SET OF INTERCONNECTABLE PRESSURE ELEMENTS FOR MAKING CONSTRUCTION MODELS

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ABSTRACT
A set of interconnectable pressure elements for making construction models, particularly buildings. These elements comprise knots, connecting rods restrainable to the knots, and walls for closing the spaces between the connecting rods and knots. A highly resistant rigid structure is formed, that can be readily provided at a low cost, since all of the elements can be easily obtained by plastic material molding.

3 Claims, 7 Drawing Figures
SET OF INTERCONNECTABLE PRESSURE ELEMENTS FOR MAKING CONSTRUCTION MODELS

This invention relates to a set of interconnectable pressure elements for making construction models. For the provision of construction models, particularly to the purpose of teaching, playtime and model art, the use is made of several interconnectable and restrainable elements. The prior art elements have disadvantages due to the high cost thereof, the need of a large amount of different elements for providing a construction, the difficulty and instability in interconnecting the elements, and mainly because of the rather unsatisfactory exterior appearance of the construction model as provided by the prior art elements.

It is the primary object of the present invention to provide a set of elements enabling by a limited amount of pieces different from one another to make up substantially any construction model, particularly buildings with extremely high precision and accuracy.

It is another object of the invention to provide such elements that can be interconnected by simple pressure, thus creating absolutely rigid structures having inner and outer walls without any discontinuity.

A further object of the invention is to provide elements of the aforesaid character, which can be readily made by molding methods and thereby accurate and of low cost of production. These and still further objects are attained by a set of elements comprising knots, elongated connecting rods having shaped ends thereof and lining plates, the set of elements being characterized in that said knots have an amount of two to six shaped zones angularly spaced apart from one another and necessary to extend in the lengthwise direction. The elongated connecting rods have shaped ends thereof in the same position on the sides of each shaped zone of the knots recesses are formed, and that projections of said connecting rods project from at least one surface and adjacent the edges of said plates.

For a better understanding of the structure and features in a set of elements according to the present invention, some practical embodiments thereof will now be described by mere way of not limiting example, reference being had to the accompanying drawings in which:

FIGS. 1 to 6 are perspective views showing some embodiments of interconnectable elements; and

FIG. 7 is a partly exploded and partly sectional view showing a construction model as provided by the elements shown in FIGS. 1 to 6.

The basic and sufficient elements for providing construction models are of three types only, namely comprising knots, connecting rods and lining plates.

Four different embodiments are shown in FIGS. 1-4.

In FIG. 1 a knot is shown as comprising a single piece of rigid material having six flat surfaces, designated by numeral 1, and such that they would lie on the six sides of a cube, in which the knot could be encased. Centrally of each of said six flat surfaces 1 a shaped hole 2 is formed having a straight axis (it should be noted that as described the axes of holes 2 are perpendicular to one another and angularly spaced apart from one another by 90°), on each side of which straight grooves 3 forming recesses are provided, as clearly shown in the drawing.

In FIG. 2 a knot has been shown as substantially provided by removing the bottom portion of the knot shown in FIG. 1. For the sake of clarity, in FIGS. 2, 3 and 4 the same reference numerals have been used as those of FIG. 1. As shown in the drawing, the knot of FIG. 2 is laterally defined by four flat surfaces 1 and at the top by a further flat surface 1. A total of five holes 2 are formed in said flat surfaces 1, having straight axes and angularly spaced apart from one another by 90°.

Sidewise of each hole 2, straight grooves 3 are formed in the knot, similar to those shown in FIG. 1.

In FIG. 3 a knot is shown as substantially comprising one fourth of the knot shown in FIG. 1, the knot of FIG. 3 having three shaped holes 2 formed at flat surfaces 1, grooves 3 of the aforementioned character being formed sidewise of the holes 2.

Finally, in FIG. 4 another knot is shown, as having four straight shaped holes 2 formed at flat surfaces 1 and lined with straight grooves 3.

As clearly shown in the heretofore described drawings, the knots are of such a structure as to be readily formed by molding a moldable material, such as plastic material or light alloy. To this end, the grooves 3 have axes that are always parallel with one of said holes 2, sidewise of which said grooves are formed.

Obviously, in addition to the described knots, further knots could be provided, but should in any case have between a minimum of two to a maximum of six shaped holes, while laterally of said holes, recesses should always be provided, which however could even be different from the grooves heretofore described with reference to the drawing.

Another basic element for the set of elements according to the present invention comprises an elongated connecting rod, such as that shown in a perspective view in FIG. 5. This rod has a main elongated body 4, preferably square in cross-section, with shaped extensions 5 projecting from each end thereof and centrally having a slot or groove, as clearly shown in FIG. 5. These extensions 5 can be pressure inserted in the knot holes, as below described in connection with FIG. 7.

