

Description

The invention concerns a coupling mechanism with a rod-shaped object and a coupling head, said coupling mechanism being adapted to be used in a toy building set containing various building elements with other types of coupling means, e.g. bushings and ball heads.

Owing to the technological development in the field of toy building sets making it possible to build more and more complex constructions, there is a need for simple building elements which are adapted to transfer pressure/pull forces, partly for stiffening static constructions, partly for moving the parts of the construction with respect to each other. This mutual movement has so far been performed by a combination of shafts and gear wheels, while the static stiffening has taken place with the known components of the toy building set, which has resulted in constructions which are more compact than is often desirable.

Transmission of forces in the mechanical world is often performed by means of quite thin, flexible cables, e.g. Bowden cables, which are used e.g. in gear and brake cables in bicycles where twisted steel wires are adapted to move within a flexible envelope. The travel of the inner cable with respect to the envelope may then be used for controlling the position of movable parts. The spokes of a bicycle wheel are an example of the use of such thin, cable-like bodies for mechanical stiffening.

However, constructions of this type are not suitable for use in toy building sets, since consideration has been paid to the forces occurring in practice when constructing the cables and when arranging the means used for fixing the cables to the construction in general, while mounting is often difficult and requires the experience of a skilled person.

Swedish patent No. 351 369 describes a flexible building element for a toy building set. The building element has a coil spring terminated at each end by a coupling head which can be coupled with the other elements of the toy building set. The coil spring and the coupling heads form an integral part and it is thus not possible to change the coupling heads.

The object of the invention is therefore to provide a coupling mechanism which is to be used in an existing toy building set for transferring forces between various elements in constructions built with the toy building set, e.g. for transferring pressure, pull and rotation between the individual construction elements or e.g. for stabilizing a static construction built with the toy building set, where such a coupling mechanism must of course be easy to mount and be connectible with various building elements in the toy building set.

This object is achieved in that the rod-shaped object has at least one terminal part adapted to releasably engage the coupling head, said terminal part being adapted to be received between two resilient walls on the coupling head, and that the coupling head has secondary coupling means for coupling with other parts belonging to the toy building set. This provides a releasable connection between the rod-shaped object and the coupling head, e.g. in the form of a snap action, whereby these two parts can easily be engaged with and disengaged from each other.

The secondary coupling means of the coupling head may e.g. comprise a cylindrical eye adapted to receive a cylindrical bushing, or having two axially spaced stop means inside the eye so that a ball head can be received rotatably. In the preferred embodiment, the rod-shaped object has a circular cross-section and a constriction spaced from the end to receive the terminal part. At least one of the resilient walls of the coupling head has a collar transversely to the axial direction of the rod-shaped object. Upon interconnection of two parts of the coupling mechanism, this collar will counteract axial movement of the rod-shaped object with respect to the coupling head. To stiffen the coupling head, the two resilient walls are normally connected by a portion of material extending in the axial direction of the rod-shaped object. When coupled with the coupling head, the rod-shaped object can then be caused to engage said portion of material.

The rod-shaped object may be adapted to be passed through a tubular liner or envelope with an internal diameter corresponding to the diameter of the object. This is feasible when the rod-shaped object is formed with a terminal part whose diameter is smaller than or equal to the diameter of the rest of the rod-shaped object. Thus, the rod-shaped object may be used as a type of Bowden cable where the travel of the cable with respect to the end point of the liner may be used for displacing parts in a construction built with the toy building set. The cable liner may advantageously be attached in a bushing whose outer diameter corresponds to other parts incorporated in the toy building set, so that the cable lining may be fixed in existing building elements. Since the coupling head can easily be released from the rod-shaped object, it is the diameter of the cable liner which puts a limit to the type of components through which the cable can be passed. The rod-shaped object preferably has a terminal part at each end so that a coupling head may be mounted at each end. However, in some cases it is expedient that one end of the rod-shaped object is an integral part of a component incorporated in the toy building set. It may thus be connected directly to the piston

rod in a pressure operated cylinder.

However, the rod-shaped object may also be formed with a terminal part having e.g. a four-sided cross-section, so that the coupling mechanism will be able to transfer torsion or rotation between two construction parts. If only the rod-shaped object is to be used for static stiffening, i.e. without cable liner, the terminal part of the rod-shaped object may be formed with a diameter greater than the rest of the object, so that there is no need for passing the object through a narrow envelope.

The invention furthermore concerns a coupling mechanism comprising a coupling head and a rod-shaped element adapted to be releasably engaged with said coupling head to form a composite structure. The rod-shaped element is received between two resilient walls on the coupling head in a lateral insertion movement. The rod-shaped element is locked in axial direction and said locking is provided by coaction between a channel on the element and projections on the coupling head.

