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(54) **System of modular components for toy construction**

(57) A system of modular components is disclosed, allowing to build toy constructions. The system comprises two kinds of modules referred to as active modules and passive modules. The active modules are provided with magnets while the passive modules are of non-

magnetized metallic or semimetallic material so as to be attracted by the magnets. In this way toy constructions of any kind can be built by simple juxtaposition of active modules only or active modules alternated with passive modules.

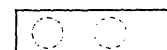
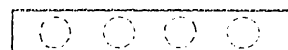
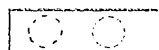
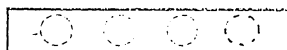
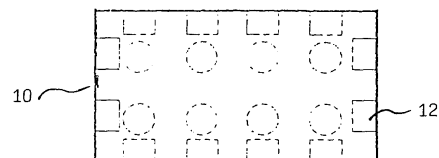
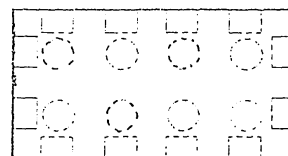


Fig.1



Description

[0001] The present invention relates to a novel system of modular components in the form of symmetrical or unsymmetrical bricks, cylinders, pyramids and so forth, made of any kind of materials. The modular nature of these components allows children to build toy constructions such as houses, bridges, castles and the like as well as stylized figures of persons, animals, objects by the mere juxtaposition of a very limited number of different modules. Therefore the common feature of the modular constructions presently available on the market is overcome, requiring means for connecting, fixing, coupling, joining, inserting the components one another.

[0002] The modular components of the system according to the present invention are of two basic types, which will be hereinafter referred to as active module (A type) and passive module (B type).

[0003] The type A module is provided with one or more magnets of any shape, arranged inside or along its lateral surfaces. These magnets are made with any suitable means, for instance little magnetic pieces of cylindrical or prismatic shape, magnetic flakes, chips, wire, or magnetized gums, paints, lacquers, foils, applied on the surfaces of the module.

[0004] Each module can be provided with one or more magnets. In case of more magnets, each magnet is arranged so as to have either one or both the poles pointing to the outer surface of the module.

[0005] The type B module, also made of any desired shape and material, consists of a simple piece of non magnetized material, that however must be metallic or semimetallic so as to be attracted by the magnets.

[0006] The operation of the system according to the present invention is extremely simple, as no connecting, fixing, coupling, joining, inserting or any other similar operation is required.

[0007] The type A modules when juxtaposed will be mutually attracted and adhesion to one another will occur along the alignment axes of the magnets.

[0008] The modules may be provided with poles facing one or more lateral surfaces and this will give the possibility to connect the modules in various ways and along different planes. The connection can be effected so as to obtain an unlimited sequence of type A modules, or an alternate sequence of type A and B modules.

[0009] The alternate arrangement of the poles allows to align the components and a type A module may be overturned, upturned, reversed so as to choose the poles to be connected to those of another type A module and obtain the arrangement in the desired direction and/or orientation.

[0010] The type B modules have the function of being added to or placed between type A modules so as to decrease the cost of a construction and/or to allow curvature of the construction by making them with particular curved shapes. The type B modules however may also be of the same shape of the type A modules but without

magnetization.

[0011] The type B modules connected on one side to a magnetized type A module, have also the important function of creating an opposite side adapted to be connected either to another module of type B or to a type A module that can be juxtaposed in any desired orientation, because in this case the orientation of its magnetic supports of the adjacent surface is irrelevant.

[0012] The modules have also a decoration function. For instance they may be placed at any point of the facade of a building, when made in the form of roses, windows, balconies, tiles and the like. In the same way the modules could be shaped as parts of the human body, animals or any desired object, thus increasing unlimitedly the possibility of constructions that can be made with said modules.

