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(54) **CONSTRUCTION TOY**

KONSTRUKTIONSSPIELZEUG

JOUET DE CONSTRUCTION

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Description

[0001] The present invention relates to a construction toy set for building two and three dimensional structures.

[0002] These construction sets are known which are formed of a plurality of rod elements having a C-shaped clip attached at both ends and a plurality of torus connecting elements, which are combined together to form structures.

[0003] These existing construction toy sets have shortcomings as they require a large number of parts to build structures.

[0004] US 3,927,489 discloses a construction toy for children having at least one rod element having a control portion with a C-shaped gripping element at both ends that are connected together with the help of separate rings.

[0005] The device of the present invention, while being known includes advantageous features which greatly enhance its performance and reduce significantly the number of parts used to build basic and complex structures.

[0006] The construction toy set of the present invention comprise a plurality of first type of rod elements having a torus element attached at both ends; a plurality of second type of rod elements having a C-shaped gripping clip attached at both ends and a plurality of third type of rod elements having a torus element attached at one end and a C-shaped gripping clip attached at the other end.

[0007] Still according to the present invention, at least one of any said rod element include one or more torus connecting element between its ends.

[0008] Still according to the present invention, at least one of any said rod element include one or more U-shaped gripping sockets between its ends so that two or more such rod elements can be connected by snap fit connection to form cruciform or grid composite structures.

[0009] Other objects and advantageous features of this present invention will be more apparent on the description carried out in accordance to the drawings included, in which;

FIGS.1 to 3 show a front view of rod elements having a C-shaped gripping clip at each end.

FIG.4 is a top view, at an enlarged scale, of a part of a rod of FIGS.1 to 3.

FIGS.5, 7 and 9 illustrates rod elements having a torus element at each end.

FIG.6 shows another rod element having a C-shaped gripping clip at one end and a torus connecting element at the other end.

FIG.8 and 10 show torus segments that may be used in this present invention.

FIG.11 shows another rod element according to the present invention.

FIG.12 shows a body of an elongated rod element, in cross section, having a plurality of torus connecting elements between its ends. FIG.13 shows a body of an elongated rod element, in cross section, having one or more U-shaped gripping sockets between its ends.

FIG.14 shows a cruciform composite structure formed with rods of FIG.13.

FIG.15 shows a grid composite structure formed with rod elements of FIG.13.

FIG.16 and 17 illustrate a body of a rod element, in cross section, formed in two parts.

FIGS.18 and 19 illustrate plate panel elements that may be used in the present invention.

FIGS.20 and 21 show composite structures built with elements of this invention.

[0010] Referring to the drawings; FIG.1 illustrates a rod element 10 formed with a body portion 11. The distal ends of the rod element are formed with a tapered portion 15 in which a C-shaped gripping clip 13 is integrally connected so that to snap and detachably connect into the torus connecting elements 31 of the rod elements of FIGS.5,6,7 and 9.

[0011] The C-shaped gripping clip 13 is formed with two symmetrically opposed gripping jaws 14 which extend parallelly to the longitudinal axis of the rod element 10 as shown in FIG.1.

[0012] The internal diameter R of the C-shaped gripping clips 13, as shown in FIG.1, is slightly smaller than the cross section of the torus elements 31 of the rod elements so that the jaws 14 can slightly extend to snap and firmly hold the torus elements 31 and its disassembly is made in the reverse order.

[0013] FIG.2 shows the embodiment of a second rod element 20, similar to the one of FIG.1. Here the jaws 14 of the C-shaped gripping clip extend perpendicularly to the longitudinal axis of the rod element 20 to allow a lateral snap fit connection between the rod elements, so that the center to center distance of a pair of torus of rod elements does not have to be distorted and enlarged in order to receive a C-shaped clip of another rod element.

[0014] FIG.3 illustrates a rod element 30 which is another alternative to the rod elements of FIGS.1 and 2. Here the rod element 30 is formed with one C-shaped gripping clip similar to the one of rod element of FIG.1 and the other similar to the one of rod element of FIG.2. The first end A of the rod element 30 can be assembled from any angular position, then the other end B is swiveled for a radial connection and its disassembly is

made in the reverse order.

[0015] As shown from FIG.4, at an enlarged scale, each jaw 14 of the rod elements is symmetrically tapered reducing the width W of the jaw towards its distal end to make a generally smaller pointed end19. The jaws 14 could be formed as not tapered.

[0016] FIG.5 shows another rod element 50 according to the present invention which has a torus connecting element 31 attached at both ends.