The invention will be explained more fully below with reference to the drawing, in which

fig. 1 shows a preferred embodiment of a cable end with a terminal part according to the invention,

fig. 2 shows an embodiment of a coupling head according to the invention,

fig. 3 shows a second embodiment of a coupling head according to the invention,

fig. 4 is a lateral view of the coupling head shown in fig. 3,

fig. 5 is an end view of the coupling head shown in figs. 3 and 4,

fig. 6 shows an application of the coupling mechanism according to the invention,

fig. 7 shows a second application of a coupling mechanism according to the invention,

fig. 8 shows a third application of a coupling mechanism according to the invention,

fig. 9 schematically shows a fourth application of a coupling mechanism according to the invention,

fig. 10 shows an alternative embodiment of a rod-shaped object according to the invention, and

fig. 11 shows a further alternative of a rod-shaped object according to the invention.

Fig. 1 shows a preferred embodiment of a rod-shaped object 10 for a coupling mechanism according to the invention. The rod-shaped object 10 has a terminal part consisting of a constriction 15 which forms an integral part of the rod-shaped object 10. The constriction 15 is connected to the end 12 and main body of the rod-shaped object 10, respectively, by two frusto-conical parts 13, 14. In a preferred embodiment, the rod-shaped object 10 has a maximum diameter corresponding to the

diameter of the main body.

Fig. 2 shows a coupling head 20 for the coupling mechanism, where the coupling head 20 has two resilient walls 27 adapted to releasably receive and retain the terminal part of the rod-shaped object 10. The coupling head 20 is a flat, oval body with a cylindrical, through-going eye 21 at one end, which is adapted to rotatably receive and retain a cylindrical bushing on another building element incorporated in the toy building set. A circular channel 23 is provided between the two resilient walls 27 in the longitudinal direction of the coupling head 20, said channel serving to receive the terminal part of the rod-shaped object 10. A cavity is formed between the resilient walls 27 on the coupling head 20 and is divided into an inner part 24 and an outer part 22, between which a collar 28 is provided, extending between the cavities 22, 24 transversely to the longitudinal direction of the coupling head 20. The coupling head 20 is typically manufactured by injection moulding of a plastics material, so the coupling head 20 may in certain areas be formed with recesses 25 to reduce the wall thickness and to thereby achieve the best possible product.

Fig. 3 shows a coupling head 30 substantially corresponding to the one shown in fig. 2, where a cylindrical eye is adapted to rotatably receive a ball head; the eye therefore has two axially spaced stop means 36 which may e.g. consist of two spaced rings or, as is the case here, parts of two such rings. Two resilient walls 37 form an outer and an inner cavity 32, 34 separated by a collar 38. A rod-shaped object 10, displaced laterally, may be received in a substantially circular channel 23 which forms the rear wall of the cavities 32, 34 formed by the resilient flaps 37. Heretoo, some recesses 35 of reduced thickness may be provided owing to the wall thickness.

Figs. 4 and 5 are a lateral view and an end view, respectively, of the coupling head 30 shown in fig. 3. It is seen in fig. 4 how the inner part 34 of the cavity formed by the resilient walls 37 has the shape of the end 12 on the rod-shaped object 10. The width of the cavity 34, i.e. the distance between the two resilient walls 37 in this part, is constant in the entire depth of the cavity. Thus, the end 12 on the rod-shaped object 10 will not meet with any resistance until it reaches the rear wall of the inner part 34 of the cavity. It is seen in fig. 5 how the outer part 32 of the cavity is hopper-shaped so that the resilient walls 37 of the coupling head 30 are forced apart in this area upon mounting of the rod-shaped object 10. Once the rod-shaped object 10 has been positioned in the cylindrical channel 33, the rod-shaped object can only be disengaged when subjected to strong lateral forces. The collar 38, which separates the inner

and outer parts 34, 32 of the cavity, is formed with inclined walls which correspond to the frusto-conical part 13 of the rod-shaped object, so that the collar 38 on the resilient walls 37 will yield when the pull in the rod-shaped object 10 in an axial direction exceeds a certain value, and the rod-shaped object 10 will therefore not be destroyed in case of overloading.

As will be seen from figs. 2 and 3, the coupling head 20 for receiving a bushing is oval, while the coupling head 30 for retaining a ball head is U-shaped. A user can hereby readily distinguish between the two types of coupling heads 20, 30.

