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(54) **Extensible plastic pillar formwork**

Ausbreitbare Kunststoff-Säulenschalung

noffrage extensible en matière plastique pour colonnes

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## Description

**[0001]** With this invention we intend to give the market a better, practical and cheaper formwork for the traditional pillar formworks used in iron and wood.

**[0002]** Formworks for pillars are known e.g. from DE29609259, using two segments of a plastic tube, which was sliced and divided lengthways along the tube axis before. The formwork is mounted by positioning both tube segments against each other thus forming the outer shell of the formwork in which an inner auxiliary formwork element can be inserted. Both tube segments are connected to each other by way of angled elements and bolts or the like. These angled elements have to be previously attached to both tube halves e.g. by gluing. As an alternative solution, a flat iron band is attached to one of the tube halves overlapping the gap between both tube segments. In addition, iron ribbons are secured around the formworks forcing the segments together.

In FR1322174 a conventional outer formwork is additionally provided with a thin layer serving as inner auxiliary formwork element in order to achieve a specific surface finish.

US5098059 describes a foam piece surrounded by a plastic layer. This plastic layer allows the foam piece to be easily removed from hardened concrete to be reused. However, in all cases no further details relating to the positioning, assembling and fixing of outer formworks for pillars of different shape are given.

Detailed description of the invention according to the claims:

**[0003]** Due to its texture in plastic the formwork according to the invention becomes light and the positioning is very easy and practical indeed.

More than that, this invention is very versatile because it permits the easy extension of the formwork because of the elements (5) from

where we can get rectangular or square sections when joined together to having always the same measure. That means that there is allways a standard element and the elements can be used in rectangular or square pillars. The elements are connected by male and female coupling means which are formed integrally by the ends of the standard elements and consist of male (4) and female (3) coupling means being removably connectable to each other. For the round sections the formwork must be made one for each diameter because the parts are fixed and can not be extended.

**[0004]** Until now, many traditional pillar formworks (in steel or wood) are in direct contact with the concrete and should be previously oiled and well cleaned later on when the job was finished. They are very heavy, they are difficult to position and transport and the price is very expensive. In this invention, the formworks, because they are very light and because the concrete is not adherent to plastic they are of very easy building and dismounting and anybody can do it even if it is not a technic worker. Due to the said before they don't need to be oiled or cleaned.

**[0005]** The formwork according to the invention is composed by two formworks (one exterior (5-4-3)- the real formwork and one interior (8) -a thin piece of plastic -which we are going to call a wrapper).

**[0006]** This interior wrapper is very important because it has the specific functions of isolating the exterior formwork from the contact with concrete and of giving the surface pillar the final polish appearance. This final surface permits direct painting.

This wrapper (8) is, of course, very cheap and is used only once. To prevent the dynamic forces of compression in the lateral walls the exterior formwork is provided with "ribs" (11) which give the formwork a better resistance and allow the fixing of vertical irons (7) which are directed to small mortar (10) previously embedded in the floor concrete. This also allows the formwork do not move while the concrete is dropped in.

The already above mentioned forces of compression, mostly in the large pillars, will be annulled by 3 or 4 metallic belts (12) disposed along the formwork and against the vertical irons (7) which provide the necessary resistance.

**[0007]** In the Fig 1 we can see a pillar formwork with ribs (11) and vertical iron (7) and the small mortar (10). Longitudinally we can see a metallic belt (12).

**[0008]** The Fig 2 represents a circular pillar formwork. To change the measures we need other elements (5) in different measures. This formwork is also formed by an interior wrapper (8).

The Fig 3 represents a pillar formwork for a square section. If we want to transform it for a rectangular section we only need to add elements (5) in two parallel walls.

**[0009]** In the Fig 4 we can see a small mortar (10) for the pillar bracing where the irons (7) come in and in the Fig 4-A we can see the small mortar (10) embedded in the floor concrete.

The Fig. 5 represents a perspective of a finished pillar with the wrapper (8).

**[0010]** Fig 6 intends to be a simple formwork for special cases when we need to make simultaneously the beam and the pillar. It's made by angled elements (13) which are closed by some vertical irons passing into rings to allow the horizontal dismount.