[0017] FIG.6 shows another rod element 60 according to the present invention having a torus connecting element 31 at one end and a C-shaped gripping clip 13 at the other end. The jaws 14 of the C-shaped clip could extend similarly to the ones of the rod element of FIG.1 or be similarly to the ones of FIG.2.

[0018] FIG.7 illustrates another rod element 70 similar to the rod element 50 of FIG.5.

[0019] Here the torus connecting elements 31 are provided with diametrically opposed transverse holes 71.The holes 71 are made to receive and retain torus segments 80 of FIG.8 by friction fit, thereby creating a rod element of FIG.11 having a sphere like connecting element at one or both ends. The torus segment 80 of FIG.8 has a shape of half a torus formed with a stem 81 at each end to frictionally fit into the holes 71 of the rod elements of FIG.7.

[0020] FIG.9 illustrates another rod element 90 similar to the one of FIG.5. Here as well the torus connecting elements 31 of the rod element 90 are provided with one through hole 91 at the tapered end of the rod element to receive and retain the torus segment 100 of FIG.10 by friction fit, thereby creating the rod element shown in FIG. 11.

[0021] FIG.11 shows a rod element having each end formed with a sphere-like connecting element. Each sphere-like element is formed with a main torus connecting element 31 into which a torus connecting segment 100 is connected.

[0022] The rod element of FIG.11 is used to create complex structures, as it allows more rod elements to be connected therein.

[0023] The torus element 31 of the rod element of FIG. 6 may be provided with holes 71 or 81 similar to the ones of respectively FIGS.7 and 8 for the same purpose. The rod elements of the present invention can be formed elongated and having one or more torus connecting elements 31 between their ends, as shown in FIG.12. The torus elements 31 between the ends of rod element of FIG.12 may be formed with holes 71 or 91 similar to the ones of respectively FIGS.7 and 9 for the same purpose.

[0024] The rod elements of the present invention may be elongated and having one or more U-shaped gripping sockets 21 between their ends as shown from FIG.13 to receive and retain such rod elements by snap fit connection, thereby creating cruciform or grid composite structures as shown in FIGS. 14 and 15. Each U-shaped socket 21 is formed with gripping lips 22 to receive and retain such U-shaped socket 21. The elongated rod elements of FIGS. 12 and 13 can be formed in rigid, flexible or semi flexible but tough plastic material. The rods of FIG.12 may be formed with both torus elements 31 and U-shaped sockets 21.

[0025] In FIG.16, a generally cylindrical or polygonal body of the rod elements of the present Invention is illustrated having adjustable length. Here the rod element Is formed in two sections one having a stem 12 formed with an external screw thread 16, the other being formed with an internal screw thread 18 to accommodate the external screw thread.

[0026] In FIG.17, a generally cylindrical or polygonal body of the rod elements of the present invention is illustrated having adjustable length. Here as well the body of the rod element is formed in two sections one having a generally cylindrical or polygonal stem 12, the other being formed with a bore 17 in which the stem 12 is received and removably retained by friction, thereby creating a composite rod element of variable length.

[0027] FIG.18 shows a top perspective view of a planar plate panel 180, made from resilient plastic material, having two or more flanges 61 extending on the edges of the panel. The panel is used to fit into the body of the rod elements of built structures by snap fit connection. The panel is shown square but can be made from any polygonal shape.

[0028] FIG.19 shows a bottom perspective view of another panel 190 similar to the one of FIG.18 having an opening 62 on its surface 63. The opening 62 can be made from any geometrical or decorative shape. The surface 63 of the panels 180 and 190 may be molded with architectural designs so that built structures are made to resemble to prototypes of buildings, monuments and towers at a reduced scale. The panels can also be made for decorative and aesthetic purposes.

[0029] The rod elements having C-shaped clips at both ends may be provided in first rods having first length and second rods having second length.

[0030] The first length of second rods is chosen equal to the diagonal 20 of a square formed of four first rods 10as sides, coupled each other in correspondence of the corners of the square by four torus elements 31 as shown in FIG.20.

[0031] Still according to the present invention, the second length of second rods is equal to half of the diagonal of a square formed of four first rod elements 10 as sides, coupled each other in correspondence of the corners of the square by four torus elements 31, minus the external radius of the torus 31 as shown in FIG.21.

[0032] The cross section of the body 11 of the rod elements of the present invention may be formed approximately equal to the cross section of the torus connecting elements 31 so that a C-shaped gripping clip 13 of one rod element can be connected to the body 11 of a second rod element.

