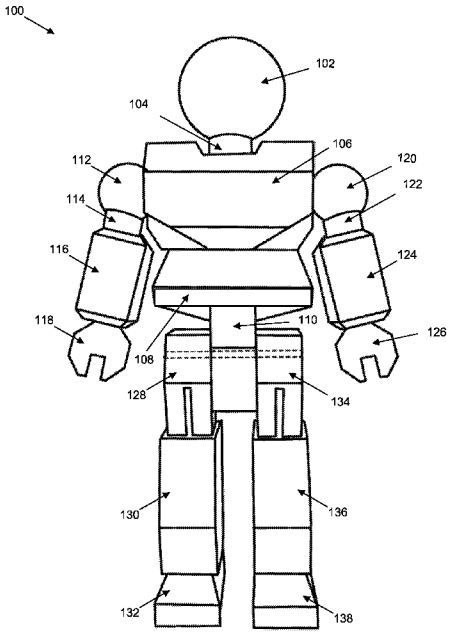

FIG. 1

WO 2023/122686 A1

ACTION FIGURES AND BUILDING BLOCKS

PRIORITY CLAIM AND INCORPORATION BY REFERENCE

[001] This application claims priority to U.S. Provisional Patent Application No. 63/292,739 filed December 22, 2021, and entitled "Action Figures and Building Blocks," the entire contents of which is incorporated by reference herein in its entirety.

BACKGROUND

[002] As the types of items and quantities of items made from plastics has increased over the past several decades, the amount of plastic waste in the environment has also increased. Additionally, an awareness of the toxicity of various plastic materials to humans, pets, wildlife, and the environment has also grown. This has led many individuals and companies to move to the use of biodegradable, compostable, or otherwise sustainable materials to produce their products. The problems resulting from plastic waste and toxicity is particularly acute in the toy industry where toys are seldom re-used and/or recycled and children can have increased exposure to the toxic chemicals present in plastics.

BRIEF DESCRIPTION OF THE DRAWINGS

[003] While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter that is regarded as forming the various implementations of the present disclosure, it is believed that the invention will be better understood from the following description taken in conjunction with the accompanying figures. In the figures, the depicted structural elements are not to scale, and certain components may be enlarged relative to the other components for purposes of emphasis and understanding.

[004] FIG. 1 is a front view of an action figure comprised of a wood material that includes limbs with multiple movable members, according to one or more implementations.

[005] FIG. 2 is a side view of an action figure comprised of a wood material that includes limbs with multiple movable members, according to one or more implementations.

[006] FIG. 3 is a view of a design of an action figure comprised of a wood material that includes limbs with multiple movable members, according to one or more implementations.

[007] FIG. 4A is a top view of a building block comprised of a biodegradable material, according to one or more implementations.

[008] FIG. 4B is a bottom view of a building block comprised of a biodegradable material, according to one or more implementations.

[009] FIG. 4C is a cross-sectional view of a building block comprised of a biodegradable material, according to one or more implementations.

[010] FIG. 4D is a side view of a building block comprised of a biodegradable material, according to one or more implementations.

[011] FIG. 5 is a side view of an action figure comprised of a wood material that includes limbs with multiple movable members showing movement of the torso of the action figure and showing engagement of the action figure with a painted building block comprised of a biodegradable material, according to one or more implementations.

[012] FIG. 6 is a cross-sectional view showing a first portion of a connector system of an action figure comprised of a biodegradable material to couple components of the action figure using one or more connectors, according to one or more implementations.

[013] FIG. 7 is a cross-sectional view showing a second portion of a connector system of an action figure comprised of a biodegradable material to couple components of the action figure using one or more connectors, according to one or more implementations.

[014] FIG. 8 is a cross-sectional view showing a third portion of a connector system of an action figure comprised of a biodegradable material to couple components of the action figure using one or more connectors, according to one or more implementations.

[015] FIG. 9 is a flow diagram of a process to produce a painted building block comprised of a biodegradable material, according to one or more implementations.

DETAILED DESCRIPTION

[016] Throughout this document, values expressed in a range format should be interpreted in a flexible manner to include not only the numerical values explicitly recited as the limits of the range, but also to include all the individual numerical values or sub-ranges encompassed within that range as if each numerical value and sub-range is explicitly recited. For example, a range of "about 0.1% to about 5%" or "about 0.1% to 5%" should be interpreted to include not just about 0.1% to about 5%, but also the individual values (e.g., 1%, 2%, 3%, and 4%) and the sub-ranges (e.g., 0.1% to 0.5%, 1.1% to 2.2%, 3.3% to 4.4%) within the indicated range. The statement "about X to Y" has the same meaning as "about X to about Y," unless indicated otherwise. Likewise, the statement "about X, Y, or about Z" has the same meaning as "about X, about Y, or about Z," unless indicated otherwise.

[017] As used herein, "about" or "approximately" as applied to one or more values or elements of interest, refers to a value or element that is similar to a stated reference value or element. In certain implementations, the term "about" or "approximately" refers to a range of

values or elements that falls within 25%, 20%, 19%, 18%, 17%, 16%, 15%, 14%, 13%, 12%, 11%, 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, 1%, or less in either direction (greater than or less than) of the stated reference value or element unless otherwise stated or otherwise evident from the context (except where such number would exceed 100% of a possible value or element).

[018] In this document, the terms "a," "an," or "the" are used to include one or more than one unless the context clearly dictates otherwise. The term "or" is used to refer to a nonexclusive "or" unless otherwise indicated. The statement "at least one of A and B" or "at least one of A or B" has the same meaning as "A, B, or A and B." In addition, it is to be understood that the phraseology or terminology employed herein, and not otherwise defined, is for the purpose of description only and not of limitation. Any use of section headings is intended to aid reading of the document and is not to be interpreted as limiting; information that is relevant to a section heading may occur within or outside of that particular section.

[019] Toys made from biodegradable materials can help to reduce the amount of plastic waste found in the environment. Additionally, toys made from biodegradable materials can reduce the amount of exposure of children and parents to toxic materials found in plastic toys. Implementations described herein are directed to action figures that are comprised of biodegradable materials. The action figures are structured to allow for a variety of options of movement of the body parts of the action figures that are not typically found in existing action figures. To achieve the number of options for movement of body parts of the action figures, a connector system including a number of cavities and recesses is located within the components of the action figures. The connector system can provide pathways for connectors that link the various components of the action figure to provide flexibility and range of motion for components of the action figures.

[020] In addition, implementations described herein are directed to building blocks that have been painted. The painting of building blocks comprised of biodegradable materials can be problematic when conventional processes are used. For example, conventional processes for painting building blocks comprised of biodegradable materials can cause portions of the building blocks to absorb moisture. In at least some scenarios, conventional processes for painting building blocks can include immersing the building blocks into a paint. For example, conventional processes for making painted building blocks can include immersing fully-formed building blocks in a paint. As the building blocks absorb moisture, the shape and/or dimensions of the building blocks can change. In various examples, regions of the building blocks used to couple building blocks to one another or to action figures can have dimensions

and/or shapes that are modified due to the painting process. As a result of the changes to the dimensions and/or shape of the coupling regions, the building blocks may no longer be able to be coupled to other building blocks or to action figures.

[021] The processes described herein for manufacturing painted building blocks overcome the problems produced by conventional processes. To illustrate, implementations of processes described herein can minimize the amount of moisture absorbed by the building blocks from the paint. In this way, the building blocks produced by implementations of the processed described herein can maintain their shape and dimensions and continue to be coupled to other building blocks or action figures after being painted. In one or more illustrative examples, a process for manufacturing painted building blocks comprised of a biodegradable material, such as wood or bamboo, can include performing a first cutting process to form coupling regions on a top surface of the building block and then applying a water-based paint to the building block with coupling regions. A drying process can then be performed, and a second cutting process can take place that forms features of a bottom of the building blocks including one or more cavities that enable the painted building blocks to be coupled to additional building blocks.

[022] FIG. 1 is a front view of an action figure 100 comprised of a biodegradable material that includes limbs with multiple movable members, according to one or more implementations. In one or more examples, the biodegradable material can include a wood material. In one or more illustrative examples, the biodegradable material can include a beech wood. In one or more additional examples, the biodegradable material can include a bamboo material. Individual components of the action figure 100 can be comprised of substantially all biodegradable material. In various examples, the action figure 100 can be free of plastic materials. In one or more additional examples, a biodegradable material, as described herein, can break down into constituent components over a period of time when exposed to the environment that is faster than the breakdown of synthetic components, such as plastics.

[023] Additionally, the action figure 100 can include surfaces that are paintable. In one or more implementations, the action figure 100 include surfaces that can accept writing and/or other markings. The writing can be placed on one or more surfaces of the action figure. In various examples, the writing can be removable. For example, crayons, colored pencils, and erasable markers can be used to write and/or provide markings on the action figure 100. Further, due to the action figure 100 being comprised of a biodegradable material, such as a wood material, the writing and/or markings can be removed using a sponge. In one or more illustrative examples, a melamine sponge can be used to remove writing or other markings made on the action figure 100 using at least one of crayon, colored pencil, or erasable marker.

[024] The action figure 100 can include a head member 102. The action figure 100 can also include a neck member 104 that is coupled to the head member 102. In one or more examples, the neck member 104 can be coupled to the head member 102 by a bonding material. In one or more illustrative examples, the neck member 104 can be coupled to the head member 102 by a glue. In various examples, a glue used to couple the neck member 104 to the head member 102 can be a wood glue.

[025] In addition, the action figure 100 can include an upper torso member 106 and a lower torso member 108. Further, the action figure 100 can include a core member 110. The head member 102, the neck member 104, the upper torso member 106, the lower torso member 108, and the core member 110 can be coupled by a connector that is disposed within the interiors of the head member 102, the neck member 104, the upper torso member 106, the lower torso member 108, and the core member 110. In one or more examples, the connector can include a rope, cord, or string. In various examples, cavities can be located within the head member 102, the neck member 104, the upper torso member 106, the lower torso member 108, and the core member 110 in which a connector can be disposed. In one or more additional examples, the connector can be fastened to the head member 102 and to the core member 110.

[026] The action figure 100 can include a left shoulder member 112, a left upper arm member 114, a left lower arm member 116, and a left hand member 118. The left shoulder member 112, the left upper arm member 114, the left lower arm member 116, and the left hand member 118 can be coupled by a connector that is disposed within cavities of the left shoulder member 112, the left upper arm member 114, the left lower arm member 116, and the left hand member 118. In one or more examples, the connector can include a string, rope, or cord and can also couple the left shoulder member 112, the left upper arm member 114, the left lower arm member 116, and the left hand member 118 to the upper torso member 106.

[027] Further, the action figure 100 can include a right shoulder member 120, a right upper arm member 122, a right lower arm member 124, and a right hand member 126. The right shoulder member 120, the right upper arm member 122, the right lower arm member 124, and the right hand member 126 can be coupled by a connector that is disposed within cavities of the right shoulder member 120, the right upper arm member 122, the right lower arm member 124, and the right hand member 126. In various examples, the connector can include a string, rope, or cord and can also couple the right shoulder member 120, the right upper arm member 122, the right lower arm member 124, and the right hand member 126 to the upper torso member 106. In one or more illustrative examples, a single connector can couple the left hand member 118, the left lower arm member 116, the left upper arm member 114, the left shoulder

member 112, the upper torso member 106, the right shoulder member 120, the right upper arm member 122, the right lower arm member 124, and the right hand member 126. For example, a connector can include a rope, string, or cord and be disposed within cavities of the left hand member 118, the left lower arm member 116, the left upper arm member 114, the left shoulder member 112, the upper torso member 106, the right shoulder member 120, the right upper arm member 122, the right lower arm member 124, and the right hand member 126.

[028] At least one of the left hand member 118 or the right hand member 126 can be sized to couple to one or more additional objects. For example, at least one of the left hand member 118 or the right hand member 126 can be sized to couple to one or more building blocks. Additionally, at least one of the left hand member 118 or the right hand member 126 can be sized to grasp various accessories, such as a shield, a hilt of a sword, a rod, a pole, and the like.