INDEX

**[0011]**

1-SQUARE SECTION

2-RECTANGULAR SECTION

3-FEMALE COUPLING MEANS

4-MALE COUPLING MEANS

5-STANDARD ELEMENTS

6-RINGS

7-VERTICAL IRONS

8-WRAPPER (INTERIOR FORMWORK)

9-ROUND SECTION

10-SMALL MORTAR

11-VERTICAL "RIBS"

12-METALLIC GIRDLE

13- ANGLED ELEMENTS

**Claims**

1. Formwork for the casting of concrete pillars being an alternative to iron or wood formworks, consisting of several structural standard elements (5) which, assembled together, form an extendable volume of square or rectangular or circular section to be invaded by concrete, the standard elements (5) being connected to each other by coupling means (3, 4) positioned adjacent to the lateral right and left endings of each element, the elements being reinforceable by iron rods (7) keeping the formwork in perpendicular position, a separate plastic film wrapper (8), being inserted into the assembled formwork, covering the joint sections between individual elements, protecting the interior surfaces of the structural elements (5) from the contact with concrete and giving the cured concrete a polished appearance, said formwork being **characterised in that** said coupling means are formed integrally by the ends of the standard elements and consist of male (4) and female (3) coupling means being removably connectable to each other.

2. Formwork according to claim 1, said standard elements (5) being made of plastic material.

3. Formwork according to every preceding claim, the wrapper being made of cheap replaceable plastic film material for one way use in each casting operation.

4. Formwork according to every preceding claim, said iron rods (7) being secured in a mortar base ( 10) previously embedded in the concrete floor.

5. Formwork according to every preceding claim, said standard elements (5) being supported against the compression forces by 3 or 4 metallic belts (12) disposed along the height of the formwork.

6. Formwork according to claim 2 and 3, said coupling means being connectable to each other, the degree of the rotation given by the hinge design.

**Patentansprüche**

1. Schalung zum Giessen von Betonsäulen, die eine Alternative zu Schalungen aus Eisen oder Holz darstellt, bestehend aus mehreren formgebenden Standardelementen (5) welche zusammengebaut ein erweiterbares Volumen quadratischen, rechtekkigen oder kreisförmigen Querschnitts formen, das von Beton eingenommen werden kann, wobei die Standardelemente (5) über Verbindungsmittel (3,4), die an den jeweils linken und rechten seitlichen Endbereichen besagter Elemente positioniert sind, miteinander verbunden werden, besagte Elemente durch Eisenstäbe (7), die die Schalung in senkrechter Stellung halten, verstärkbar sind, eine separate Plastikplane (8), die in die zusammengebaute Schalung eingelegt wird, die Fügestellen zwischen den einzelnen Elementen bedeckt, die Innenflächen der formgebenden Elemente (5) vor dem Kontakt mit Beton schützt und dem ausgehärteten Beton ein poliertes Aussehen gibt, wobei die besagte Schalung **dadurch gekennzeichnet ist, dass** die besagten Verbindungsmittel integral von den Endbereichen der Standardelemente gebildet werden und aus männlichen (4) und weiblichen (3) Verbindungsmitteln bestehen, die lösbar miteinander verbindbar sind.

2. Schalung entsprechend Anspruch 1, wobei besagte Standardelemente (5) aus Kunststoff hergestellt sind.

3. Schalung entsprechend jedem vorangehenden Anspruch, wobei die Plastikplane aus kostengünstig ersetzbarer Kunststoffolie zur einmaligen Benutzung pro Gussvorgang besteht.

4. Schalung entsprechend jedem vorangehenden Anspruch, wobei besagte Eisenstäbe (7) in einer zuvor im Betonboden eingebetteten Mörtel-Basis gesichert sind.

5. Schalung entsprechend jedem vorangehenden Anspruch, wobei besagte Standardelemente (5) gegen Druckkräfte durch 3 oder 4 metallische Gürtel (12) gestützt werden, die entlang der Höhe der Schalung angebracht sind.

6. Schalung entsprechend Anspruch 2 und 3, wobei

besagte Verbindungsmittel miteinander verbindbar sind und das Ausmass der Verdrehung durch die Ausbildung des Scharniers bestimmt wird.

