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(54) **Structure of a stand for supporting and containing test tubes and the like.**

(57) The structure of a stand for supporting and containing test tubes and the like comprises a containment body (1) with an alveoliform configuration for defining a plurality of accommodation seats (2) for test tubes and the like. To said body there is applicable a lid element (10) defining, at each of said seats (2), an opening for introducing a test tube and provided with elastic blades (20) for removably retaining said test tubes in said seats.

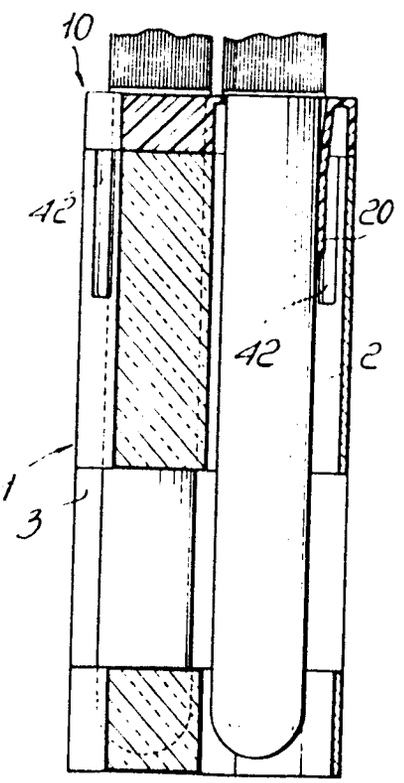

Fig. 4

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STRUCTURE OF A STAND FOR SUPPORTING AND CONTAINING TEST TUBES AND THE LIKE.

The present invention relates to a structure of a stand for supporting and containing test tubes and the like.

As is known, in analysis laboratories and the like, for supporting test tubes for performing the various analyses, stands are currently employed which are substantially composed of a base element, spaced from which a supporting element is provided which defines a plurality of openings for inserting the test tubes.

The test tubes are thus supported in a substantially vertical position, resting on the base and leaning on the edges of the openings.

With this arrangement, however, the test tubes are not retained against slipping out and, as a consequence, their shifting is remarkably difficult, since, as they are not firmly retained, the test tubes might come out of their respective seats with the consequent related disadvantages.

Another disadvantage which can be ascribed to the solutions of the prior art lies in that with the stands of the known kind it is necessary to remove the various test tubes when they are to be inserted in the various analysis machines, since the stands of the prior art cannot be employed directly on the machines.

The aim proposed by the invention is indeed to eliminate the above described disadvantages by providing a structure of a stand for the containment and support of

test tubes and the like which in practice constitues a complementary element of the test tube and can accompany the test tube itself in most situations and operations.

Within the scope of the above described aim, a particular object of the invention is to provide a structure of a stand which is extremely compact and allows the possibility of improving the flow of the fluid and of the liquid around the test tube, when this is necessary for the various tests.

Still another object of the present invention is to provide a structure of a stand which aids visualization for optical examination of the test tubes, in order to assess the coloring achieved and that, furthermore, allows the possibility of supporting the test tubes in any position, be it horizontal or vertical, so as to adapt to all situations which occur in the cases wherein there is the need to rotate or vibrate the test tubes for reaction or chemical analysis requirements.

A further object of the present invention is to provide a stand which is capable of allowing an adequate protection of the test tubes against shocks and falls, without thereby hindering the good visibility of the same test tube.

Not least object of the present invention is to provide a stand which is easily composeable with identical stands, so as to vary the total useful capacity, and that, furthermore, has the possibility of being carried and directly coupled to automatic machines without having to remove the test tubes individually.

Still another object of the present invention is to

provide a stand which allows the possibility of clearly numbering the test tubes and which allows the possibility of visually identifying, by means of a different coloring, the various stands, according to, e.g., the type of analysis to be performed.

The above described aim, as well as the objects mentioned and others which will better appear hereinafter, are achieved by a structure of a stand for supporting and containing test tubes and the like, according to the invention, characterized in that it comprises a containment body with an alveoliform configuration for defining a plurality of accommodation seats for test tubes and the like, to said body there being applicable a lid element defining, at each of said seats, an opening for introducing a test tube, and provided with engagement means for removably retaining said test tubes in said seats.