[029] The action figure 100 can include a left upper leg member 128, a left lower leg member 130, and a left foot member 132. In addition, the action figure 100 can include a right upper leg member 134, a right lower leg member 136, and a right foot member 138. The left upper leg member 128 can be coupled to the core member 110 by a fastener that is disposed in cavities located within the left upper leg member 128 and the core member 110. In addition, the right upper leg member 134 can be coupled to the core member 110 by a fastener that is disposed in cavities of the right upper leg member 134 and the core member 110. In various examples, the left upper leg member 128 and the right upper leg member 134 are coupled to the core member 110 using a single fastener. In one or more illustrative examples, a fastener used to couple the at least one of the left upper leg member 128 or the right upper leg member 134 to the core member 110 can be comprised of a metallic material or a polymeric material.

[030] The left upper leg member 128, the left lower leg member 130, and the left foot member 132 can be coupled by a connector. The connector can include a rope, string, or cord. In one or more examples, a connector coupling the left upper leg member 128, the left lower leg member 130, and the left foot member 132 can be disposed in cavities located within the left upper leg member 128, the left lower leg member 130, and the left foot member 132. Additionally, the right upper leg member 134, the right lower leg member 136, and the right foot member 138 can be coupled by a connector. The connector can include a rope, string, or cord. In various examples, a connector coupling the right upper leg member 134, the right lower leg member 136, and the right foot member 138 can be disposed within cavities located in cavities disposed within the right upper leg member 134, the right lower leg member 136, and the right foot member 138.

[031] In one or more examples, the head member 102, the neck member 104, the upper torso member 106, the lower torso member 108, the core member 110, the left shoulder member 112, the left upper arm member 114, the left lower arm member 116, the left hand member 118, the right shoulder member 120, the right upper arm member 122, the right lower arm member 124, the right hand member 126, the left upper leg member 128, the left lower leg member 130, the left foot member 132, the right upper leg member 134, the right lower leg member 136, and the right foot member 138 can be composed of a biodegradable material, such as a beech wood or bamboo.

[032] FIG. 2 is a side view of an action figure 100 comprised of a biodegradable material that includes limbs with multiple movable members, according to one or more implementations. The illustrative example of FIG. 2 shows a fastener 200 that can connect at least one of the left upper leg member 128 or the right upper leg member 134 to the core member 110. Additionally, the illustrative example of FIG. 2 shows that the action figure 100 has a height 202 and that the left foot member 132 has a length 204. The height 202 can be from about 4 cm to about 32 cm, from about 4 cm to about 10 cm, from about 10 cm to about 20 cm, from about 20 cm to about 32 cm, from about 8 cm to about 18 cm, or from about 15 cm to about 25 cm. Further, the length 204 can be from about 2 cm to about 8 cm, from about 4 cm to about 6 cm, or from about 2 cm to about 4 cm.

[033] In one or more examples, the head member 102 can have a height from about 1 cm to about 10 cm or from about 2 cm to about 6 cm and a width from about 1 cm to 10 cm or from about 2 cm to about 6 cm. Additionally, the upper torso member 106 can have a height from about 2 cm to about 15 cm, from about 3 cm to about 12 cm, or from about 3 cm to about 8 cm. The upper torso member 106 can also have a width from about 1 cm to about 12 cm, from about 2 cm to about 10 cm, or from about 2 cm to about 8 cm. The lower torso member 108 can have a height from about 0.5 cm to about 8 cm or from about 1 cm to about 5 cm and a width from about 1 cm to about 10 cm or from about 2 cm to about 6 cm.

[034] Further, a combination of the left shoulder member 112, the left upper arm member 114, the left lower arm member 116, and the left hand member 118 can have a length from about 2 cm to about 15 cm, from about 3 cm to about 12 cm, or from about 4 cm to about 10 cm. The left shoulder member 112, the left upper arm member 114, the left lower arm member 116, and the left hand member 118, individually, can have a length from about 0.2 cm to about 10 cm, from about 0.5 cm to about 8 cm, or from about 1 cm to about 5 cm, and a width from about 0.5 cm to about 8 cm or from about 1 cm to about 4 cm. Although not shown in the illustrative example of FIG. 2, a combination of the right shoulder member 120, the right upper

arm member 122, the right lower arm member 124, and the right hand member 126 can have a length from about 2 cm to about 15 cm, from about 3 cm to about 12 cm, or from about 4 cm to about 10 cm. In addition, although not shown in the illustrative example of FIG. 2, the right upper arm member 122, the right lower arm member 124, and the right hand member 126 , individually, can have a length from about 0.2 cm to about 10 cm, from about 0.5 cm to about 8 cm, or from about 1 cm to about 5 cm and a width from about 0.5 cm to about 8 cm or from about 1 cm to about 4 cm.

[035] In various examples, the core member 110 can have a length from about 0.5 cm to about 6 cm or from about 1 cm to about 4 cm and a width from about 0.2 cm to about 4 cm or from about 0.5 cm to about 3 cm. A combination of the left upper leg member 128, the left lower leg member 130, and the left foot member 132 can have a length from about 5 cm to about 35 cm, from about 8 cm to about 30 cm, or from about 12 cm to about 25 cm. The left upper leg member 128 and the left lower leg member 130, individually, can have a length from about 1 cm to about 15 cm, from about 2 cm to about 10 cm, from about 2 cm to about 6 cm, or from about 3 cm to about 8 cm and a width from about 0.5 cm to about 8 cm or from about 1 cm to about 6 cm. The left foot member 132 can have a width from about 0.2 cm to about 6 cm or from about 0.5 cm to 4 about cm. Although not shown in the illustrative example of FIG. 2, a combination of the right upper leg member 134, the right lower leg member 136, and the right foot member 138 can have a length from about 5 cm to about 35 cm, from about 8 cm to about 30 cm, or from about 12 cm to about 25 cm. The right upper leg member 134 and the right lower leg member 136, individually, can have a length from about 1 cm to about 15 cm, from about 2 cm to about 10 cm, from about 2 cm to about 6 cm, or from about 3 cm to about 8 cm and a width from about 0.5 cm to about 8 cm or from about 1 cm to about 6 cm. The right foot member 138 can have a width from about 0.2 cm to about 6 cm or from about 0.5 cm to about 4 cm.

[036] In one or more examples, the action figure 200 can be a piece of jewelry, such as an earring and/or a pendant that can be attached to a bracelet, necklace, or anklet. In these scenarios, one or more components of the action figure 200 can include one or more holes and/or one or more attachment mechanisms such that the action figure 200 can function as a piece of jewelry. For example, an attachment mechanism, such as an open loop, a closable loop, or a closed loop, can be coupled to the head member 102 to enable the action figure 200 to function as a pendant and/or earrings. In at least some cases, the attachment mechanism can be embedded in the head member 102. In one or more additional examples, the action figure 200 can comprise one or more holes through which a necklace, chain, and/or an attachment

mechanism can be strung or looped. In one or more illustrative examples, the holes can be present in at least one of the head member 102, the neck member 102, the upper torso member 106, the left hand member 118, the right hand member 126, the left foot member 132, or the right foot member 138. In situations where the action figure 200 functions as a piece of jewelry, the dimensions of the components of the action figure 200 can be smaller than those described above. In various examples, when the action figure 200 functions as a piece of jewelry, the height 202 can be from about 1 cm to about 10 cm or from about 2 cm to about 8 cm and the length 204 can be about 0.1 cm to about 3 cm or from about 0.2 cm to about 2 cm.

[037] FIG. 3 is a view of a design of an action figure 300 comprised of a biodegradable material that includes limbs with multiple movable members, according to one or more implementations. The action figure 300 can have a number of design features. The design features can be produced by at least one of paint, dye, or ink. In addition, the design features can be related to facial features of the action figure 300. Further, the design features can be related to clothing or a costume of the action figure 300.

[038] In the illustrative example of FIG. 3, the action figure 300 includes a first design feature 302 and a second design feature 304 that correspond to eyes of the action figure 300 and a third design feature 306 that corresponds to a mouth. In addition, the action figure 300 can include a fourth design feature 308 that corresponds to hair. The action figure 300 can also include a fifth design feature 310 that includes color on the left lower arm member and a sixth design feature 312 that includes color on the right lower are member. Further, the action figure 300 can include a seventh, colored design feature 314 on the upper torso member and an eighth, symbolic design feature 316 also on the upper torso member. In the illustrative example of FIG. 3, the lower torso member and the core member can also have ninth and tenth design features 318, 320 respectively. The left upper leg member can include an eleventh design feature 322 and the right upper leg member can include a twelfth design feature 324. The left lower leg member and the right lower leg member can include a thirteenth design feature 326 and fourteenth design feature 328, respectively, while the left foot member includes a fifteenth design feature 330 and the right foot member includes a sixteenth design feature 332.

[039] Although the illustrative example of FIG. 3 shows the action figure 300 with a number of design features, in additional examples, action figures according to implementations herein can be free of design features or have a different quantity and/or different style of design features than those of the action figure 300.

[040] FIG. 4A is a top view of a building block 400 having a body 402 comprised of a biodegradable material, according to one or more implementations. In various examples, the

building block 400 can have a color produced by paint applied to the building block 400. The building block 400 can include a top surface 404. A number of coupling regions 406 can be disposed on the top surface 404. The coupling regions 406 can be configured to cause the building block 400 to be coupled to another building block comprised of a biodegradable material. Additionally, the coupling regions 406 can be configured to cause the building block 400 to be coupled to building blocks comprised of different materials, such as building blocks comprised of one or more plastic materials. Further, the coupling regions 406 can be configured to cause the building block 400 to be coupled to other items, such as action figures. The coupling regions 406 can be raised above the top surface 404. In one or more examples, the coupling regions 406 can be solid and have a substantially flat top surface. In one or more additional examples, the raised coupling regions 406 can include a recessed region 408 having an interior depth from a rim 410 of the coupling region 406 to the top surface 404.

[041] Although the illustrative example of FIG. 4A shows that the top surface 404 includes eight coupling regions 406, in additional examples, the top surface 404 can comprise a different number of coupling regions 406, such as 2 coupling regions 406, 4 coupling regions 406, 6 coupling regions 406, 10 coupling regions 406, 12 coupling regions 406, 14 coupling regions 406, 16 coupling regions 406, 18 coupling regions 406, 20 coupling regions 406, 22 coupling regions 406, 24 coupling regions 406, 26 coupling regions 406, 28 coupling regions 406, or 30 coupling regions 406. In various examples, the top surface 404 can have an odd number of coupling regions 406, such as from 1 to 100 coupling regions 406. In one or more illustrative examples, the top surface 404 can have from 2 coupling regions 406 to 20 coupling regions 406, from 20 coupling regions 406 to 40 coupling regions 406, from 40 coupling regions 406 to 60 coupling regions 406, from 60 coupling regions 406 to 80 coupling regions 406, from 80 coupling regions 406 to 100 coupling regions 406, from 50 coupling regions 406 to 100 coupling regions 406, from 25 coupling regions 406 to 75 coupling regions 406, or from 40 coupling regions 406 to 80 coupling regions 406.

[042] FIG. 4B is a bottom view of a building block 400 comprised of a biodegradable material, according to one or more implementations. The bottom of the building block 400 can include a number of painted and unpainted regions that are a result of the process used to make the building block 400. In various examples, the building block 400 can include one or more cavities that include unpainted regions of the body 402. For example, the building block 400 can include a first cavity 412 and a second cavity 414. The building block 400 can also include a first boundary region 416 that is disposed around the first cavity 412 and a second boundary

region 418 that is disposed around the second cavity 414. The first boundary region 416 and the second boundary region 418 can be painted.