A third and last basic element for the set according to the invention comprises a lining plate, such as that shown in a perspective view in FIG. 6. This plate includes a wall 6, with ridges 7 projecting from one side thereof and at least at the edges of the wall, which ridges can be pressure introduced and clamped within the knot recesses, and more particularly with reference to FIGS. 1-4, within the knot grooves 3.

Preferably, the knot surface is lowered by a step having a same height as the width of walls 6, at that zone where the knot surface is opposite to the surface of the lining plates in the construction models as made by the described elements, thereby allowing that the knot surfaces and the adjacent surfaces of the walls 6 opposite to those surfaces having the ridges 7 projecting therefrom, lie on a same plane along with the surfaces of the rods 4 adjacent to the associated walls.

By means of the above described elements, the most varied construction models, such as small house models, can be made. In FIG. 7 there is schematically shown an assembling of the elements heretofore mentioned: for the sake of more clarity in description, elements similar to one another have been designated by different reference numerals.
In this FIG. 7, two rods 9 and 10, respectively, are coupled and fixedly pressure retained to a four-hole knot 8, while a further rod 11 has been drawn as slightly spaced apart from said knot.

The upper end of rod 11 is in turn coupled to a knot 12 having three holes at right angles to one another, to which a rod 13 is also coupled and to which a rod 14 is juxtaposed, the end shaped extension of the latter has not yet been introduced into the corresponding hole of knot 12. Opposite the left free end of the rod 9, there is shown a knot 15 (such as that shown in FIG. 3), in one hole of which the extension projecting from the free end of rod 9 can be inserted and clamped. Similarly, a rod 16 and a rod 17 can then be connected to said knot 15, which rod 17 can in turn be connected to a rod 13 by a knot, not shown on the drawing.

Through the knots and connecting rods as shown in FIG. 7, entirely rigid frames can be simply and readily made, which frames may have also very complex conformations, time by time using different types of knots.

After connecting the rods with the knots, lining plates are introduced into the spaces defined by said knots and rods, which lining plates are intended to form the walls, floors or ceilings for the construction being made. Preferably, these lining plates are used by pairs: for example, each pair comprise a plate 18 and a plate 19 having ridges 20 and 21, respectively, facing one another and pressure fitted within the grooves as provided in the knots on the side of the shaped holes of said knots. Thus, as clearly shown in FIG. 7, a construction wall comprises two lining plates kuxtapested to and spaced apart from each other (so that the construction wall is of the "drum" type), and it is important to note that without noticeable clearances said plates insert between the spaces defined by the connecting rods and knots at those zones of the knots where the latter are lowered by a step having the same height as the plates. Thus, construction models can be made, in which the front surfaces of the knots, connecting rods, and lining plates comprise smooth surfaces, that is free of projections, so that construction models can be made as perfectly reproducing the external appearance of any building.

Of course, the described elements could be used for making any construction models, such as buildings or containers, for general model purpose, for teaching purpose, or merely for play provision.

As above stated, the axes for the holes formed in the knots are arranged so as to be perpendicular to or parallel with one another, but it is apparent that such axes could also make any angles to one another other than 90° or multiples of 90°. Preferably, all of the described elements are made by plastic material or light alloy moulding, and are of highly reduced cost of production, while having a high degree in accuracy and finishing.

What I claim is:

1. A combination of pressure interconnectable construction elements comprising:
   - connectors;
   - elongated connecting rods; and
   - cover plates;
   - each said connector having at least two connection means angularly spaced from one another, and a recess formed on at least one side of each of said connection means;
   - each said rod having a connection means at each of its ends removably pressure fitted within said connector connection means; and
   - each of said plates having ridges projecting from at least one surface and adjacent the edges thereof, said ridges removably pressure fitted within the recesses in said connector.

2. The combination as claimed in claim 1, wherein said connectors, rods, and plates are shaped and sized so as to form smooth flush surfaces when assembled.

3. A combination of pressure interconnectable construction elements comprising:
   - connectors;
   - elongated connecting rods; and
   - cover plates;
   - each of said connectors having at least two wall means angularly spaced from one another, wall means defining a hole in said connector, each hole having a straight axis angularly spaced from the axis of any other hole by multiples of 90°, said wall means having a recess forming a straight groove on at least one side of each of said wall means, and a step adjacent said recesses having the same height as the width of said plates;
   - each said rod having a connection means at each of its ends comprising end extensions each of which is adapted to be matingly engaged and pressure fitted in said hole; and
   - each of said plates having ridges projecting from at least one surface and adjacent the edges thereof, said ridges adapted to matingly engage and pressure fit within said recesses in said connector whereby the outer surfaces of said plate and said connector are flush when said ridges are pressure fitted in said recesses.

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