[0013] The system according to the present invention will be better understood by having reference to the following description of some exemplary and non limiting examples, shown in the figures of the illustrative sheets of drawings, in which:

Fig. 1 shows the views of the six sides of the component, an active type A module 10 with the arrangement of the magnetic poles 12;

Fig. 2 shows an example of Type A module 20 with one row of through magnets 22 crossing the component from one base to the other and magnets 24 arranged on the four lateral faces;

Fig. 3 is a view similar to Fig. 2 of a module having two rows of through magnets 22;

Fig. 4 shows an example of type A module 20' similar to Fig. 2 but with one row of magnets 26 arranged at the two bases;

Fig. 5 is a view similar to Fig. 4 of a module 20' with two rows of magnets 26 arranged at the two bases; Fig. 6 shows a type A module 30 with selforienting magnets 32 arranged close to the lateral surfaces in cavities 34 inside the module, that are free to move being attracted by another magnet of a type A module or by a juxtaposed type B module.

Fig. 7 shows another embodiment of the component, to be used for both type A and type B modules, referred to as magazine module.

[0014] This embodiment comprises an outer envelope or housing 40 preferably made of plastics. Said housing is practically hollow and this inner cavity is the place where a magazine 42 is inserted, said magazine being of various shapes and having a number of seats 44 in which one or more magnets may be inserted according to the requirements. Such a magazine 42 is inserted inside a type A module in a working position only at the required location, so as to need only a very limited number of little magnets. On the contrary if a type B module must be made, instead of magnets single pieces of magnetizable iron will be inserted into said seats 44 or the entire magazine may be made of magnetizable

iron or iron alloy.

[0015] Fig. 8 shows a module 50 with non parallel lateral surfaces 52 arranged with an incident angle Y. With the juxtaposition of two or more type A modules or alternatively a type A and a type B module of this kind, arches, wells and any other construction with curved outline may be obtained; if several modules of this kind are juxtaposed having a different incident angle Y, an arch with variable curve is obtained. This module may be provided with a projection or fin 54 having the purpose of concealing misalignment in the junction with modules of a different shape.

[0016] The following Figures 9 to 17 shows other modular elements having particular shapes for use in specific constructions, and all these elements may be either of the active type A or the passive type B.

[0017] These figures show in detail:

Fig. 9 a module 60 having the shape of typical capital to construct balconies and porches in one or more pieces;

Fig. 10 a module 62 for tower and wall merlons in one or more pieces;

Fig. 11 a module 64 for cylindrical columns in one or more pieces;

Fig. 12 a module 66 for prismatic columns in one or more pieces;

Fig. 13 and 14 modules 68-70 for making spheres and similar round solids;

Fig. 15 a diagonally cut module 72 for making slides, chutes and so forth;

Fig. 16 a module 74 for making roofs; and

Fig. 17 a module 76 for pyramid edges, obtained from a parallelepipedal piece cut along planes passing at the apexes A-B-C of the basis, starting from the diagonal plane or line D.

[0018] Since the type B modules are simple pieces of non-magnetized metallic or semimetallic material without magnets, of any shape and size, their illustrative representation in the drawings is considered unnecessary.

[0019] Finally it is to be pointed out that the foregoing description was given as an exemplary means for a better understanding of the invention, but many modifications, additions, variations and/or substitutions may be resorted to the elements, without however departing from its spirit and object, nor from its scope of protection as defined in the appended claims.

Claims

1. System of modular components for toy construction, comprising modular elements of two types that may be fitted by juxtaposition and are of any desired shape, said two types of modular elements including a first active module provided with magnets and a second passive type of non-magnetized metallic

or semimetallic material adapted to be attracted by the magnets of the active modules.

2. System according to claim 1, characterized in that the active modules are provided with one or more magnets of any shape and/or type arranged inside the module and/or along one or more of its lateral surfaces.

3. System according to claim 2, characterized in that the active modules provided with at least two magnets, have the magnets arranged with one or both poles pointing to the outer surfaces of the module.

4. System according to claim 1, characterized in that the modular components of both types are made with a decorative shape so as to construct toy objects of any desired type and/or shape.

5. System according to claim 2, characterized in that the magnets of the modules of active type are through magnets crossing the module from one side to the opposite one.

6. System according to claim 2, characterized in that the magnets of the modules of active type are so arranged that each magnet corresponds to a determined face of the module.