[043] FIG. 4C is a cross-sectional view of a building block 400 comprised of a biodegradable material, according to one or more implementations. The building block 400 can have a height 420 and a length 422. The height 420 can be from about 0.5 centimeters (cm) to about 5 cm, from about 1 cm to about 4 cm, from about 0.5 cm to about 3 cm, from about 1 cm to about 2 cm, from about 0.5 cm to about 2.5 cm, from about 1 cm to about 3 cm, from about 0.5 cm to about 1.5 cm, or from about 1.5 cm to about 2.5 cm. In addition, the length 422 of the building block 400 can be from about 0.5 cm to about 12 cm, from about 0.5 cm to about 14 cm, from about 1 cm to about 4 cm, from about 3 cm to about 7 cm, from about 2 cm to about 8 cm, or from about 4 cm to about 10 cm, from about 6 cm to about 14 cm, from about 3 cm to about 5 cm, or from about 5 cm to about 7 cm.

[044] Further, as the length 422 of the building block 400 increases, the number of cavities included in the body 402 can also increase and as the length 422 of the building block 400 decreases, the number of cavities in the body 402 can also decrease. In the illustrative example of Figure 4C, the body 402 includes four cavities: a first cavity 412, a second cavity 414, a third cavity 424 and a fourth cavity 426. In additional implementations, the body 402 can have from 2 cavities to 80 cavities, from 2 cavities to 8 cavities, from 8 cavities to 20 cavities, from 20 cavities to 40 cavities, from 40 cavities to 60 cavities, from 60 cavities to 80 cavities, from 25 cavities to 75 cavities, from 30 cavities to 50 cavities, from 10 cavities to 20 cavities, from 20 cavities to 30 cavities, from 30 cavities to 40 cavities, or from 40 cavities to 50 cavities.

[045] In one or more illustrative examples, the building block 400 can have a length 422 from about 3 cm to about 12 cm, a width 438 from about 1 cm to about 12 cm, have from about 8 coupling regions 406 to about 80 coupling regions 406, and have from about 4 cavities to about 40 cavities.

[046] In various examples, building blocks 400 can be formed without cavities. In these implementations, the building blocks 400 can be painted or unpainted. Unpainted building blocks 400 can be coated with an oil, such as a hemp seed oil. Additionally, in these scenarios, the building blocks 400 can have lengths 422 from about 4 cm to about 40 cm and width 438 from about 1 cm to about 40 cm. Further, in instances where the building blocks 400 are formed without cavities, the building blocks 400 can have from 10 coupling regions 406 to 400 coupling regions 406.

[047] The first cavity 412 can have a first length 428 and the second cavity 414 can have a second length 430. In one or more examples, a length of the third cavity 424 can be at least

substantially the same as the first length 428 and a length of the fourth cavity 426 can be at least substantially the same as the second length 430. The first length 428 can be from about 0.3 cm to about 6 cm, from about 0.5 cm to about 4 cm, from about 1 cm to about 2 cm, from about 2 cm to about 3 cm, from about 1 cm to about 3 cm, from about 1.5 cm to about 2.5 cm, or from about 2 cm to about 4 cm. In addition, the second length 430 can be from about 0.1 cm to about 2 cm, from about 0.3 cm to about 1 cm, from about 0.5 cm to about 1 cm, from about 0.5 cm to about 1.5 cm, from about 0.4 cm to about 0.6 cm, from about 0.8 cm to about 1.2 cm, from about 1 cm to about 1.5 cm, or from about 1 cm to about 2 cm. In various examples, the second length 430 can represent a diameter when the second cavity 414 has a circular shape. Additionally, the first cavity 412, the second cavity 414, the third cavity 424, and the fourth cavity 426 can have a height 432. The height 432 can be from about 0.1 cm to about 4 cm, from about 0.2 cm to about 2 cm, from about 0.2 cm to about 1 cm, from about 0.2 cm to about 0.5 cm, from about 0.8 cm to about 1.2 cm, from about 0.5 cm to about 1.0 cm, or from about 0.6 cm to about 1.4 cm. In various examples, a ratio of the height 432 to the height 420 can be no greater than about 1 cm, no greater than about 0.8, no greater than about 0.6, no greater than about 0.4, or no greater than about 0.2. In one or more illustrative examples, the height 432 can be no greater than about 0.5 times the height 420. In one or more additional examples, the height 432 can be less than a height of cavities of conventional building blocks. In one or more further examples, the height 432 can be configured to provide an amount of stability to structures built using multiple building blocks. The amount of stability provided by the dimensions of the building block 400 can be greater than an amount of stability of conventional building blocks.

[048] The coupling region 406 can have a diameter 434 and a height 43. The diameter 434 can be about 0.1 cm to about 1.5 cm, from about 0.2 cm to about 1.2 cm, from about 0.3 cm to about 0.6 cm, from about 0.8 cm to about 1.2 cm, from about 0.5 cm to about 1.5 cm, or from about 0.4 cm to about 0.8 cm. In scenarios, where the coupling region 406 can have an inner diameter and an outer diameter, the diameter 434 can represent the outer diameter, and the inner diameter can be at least about 0.5 times the outer diameter, at least about 0.6 times the outer diameter, at least about 0.7 times the outer diameter, at least about 0.8 times the outer diameter, or at least about 0.9 times the outer diameter. The height 436 can be from about 0.1 cm to about 1 cm, from about 0.1 cm to about 0.8 cm, from about 0.1 cm to about 0.5 cm, or from about 0.2 cm to about 0.6 cm. In addition to the number of coupling regions 406 included in the building block 400, the diameter 434 and the height 436 can be configured to couple the building block 400 to additional building blocks and/or to one or more action figures.

[049] FIG. 4D is a side view of a building block 400 having a body 402 comprised of a biodegradable material, according to one or more implementations. The building block 400 can have a width 438 that is from about 0.5 cm to about 14 cm, from about 1 cm to about 4 cm, from about 1 cm to about 2 cm, from about 2 cm to about 4 cm, from about 3 cm to about 4 cm, from about 2 cm to about 10 cm, from about 4 cm to about 12 cm, or from about 2 cm to about 8 cm.

[050] In various examples, building blocks 400 having different sizes can be compatible and be coupled with one another. For example, first building blocks having widths 438 from about 0.5 cm to about 1.5 cm and heights 420 from about 0.5 cm to about 1.5 cm can be coupled with additional first building blocks and with second building blocks having widths 438 from about 2.5 cm to about 3.5 cm and heights 420 from about 1.5 cm to about 2.5 cm. In one or more examples, individual first building blocks having lengths 422 from about 5.5 cm to about 6.5 cm and having lengths 422 from about 2.5 cm to about 3.5 cm can both fit into individual second building blocks having lengths 422 from about 5.5 cm to about 6.5 cm. In these implementations, dimensions of cavities of the second building blocks can correspond to at least one of lengths or widths of the first building blocks such that one or more first building blocks can be coupled to a second building block.

[051] FIG. 5 is a side view of an action figure 100 comprised of a biodegradable material that includes limbs with multiple movable members showing movement of the torso of the action figure and showing engagement of the action figure with a painted building block comprised of a biodegradable material, according to one or more implementations. In the illustrative example of FIG. 5, the action figure 100 is bending by moving the core member 110 and/or the left upper leg member 128 and the right upper leg member 134. In various examples, the action figure 100 can move from a first position (a standing position) to a second position (a bending position).

[052] The action figure 100 can also be coupled to a building block 400. In one or more examples, the coupling regions 406 of the building block 400 can be configured to couple to the left foot member 132 and/or the right foot member 138 of the action figure 100. For example, a bottom of the left foot member 132 can include a border region 500 and a recessed region 502. The recessed region 502 can engage with at least a portion of the coupling regions 406 of the building block 400 to couple the action figure 100 to the building block 400. Additionally, the bottom of the left foot member 132 can include an opening 504. The opening 504 can be an opening to a cavity disposed within the left foot member 132 and a connector can be disposed within the cavity to couple the left foot member 132 to the left lower leg

member 130 and the left upper leg member 128. In various examples, a bottom of the right foot member 138 can include a similar configuration to couple the right foot member 138 to a building block 400.

[053] FIG. 6 is a cross-sectional view showing a first portion of a connector system of an action figure comprised of a biodegradable material to couple components of the action figure using one or more connectors, according to one or more implementations. The first portion of the connector system of the action figure 100 can include a first cavity 600 located within the head member 102 and a second cavity 602 located within the neck member 104. In one or more examples, the first cavity 600 and the second cavity 602 can form a continuous path within the head member 102 and the neck member 104. Although the illustrative example of FIG 6 shows a first cavity 600 and a second cavity 602, in one or more additional examples, a single cavity can be located within the head member 102 and the neck member 104. The first portion of the connector system can also include a third cavity 604 disposed within the upper torso member 106 and a fourth cavity 606 disposed within the lower torso member 108. In addition, the first portion of the connector system can include a fifth cavity 608 disposed within the core member 110. The fifth cavity 608 can include a vertical component that aligns with the first cavity 600, the second cavity 602, the third cavity 604, and the fourth cavity 606 and a horizontal component that is disposed perpendicular to the vertical component. Further, the first portion of the connector system can include a sixth cavity 610 located within the left upper leg member 128 and a seventh cavity 612 disposed within the right upper leg member 134.

[054] A connector 614 can be disposed within the first portion of the connector system. The connector 614 can include at least one of a rope, string, or cord. In one or more illustrative examples, the connector 614 can include a nylon cord. In various examples, the connector 614 can be comprised of a material that enables the connector 614 to be extended from an initial length to an extended length when a pulling force is applied and to recover to the initial length when the pulling force is removed. In this way, at least a portion of the components of the action figure 100 can be separated. For example, the head member 102 and the neck member 104 can be separated from the upper torso member 106. In addition, the upper torso member 106 can be separated from the lower torso member 108.

[055] In one or more additional illustrative examples, the lower torso member 108 can be coupled to the core member 110 such that the lower torso member 108 and the core member 110 are not able to be separated without application of a destructive force. To illustrate, the lower torso member 108 and the core member 110 can be coupled by an adhesive. In one or more further illustrative examples, the lower torso member 108 can be coupled to the core

member 110 by a glue, such as a wood glue. In various examples, the coupling of the core member 110 to the lower torso member 108 using an adhesive can help to provide stability to the action figure 100 when in a standing position.

[056] In one or more examples, the connector 614 can be disposed in the first cavity 600, the second cavity 602, the third cavity 604, the fourth cavity 606, and at least a portion of the fifth cavity 608. In various examples, the connector 614 can be anchored at a first end within the head member 102 using a metallic hook 616. Additionally, the connector 614 can be anchored at a second end within the fifth cavity 608. For example, the connector 614 can be tied in such a way at the second end and the fifth cavity 608 can be shaped such that a pulling force can be applied to at least one of the head member 102 or the upper torso member 106 to expand the connector 614, while the connector 614 remains anchored to the core member 110.

[057] Additionally, the connector 614 can be configured within the first portion of the connector system such that components of the action figure 100 are rotatable. For example, a combination of the head member 102 and the neck member 104 can rotate up to 360° with respect to the upper torso member 106. Further, the upper torso member 106 can rotate up to 360° with respect to the lower torso member 108.

[058] The left upper leg member 128 can include a sixth cavity 618 and the right upper leg member 134 can include a seventh cavity 620. A first additional connector 622 can be disposed within the sixth cavity 618 and at least a portion of the horizontal portion of the fifth cavity 608. In addition, a second additional connector 624 can be disposed within the seventh cavity 620 and at least a portion of the horizontal portion of the fifth cavity 608. The first additional connector 622 and the second additional connector 624 can join the left upper leg member 128 to the right upper leg member 134. In various examples, the first additional connector 622 and the second additional connector 624 can form a fastener, such as the fastener 200 of FIG. 2, that couples the left upper leg member 128 to the right upper leg member 134. In one or more illustrative examples, the first additional connector 622 and the second additional connector 624 can be configured such that the first additional connector 622 can be inserted into the second additional connector 624 to connect the first additional connector 622 to the second additional connector 624. In these scenarios, a portion of the second additional connector 624 can be hollow such that a shaft of the first additional connector 622 can be inserted into the hollow region of the second additional connector 624. In one or more additional examples, the first additional connector 622 and the second additional connector 624 can be configured such that the second additional connector 624 can be inserted into the first additional connector 622 to connect the first additional connector 622 to the second additional connector 624. In these

situations, a portion of the first additional connector 622 can be hollow such that a shaft of the second additional connector 624 can be inserted into the hollow region of the first additional connector 622.