[0033] Basic torus connecting elements may be added the construction set of the present invention to enhance its versatility and its performance.

[0034] The rod elements of the present invention may be provided with curved shapes so that circular and curved structures can be built.

[0035] The rod elements of this present invention are made from a suitable plastic material and may include different lengths and the rod elements can be made in different size scales so that to be suitable for all different ages.

[0036] This construction set may also be used in outdoor playground equipment, where the rod elements are made in large sizes which are blow molded for weight purposes.

[0037] The construction set of the present invention is provided with elements having a plurality of interconnections which allow a wide range of angular orientations between the rod elements and it may include wheels so that dynamic structure, such as vehicles, can be built.

[0038] The different rod elements of the present invention can be combined in different ways to form a combination of different construction toy sets as it is not necessary to use all of the different rod elements, at the same time, in order to create a construction toy set. A simple set of rod elements of FIG.3 and FIG.5 can be combined to form a construction set.

[0039] Also, it is contemplated that the present invention can be a platform for other toys which resemble to real life objects such as animals, humans, plants, or robots or action figures where the body 11 of the rod elements are shaped to resemble to arms, legs, wings, bodies, robot parts or other structures.

[0040] Although this invention is preferably designed for use as a construction toy set but it can be used as an education set for demonstrating and explaining education principles or can be used for architectural or engineering purposes.

[0041] The present invention has been disclosed for illustrative but not limitative purposes, it will be obvious that modifications and changes may be introduced. The scope of the invention being defined by the appendent claims.

Claims

1. A construction toy set, comprising: at least one of a first type of construction element (50) and at least one of a second type of construction element (10, 20 and/or 30), where the at least one of a second type of construction element has a central body portion (11) with a C-shaped gripping clip (14) at both ends of the body portion, **characterized in that** the set further comprises at least one of a first type of construction element, wherein the first type of construction element has a central body portion (11) with a torus portion (31) at one or both ends of the body portion, and the C-shaped gripping clip of the second type of construction element is configured to detachably grip a torus portion of a construction element of the first type.

2. A construction toy set according to claim 1, further comprising at least one of a third type of construction element (60) having a central body portion (11) with a torus portion (31) at one end of the body portion and a C-shaped gripping clip (14) at the other end of the body portion, the C-shaped gripping clip being configured to detachably grip a torus portion of a construction element of the first (50) or third type (60), and wherein the C-shaped gripping clip of the second type of construction element (10, 20 and/or 30) is configured to detachably grip a torus portion (31) of a construction element of the first type (50) and the third type (60).

3. A construction toy set according to claim 1 or 2, wherein at least one of any said construction elements includes at least one torus element (31) and/or at least one U-shaped gripping socket (21) between its ends.

4. A construction toy set according to any preceding claim, wherein the body portion (11) of at least one construction element is formed in two sections, one section having a stem (12) formed with external screw threads (16), the other section (11) being formed with internal screw threads (18) to accommodate the said external screw threads (16) so that the length of said construction elementcan be adjusted.

5. A construction toy set according to any preceding claim, wherein the body portion (11) of at least one of said construction elements is formed in two sections, one section having a generally cylindrical stem (12), the other section being formed with a bore (11) in which the said stem is received and removably retained by friction, thereby creating a composite construction element of variable length.

6. A construction toy set according to any preceding claim, wherein the body portion (11) of at least one said construction elements has a cross section approximately equal to the internal diameter of the said C-shaped gripping clip (14) so that a C-shaped gripping clip of one construction element can be connected and be detachably retained by the body of another construction element.

7. A construction toy set according to any preceding claim, wherein two sets of said second type of construction elements (10, 20 and/or 30) are provided, the first set having a first length and the second set having a second length.

8. A construction toy set according to claim 7, wherein said second length equals the diagonal of a square

formed of four first construction elements (50) of the first length as sides, coupled with each other in correspondence of the corners of the square by four torus elements (31).

9. A construction toy set according to claim 7, wherein said second length equals half of the diagonal of a square formed of four first elements (50) of the set length as sides, coupled with each other in correspondence of the corners of the square by four torus elements (31), minus the external radius of the torus element.