**Revendications**

1. Un coffrage destiné à la fabrication des piliers en béton étant une alternative à des piliers en fer ou bois, comprenant plusieurs éléments structuraux standard (5), qui, en état assemblé forment un volume extensible de section carrée, rectangulaire ou circulaire pour être envahi de béton, les éléments standard (5) étant liés entre eux par des moyens de couplage (3,4) positionnés auprès des extrémités latérales de droite et de gauche de chaque élément, les éléments pouvant être renforcés à l'aide des férules en fer afin de maintenir le coffrage en position perpendiculaire, une couche en plastique (8) supplémentaire étant insérée dans le coffrage assemblé, couvrant les sections de liaison entre les éléments individuels, protégeant les surfaces internes des éléments structuraux (5) du contacte avec le béton et donnant un aspect poli au béton endurci, ledit coffrage étant **caractérisé en ce que** les dites moyens de couplage sont formés intégralement par les dites extrémités des éléments standard et sont composés de moyens de couplage masculins (4) et féminins (3) que peuvent être accouplés et séparés.

2. Un coffrage selon la revendication 1, ledit élément standard (5) étant composé de matériau plastique.

3. Un coffrage selon chaque revendication précédente, la dite couche étant fabriquée en matériau de film en plastique couramment remplaçable afin de l'utilisation unique par opération de rempli de béton.

4. Un coffrage selon chaque revendication précédente, les dites férules (7) étant supportées par une base en mortier (19) préalablement intégrée dans le sol de béton.

5. Un coffrage selon chaque revendication précédente, les dites éléments standard (5) étant supportés contre les forces de compression par 3 ou 4 ceintures métalliques (12) disposés le long de la hauteur du coffrage.

6. Un coffrage selon les revendication 2 et 3, les dites moyens de couplage (3,4) pouvant être connectés entre eux et le montant de rotation relative étant déterminé par le design de l'articulation.