[059] FIG. 7 is a cross-sectional view showing a second portion of a connector system of an action figure comprised of a biodegradable material to couple components of the action figure using one or more connectors, according to one or more implementations. The action figure can include an upper leg member 700, such as the left upper leg member 128 or the right upper leg member 134. In addition, the second portion of the connector system can include an eighth cavity 702 disposed within the upper leg member 700. The action figure can also include a lower leg member 704, such as the left lower leg member 130 or the right lower leg member 136. A ninth cavity 706 of the second portion of the connector system can be located within the lower leg member 704. Further, the action figure can include a foot member 708, such as the left foot member 132 or the right foot member 138. The second portion of the connector system can include a tenth cavity 710 located within the foot member 708.

[060] In various examples, a third additional connector 712 can be disposed within the second portion of the connector system. The third additional connector 712 can include at least one of a rope, string, or cord. In one or more illustrative examples, the third additional connector 712 can include a nylon cord. In various examples, the third additional connector 712 can be comprised of a material that enables the third additional connector 712 to be extended from an initial length to an extended length when a pulling force is applied and to recover to the initial length when the pulling force is removed. In this way, at least a portion of the components of the action figure can be separated. For example, the lower leg member 704 can be separated from the upper leg member 700 and the foot member 708 can be separated from the lower leg member 704.

[061] In one or more examples, the third additional connector 712 can be disposed in the eighth cavity 702, the ninth cavity 706, and the tenth cavity 710. The third additional connector 712 can be anchored at a first end within the eighth cavity 702 and at a second end within the tenth cavity 710. For example, the eighth cavity 702 can include an opening and the third additional connector 712 can be tied in such a way that the third additional connector 712 is unable to move through the opening into the eighth cavity 702. Additionally, the tenth cavity 710 can include an opening and the third additional connector 712 can be tied in such a way that the third additional connector 712 is unable to move through the opening into the tenth cavity 710. In this way, a pulling force can be applied to at least one of the lower leg member 704 or the foot member 708 to expand the third additional connector 712 and separate the lower

leg member 704 and/or the foot member 708 from one another or from the upper leg member 700. In various examples, the upper leg member 700 can include an additional cavity, such as the sixth cavity 618 of the left upper leg member 128 or the seventh cavity 620 of the right upper leg member 134.

[062] Additionally, the third additional connector 712 can be configured within the second portion of the connector system such that components of the action figure are rotatable. For example, the lower leg member 704 can rotate up to 360° with respect to the upper leg member 700. Further, the foot member 708 can rotate up to 360° with respect to the lower leg member 704.

[063] FIG. 8 is a cross-sectional view showing a third portion of a connector system of an action figure 100 comprised of a biodegradable material to couple components of the action figure 100 using one or more connectors, according to one or more implementations. The third portion of the connector system can include an eleventh cavity 800 located within the left shoulder member 112 and a twelfth cavity 802 located within the left upper arm member 114. The third portion of the connector system can also include a thirteenth cavity 804 located within the left lower arm member 116 and a fourteenth cavity 806 located within the left hand member 118. Additionally, the third portion of the connector system can include a fifteenth cavity 808 located within the upper torso member 106, a sixteenth cavity 810 located within the right shoulder member 120, and a seventeenth cavity 812 located within the right upper arm member 122. Further, the third portion of the connector system can include an eighteenth cavity 814 located within the right lower arm member 124 and a nineteenth cavity 816 located within the right hand member 126. In one or more examples, the fifteenth cavity 808 can intersect with the third cavity 604 within the upper torso member 106.

[064] In various examples, a fourth additional connector 818 can be disposed within the third portion of the connector system. The fourth additional connector 818 can include at least one of a rope, string, or cord. In one or more illustrative examples, the fourth additional connector 818 can include a nylon cord. In various examples, the fourth additional connector 818can be comprised of a material that enables the fourth additional connector 818 to be extended from an initial length to an extended length when a pulling force is applied and to recover to the initial length when the pulling force is removed. In this way, at least a portion of the components of the action figure 100 can be separated. For example, left shoulder member 112 can be separated from the upper torso member 106 and the left upper arm member 114 and the left upper arm member 114 can also be separated from the left lower are member 116. Additionally, the left lower arm member 116 can be separated from the hand member 118.

Further, the right shoulder member 120 can be separated from the upper torso member 106 and the right upper arm member 122 and the right upper arm member 122 can also be separated from the right lower arm member 124. In addition, the right lower arm member 124 can be separated from the right hand member 126.

[065] In one or more examples, the fourth additional connector 818 can be disposed in the eleventh cavity 800, the twelfth cavity 802, the thirteenth cavity 804, the fourteenth cavity 806, the fifteenth cavity 808, the sixteenth cavity 810, the seventeenth cavity 812, the eighteenth cavity 814, and the nineteenth cavity 816. The fourth additional connector 818 can be anchored at a first end within the fourteenth cavity 806 and at a second end within the nineteenth cavity 816. For example, the fourteenth cavity 806 can include an opening and the fourth additional connector 818 can be tied in such a way that the fourth additional connector 818 is unable to move through the opening into the fourteenth cavity 806. Additionally, the nineteenth cavity 816 can include an opening and the fourth additional connector 818 can be tied in such a way that the fourth additional connector 818 is unable to move through the opening into the nineteenth cavity 816. In this way, a pulling force can be applied to at least one of the left hand member 118, the left lower arm member 116, the left upper arm member 114, or the left shoulder member 112 to separate the members 112, 114, 116, 118 from one or more additional members 112, 114, 116, 118 or from the upper torso member 106. Further, a pulling force can be applied to at least one of the right hand member 126, the right lower arm member 124, the right upper arm member 122, or the right shoulder member 120 to separate the members 120, 122, 124, 126 from one or more additional members 120, 122, 124, 126 or from the upper torso member 106

[066] Additionally, the fourth additional connector 818 can be configured within the third portion of the connector system such that components of the action figure 100 are rotatable. For example, the left hand member 118 can rotate up to 360° with respect to the left lower arm member 116 and the left lower arm member 116 can rotate 360° with respect to the left hand member 118 and the left upper arm member 114. In addition, the left upper arm member 114 can rotate 360° with respect to the left shoulder member 112 and the left lower arm member 116. Further, the left shoulder member 112 can rotate up to 360° with respect to the left upper arm member 116 and the upper torso member 106. In one or more examples, the right hand member 126 can rotate up to 360° with respect to the right lower arm member 124 and the right lower arm member 124 can rotate 360° with respect to the right hand member 126 and the right upper arm member 122. In one or more additional examples, the right upper arm member 122 can rotate 360° with respect to the right shoulder member 120 and the right lower arm member

124. In one or more further examples, the right shoulder member 120 can rotate up to 360° with respect to the right upper arm member 122 and the upper torso member 106.

[067] FIG. 9 is a flow diagram of a process 900 to produce a painted building block comprised of a biodegradable material, according to one or more implementations. At 902, the process 900 includes performing a first cutting process to produce a partially-formed building block having a solid body with a number of coupling regions on a top surface of the partially-formed building block. The coupling regions can include regions that are raised above the top surface and can be configured to couple the building block to one or more additional building blocks and/or to one or more action figures. In one or more examples, the number of coupling regions can be formed using a computer numerical control (CNC) wood cutting machine.

[068] In one or more examples, an oil can be applied to the partially-formed building block. For example, a hemp-based oil can be applied to the number of coupling regions and the top surface of the partially-formed building block. In various examples, a curing process can be performed after applying the oil to the partially-formed building block. In one or more illustrative examples, the curing process can be performed at temperatures from about 65 °C to about 80 °C for a duration from about 24 hours to about 48 hours.

[069] The process 900 can also include, at 904, applying paint to the partially-formed building block to produce a painted partially-formed building block. The paint can be applied to the partially-formed building block by a spraying process. In one or more additional examples, the paint can be applied using a brush. The paint can be a water-based paint. In one or more examples, the paint can be a non-toxic 10 tin paint.

[070] In addition, at 906, the process 900 can include performing a drying process with respect to the painted partially-formed building block. In various examples, the drying process can be performed within a chamber at a temperature from about 60 °C to about 90 °C, from about 70°C to about 80 °C, from about 75 °C to about 85 °C, or from about 65 °C to about 75°C. Additionally, the drying process can be performed for at least 36 hours, at least 48 hours, at least 60 hours, at least 72 hours, or at least 84 hours. Further, the drying process can be performed for no greater than about 120 hours, no greater than about 108 hours, or no greater than about 96 hours. In one or more illustrative examples, the drying process can be performed from about 36 hours to about 120 hours, from about 60 hours to about 96 hours, or from about 84 hours to about 108 hours. In one or more additional illustrative examples, the drying process can be performed at temperatures from about 70° C to about 80 °C for a duration from about 84 hours to about 108 hours.

[071] Further, at 908, the process 900 can include performing a second cutting process on a bottom surface of the painted partially-formed building block to produce a fully-formed building block having one or more cavities within the body. In one or more illustrative examples, the second cutting process can create the one or more cavities within the body. That is, the second cutting process can produce hollow regions within the body that are free of material. In various examples, the fully-formed building block can include a top surface, a plurality of side surfaces, and a bottom surface. Paint can be disposed on the top surface and the plurality of side surfaces. Additionally, paint can be disposed on a portion of the bottom surface. Further, an additional portion of the bottom surface can be free of paint. For example, portions of the bottom surface of the fully-formed building block that correspond to interior regions of the plurality of cavities can be free of paint.

[072] In one or more examples, the second cutting process can be performed using a CNC wood cutting machine. In various examples, an oil can be applied to the fully-formed building block. To illustrate, a hemp-based oil can be applied to the fully-formed building block. Additionally, a curing process can be performed after applying the oil to the fully-formed building block. In one or more illustrative examples, the curing process can be performed at temperatures from about 65 °C to about 80 °C for a duration from about 24 hours to about 48 hours.

[073] Although a flowchart or block diagram may illustrate a method as comprising sequential steps or a process as having a particular order of operations, many of the steps or operations in the flowchart(s) or block diagram(s) illustrated herein can be performed in parallel or concurrently, and the flowchart(s) or block diagram(s) should be read in the context of the various implementations of the present disclosure. In addition, the order of the method steps or process operations illustrated in a flowchart or block diagram may be rearranged for some implementations. Similarly, a method or process illustrated in a flow chart or block diagram could have additional steps or operations not included therein or fewer steps or operations than those shown. Moreover, a method step may correspond to a method, a function, a procedure, a subroutine, a subprogram, etc.

[074] As used herein, the terms “substantially” or “generally” refer to the complete or nearly complete extent or degree of an action, characteristic, property, state, structure, item, or result. For example, an object that is “substantially” or “generally” enclosed would mean that the object is either completely enclosed or nearly completely enclosed. The exact allowable degree of deviation from absolute completeness may in some cases depend on the specific context. However, generally speaking, the nearness of completion will be so as to have generally the

same overall result as if absolute and total completion were obtained. The use of "substantially" or "generally" is equally applicable when used in a negative connotation to refer to the complete or near complete lack of an action, characteristic, property, state, structure, item, or result. For example, an element, combination, implementation, or composition that is "substantially free of" or "generally free of" an element may still actually contain such element as long as there is generally no significant effect thereof.

[075] In the foregoing description various implementations of the present disclosure have been presented for the purpose of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise form disclosed. Obvious modifications or variations are possible in light of the above teachings. The various implementations were chosen and described to provide the best illustration of the principals of the disclosure and their practical application, and to enable one of ordinary skill in the art to utilize the various implementations with various modifications as are suited to the particular use contemplated. All such modifications and variations are within the scope of the present disclosure as determined by the appended claims when interpreted in accordance with the breadth they are fairly, legally, and equitably entitled.

[076] A numbered non-limiting list of aspects of the present subject matter is presented below.