Patentansprüche

1. Bauspielzeugsatz, der Folgendes umfasst: mindestens einen eines ersten Typs von Bauelement (50) und mindestens einen eines zweiten Typs von Bauelement (10, 20 und/oder 30), wobei der mindestens eine eines zweiten Typs von Bauelement einen mittigen Körperabschnitt (11) mit einem C-förmigen Klemmclip (14) an beiden Enden des Körperabschnitts aufweist, **dadurch gekennzeichnet, dass** der Satz außerdem mindestens einen eines ersten Typs von Bauelement umfasst, wobei der erste Typ von Bauelement einen mittigen Körperabschnitt (11) mit einem Torusteil (31) an einem oder beiden Enden des Körperabschnitts, und der C-förmige Klemmclip des zweiten Typs von Bauelement für das lösbare Klemmen um einen Torusteil eines Bauelements des ersten Typs konfiguriert ist.

2. Bauspielzeugsatz nach Anspruch 1, das außerdem mindestens einen dritten Typ von Bauelement (60) umfasst, das einen mittigen Körperabschnitt (11) mit einem Torusteil (31) an einem Ende des Körperabschnitts und einen C-förmigen Klemmclip (14) an dem anderen Ende des Körperabschnitts aufweist, wobei der C-förmige Klemmclip für das lösbare Klemmen um einen Torusteil eines Bauelementes des ersten (50) oder dritten Typs (60) konfiguriert ist, und wobei der C-förmige Klemmclip des zweiten Typs von Bauelement (10, 20 und/oder 30) für das lösbare Klemmen um einen Torusteil (31) eines Bauelementes des ersten Typs (50) und des dritten Typs (60) konfiguriert ist.

3. Bauspielzeugsatz nach Anspruch 1 oder 2, bei dem mindestens eines der Bauelemente mindestens ein Toruselement (31) aufweist und/oder mindestens eine U-förmige Klemmaufnahme (21) zwischen dessen Enden aufweist.

4. Bauspielzeugsatz nach irgendeinem vorhergehenden Anspruch, bei dem der Körperabschnitt (11) von mindestens einem Bauelement in Form zweier Abschnitte ausgebildet ist, wobei ein Abschnitt einen Schaft (12) aufweist, der mit Außengewindegängen (16) ausgebildet ist, und der andere Abschnitt (11) mit Innengewindegängen (18) ausgebildet ist, um die Außengewindegänge (16) so aufzunehmen, dass die Länge des Bauelementes angepasst werden kann.

5. Bauspielzeugsatz nach irgendeinem vorhergehenden Anspruch, bei dem der Körperabschnitt (11) von mindestens einem der Bauelemente in Form zweier Abschnitte ausgebildet ist, wobei der eine Abschnitt einen im Allgemeinen zylindrischen Schaft (12) aufweist und der andere Abschnitt mit einer Bohrung (11) ausgebildet ist, in der der Schaft aufgenommen und durch Reibung entnehmbar festgehalten wird, wodurch ein Verbundbauelement variabler Länge geschaffen wird.

6. Bauspielzeugsatz nach irgendeinem vorhergehenden Anspruch, bei dem der Körperabschnitt (11) von mindestens einem der Bauelemente einen Querschnitt aufweist, der ungefähr gleich dem Innendurchmesser des C-förmigen Klemmclips (14) ist, so dass ein C-förmiger Klemmclip eines Bauelementes angeschlossen und von dem Körper eines anderen Bauelementes lösbar gehalten werden kann.

7. Bauspielzeugsatz nach irgendeinem vorhergehenden Anspruch, bei dem zwei Sätze des zweiten Typs von Bauelementen (10, 20 und/oder 30) bereitgestellt werden, wobei der erste Satz eine erste Länge aufweist und der zweite Satz eine zweite Länge aufweist.

8. Bauspielzeugsatz nach Anspruch 7, bei dem die zweite Länge gleich der Diagonale eines Quadrats ist, das aus vier ersten Bauelementen (50) der ersten Länge als Seiten gebildet ist, die in Übereinstimmung mit den Ecken des Quadrats mit Toruselementen (31) miteinander verbunden sind.

9. Bauspielzeugsatz nach Anspruch 7, bei dem die zweite Länge gleich der Hälfte der Diagonale eines Quadrats ist, das aus vier ersten Elementen (50) der Satzlänge als Seiten gebildet ist, die in Übereinstimmung mit den Ecken des Quadrats mit vier Toruselementen (31), abzüglich des Außenradius des Toruselementes, miteinander verbunden sind.