Further characteristics and advantages will become apparent from the detailed description of a structure of a stand for supporting and containing test tubes and the like, illustrated by way of example only in the accompanying drawings, where:

Fig.1 is a schematic perspective view of the containment body;

Fig.2 is a top plan view of the containment body;

Fig.3 is a partially exploded cross section view along the line III-III of Fig. 2;

Fig.4 is a cross section view along the line III-III of Fig. 2 with the lid element coupled with the containment body;

Fig. 5 is a top plan view of the lid element;

Fig.6 is a partial cross section elevation view of the lid element.

With reference to the above described figures, the structure of a stand for supporting and containing test tubes and the like, according to the invention, comprises a containment body 1, which has an alveoliform configuration, defining a plurality of seats 2, arranged side by side, and defining a honeycomb configuration. Preferably, but not necessarily, two rows with hexagonal cross section are provided, so that the seats of each row are offset with respect to the seats of the adjacent row.

Preferably, but not necessarily, the containment body is provided in optically transparent material and advantageously is obtained in high-resistance plastic material, such as polycarbonate and the like.

The containment body 1 has a height dimension which is sufficient to contain all the standard test tubes, and the pitch of the hexagon, i.e. the measure of the seat, is determined by the typical measures of the test tube to be supported.

Furthermore, the containment body 1, preferably, at the lower portion thereof, has a recess or window, designated with the reference numeral 3, which allows the possibility of better visualizing the test tubes themselves and of aiding the "reading" thereof both visually and with automatic machines.

The window extends on a middle portion of the longitudinal extension of the seats so as not to mechanically weaken the containment body itself and to

offer downwardly a portion of a seat which allows accommodation of the lower portion of the test tubes.

At its lateral ends, the containment body defines, respectively, male coupling elements 5 and coupling elements 6, which allow the possibility of achieving the coupling of a plurality of containment bodies, obtaining a perfect matching and a remarkable compactness in the overall dimensions.

To said containment body 1 is engageable a lid element 10 which has a configuration which substantially matches the horizontal cross section of the containment body, so as to be superimposable on the body itself and is provided with a plurality of openings 12 which allow the insertion of the test tubes.

The openings 12 are provided at the seats and have a diameter such as to allow the passage of the body of the test tubes, but not of the widened lip of the same test tubes.

The coupling of the lid element 10 to the containment body 1 is achieved by virtue of elastic hooking tabs 13 which extend at the longitudinal ends of the same lid and which are removably engageable with matching small teeth 14 defined on the lateral sides of the containment body.

At the various openings 12 engagement means are furthermore provided for removably retaining said test tubes in the seats, said retention means are obtained by virtue of elastic blades 20 which extend from the internal face of the lid element 10 and are insertable into the respective seats.

The elastic blades 20 have a slightly sloping

extension with respect to the line perpendicular to the resting plane of the lid element and are structured so as to elastically engage with the outer surface of the test tube, so as to push the test tube itself against the wall of the seats, so that the test tube is retained between the walls of the seats and the tab, which prevents the accidental slipping out thereof and keeps them firmly in position.

On the outer face of the lid element 10, at the various openings matching the accommodation seats of the test tubes, numbered regions are furthermore provided, designated with the reference numeral 40 in the drawing, which allow the easy identification of the test tubes themselves.

Due to the symmetry of the structure, in order to prevent the lid from being mountable in inverted position, thus biasing the matching numbering of the seats, from the lower face of the lid a reference pin protrudes, designated with the reference numeral 41, asymmetrically arranged on the lid, which inserts in asymmetrical recesses 42 provided at the upper edge of the seats.

The recesses 41 furthermore have the function, in cooperation with the window 3, of aiding the free circulation of the liquid in the seats, when this is required by the particular type of application.

To what has been said it should be furthermore added that the lid element which is preferably provided in high-resilience plastic material can be provided in different colors, so as to allow differentiation of the various stands, e.g. according to the type of analysis to be

performed.

On the lateral sides of the containment body 1 guiding recesses are furthermore provided, indicated by the reference numeral 50, as well as an engagement protrusion 51, which aid the coupling with the supporting and retention elements of the stand which are provided on the matching automatic devices employed for analysis, so as to easily and safely apply the entire stand to the machine without having to proceed with complicated operations.

From what has been described above, it can be therefore seen that the invention achieves the aims proposed, and in particular the fact is stressed that the presence of the elastic blades allows an easy introduction of the test tubes and an easy extraction of the same test tubes, when this is required, but allows a stable coupling which prevents the falling thereof even when overturning the stand, thus allowing an easy transportability of the test tubes introduced in the stand itself.