Fig. 6 shows an application of a coupling mechanism according to the invention, where a coupling head 30 is mounted at one end of a flexible cable 10. The other end of the cable 10 is secured to a piston 61 in a pressure-pull cylinder 60, said cable 10 being passed through an opening in the end plate 62 of the cylinder 60. The cylinder 60 is operated by a pump 63. Two uniform elements 40 and 42, together with the pressure operated cylinder 60, are fixed to a construction built with the toy building set. These two building elements 40, 42 have a circular opening to receive a bushing 41 and 43, respectively. These two bushings 41, 43 retain their respective ends of a tubular envelope 50 with respect to the two building elements 40, 42. The envelope 50 will preferably be flexible and formed with an inside diameter corresponding to the diameter of the rod-shaped object or the cable 10. Since the cable 10 can easily be separated from the coupling head 30, this can easily be passed through with a tubular envelope 50. The cable 10 is passed through the envelope 50 after the envelope has been attached to the building elements 40, 42 by means of the bushings 41, 43. The travel of the piston 61 in the pressure operated cylinder will thus be transferred through the cable 10 so that the coupling head will perform a corresponding travel with respect to the building element 40. This travel may be used for moving other parts (not shown) of the construction.

Fig. 7 shows an example of an application of such a cable construction. The shown construction may e.g. be used for regulating the inclination of a toy helicopter rotor. A power supply and regulation device 104 controls the supply power to an electric motor 100. The electric motor 100 has a drive shaft, which through a connector 105 is connected to the rotor shaft of the helicopter. The shaft is moved through a flat building element 120 with holes to receive shafts and bushings. The shaft 120 is retained vertically with respect to the flat building element 120 by means of positioning rings 122 mounted on each side of the flat building element. The shaft 110 is secured to a cardan ball (not shown), which is engaged with carrier pins on an

internal cylinder face on a cross-shaped element 130, so that its rotation is provided by the shaft 110. The cross-shaped element 130 has four radially protruding arms with coupling studs 132 with which helicopter blades may be mounted. A guide ring 140 is rotatably journaled about the tubular part of the cross-shaped element 130, so that the guide ring 140 may be used for regulating the inclination of the element 130 with respect to horizontal. The guide ring 140 has four radially protruding arms with ball heads 145. A coupling head 160 of the second type (30) is secured to one of these ball heads 145. As previously mentioned, this coupling head 160 is connected with a flexible cable 160 and is passed into a bushing 180 extending through the flat building element 121 as well as an additional element 122 whereby the bushing will be able to retain a flexible envelope 170, whose other end is secured with a bushing 181 to a building element 185. The cable 160 is attached at its other end to a coupling head 155 of the first type (20), which is secured via a bushing 190 to a lever or swing arm 192 which may be pivoted about a stationary pivot shaft 195. The shaft 195, the building element 185, the building elements 120 and 121 and the electric motor 100 are secured to stationary construction parts which are omitted for the sake of clarity. When the swing arm 192 is pivoted about the shaft 195, the cable 160 will be displaced in the envelope 170, and the rotation about the shaft 195 will result in a linear displacement of the coupling head 160 and thereby change the inclination of the cross-shaped element 130. When connecting one more of the ball heads 145 of the guide ring 140 with a guide device, it is possible to regulate the inclination of the plane spanned by the cross-shaped element. Alternatively, one of the ball heads may be fixed with respect to the flat building element 120, so that the element 130 can now only tilt about an axis.

Fig. 8 shows that the coupling mechanism according to the invention may be used for stiffening stationary constructions, which is exemplified by a tail portion of a helicopter built with the elements of the toy building set. The tail portion is composed of long building elements having through openings to receive shafts. The construction consists of five beams 210, 220, 230, 240, 250 which are coupled together with shafts and bushings to form a substantially trapeziform body constituting the tail of the helicopter. Since the individual beams are rotatably connected with each other, the tail portion will not be stable as such, and two stiffening elements 260, 270 are therefore connected between the two substantially parallel beams 210 and 240. These stiffening elements 260, 270 consist of a cable 10 provided at each end with a coupling head 20, which is secured to respective beams

210, 240 by means of bushings or shafts extending through the openings of the beam.

Fig. 9 schematically shows how a cable construction of the type shown in fig. 6 may be used for controlling the shape of an otherwise semistatic construction. The construction is formed by four beams 300, 301, 302 and 303 which are rotatably secured to each other through shafts 380, 381, 382 and 383. Thus, the beams 301-303 form a trapezium whose shape may be varied by adjusting the angle between two of the beams 300 and 303 forming part of the parallelogram. A Bowden cable comprises an envelope 360 attached to the beam 300 and an inner cable 310 attached to the beam 303 through a coupling head 320 by means of a bushing. The travel of the inner cable 310 in the envelope 360 will thus be able to adjust the angle between the beam 300 and the beam 303.

Fig. 10 shows an alternative embodiment of a rod-shaped object 10 according to the invention with a terminal part in the form of a ball 12. This rod-shaped object will be useful in connection with static constructions since, in this case, it is not necessary that the object 10 is to be movable through a cable envelope, but is merely to be received in a coupling head. This coupling head must be shaped such that an inner part of the cavity between the flexible walls of the coupling head must be receivable on the ball-shaped terminal part.