[077] Aspect 1. An action figure comprising: a plurality of members comprised of one or more biodegradable materials; a connector system including a plurality of cavities located within the plurality of members; and a plurality of connectors disposed within the plurality of cavities, a first connector of the plurality of connectors configured to connect a first portion of the plurality of members and a second connector of the plurality of connectors configured to connect a second portion of the plurality of members.

[078] Aspect 2. The action figure of claim 1, wherein: the first portion of the plurality of members include a head member, a neck member, an upper torso member, a lower torso member, and a core member; and the first connector is located within a first cavity of the head member and the neck member, a second cavity of the upper torso member, a third cavity of the lower torso member, and a fifth cavity of the core member.

[079] Aspect 3. The action figure of aspect 2, wherein a first end of the first connector is coupled to the head member using a hook.

[080] Aspect 4. The action figure of any one of aspects 1-3, wherein: the second portion of the plurality of members includes one or more hand members, one or more lower arm members, and one or more upper arm members; and the second connector is located within one or more

first cavities of the one or more hand members, one or more second cavities of the one or more lower arm members, and one or more third cavities of the one or more upper arm members.

[081] Aspect 5. The action figure of any one of aspects 1-4, wherein the first connector and the second connector comprise a nylon cord.

[082] Aspect 6. The action figure of any one of aspects 1-5, wherein: the plurality of connectors include a third connector configured to connect a foot member, a lower leg member, and an upper leg member; and the third connector is located within a cavity of the foot member, a first additional cavity of the lower leg member, and a second additional cavity of the upper leg member.

[083] Aspect 7. The action figure of any one of aspects 1-6, wherein: the plurality of connectors include an additional connector to connect a left upper leg member to a right upper leg member; the additional connector is disposed within a cavity of the left upper leg member, a first additional cavity of a core member, and a second additional cavity of the right upper leg member; and the additional connector includes a fastener.

[084] Aspect 8. A building block including: a body comprised of a biodegradable material and the body including: a top surface having a plurality of coupling regions disposed on the top surface; a plurality of side surfaces; a bottom surface; and a plurality of cavities disposed within the body; wherein paint is disposed on the top surface, the plurality of side surfaces, and a portion of the bottom surface and an additional portion of the bottom surface is free of paint, the additional portion of the bottom surface corresponding to interior regions of the plurality of cavities.

[085] Aspect 9. The building block of aspect 8, wherein the biodegradable material comprises a wood material or bamboo.

[086] Aspect 10. The building block of aspect 8 or 9, wherein the paint is a water-based paint.

[087] Aspect 11. A process comprising: performing a first cutting process to produce a partially-formed building bloc having a solid body with a number of coupling regions located on a top surface of the partially-formed building block; applying paint to the partially-formed building block to produce a painted partially-formed building block; performing a drying process with respect to the painted-partially formed building block; and performing a second cutting process on a bottom surface of the painted partially-formed building block to produce a fully-formed building block having one or more cavities within the body.

[088] Aspect 12. The process of aspect 11, comprising applying an oil to a top surface and the number of coupling regions of the partially-formed building block.

[089] Aspect 13. The process of aspect 11 or 12, comprising applying the oil to the top surface and the number of coupling regions of the fully-formed building block.

[090] Aspect 14. The process of any one of aspects 11-13, wherein the first cutting process and the second cutting process are performed using a computer numerical control (CNC) wood cutting machine.

[091] Aspect 15. The process of any one of aspects 11-14, wherein the drying process is performed at temperatures from about 65 °C to about 80 °C for a duration from about 24 hours to about 48 hours.

[092] Aspect 16. The process of any one of aspects 11-15, wherein: paint is disposed on a top surface of the building block, a plurality of side surfaces of the building block, and a portion of a bottom surface of the building block; and an additional portion of the bottom surface is free of paint, the additional portion of the bottom surface corresponding to interior regions of a plurality of cavities of the building block.

CLAIMS

What is claimed is:

1. An action figure comprising:

a plurality of members comprised of one or more biodegradable materials;

a connector system including a plurality of cavities located within the plurality of members; and

a plurality of connectors disposed within the plurality of cavities, a first connector of the plurality of connectors configured to connect a first portion of the plurality of members and a second connector of the plurality of connectors configured to connect a second portion of the plurality of members.

2. The action figure of claim 1, wherein:

the first portion of the plurality of members include a head member, a neck member, an upper torso member, a lower torso member, and a core member; and

the first connector is located within a first cavity of the head member and the neck member, a second cavity of the upper torso member, a third cavity of the lower torso member, and a fifth cavity of the core member.

3. The action figure of claim 2, wherein a first end of the first connector is coupled to the head member using a hook.

4. The action figure of claim 1, wherein:

the second portion of the plurality of members includes one or more hand members, one or more lower arm members, and one or more upper arm members; and

the second connector is located within one or more first cavities of the one or more hand members, one or more second cavities of the one or more lower arm members, and one or more third cavities of the one or more upper arm members.

5. The action figure of claim 1, wherein the first connector and the second connector comprise a nylon cord.

6. The action figure of claim 1, wherein:

the plurality of connectors include a third connector configured to connect a foot member, a lower leg member, and an upper leg member; and

the third connector is located within a cavity of the foot member, a first additional cavity of the lower leg member, and a second additional cavity of the upper leg member.

7. The action figure of claim 1, wherein:

the plurality of connectors include an additional connector to connect a left upper leg member to a right upper leg member;

the additional connector is disposed within a cavity of the left upper leg member, a first additional cavity of a core member, and a second additional cavity of the right upper leg member; and

the additional connector includes a fastener.

8. A building block including:

a body comprised of a biodegradable material and the body including:

a top surface having a plurality of coupling regions disposed on the top surface;

a plurality of side surfaces;

a bottom surface; and

a plurality of cavities disposed within the body;

wherein paint is disposed on the top surface, the plurality of side surfaces, and a portion of the bottom surface and an additional portion of the bottom surface is free of paint, the additional portion of the bottom surface corresponding to interior regions of the plurality of cavities.

9. The building block of claim 8, wherein the biodegradable material comprises a wood material or bamboo.

10. The building block of claim 8, wherein the paint is a water-based paint.

11. A process comprising:

performing a first cutting process to produce a partially-formed building block having a solid body with a number of coupling regions located on a top surface of the partially-formed building block;

applying paint to the partially-formed building block to produce a painted partially-formed building block;

performing a drying process with respect to the painted-partially formed building block; and

performing a second cutting process on a bottom surface of the painted partially-formed building block to produce a fully-formed building block having one or more cavities within the body.

12. The process of claim 11, comprising applying an oil to a top surface and the number of coupling regions of the partially-formed building block.

13. The process of claim 12, comprising applying the oil to the top surface and the number of coupling regions of the fully-formed building block.

14. The process of claim 11, wherein the first cutting process and the second cutting process are performed using a computer numerical control (CNC) wood cutting machine.

15. The process of claim 11, wherein the drying process is performed at temperatures from about 65 °C to about 80 °C for a duration from about 24 hours to about 48 hours.

16. The process of claim 11, wherein:

paint is disposed on a top surface of the fully-formed building block, a plurality of side surfaces of the fully-formed building block, and a portion of a bottom surface of the fully-formed building block; and

an additional portion of the bottom surface is free of paint, the additional portion of the bottom surface corresponding to interior regions of a plurality of cavities of the fully-formed building block.

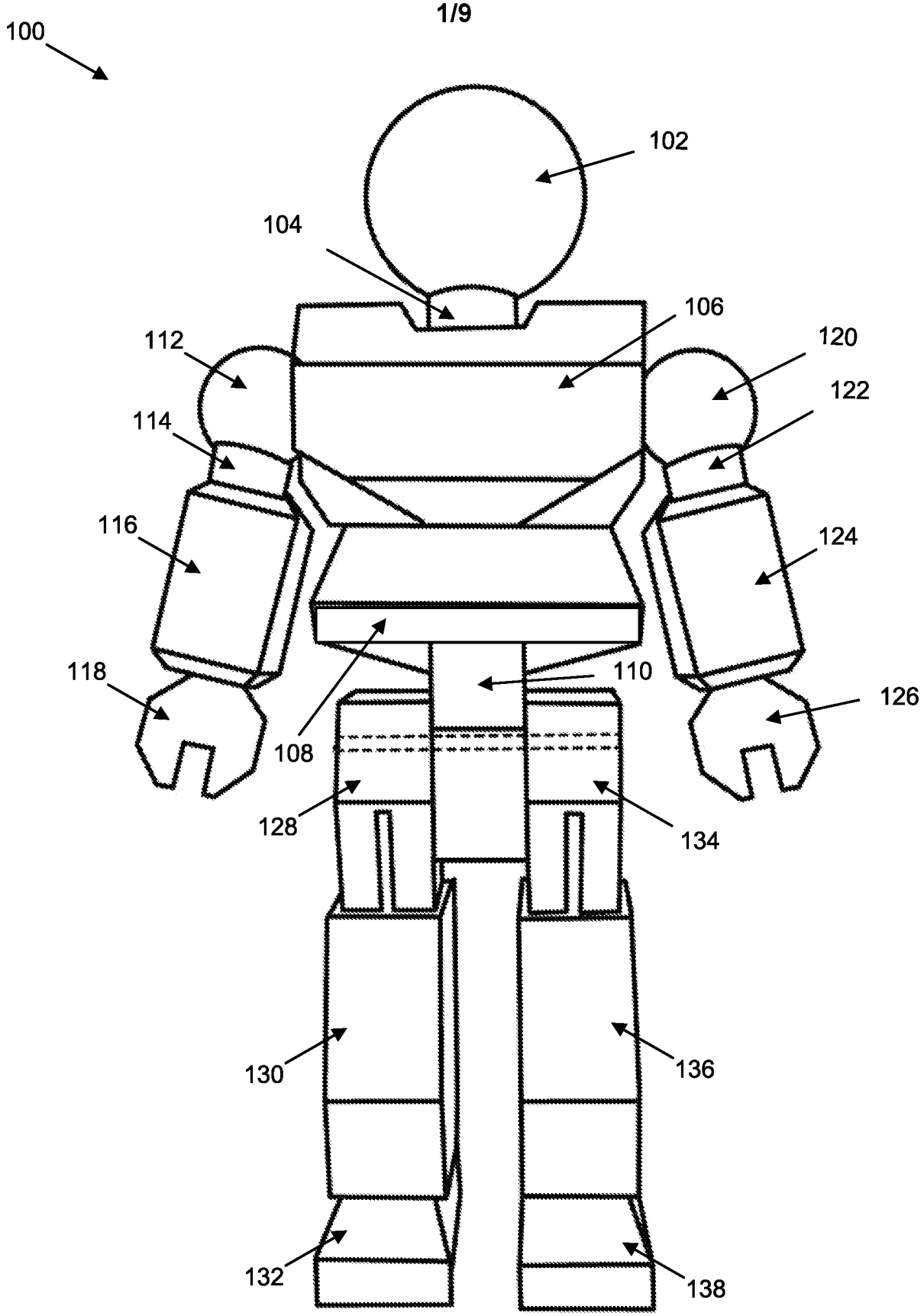
100
102
104
106
112
120
122
114
116
124
118
110
126
108
128
134
130
136
132
138