Revendications

1. Ensemble de jeux de construction, comprenant : au moins l'un d'un premier type d'élément de construction (50) et au moins l'un d'un deuxième type d'élément de construction (10, 20 et/ou 30), où le au moins un d' un deuxième type d'élément de construction a une portion de corps centrale (11) avec

une pince de préhension en forme de C (14) aux deux extrémités de la portion de corps, **caractérisé en ce que** l'ensemble comprend en outre au moins l'un d'un premier type d'élément de construction, dans lequel le premier type d'élément de construction a une portion de corps centrale (11) avec une portion torique (31) à l'une ou aux deux extrémités de la portion de corps et la pince de préhension en forme de C du deuxième type d'élément de construction est configurée pour saisir de manière détachable une portion torique d'un élément de construction du premier type.

2. Ensemble de jeux de construction selon la revendication 1, comprenant en outre au moins l'un d'un troisième type d'élément de construction (60) ayant une portion de corps centrale (11) avec une portion torique (31) à une extrémité de la portion de corps et une pince de préhension en forme de C (14) à l'autre extrémité de la portion de corps, la pince de préhension en forme de C étant configurée pour saisir de manière amovible une portion torique d'un élément de construction du premier (50) ou du troisième type (60) et dans lequel la pince de préhension en forme de C du deuxième type d'élément de construction (10, 20 et/ou 30) est configurée pour saisir de manière amovible une portion torique (31) d'un élément de construction du premier type (50) et du troisième type (60).

3. Ensemble de jeux de construction selon la revendication 1 ou 2, dans lequel au moins l'un desdits éléments de construction comprend au moins un élément torique (31) et/ou au moins une douille de préhension en forme de U (21) entre ses extrémités.

4. Ensemble de jeux de construction selon l'une quelconque des revendications précédentes, dans lequel la portion de corps (11) d'au moins un élément de construction est formée dans deux sections, une section ayant une tige (12) formée avec des filets de vis externes (16), l'autre section (11) étant formée avec des filets de vis internes (18) pour recevoir lesdits filets de vis externes (16) de sorte que la longueur dudit élément de construction puisse être ajustée.

5. Ensemble de jeux de construction selon l'une quelconque des revendications précédentes, dans lequel la portion de corps (11) d'au moins un desdits éléments de construction est formée en deux sections, une section ayant une tige généralement cylindrique (12), l'autre section étant formée avec un orifice (11) dans lequel ladite tige est reçue et retenue de manière amovible par frottement, créant ainsi un élément de construction composite de longueur variable.

6. Ensemble de jeux de construction selon l'une quelconque des revendications précédentes, dans lequel la portion de corps (11) d'au moins un desdits éléments de construction a une coupe transversale à peu près égale au diamètre interne de ladite pince de préhension en forme de C (14) de sorte qu'une pince de préhension en forme de C d'un élément de construction puisse être raccordée et retenue de manière amovible par le corps d'un autre élément de construction.

7. Ensemble de jeux de construction selon l'une quelconque des revendications précédentes, dans lequel il y a deux ensembles dudit deuxième type d'éléments de construction (10, 20 et/ou 30), le premier ensemble ayant une première longueur et le second ensemble ayant une seconde longueur.

8. Ensemble de jeux de construction selon la revendication 7, dans lequel ladite seconde longueur est égale à la diagonale d'un carré formé de quatre premiers éléments de construction (50) de la première longueur comme côtés, couplés l'un à l'autre en correspondance avec les coins du carré par quatre éléments toriques (31).

9. Ensemble de jeux de construction selon la revendication 7, dans lequel ladite seconde longueur est égale à la moitié de la diagonale d'un carré formé de quatre premiers éléments (50) de la longueur de l'ensemble comme côtés, couplés l'un à l'autre en correspondance avec les coins du carré par quatre éléments toriques (31), moins le rayon externe de l'élément torique.