The stand thus structured can constitute a box for transporting the test tubes, both empty and full, or possibly a component directly applicable to the automatic machine which must perform the analyses or in any case the operations to which the various test tubes are to be subjected.

Another important feature of the invention is that the presence of the windows and the offset arrangement of the test tubes on two separate lines gives the operator the possibility of having immediate visual perception of the coloring of the various test tubes on both rows of

arrangement of the same test tubes; furthermore, the possibility of applying the lid separately allows to differentiate the coloring of the lids according to the different processes to be performed.

In practice, the materials employed, though the best results have been achieved by employing the above mentioned materials, as well as the dimensions and the contingent shapes may be any according to the requirements.

CLAIMS

1. Structure of a stand for supporting and containing test tubes and the like, characterized in that it comprises a containment body with an alveoliform configuration for defining a plurality of accommodation seats for test tubes and the like, to said body there being applicable a lid element defining, at each of said seats, an opening for introducing a test tube and provided with engagement means for removably retaining said test tubes in said seats.

2. Structure of a stand, according to the preceding claim, characterized in that said containment body with an alveoliform configuration has a plurality of honeycomb containment seats reciprocally adjacent to each other.

3. Structure of a stand, according to the preceding claims, characterized in that it comprises a window in a middle portion of the longitudinal extension of said seats.

4. Structure of a stand, according to one or more of the preceding claims, characterized in that said containment body is provided at its ends with male coupling elements and with female coupling elements for the mutual engagement of said containment bodies.

5. Structure of a stand, according to one or more of the preceding claims, characterized in that said lid element has a configuration matching the plan configuration of said containment body.

6. Structure of a stand, according to one or more of the preceding claims, characterized in that it comprises reciprocal coupling means between said lid element and

said containment body, composed of elastic hooking tabs provided at the longitudinal ends of said lid element and engageable with coupling teeth defined on the lateral sides of said containment body.

7. Structure of a stand, according to one or more of the preceding claims, characterized in that it comprises, proximate to the upper end of said seats of said containment body, recesses arranged asymmetrically with respect to said seats.

8. Structure of a stand, according to one or more of the preceding claims, characterized in that it comprises on said lid element a reference pin extending asymmetrically from the lower face of said lid and engageable in one of said recesses for the mutual orientation between said containment body and said lid element.

9. Structure of a stand, according to one or more of the preceding claims, characterized in that said engagement means for removably retaining said test tubes in said seats are composed of elastic blades extending from the lower face of said lid element at each of said openings, said elastic blades engaging by contact with the outer surface of the test tubes inserted in said seats for engaging them against the internal walls of said seats.

10. Structure of a stand according to one or more of the preceding claims, characterized in that it comprises identification markers for each of said seats, provided at said openings of said lid element.

11. Structure of a stand, according to one or more of the preceding claims, characterized in that said lid

element can be provided in various colors.

12. Structure of a stand, according to one or more of the preceding claims, characterized in that said containment body is provided in optically transparent material.

13. Structure of a stand, according to one or more of the preceding claims, characterized in that it comprises on the lateral sides of said containment body guiding slots and engagement protrusions for coupling with the retention elements of said stand provided on the analysis machines.