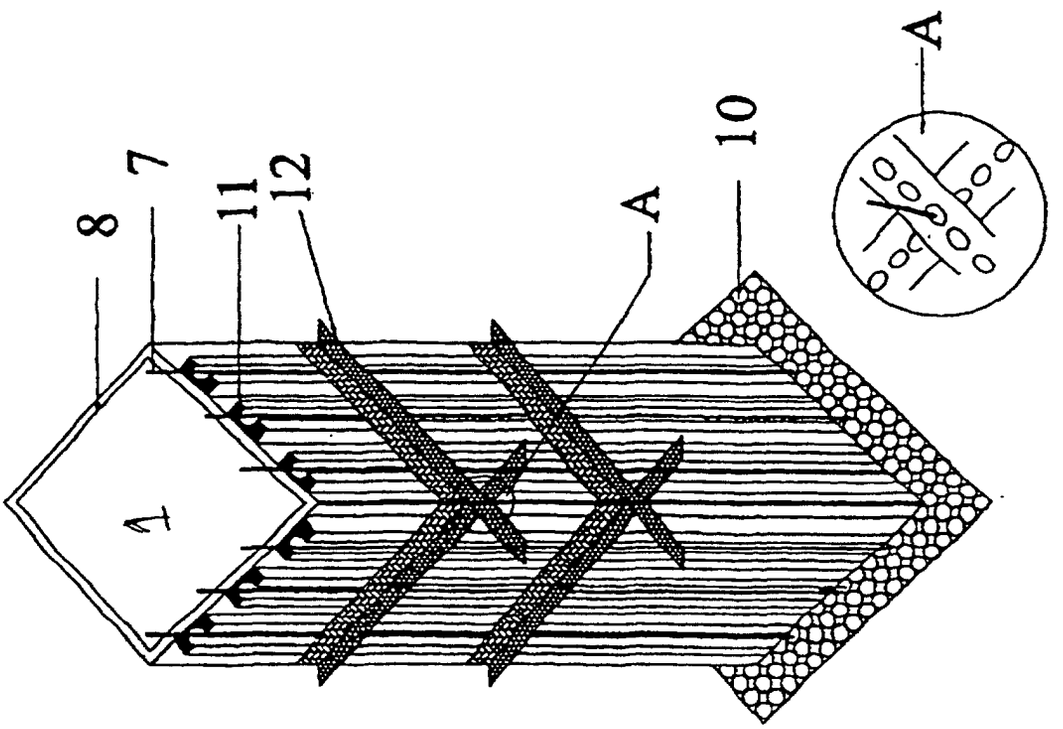



Fig 1

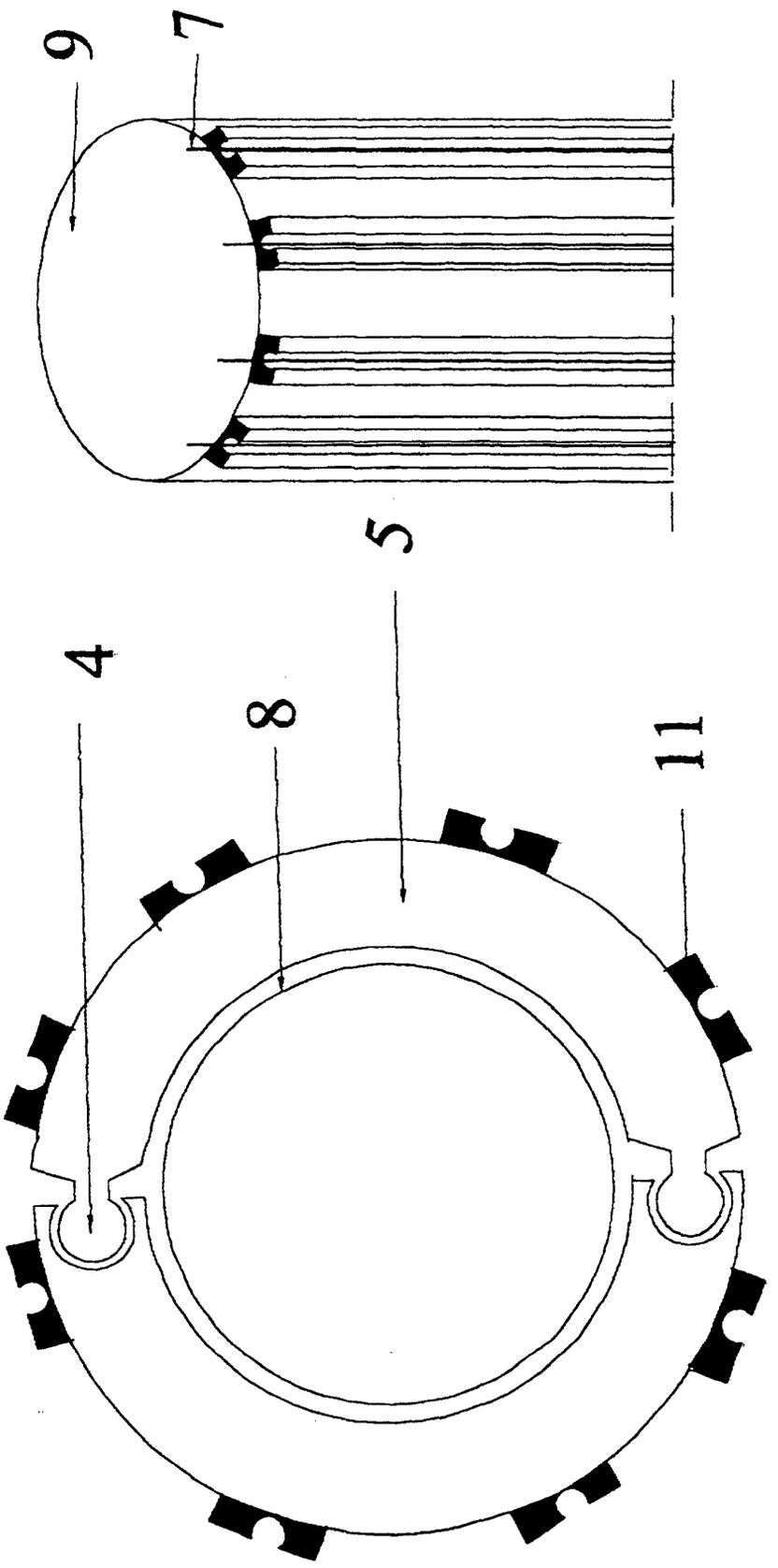