FIG. 1

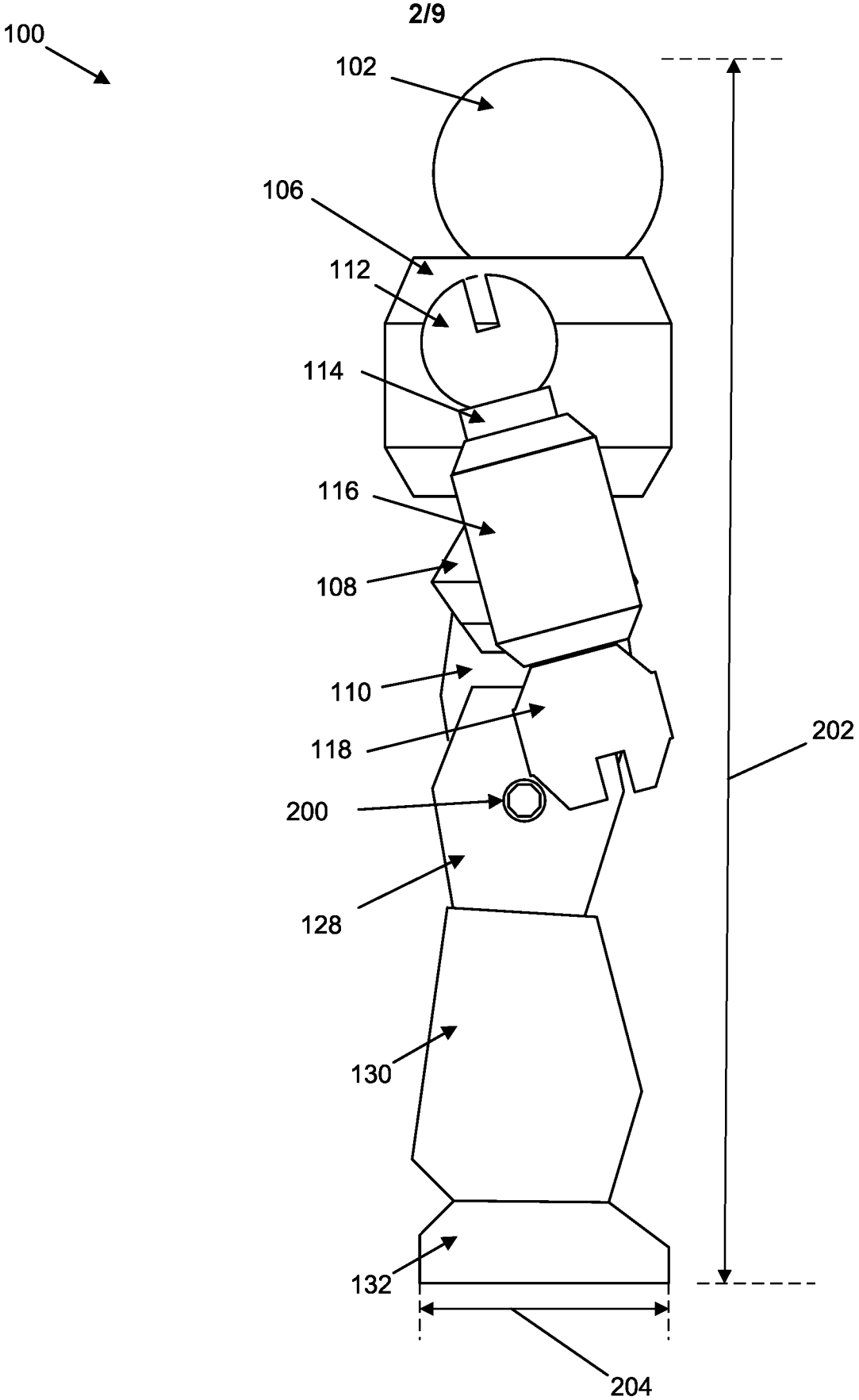

FIG. 2

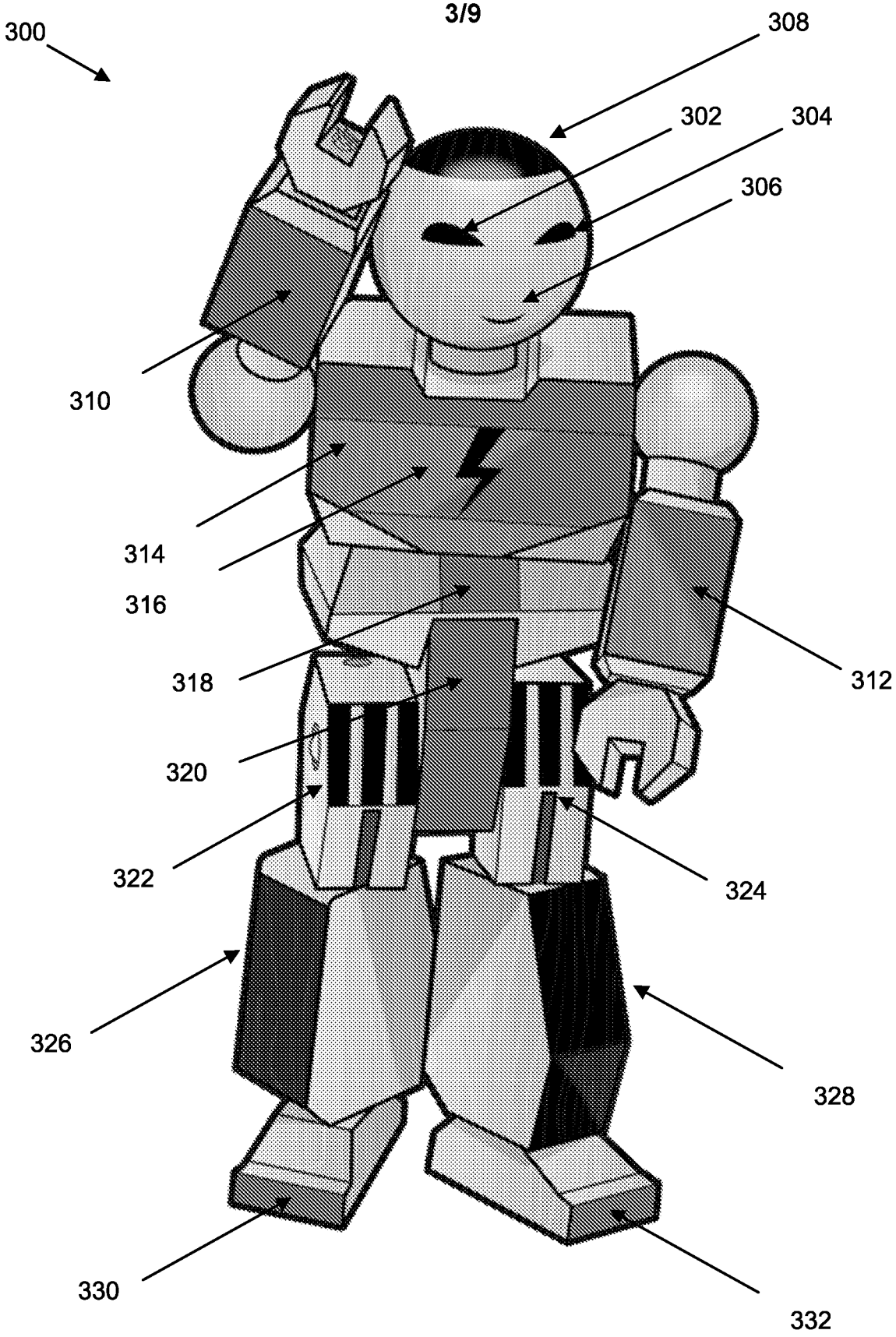
300
308
302
304
306
310
314
316
318
312
320
322
324
326
328
330
332