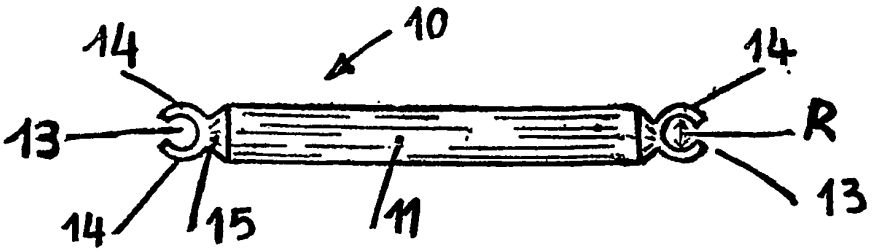


FIG.1

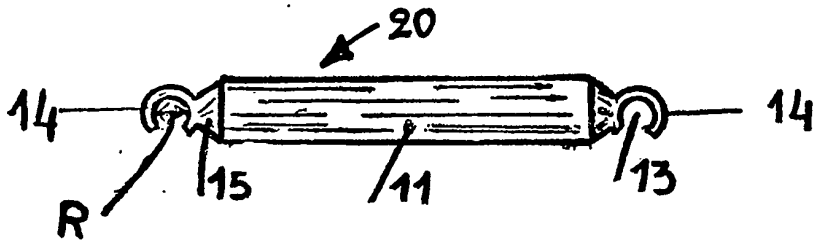


FIG.2

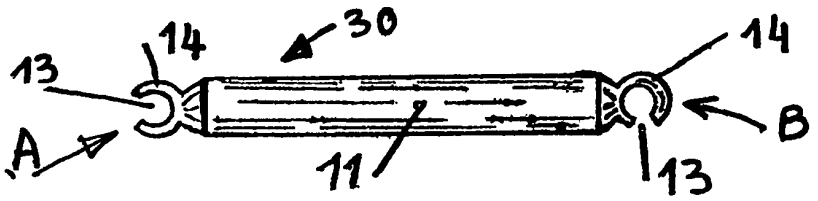


FIG.3

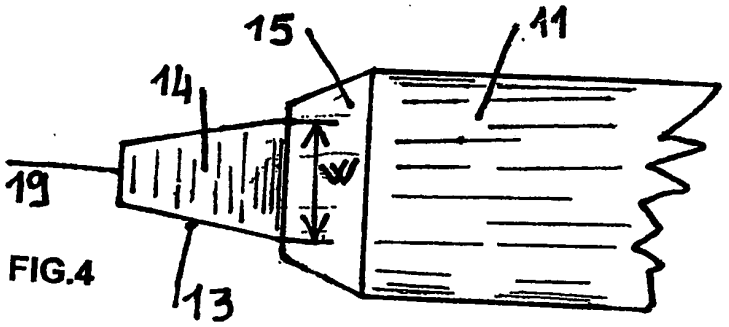


FIG.4

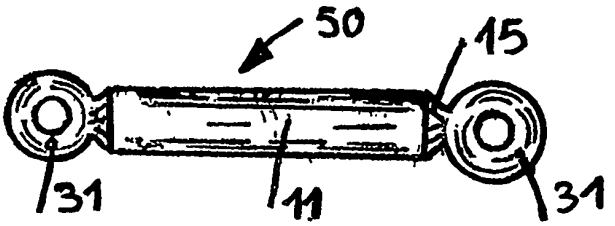


FIG.5

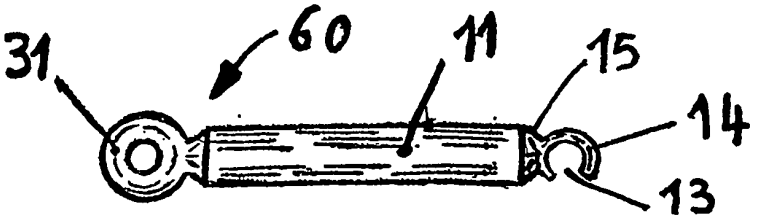


FIG.6

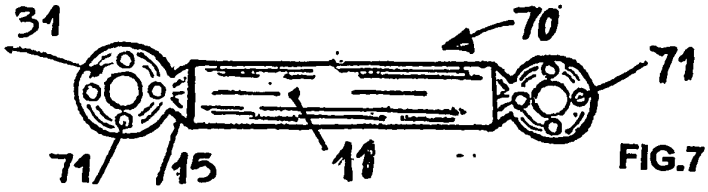


FIG.7

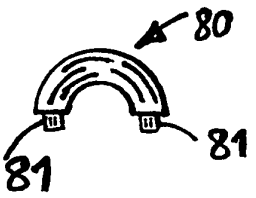