Fig 2

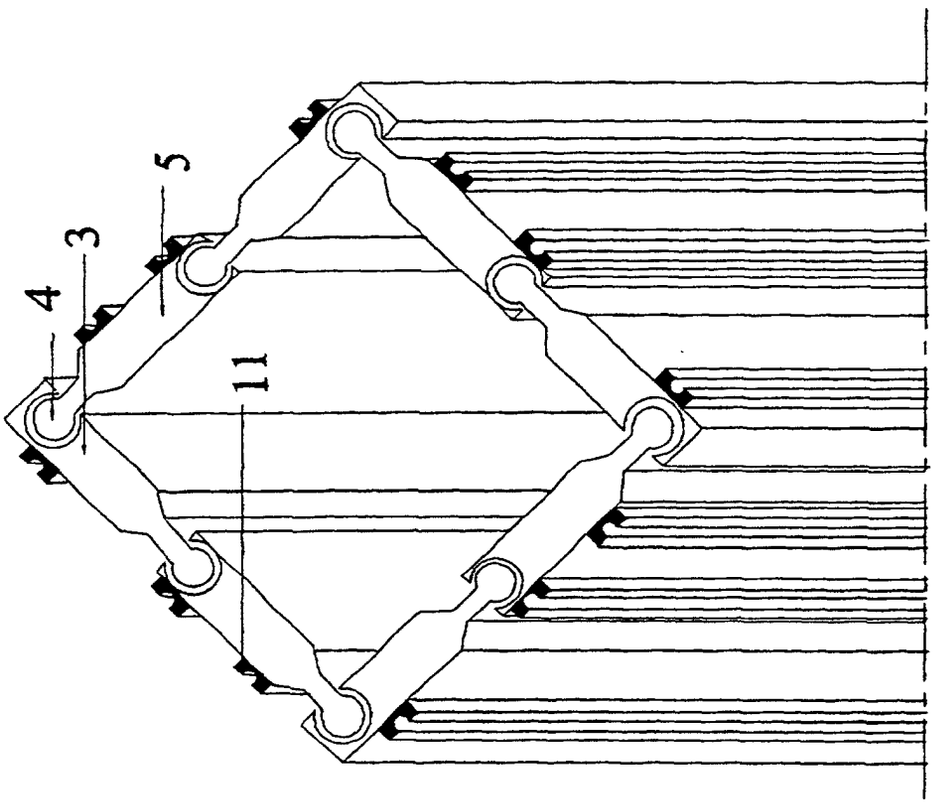



Fig 3