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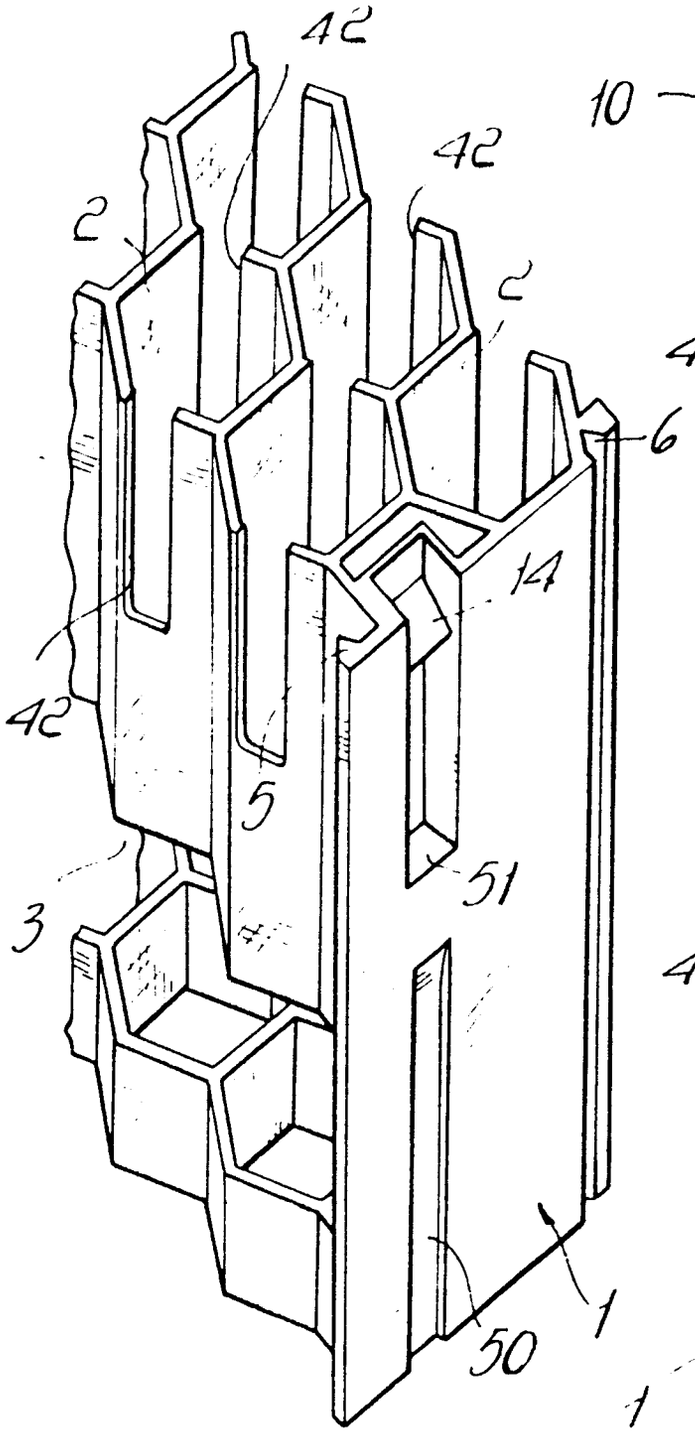


Fig. 1

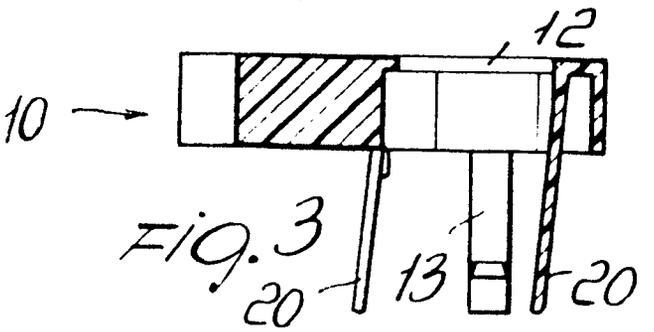
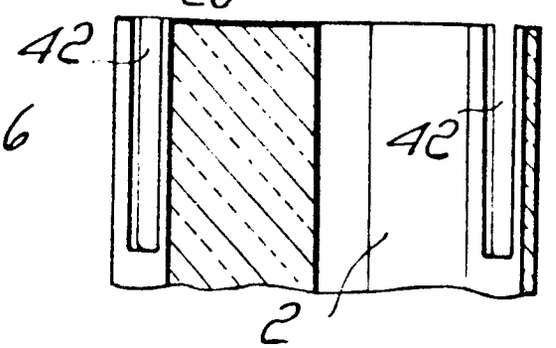