FIG. 3

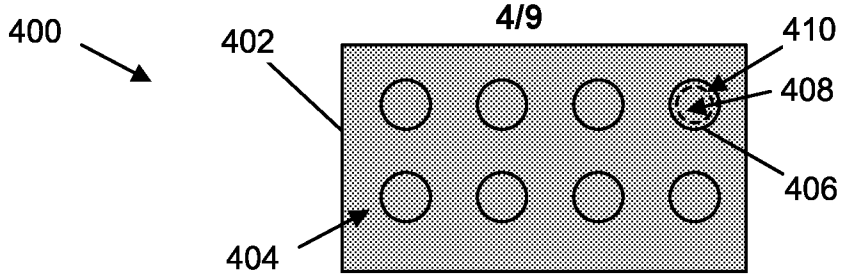

FIG. 4A

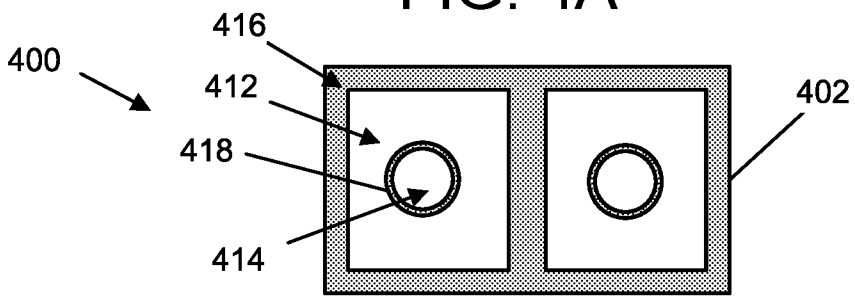

FIG. 4B

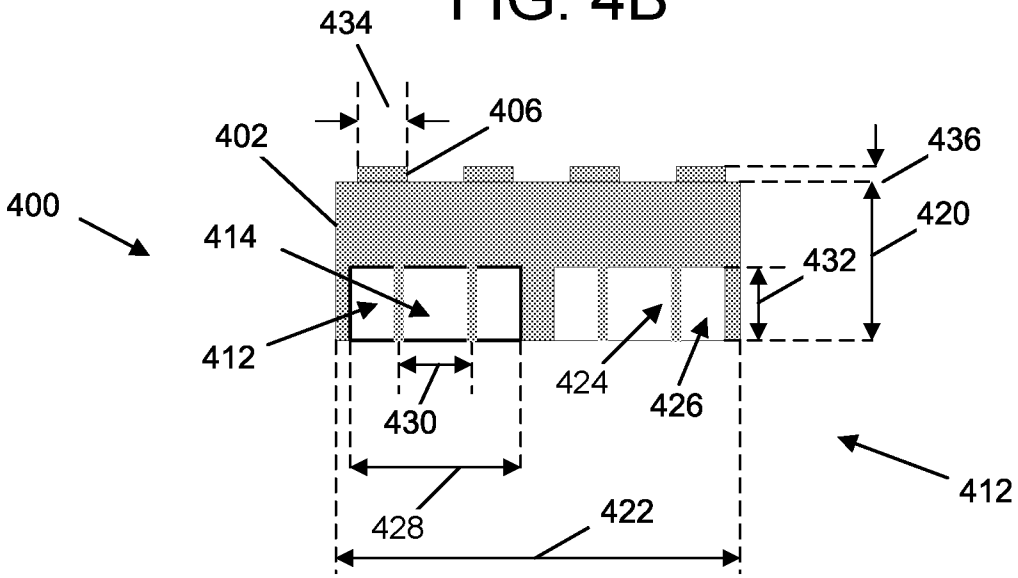

FIG. 4C

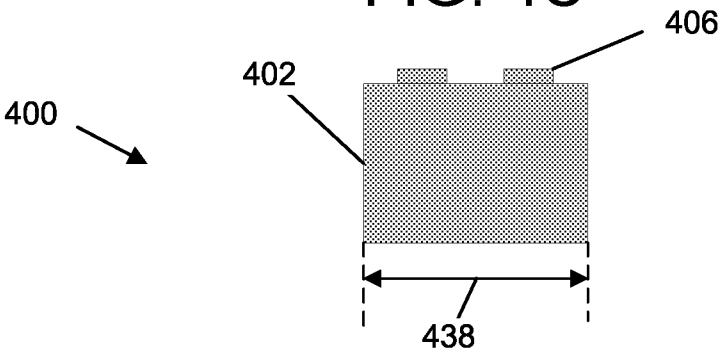

FIG. 4D

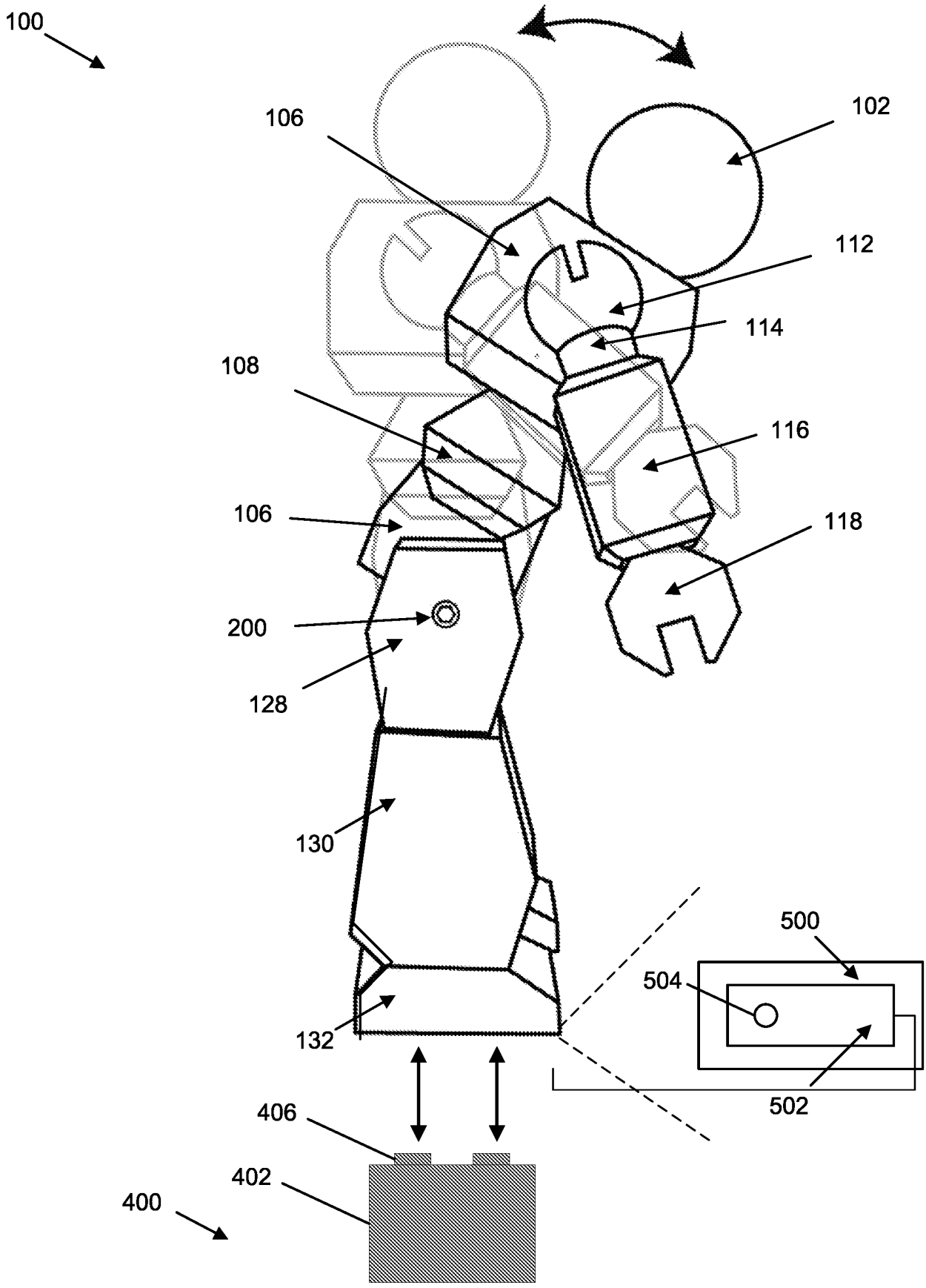
100
106
102
112
114
108
116
106
118
200
128
130
500
504
132
502
406
402
400

FIG. 5

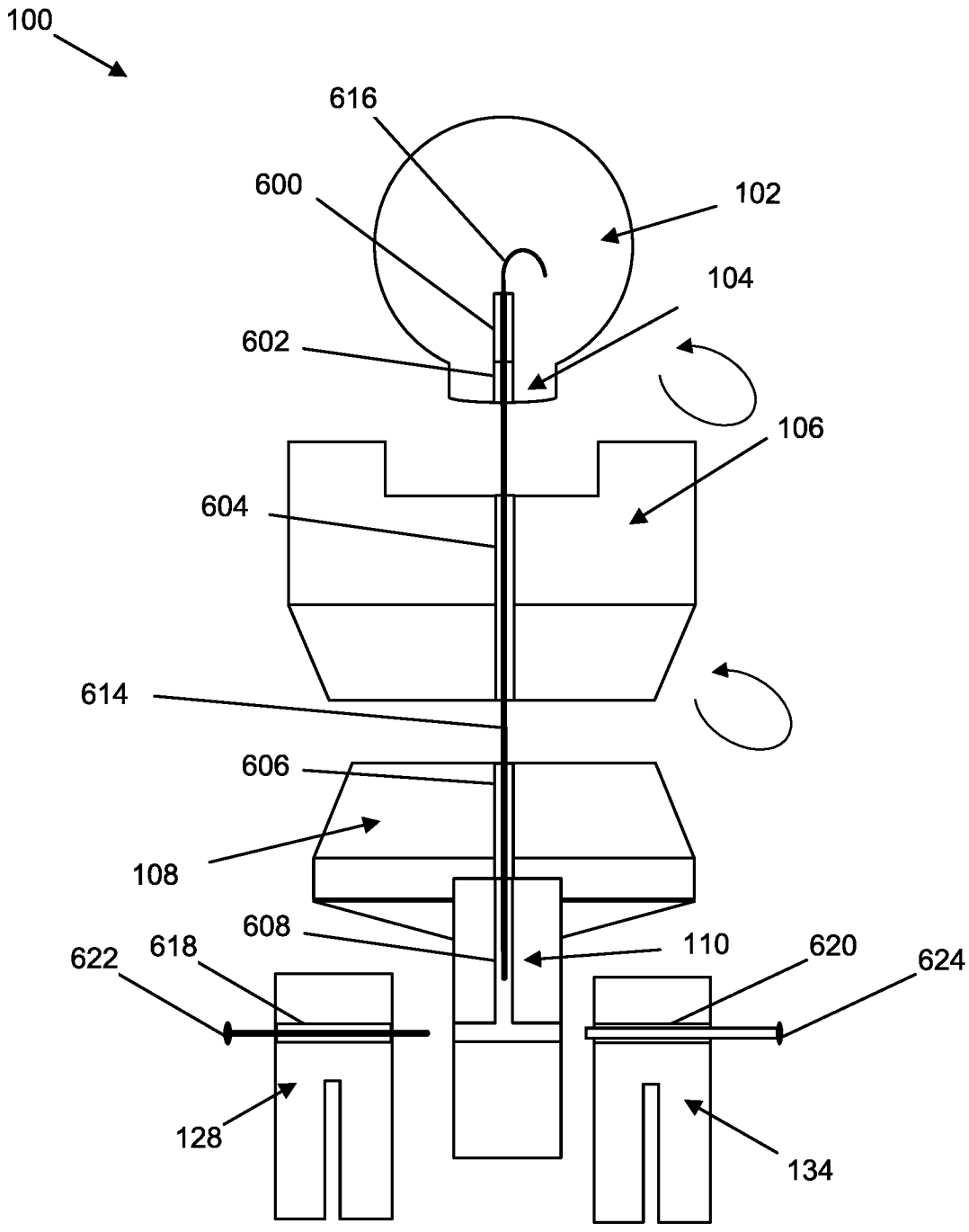
100
616
600
102
104
602
106
604
614
606
108
608
110
620
624
622
618
128
134

FIG. 6

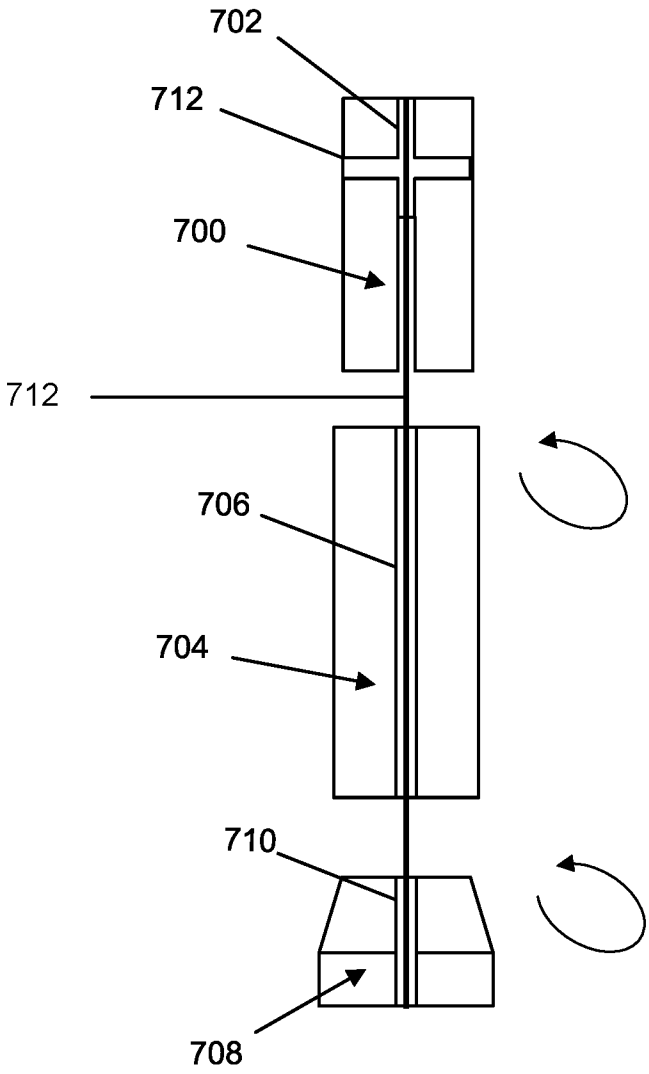

FIG. 7

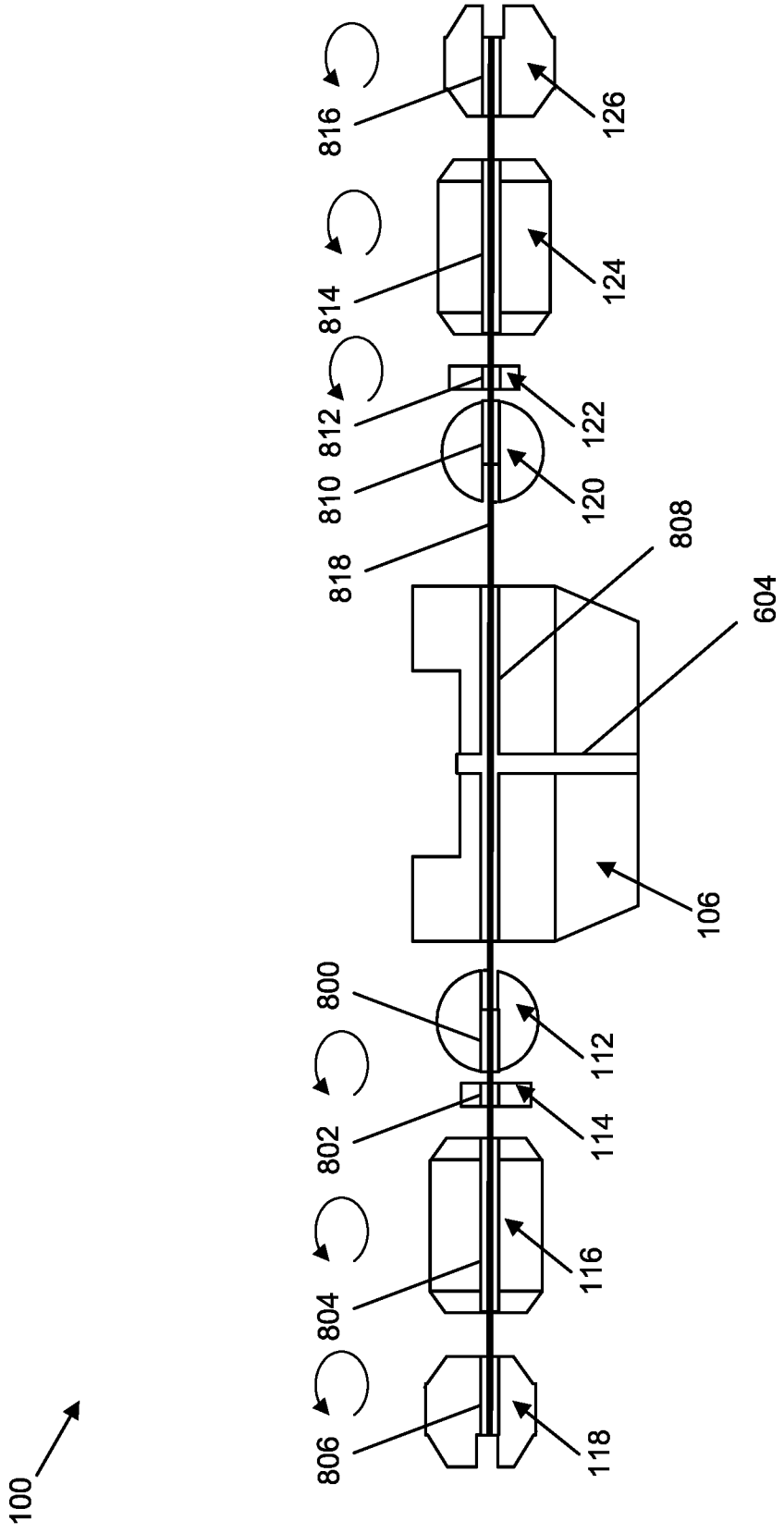
100
806
804
802
800
818
810
812
814
816
118
116
114
112
106
604
808
120
122
124
126