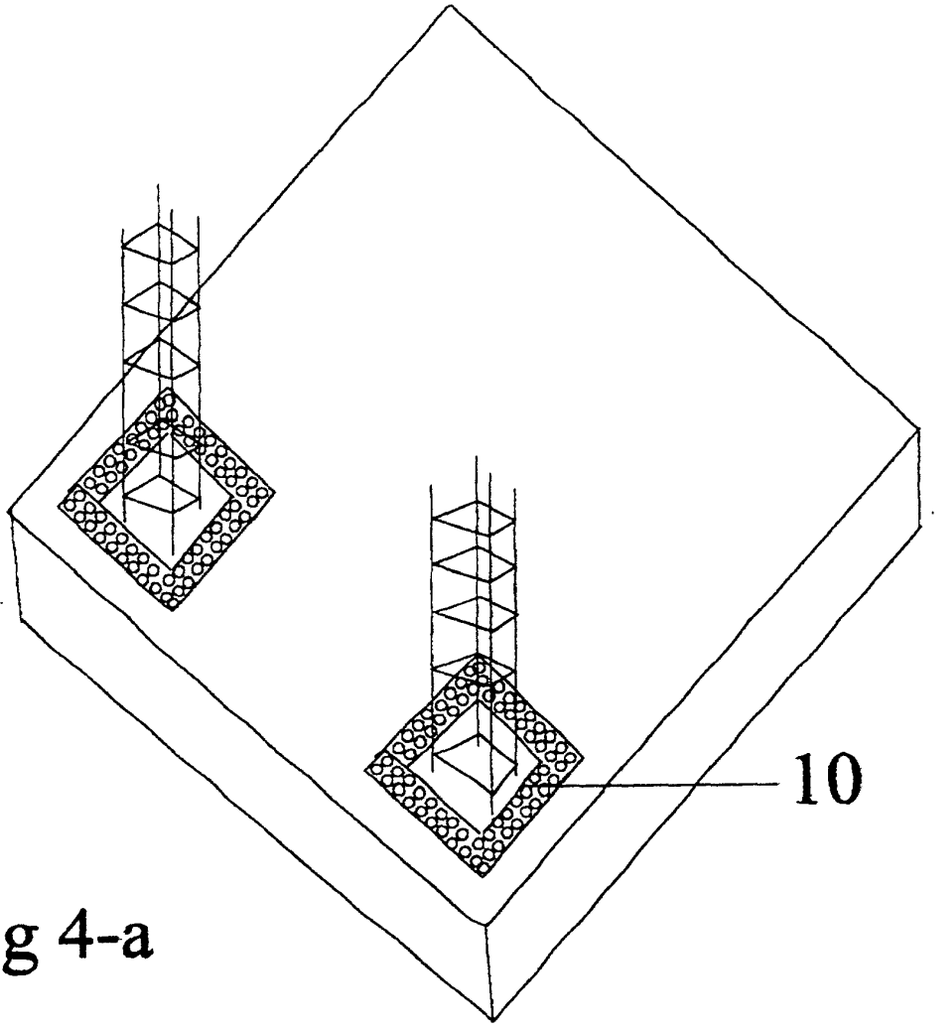
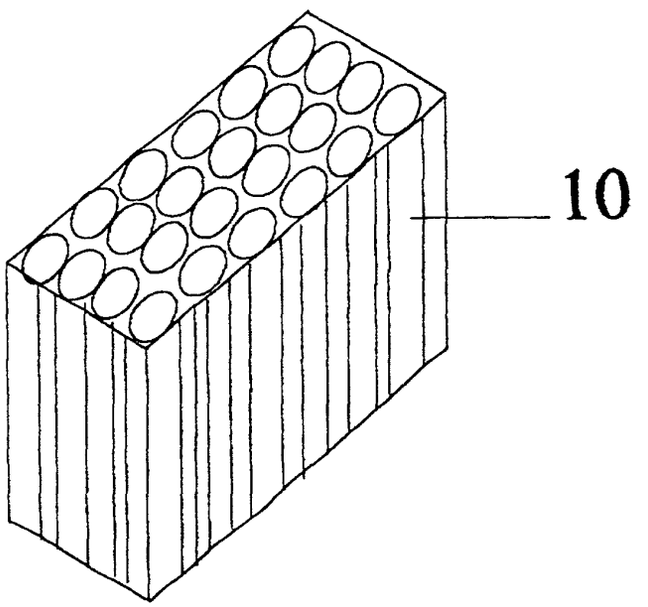