FIG.8

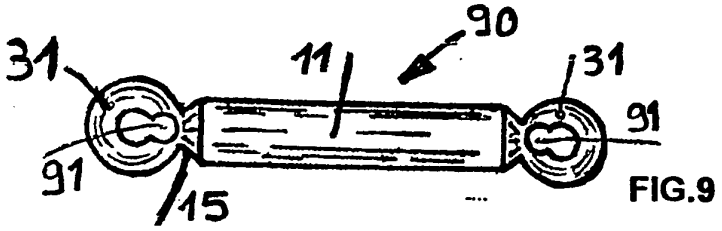


FIG.9

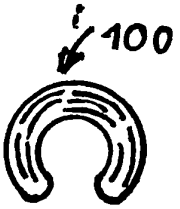


FIG.10

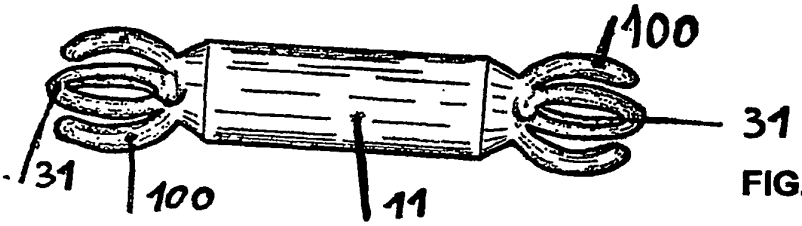


FIG.11

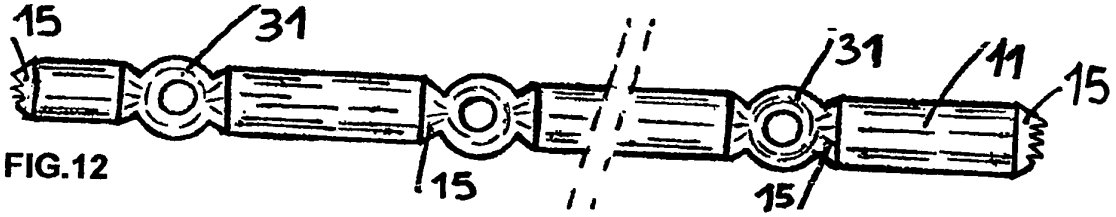


FIG.12

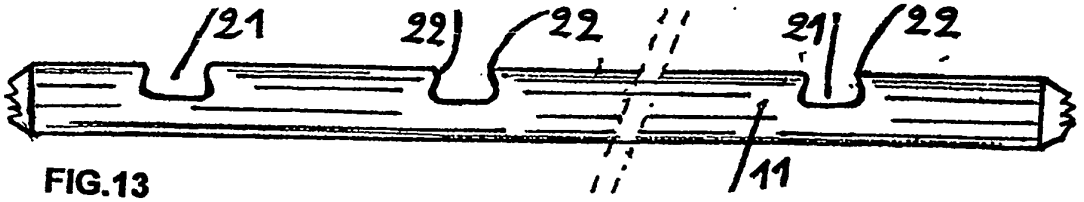


FIG.13

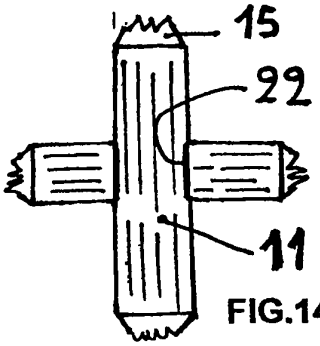


FIG.14

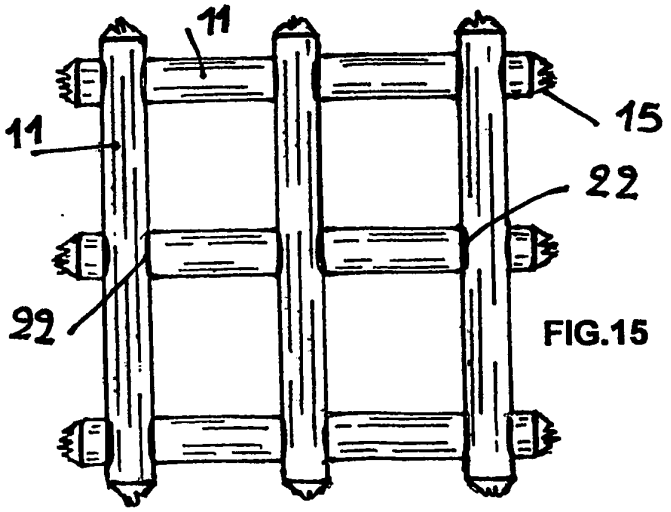


FIG.15

FIG.16