Fig. 3



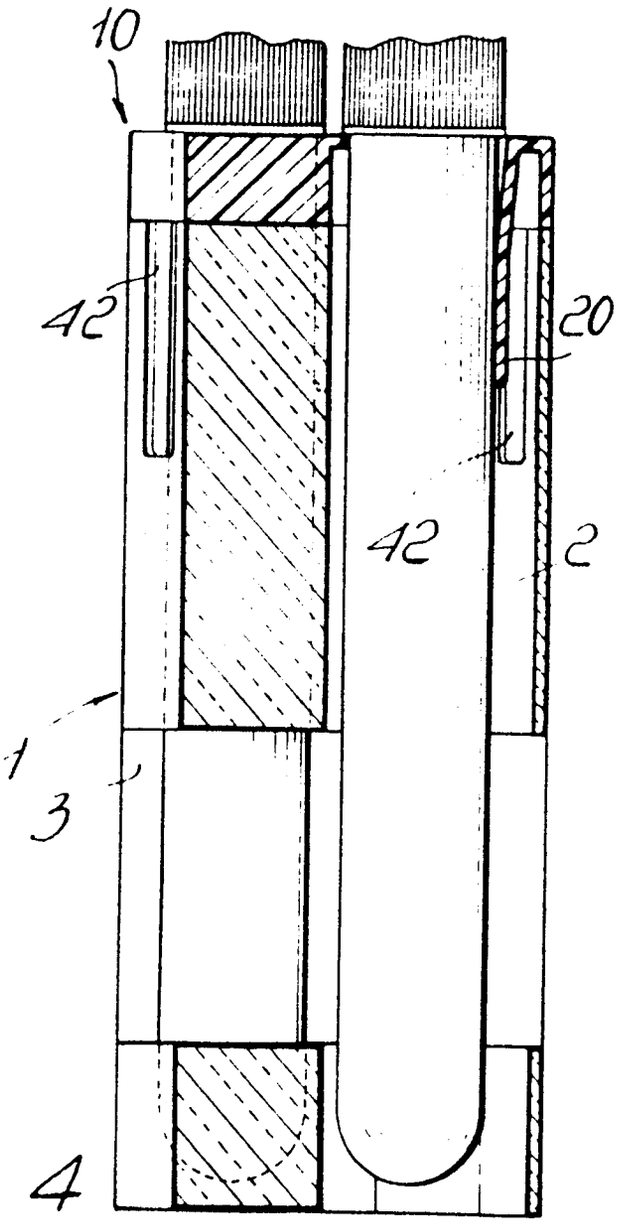


Fig. 4

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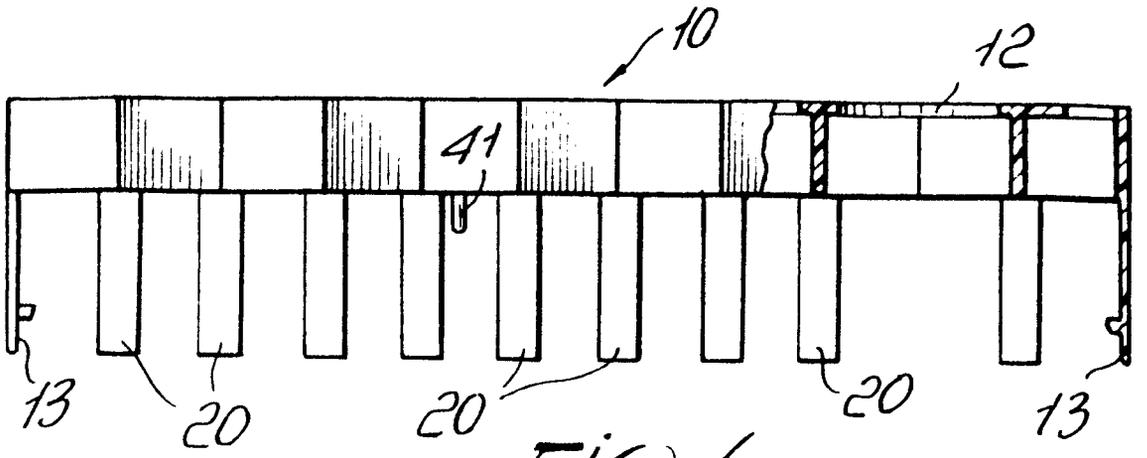