Fig. 11 shows an alternative embodiment of the rod-shaped object where the terminal part is here formed with an end part 12a having a square cross-shaped section. The rod-shaped object 10 otherwise corresponds to the rod-shaped object shown in fig. 1, but owing to the plane faces 12a of the end part, it will be able to transmit rotary movements or torsion if the coupling head is formed with corresponding complementary plane faces.

Claims

1. A coupling mechanism with a rod-shaped object (10) and a coupling head (20, 30) and adapted to be used in a toy building set containing various building elements with other types of coupling means, e.g. bushings or ball heads, said coupling head (20, 30) has secondary coupling means (21, 31) for connection with other parts belonging to the toy building set, and said rod-shaped object (10) has at least one terminal part (12-15), **characterized** in that said terminal part (12-15) is adapted to be received and retained in a releasable engagement between two resilient walls (27, 37) on the coupling head (20, 30).

2. A coupling mechanism according to claim 1, **characterized** in that the secondary coupling means of the coupling head (20) comprise a cylindrical eye (21) adapted to rotatably receive a cylindrical bushing.
3. A coupling mechanism according to claim 1, **characterized** in that the secondary coupling means of the coupling head (30) comprise a cylindrical eye (31), and that the coupling head has two axially spaced stop means (36) inside the eye so that a ball head when mounted in the eye (31) is retained rotatably by said stop means (36).
4. A coupling mechanism according to claims 1-3, **characterized** in that the rod-shaped object has a circular cross-section and a constriction (15) spaced from the end to form the terminal part, and that at least one of the resilient walls (27, 37) of the coupling head has a collar (28, 38) transversely to the axial direction of the rod-shaped object, and that the collar (28, 38) upon interconnection of the two parts (10, 20; 10, 30) of the coupling mechanism counteracts axial movement of the rod-shaped object (10) with respect to the coupling head (20, 30).
5. A coupling mechanism according to claims 1-4, **characterized** in that the two resilient walls (27, 37) of the coupling head are connected by a portion of material extending in the axial direction of the rod-shaped object.
6. A coupling mechanism according to claims 1-5, **characterized** in that the rod-shaped object is adapted to be received in a tubular envelope (50) having an inside diameter corresponding to the diameter of the rod-shaped object (10) and its terminal part (12-15).
7. A coupling mechanism according to claims 1-6, **characterized** in that at the end facing away from the terminal part (12-15) the rod-shaped object (10) is integral with another component (60-62) incorporated in the toy building set.
8. A coupling mechanism according to claims 1-7, **characterized** in that the rod-shaped object (10) has terminal parts (12-15) at respective ends.
9. A coupling mechanism according to claims 1-8, **characterized** in that the terminal part (12-15) of the rod-shaped object has a plurality of plane faces (12a) extending in the axial direction of the object and being adapted to be



210, 240 by means of bushings or shafts extending through the openings of the beam.

Fig. 9 schematically shows how a cable construction of the type shown in fig. 6 may be used for controlling the shape of an otherwise semistatic construction. The construction is formed by four beams 300, 301, 302 and 303 which are rotatably secured to each other through shafts 380, 381, 382 and 383. Thus, the beams 301-303 form a trapezium whose shape may be varied by adjusting the angle between two of the beams 300 and 303 forming part of the parallelogram. A Bowden cable comprises an envelope 360 attached to the beam 300 and an inner cable 310 attached to the beam 303 through a coupling head 320 by means of a bushing. The travel of the inner cable 310 in the envelope 360 will thus be able to adjust the angle between the beam 300 and the beam 303.

Fig. 10 shows an alternative embodiment of a rod-shaped object 10 according to the invention with a terminal part in the form of a ball 12. This rod-shaped object will be useful in connection with static constructions since, in this case, it is not necessary that the object 10 is to be movable through a cable envelope, but is merely to be received in a coupling head. This coupling head must be shaped such that an inner part of the cavity between the flexible walls of the coupling head must be receivable on the ball-shaped terminal part.

Fig. 11 shows an alternative embodiment of the rod-shaped object where the terminal part is here formed with an end part 12a having a square cross-shaped section. The rod-shaped object 10 otherwise corresponds to the rod-shaped object shown in fig. 1, but owing to the plane faces 12a of the end part, it will be able to transmit rotary movements or torsion if the coupling head is formed with corresponding complementary plane faces.