7. System according to claim 2, characterized in that an active type module is provided with internal magnets close to its lateral surfaces, arranged in internal cavities of the module where they are free to move so as to be selforiented by attraction of either a magnet of another active module or a passive module juxtaposed to said surfaces.

8. System according to Claim 2, characterized in that the modules consist of an outer envelope or housing in which a magazine provided with seats is inserted where one or more magnets to obtain an active module or pieces of magnetizable iron to obtain a passive module may be inserted in said seats.

9. System according to Claim 8, characterized in that the whole magazine is made of magnetizable iron or iron alloy.

10. System according to Claim 2, characterized in that the module has lateral surfaces non parallel to each other, with any desired incidence angle in order to make constructions with curved outline.

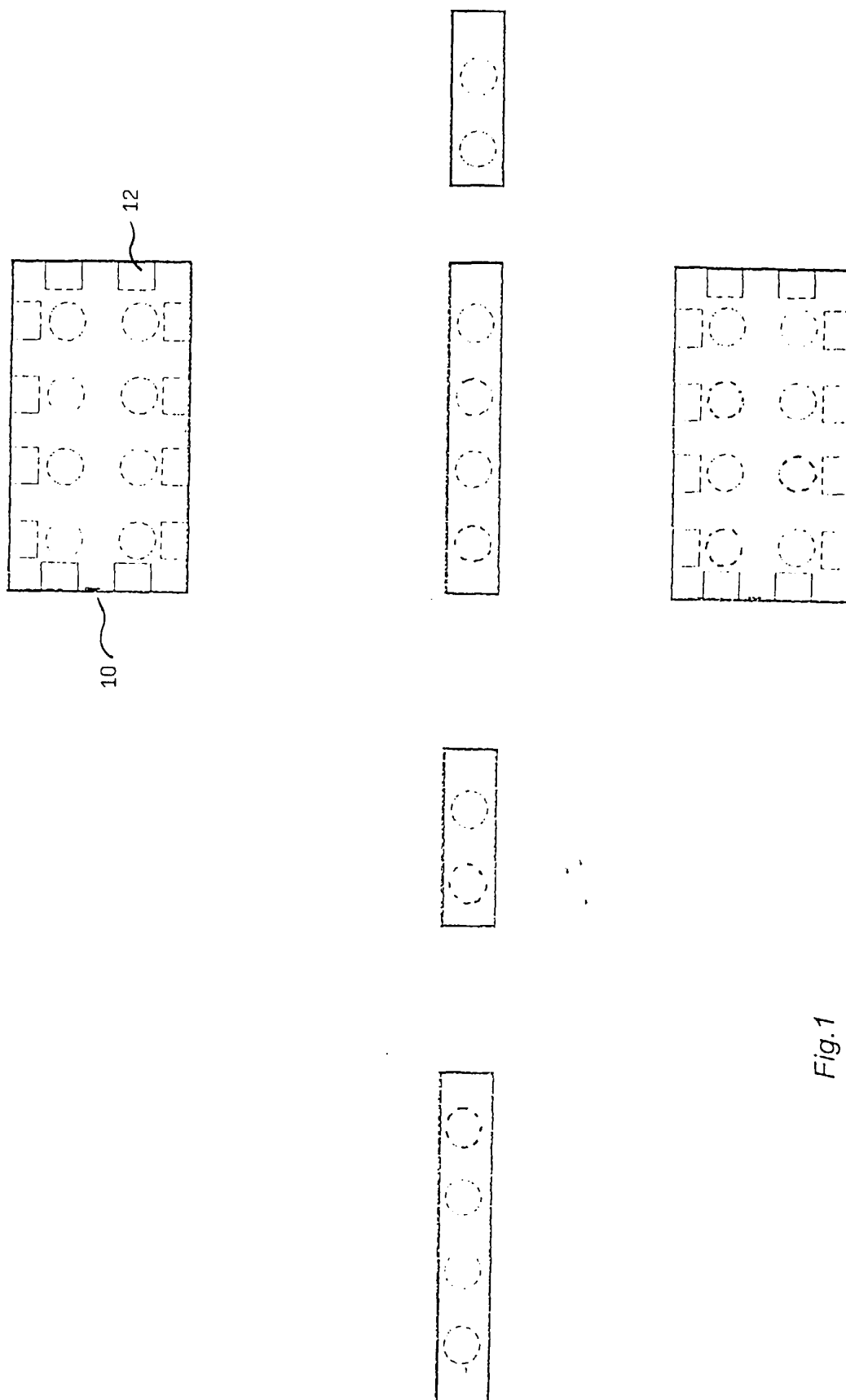


Fig. 1

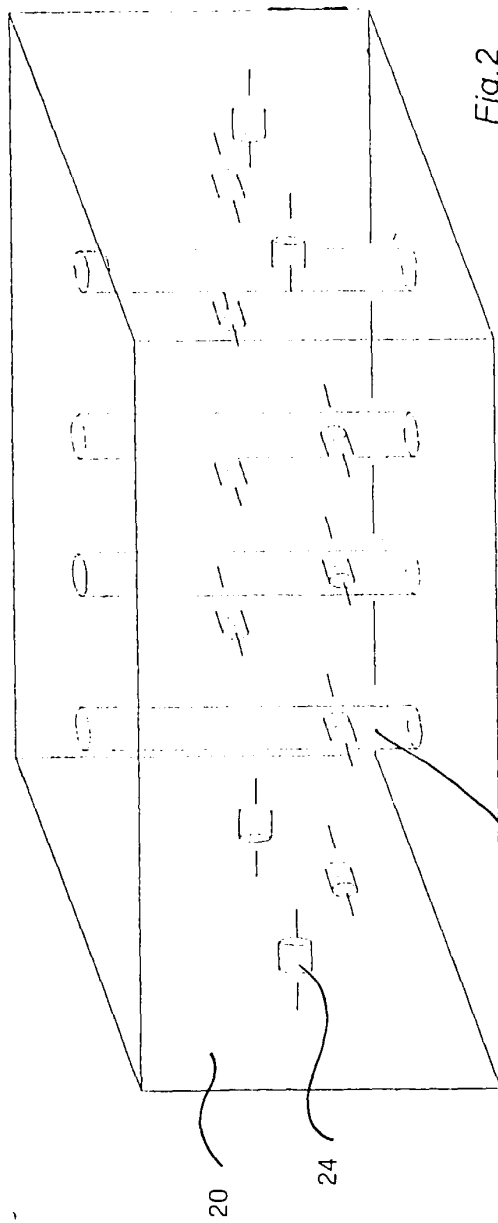


Fig. 2

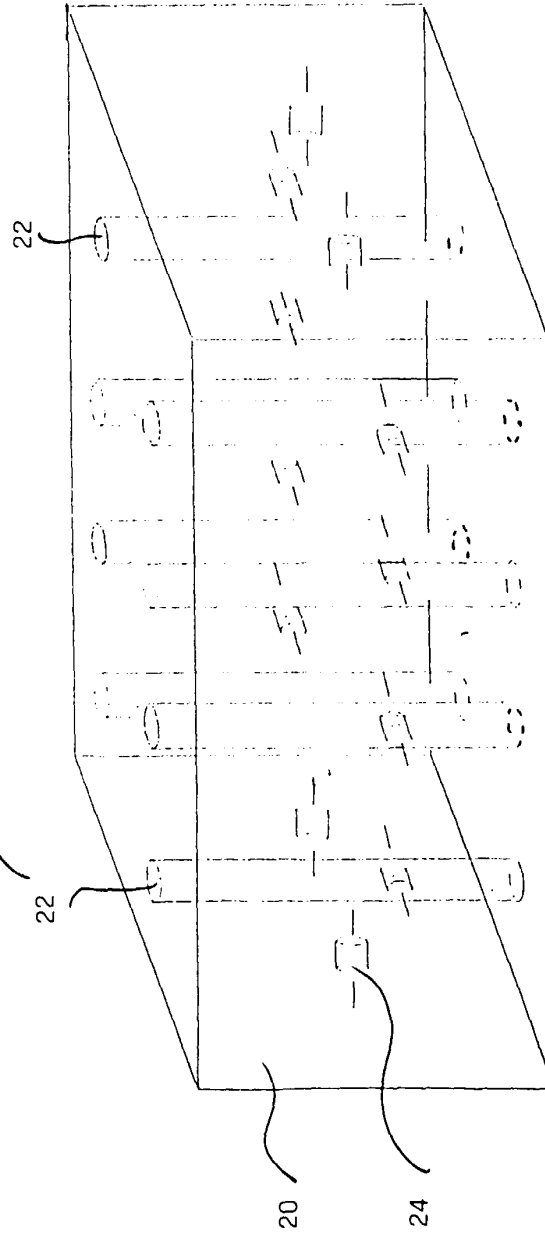


Fig. 3

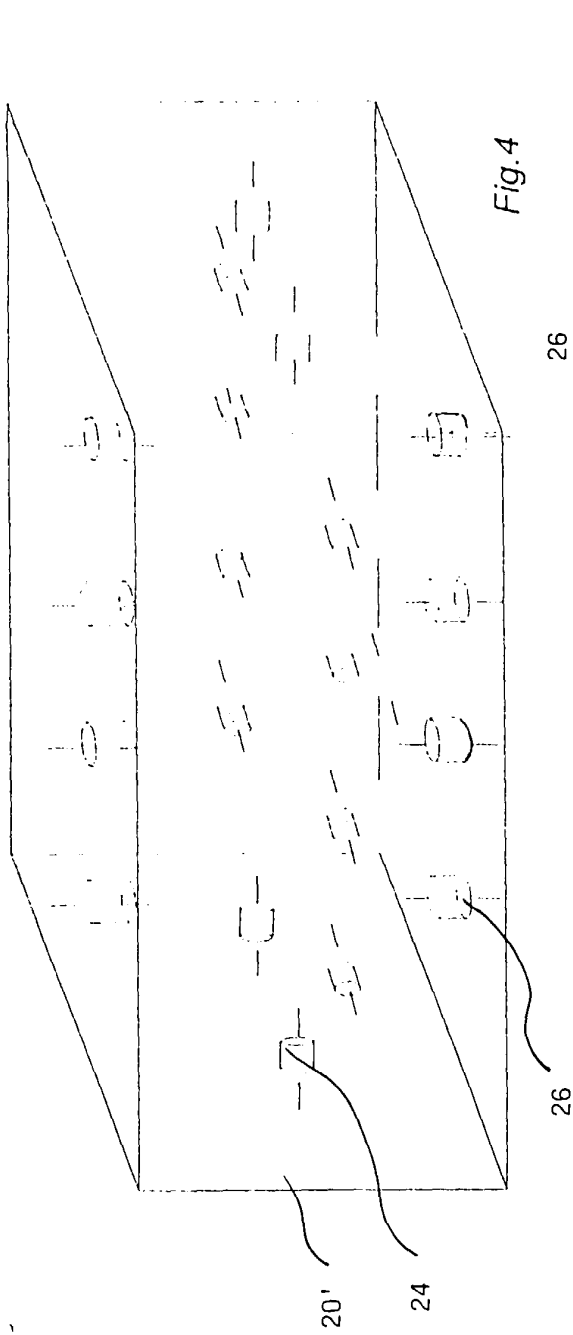


Fig. 4

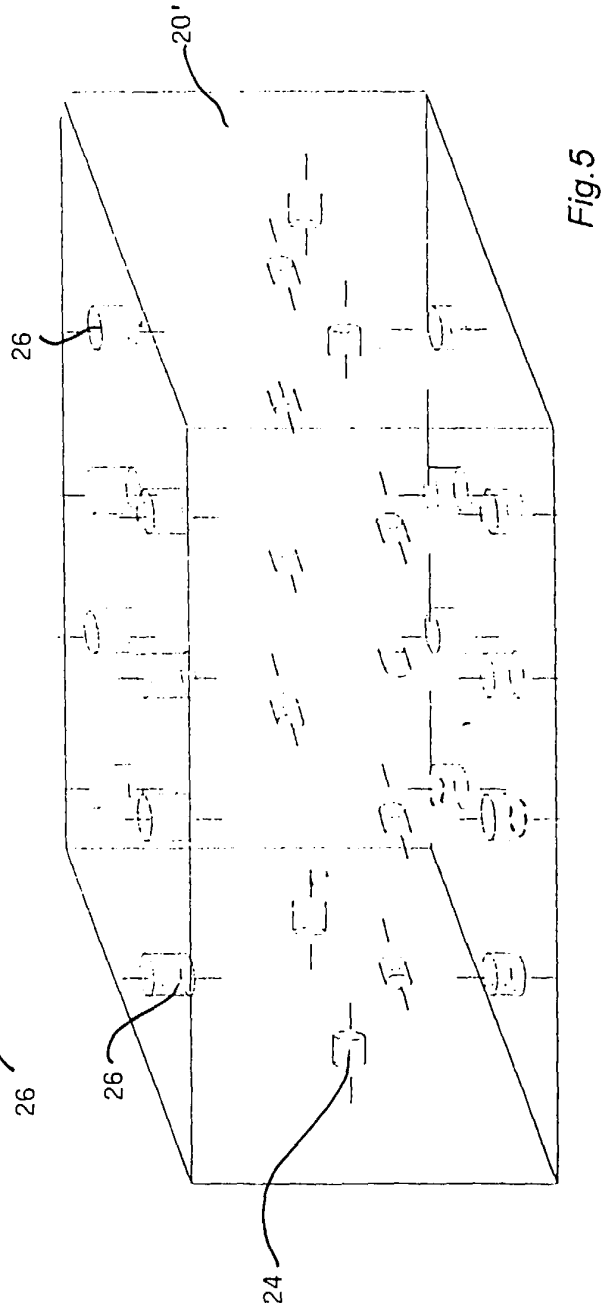


Fig. 5

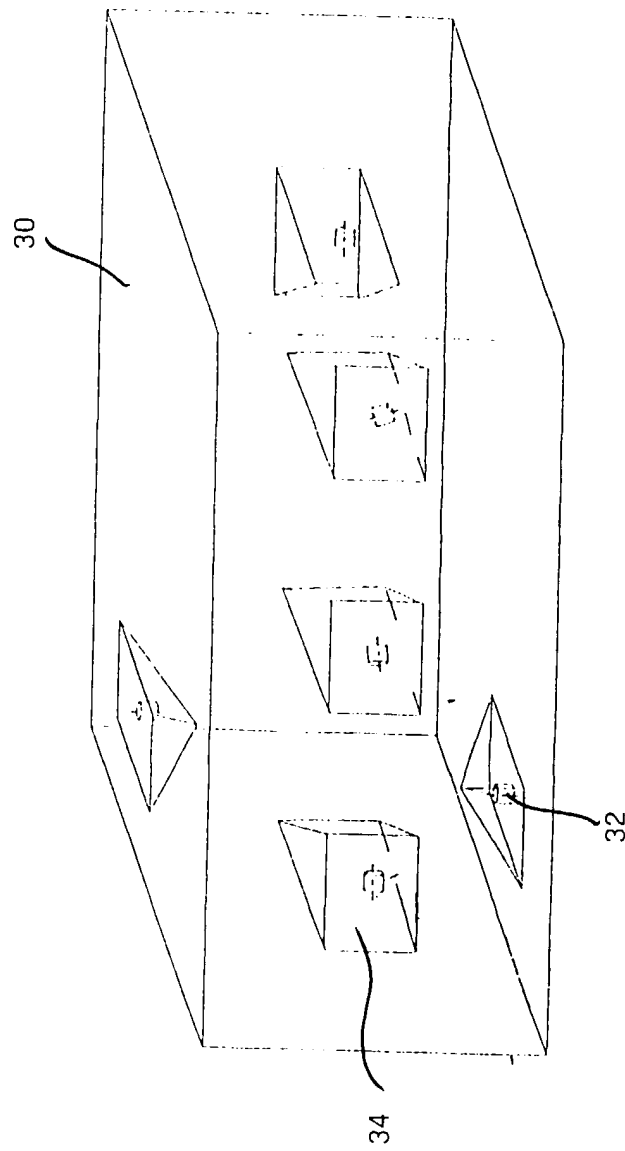


Fig. 6

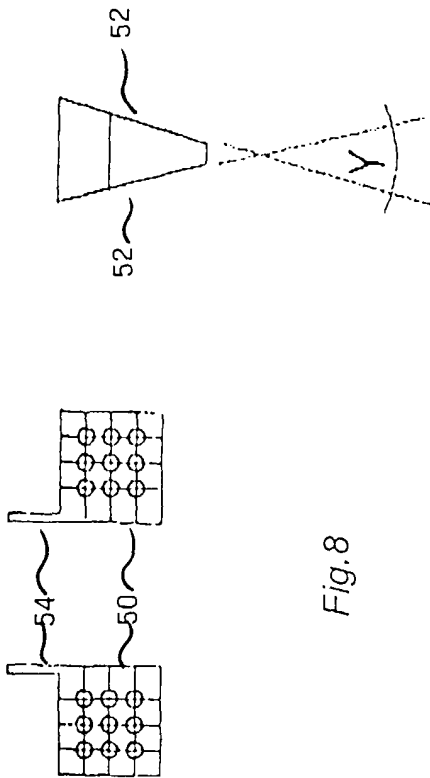