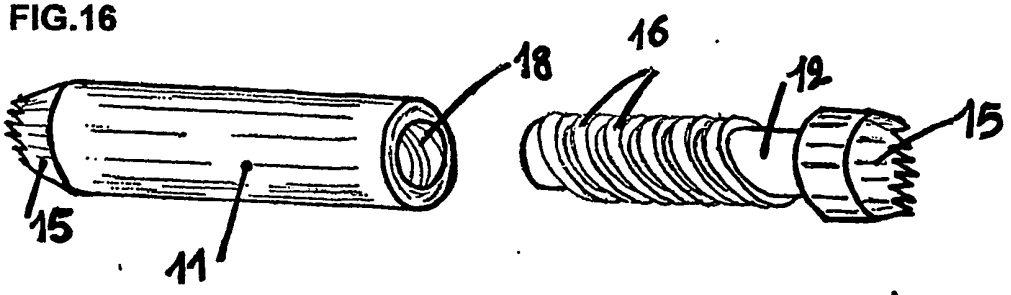
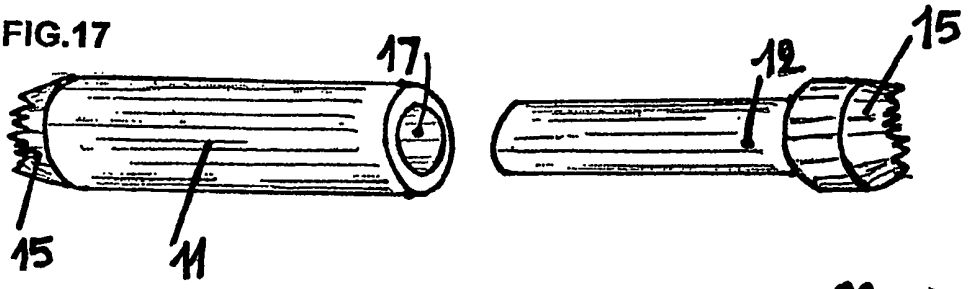


FIG.17



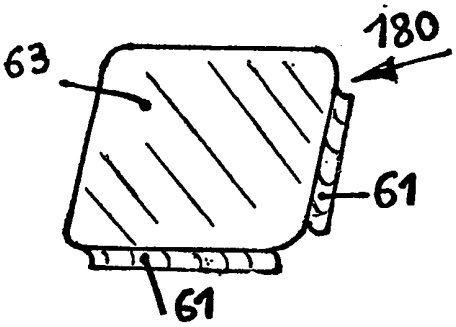


FIG.18

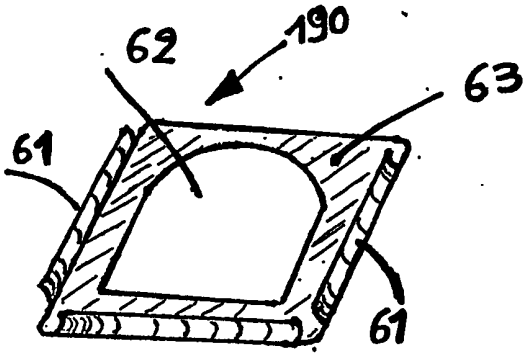


FIG.19

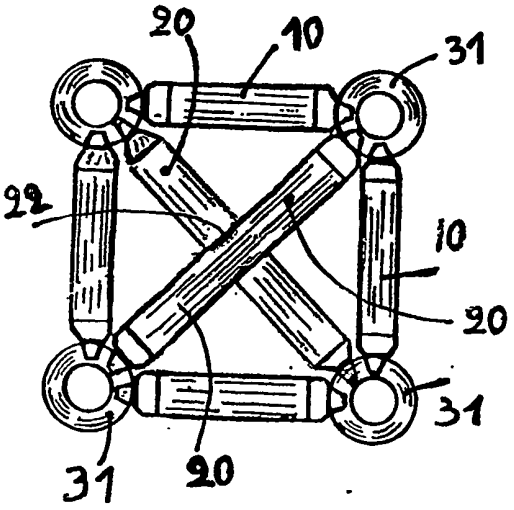


FIG.20

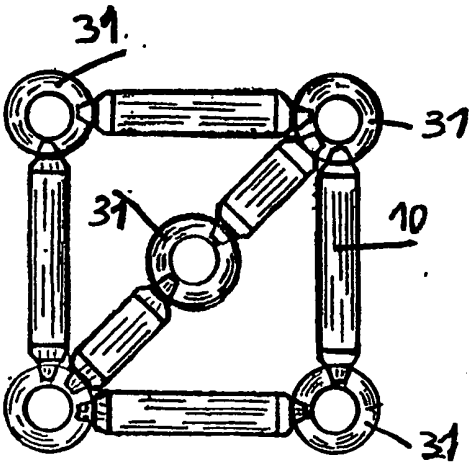


FIG.21

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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