Claims

1. A coupling mechanism with a rod-shaped object (10) and a coupling head (20, 30) and adapted to be used in a toy building set containing various building elements with other types of coupling means, e.g. bushings or ball heads, said coupling head (20, 30) has secondary coupling means (21, 31) for connection with other parts belonging to the toy building set, and said rod-shaped object (10) has at least one terminal part (12-15), characterized in that said terminal part (12-15) is adapted to be received and retained in a releasable engagement between two resilient walls (27, 37) on the coupling head (20, 30).

2. A coupling mechanism according to claim 1, characterized in that the secondary coupling means of the coupling head (20) comprise a cylindrical eye (21) adapted to rotatably receive a cylindrical bushing.
3. A coupling mechanism according to claim 1, characterized in that the secondary coupling means of the coupling head (30) comprise a cylindrical eye (31), and that the coupling head has two axially spaced stop means (36) inside the eye so that a ball head when mounted in the eye (31) is retained rotatably by said stop means (36).
4. A coupling mechanism according to claims 1-3, characterized in that the rod-shaped object has a circular cross-section and a constriction (15) spaced from the end to form the terminal part, and that at least one of the resilient walls (27, 37) of the coupling head has a collar (28, 38) transversely to the axial direction of the rod-shaped object, and that the collar (28, 38) upon interconnection of the two parts (10, 20; 10, 30) of the coupling mechanism counteracts axial movement of the rod-shaped object (10) with respect to the coupling head (20, 30).
5. A coupling mechanism according to claims 1-4, characterized in that the two resilient walls (27, 37) of the coupling head are connected by a portion of material extending in the axial direction of the rod-shaped object.
6. A coupling mechanism according to claims 1-5, characterized in that the rod-shaped object is adapted to be received in a tubular envelope (50) having an inside diameter corresponding to the diameter of the rod-shaped object (10) and its terminal part (12-15).
7. A coupling mechanism according to claims 1-6, characterized in that at the end facing away from the terminal part (12-15) the rod-shaped object (10) is integral with another component (60-62) incorporated in the toy building set.
8. A coupling mechanism according to claims 1-7, characterized in that the rod-shaped object (10) has terminal parts (12-15) at respective ends.
9. A coupling mechanism according to claims 1-8, characterized in that the terminal part (12-15) of the rod-shaped object has a plurality of plane faces (12a) extending in the axial direction of the object and being adapted to be



engaged with corresponding complementary faces between the resilient walls (27, 37) of the coupling head.

10. A coupling mechanism according to claims 1-8, characterized in that the terminal part of the rod-shaped object is ball-shaped and has a greater diameter than the rest of the object (10).

11. A coupling mechanism comprising a coupling head (20; 30) and a rod-shaped element (10) adapted to be releasably engaged with said coupling head (20;30) to form a composite structure, characterized in that

i) said coupling head (20; 30) has an open-ended cavity (22, 24; 32, 34) for receiving and retaining a rod-shaped element (10) by its end,

ii) each said cavity (22, 24; 32, 34) has an inner end wall and a pair of spaced-apart side walls (27; 37) defining an axis extending between said side walls (27; 37),

iii) integral locking projection means (28; 38) extend inwardly from at least one of said side walls (27; 37),

iv) said locking projection means (28; 38) are spaced from said inner end wall and define with said end wall an inner locking chamber (24; 34),

v) said side walls (27; 37) are formed with a circular channel (23; 33) therein extending from said locking projection means (28; 38) toward the open end of said cavity (22, 24; 32, 34),

vi) said channel (23; 33) is coaxial with said axis and said channel (23; 33) defines together with the side walls (27; 37) an outer locking chamber (22; 32),

vii) at least one end portion of said rod-shaped element (10) is shaped to be confined within a generally cylindrical envelope, viii) said end portion defines an axis of said rod-shaped element (10) and has an end portion (12) at the end extremity, receivable laterally within said inner locking chamber (24; 34) and is locked therein against movement in the direction of the axis of said rod-shaped element (10),

ix) said end portion further has an annular groove (15) immediately adjacent and partly defining said end portion (12),

x) said annular groove (15) is adapted to receive said locking projection means (28; 38) when said rod-shaped element (10) is inserted laterally into said open-ended cavity (22, 24; 32, 34),

xi) said channel (23; 33) is shaped and positioned to closely receive portions of the cylindrical envelope of said rod-shaped element (10), and that

xii) said side walls (27; 37) are elastically deflectable to accommodate lateral insertion of said rod-shaped element (10) into said cavity (22, 24; 32, 34).