Fig. 8

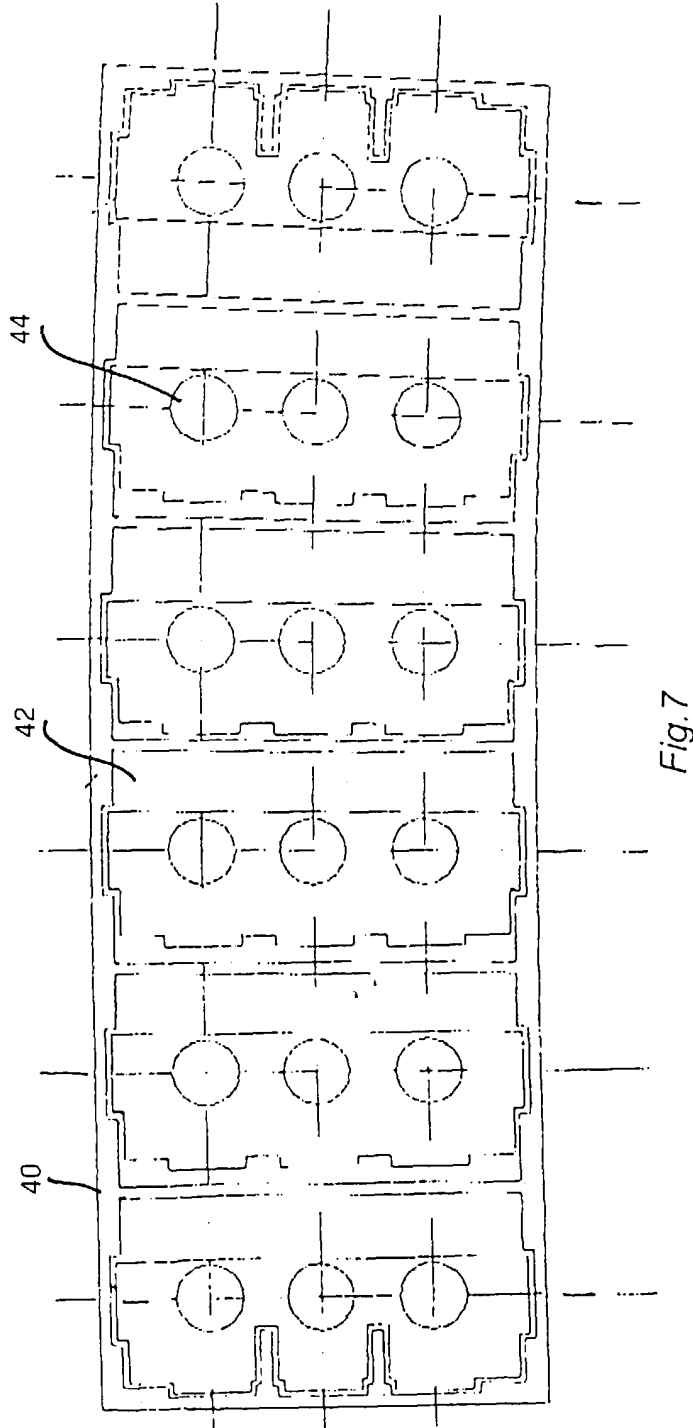


Fig. 7

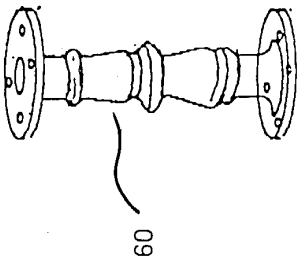


Fig. 9

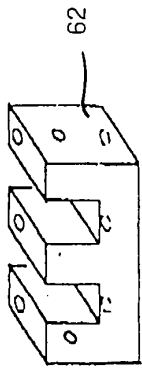


Fig. 10

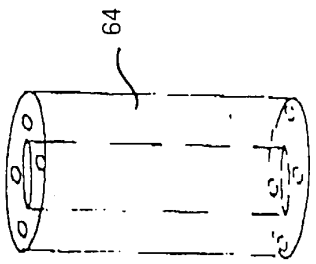


Fig. 11

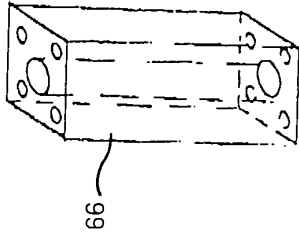


Fig. 12

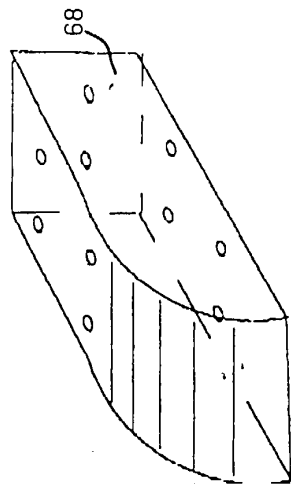


Fig. 13