Fig. 6

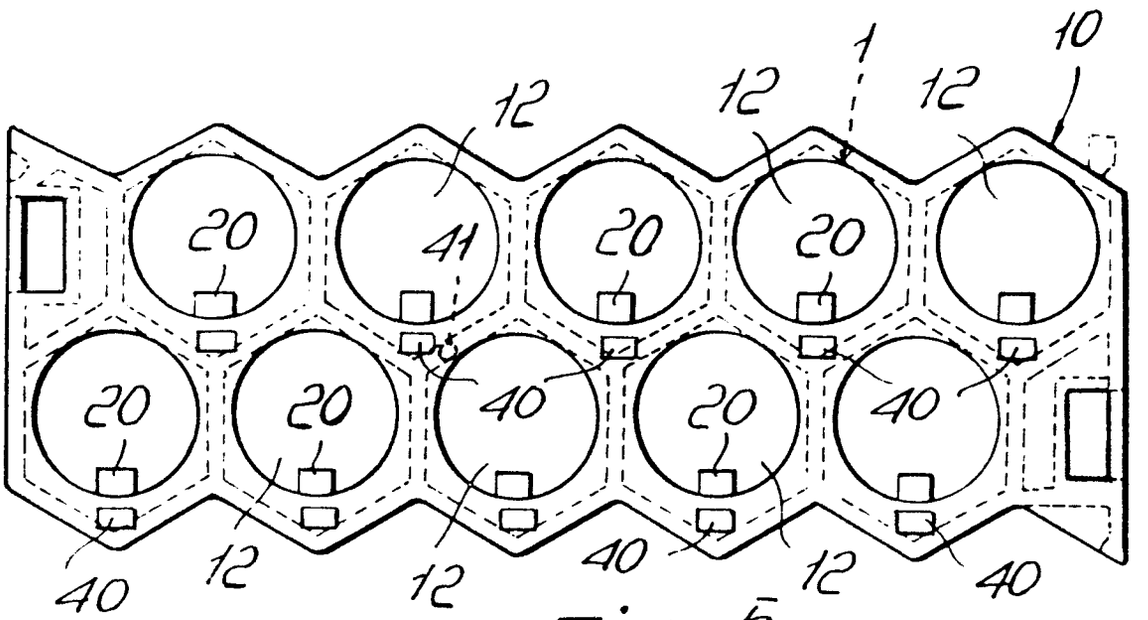

Fig. 5

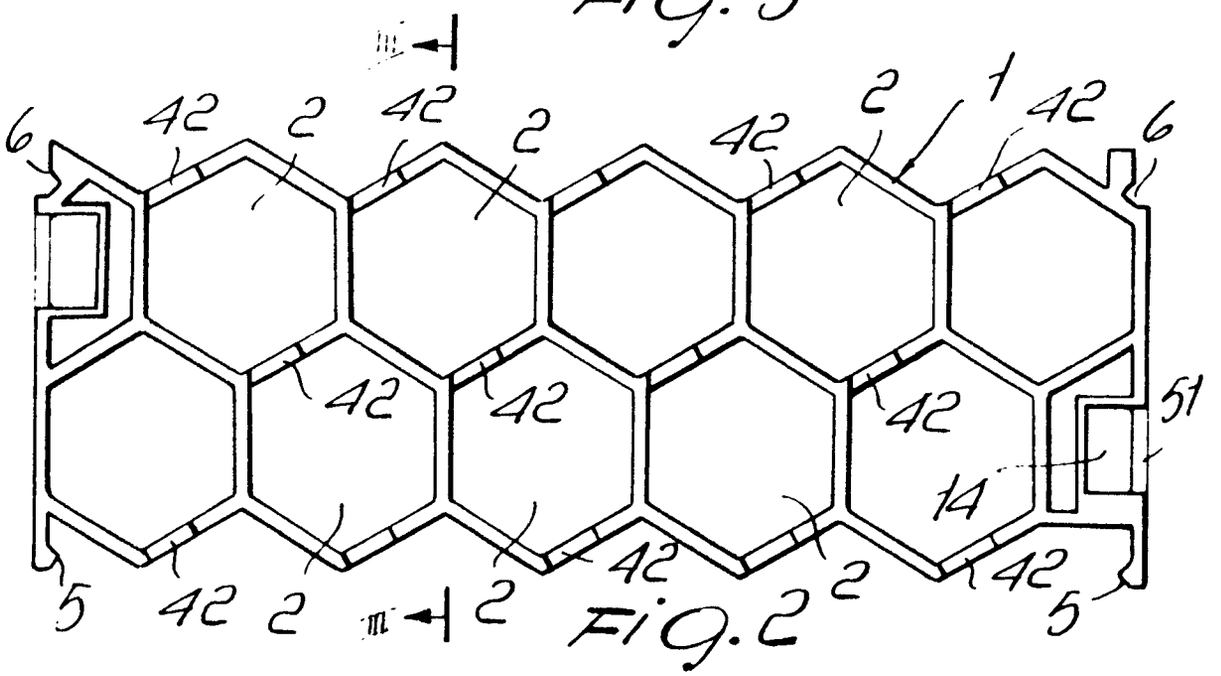

Fig. 2