FIG. 8

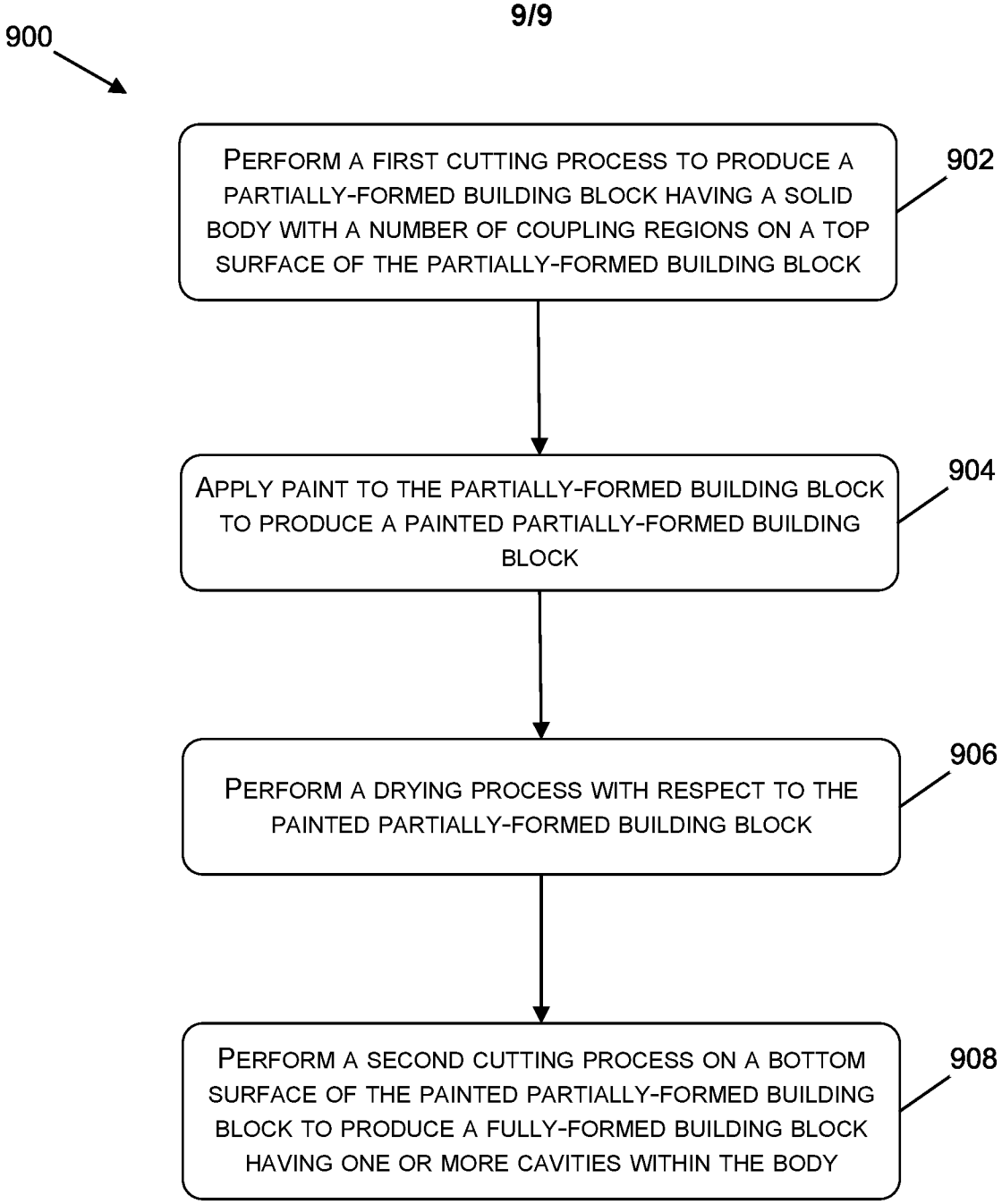
900
PERFORM A FIRST CUTTING PROCESS TO PRODUCE A PARTIALLY-FORMED BUILDING BLOCK HAVING A SOLID BODY WITH A NUMBER OF COUPLING REGIONS ON A TOP SURFACE OF THE PARTIALLY-FORMED BUILDING BLOCK
902
APPLY PAINT TO THE PARTIALLY-FORMED BUILDING BLOCK TO PRODUCE A PAINTED PARTIALLY-FORMED BUILDING BLOCK
904
PERFORM A DRYING PROCESS WITH RESPECT TO THE PAINTED PARTIALLY-FORMED BUILDING BLOCK
906
PERFORM A SECOND CUTTING PROCESS ON A BOTTOM SURFACE OF THE PAINTED PARTIALLY-FORMED BUILDING BLOCK TO PRODUCE A FULLY-FORMED BUILDING BLOCK HAVING ONE OR MORE CAVITIES WITHIN THE BODY
908

FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 22/82172

A. CLASSIFICATION OF SUBJECT MATTER

IPC - INV. A63H 3/46, A63H 3/48, A63H 3/00 (2023.01)
ADD. A63H 3/36, A63H 3/16, A63H 33/04, A63H 33/06, A63H 33/08 (2023.01)

CPC - INV. A63H 3/46, A63H 3/48, A63H 3/00
ADD. A63H 3/36, A63H 3/16, A63F 2009/0661, A63H 33/04, A63H 33/06, A63H 33/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,482,063 B1 (Frigard) 19 November 2002 (19.11.2002), entire document, especially Fig. 1, 5A, 5B, 5C, 6; col 2, ln 29-36; col 4, ln 1-8; col 2, ln 47-59; col 2, ln 60 to col 3, ln 5; col 3, ln 6-14; col 3, ln 15-30;	1, 4-6
X --- Y	US 1,348,216 A (Giebeler-Wanke) 03 August 1920 (03.08.1920), entire document, especially Fig. 1, 2; page 1, ln 55-68; page 1, ln 76-93; page 1, ln 104 to page 2, ln 5; page 2, ln 28-32; page 2, ln 45-67; page 2, ln 68-86; page 2, ln 87-115; page 2, ln 6-27;	1, 4, 6 --- 1-3, 7
Y	"Play Heroes Hard-DIY Wooden Action Figure" (Little Wonder & Co.) 28 November 2021 (28.11.2021) [online] (retrieved from the internet on 02.02.2023) <URL https://web.archive.org/web/20211128002544/https://littlewonderandco.com/products/playhard-hero-factory-diy-wooden-action-figure>, entire document, especially Page 1, Figure 1; Page 4, Title; Annotated Drawing; Page 5, Line 3; Page 5, Line 4; Page 4, Line 2-4;	1, 7
Y	US 130,068 A (Parent) 30 July 1872 (30.07.1872), entire document, especially Fig. 1, 2; page 1, col 1, paragraph 5 to page 1, col 2, paragraph 1;	1-3
Y	US 2003/0027488 A1 (Langton) 06 February 2003 (06.02.2003), entire document, especially Fig. 1, 3; para[0016]; para[0020]; para[0021];	3
A	US 2021/0156960 A1 (Weeks) 21 June 2012 (21.06.2012), entire document	1-7
A	WO 2021/095765 A1 (ITO YOSHIAKI) 20 May 2021 (20.05.2021), entire document	1-7

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
03 February 2023	MAY 10 2023
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Kari Rodriquez Telephone No. PCT Helpdesk: 571-272-4300

Form PCT/ISA/210 (second sheet) (July 2022)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 22/82172

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I: Claims 1-7 directed to an action figure. (Fig. 1-3, 6-8)

Group II: Claim 8-10 directed to a building block. (Fig. 4A-4D)

Group III: Claim 11-16 directed to a process of forming a building block. (Fig. 9)

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

--- Continued in Supplemental Box ---

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-7

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 22/82172

--- Continuation of Box No. III Observations where unity of invention is lacking ---

SPECIAL TECHNICAL FEATURES

The invention of Group I includes the special technical features of an action figure comprising: a plurality of members, a connector system including a plurality of cavities, and a plurality of connectors, not required by the claims of Groups II-III.

The invention of Group II includes the special technical features of a building block comprising a body including a top surface having a plurality of coupling regions, a plurality of side surfaces, a bottom surface and a plurality of cavities disposed within the body, not required by the claims of Groups I.

The invention of Group III includes the special technical features of a process comprising performing a first cutting process to produce a partially-formed building block having a solid body, applying paint to the partially-formed building block, performing a drying process, and performing a second cutting process on a bottom surface of the painted partially-formed building block to produce a fully-formed building block, not required by the claims of Groups I and II.

COMMON TECHNICAL FEATURES

Groups I-II share the common technical features of a toy (generally) comprising: a member comprised of a biodegradable material; and a cavity disposed within the member (generally).

However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 2018/0296909 A1 (Grimes), which discloses a toy (generally) (201, Fig. 2, 3; para[0022], 'building block 201') comprising: a member (203, Fig. 2, 3; para[0022], 'body 203') comprised of a biodegradable material (Fig. 2, 3; para[0026], 'the building blocks are composed of a wood material'; para[0027]); and a cavity disposed within the member (generally) (301, Fig. 2, 3; para[0022], 'one or more cavities 301').

Groups II and III share the common technical features of a building block comprising: a body including: a top surface having a plurality of coupling regions; a bottom surface; and a plurality of cavities disposed within the body; wherein paint is at least partially disposed on the body. Specifically, Groups II-III are related as an apparatus (Groups II) and methods for using the apparatus (Group III). The apparatus is known in prior art as shown in Grimes. Therefore, Groups II and III lack unity since the shared technical features do not represent a contribution over Grimes:

Grimes discloses a building block (201, Fig. 2, 3; para[0022], 'building block 201') comprising: a body (203, Fig. 2, 3; para[0022], 'body 203') including: a top surface having a plurality of coupling regions (205, 207, Fig. 2, 3; para[0022], 'connectors 205 extending from a top surface 207'); a bottom surface (Fig. 2, 3 - see bottom surface); and a plurality of cavities disposed within the body (301, Fig. 2, 3; para[0022], 'one or more cavities 301'); wherein paint is at least partially disposed on the body (Fig. 2, 3; para[0029], 'The finished design could then be painted and sculpted to a desired appearance').

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical feature that would otherwise unify the groups.

Therefore, Groups I-III lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 22/82172

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 1,555,661 A (Grove) 29 September 1925 (29.09.1925), entire document	1-7
A	US 2017/0106302 A1 (KMA Concepts Limited) 20 April 2017 (20.04.2017), entire document	1-7
A	US 2018/0296909 A1 (Grimes) 18 October 2018 (18.10.2018), entire document	1-7