Fig. 14

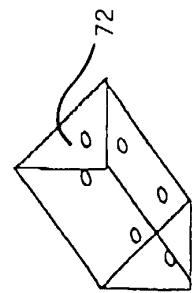


Fig. 15

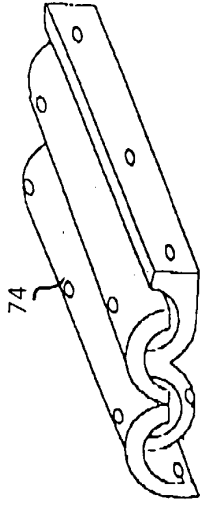


Fig. 16

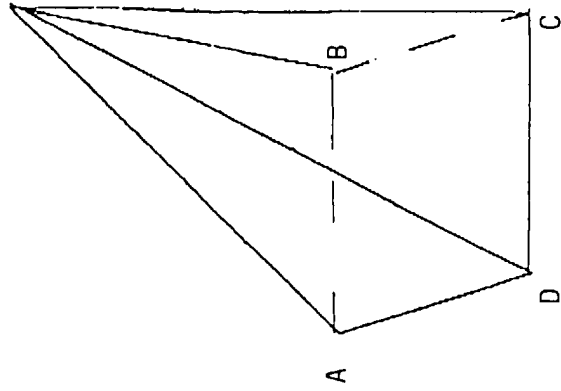
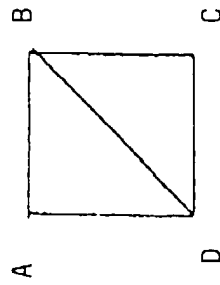
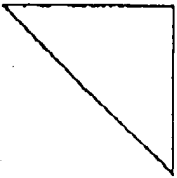
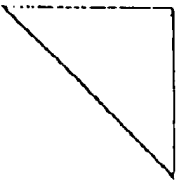
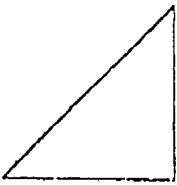


Fig. 17.