10 Patentansprüche

1. Ein Verbindungsmechanismus für einen stabförmigen Gegenstand (10) und einen Verbindungskopf (20, 30), der geeignet ist, in einem Spielzeugbausatz verwendet zu werden, der verschiedene Bauelemente mit anderen Arten von Kupplungsmitteln, beispielsweise Buchsen oder Kugelköpfen enthält, wobei der Verbindungskopf (20, 30) sekundäre Kupplungsmittel (21, 31) zur Verbindung mit anderen zu dem Spielzeugbausatz gehörenden Teilen aufweist und der stabförmige Gegenstand (10) wenigstens einen Anschlußteil (12 - 15) aufweist, dadurch gekennzeichnet, daß der Anschlußteil (12 - 15) so ausgebildet ist, daß er in freigebarem Eingriff zwischen zwei nachgiebigen Wänden (27, 37) an dem Verbindungskopf (20, 30) aufgenommen und gehalten werden kann.

2. Ein Verbindungsmechanismus nach Anspruch 1, dadurch gekennzeichnet, daß die sekundären Kupplungsmittel des Kupplungskopfes (20) ein zylindrisches Ohr (21) aufweisen, welches geeignet ist, um eine Zylindrische Buchse drehbar aufzunehmen.

3. Ein Verbindungsmechanismus nach Anspruch 1, dadurch gekennzeichnet, daß die sekundären Kupplungsmittel des Verbindungskopfes (30) ein zylindrisches Ohr (31) aufweisen und daß der Verbindungskopf zwei axial im Abstand angeordnete Anschlagmittel (36) im Inneren des Ohrs so aufweist, daß ein Kugelkopf, wenn er in dem Ohr (31) montiert ist, durch die Anschlagmittel drehbar gehalten ist.

4. Ein Verbindungsmechanismus nach den Ansprüchen 1 - 3, dadurch gekennzeichnet, daß der stabförmige Gegenstand einen Kreisquerschnitt und eine Verengung (15) hat, die im Abstand vom Ende ausgebildet ist, um einen Anschlußteil zu bilden; wenigstens eine der nachgiebigen Wände (27, 37) des Verbindungskopfes einen Kragen (28, 38) quer zur axialen Richtung des stabförmigen Gegenstandes aufweist und daß der Kragen (28, 38) bei Verbindung der beiden Teile (10, 20; 10, 30) des Kupplungsmechanismus axialer Bewe-



gung des stabförmigen Gegenstandes (10) in Bezug auf den Verbindungskopf (20, 30) entgegenwirkt.

5. Ein Verbindungsmechanismus nach den Ansprüchen 1 - 4, dadurch gekennzeichnet, daß die beiden nachgiebigen Wände (27, 37) des Kupplungskopfes durch einen Teil des Materials verbunden sind, welches sich in der axialen Richtung des stabförmigen Gegenstandes erstreckt. 5 10
6. Ein Verbindungsmechanismus nach den Ansprüchen 1 - 5, dadurch gekennzeichnet, daß der stabförmige Gegenstand geeignet ausgebildet ist, damit er in einem rohrförmigen Teil (50) Aufnahme findet, der einen Innendurchmesser hat, der dem Durchmesser des stabförmigen Gegenstandes (10) und dem Durchmesser seines Anschlußstücks (12 - 15) entspricht. 15 20
7. Ein Verbindungsmechanismus nach den Ansprüchen 1 bis 6, dadurch gekennzeichnet, daß an demjenigen Endteil, der von dem Anschlußteil (12, 15) des stabförmigen Gegenstandes (10) abgewandt ist, ein weiterer zum Bauspielzeugsatz gehörender Bauteil (60 - 62) einstückig ausgebildet ist. 25 30
8. Ein Verbindungsmechanismus nach den Ansprüchen 1 - 7, dadurch gekennzeichnet, daß der stabförmige Gegenstand (10) Anschlußteile (12 - 15) an jedem Ende aufweist. 35
9. Ein Kupplungsmechanismus nach den Ansprüchen 1 - 8, dadurch gekennzeichnet, daß der Anschlußteil (12 - 15) des stabförmigen Gegenstandes eine Mehrzahl von ebenen Flächen (12a) aufweist, die sich in der axialen Richtung des Gegenstandes erstrecken und geeignet ausgebildet sind, um mit entsprechenden komplementären Flächen zwischen den nachgiebigen Wänden (27, 37) des Kupplungskopfes in Eingriff zu treten. 40 45
10. Ein Verbindungsmechanismus nach den Ansprüchen 1 - 8, dadurch gekennzeichnet, daß der Anschlußteil des stabförmigen Gegenstandes kugelförmig ausgestaltet ist und einen größeren Durchmesser als der verbleibende Teil des Gegenstandes (10) hat. 50
11. Ein Verbindungsmechanismus, aufweisend einen Verbindungskopf (20; 30) und ein stabförmiges Element (10), das für den freigebbaren Eingriff mit dem Verbindungskopf (20; 30) ausgebildet ist, um eine zusammengesetzte Struk-