Fig 4-a

Fig 4



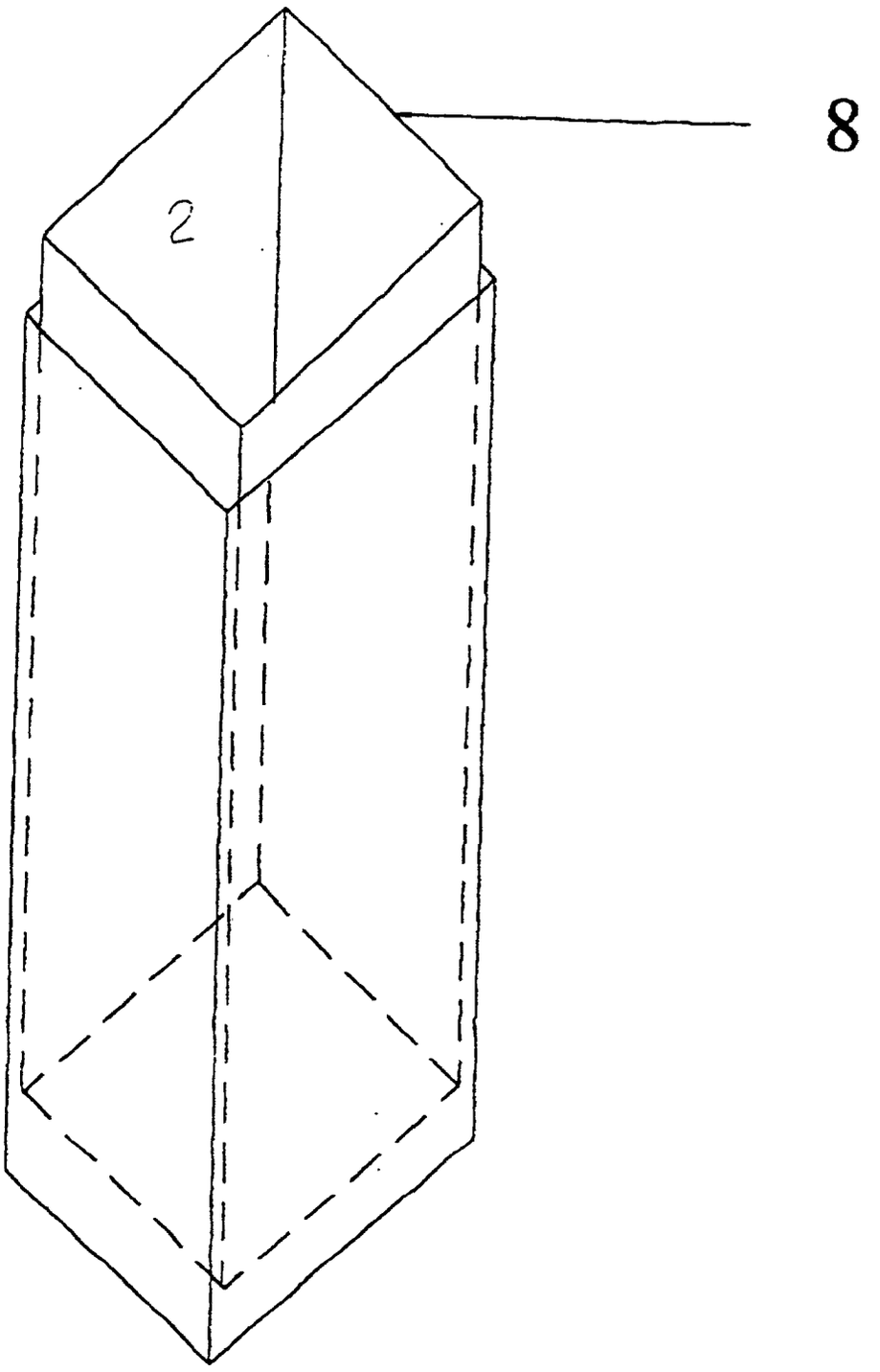



Fig 5

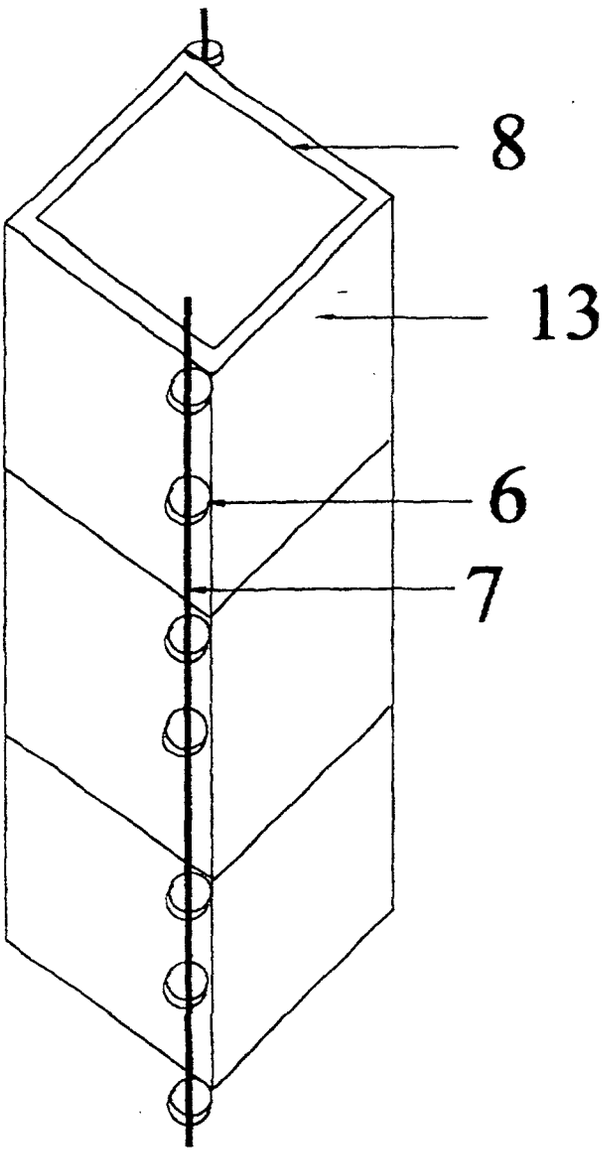



Fig 6