tur zu bilden, dadurch gekennzeichnet, daß

- i) der Verbindungskopf (20; 30) einen an den Enden offenen Hohlraum (22, 24; 32, 34) zur Aufnahme und Halterung eines stabförmigen Elementes (10) an seinem Ende aufweist,
- ii) jeder Hohlraum (22, 24; 32, 34) eine innere Endwand und ein Paar von im Abstand angeordneten Seitenwänden (27; 37) aufweist, die eine Achse festlegen, die sich zwischen den Seitenwänden (27; 37) erstreckt,
- iii) einstückig oder integral ausgebildete Verriegelungsvorsprünge (28; 38), die sich von wenigstens einer der Seitenwände (27; 37) her nach innen hin erstrecken,
- iv) die Verriegelungsvorsprünge (28; 38) zu der inneren Endwand im Abstand angeordnet sind und mit der Endwand eine innere Verriegelungskammer (24; 34) bilden,
- v) die Seitenwände (27; 37) mit einem kreisförmigen Kanal (23; 33) ausgebildet sind, der sich in diesen von den Verriegelungsvorsprüngen (28; 38) weg in Richtung auf das offene Ende des Hohlraums (22, 24; 32, 34) hin erstreckt,
- vi) der Kanal (23; 33) mit der Achse koaxial ausgerichtet ist und der Kanal (23; 33) zusammen mit den Seitenwänden (27; 37) eine äußere Verriegelungskammer (22, 32) bildet,
- vii) wenigstens der eine Endteil des stabförmigen Elementes (10) so ausgestaltet ist, daß er von einem allgemein zylindrischen Umhüllungsteil oder Mantel umschlossen wird,
- viii) der Endteil eine Achse des stabförmigen Elementes (10) festlegt und einen Abschnitt (12) an dem Endteil aufweist, der innerhalb der inneren Verriegelungskammer (24; 34) seitlich aufnehmbar ist und in dieser gegen Bewegung in Achsrichtung des stabförmigen Elementes (10) verriegelt ist,
- ix) der Endteil weiterhin eine Ringnut (15) in unmittelbarer Nachbarschaft aufweist und zum Teil den offenen Abschnitt (12) begrenzend ausgebildet ist,
- x) die Ringnut (15) geeignet ausgebildet ist, um den Verriegelungsvorsprung (28; 38) aufzunehmen, wenn das stabförmige Element (10) in den offen-endenden Hohlraum (22, 24; 32, 34) seitlich eingesetzt wird,
- xi) der Kanal (23; 33) ausgestaltet und angeordnet ist, um Teile der zylindrischen Umhüllung des stabförmigen Elementes (10) engumschließend aufzunehmen, und daß
- xii) die Seitenwände (27, 37) elastisch verbiegbare sind, um seitliches Einsetzen des



stabförmigen Elementes (10) in den Hohlraum (22, 24; 32, 34) zu ermöglichen.

Revendications

1. Mécanisme d'accouplement ayant un objet (10) en forme de tige et une tête d'accouplement (20, 30) et destiné à être utilisé dans un ensemble de jeu de construction contenant divers éléments de construction avec d'autres types de moyens d'accouplement, par exemple des coussinets ou des têtes à rotule, la tête d'accouplement (20, 30) possède des moyens secondaires d'accouplement (21, 31) permettant la connexion à d'autres parties appartenant à l'ensemble du jeu de construction, et l'objet en forme de tige (10) a au moins une partie terminale (12 à 15), caractérisé en ce que la partie terminale (12 à 15) est destinée à être logée et retenue par coopération temporaire entre deux parois élastiques (27, 37) formées sur la tête d'accouplement (20, 30).
2. Mécanisme d'accouplement selon la revendication 1, caractérisé en ce que les moyens secondaires d'accouplement de la tête d'accouplement (20) comportent un oeillet cylindrique (21) destiné à loger un coussinet cylindrique afin qu'il puisse tourner.
3. Mécanisme d'accouplement selon la revendication 1, caractérisé en ce que les moyens secondaires d'accouplement de la tête d'accouplement (30) comportent un oeillet cylindrique (31), et la tête d'accouplement possède deux moyens axialement espacés (36) d'arrêt placés à l'intérieur de l'oeillet afin qu'une tête à rotule, lorsqu'elle est montée dans l'oeillet (31), soit retenue par les moyens d'arrêt (36) en rotation.
4. Mécanisme d'accouplement selon les revendications 1 à 3, caractérisé en ce que l'objet en forme de tige a une section transversale circulaire et un rétrécissement (15) distant de l'extrémité pour la formation de la partie terminale, et en ce que l'une au moins des parois élastiques (27, 37) de la tête d'accouplement comporte un collier (28, 38) disposé transversalement à la direction axiale de l'objet en forme de tige, et en ce que le collier (28, 38) après interconnexion des deux parties (10, 20 ; 10, 30) du mécanisme d'accouplement, s'oppose au déplacement axial de l'objet en forme de tige (10) par rapport à la tête d'accouplement (20, 30).
5. Mécanisme d'accouplement selon les revendications 1 à 4, caractérisé en ce que les deux parois élastiques (27, 37) de la tête d'accouplement sont raccordées par une partie de matériau disposée dans la direction axiale de l'objet en forme de tige.
6. Mécanisme d'accouplement selon les revendications 1 à 5, caractérisé en ce que l'objet en forme de tige est destiné à être logé dans une enveloppe tubulaire (50) ayant un diamètre interne qui correspond au diamètre de l'objet en forme de tige (10) et de sa partie terminale (12 à 15).
7. Mécanisme d'accouplement selon les revendications 1 à 6, caractérisé en ce que, à l'extrémité tournée du côté opposé à la partie terminale (12 à 15), l'objet en forme de tige (10) est solidaire d'un autre élément (60 à 62) incorporé à l'ensemble du jeu de construction.
8. Mécanisme d'accouplement selon les revendications 1 à 7, caractérisé en ce que l'objet (10) en forme de tige a des parties terminales (12 à 15) à ses extrémités respectives.
9. Mécanisme d'accouplement selon les revendications 1 à 8, caractérisé en ce que la partie terminale (12 à 15) de l'objet en forme de tige a plusieurs faces planes (12a) placées dans la direction axiale de l'objet et destinées à coopérer avec des faces complémentaires correspondantes entre les parois élastiques (27, 37) de la tête d'accouplement.
10. Mécanisme d'accouplement selon les revendications 1 à 8, caractérisé en ce que la partie terminale de l'objet en forme de tige a une configuration de rotule et a un diamètre supérieur à celui du reste de l'objet (10).
11. Mécanisme d'accouplement comprenant une tête d'accouplement (20 ; 30) et un élément en forme de tige (10) destiné à coopérer temporairement avec la tête d'accouplement (20 ; 30) pour la formation d'une structure composite, caractérisé en ce que :
 - i) la tête d'accouplement (20 ; 30) possède une cavité (22, 24 ; 32, 34) à extrémité ouverte destinée à loger et retenir un élément en forme de tige (10) par son extrémité,
 - ii) chaque cavité (22, 24 ; 32, 34) a une paroi d'extrémité interne et une paire de parois latérales espacées (27 ; 37) délimitant un axe disposé entre les parois latérales (27 ; 37),



- iii) des moyens solidaires (28 ; 38) à saillies de blocage dépasse vers l'intérieur de l'une au moins des parois latérales (27 ; 37),
- iv) les moyens (28 ; 38) à saillies de blocage sont distants de la paroi d'extrémité interne et délimite avec cette paroi interne une chambre interne de blocage (24 ; 34), 5
- v) les parois latérales (27 ; 37) sont formées avec un canal circulaire (23 ; 33) s'étendent depuis les moyens à saillies de blocage (28 ; 38) vers une extrémité ouverte de la cavité (22, 24 ; 32, 34), 10
- vi) le canal (23 ; 33) est coaxial à l'axe et le canal (23 ; 33) délimite avec les parois latérales (27 ; 37) une chambre externe de blocage (22 ; 32), 15
- vii) une partie d'extrémité au moins de l'élément en forme de tige (10) a une configuration telle qu'elle peut être retenue à l'intérieur d'une enveloppe de forme générale cylindrique, 20
- viii) la partie d'extrémité délimite un axe de l'élément en forme de tige (10) et a une partie d'extrémité (12) à l'extrémité, destinée à être logée latéralement dans la chambre interne de blocage (24 ; 34) et est bloquée à l'intérieur afin qu'elle ne puisse pas se déplacer dans la direction de l'axe de l'élément en forme de tige (10), 25
- ix) la partie d'extrémité comprend en outre une gorge annulaire (15) immédiatement adjacente et qui définit partiellement la partie d'extrémité, 30
- x) la gorge annulaire (15) est destinée à loger les moyens à saillies de blocage (28 ; 38) lorsque l'élément en forme de tige (10) est introduit latéralement dans la cavité à extrémité ouverte (22, 24 ; 32, 34), 35
- xi) le canal (23 ; 33) a une configuration et une disposition telles qu'il loge intimement des parties de l'enveloppe cylindrique de l'élément en forme de tige (10), et en ce que 40
- xii) les parois latérales (27 ; 37) peuvent fléchir élastiquement afin qu'elles permettent l'insertion latérale de l'élément en forme de tige (10) dans la cavité (22, 24 ; 32, 34). 45

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