(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 248 525**
A2

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **87303705.5**

(22) Date of filing: **27.04.87**

(51) Int. Cl.³: **B 44 F 1/02**
B 44 F 1/08, B 44 F 1/10
B 44 F 3/00, B 44 F 7/00
B 44 C 3/12

(30) Priority: **26.04.86 GB 8610281**
10.05.86 GB 8611479

(43) Date of publication of application:
09.12.87 Bulletin 87/50

(84) Designated Contracting States:
CH DE FR GB IT LI SE

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(54) **Faceted decorative unit.**

(57) A decorative unit is a fabrication of transparent material incorporating surfaces or objects coated with two way mirror material, particularly dichroic material, to enable an observer viewing the unit from outside to perceive an image generated by multiple reflections including those from surfaces coated with the dichroic material.

The unit can contain objects or images for viewing by the observer for architectural, commercial, promotional or domestic applications.

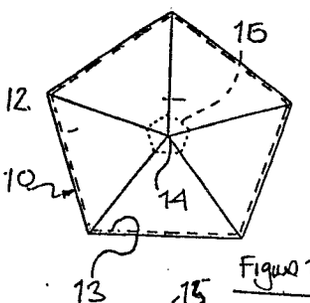

Figure 1A

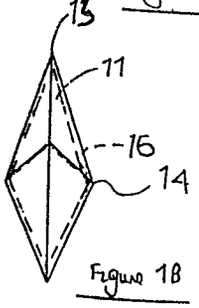

Figure 1B

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TITLE MODIFIED
see front page

DECORATIVE UNIT

This invention relates to a decorative unit. It is particularly, though not exclusively, concerned with a decorative unit and is intended for use for promoting a visually distinctive effect in an architectural, commercial, promotional or domestic context.

Such a unit is used, for example, in bars and restaurants to display for promotional purposes three dimensional representations of bottles or related subjects in an illuminated array.

According to the present invention there is provided a decorative unit comprising a faceted fabrication substantially of transparent material, at least two facets being transparent and either at least one facet or an object disposed within the member having a surface coated with a dichroic material, at least one remaining facet being adopted to reflect light within the fabrication; the disposition of the facets being such that when the interior of the fabrication, or an object or image within it is sufficiently illuminated relative to ambient illumination about the fabrication an observer looking into the

fabrication by way of a facet sees a plurality of images due to multiple reflection between the facet and other facets reflecting light within the fabrication.

According to a first preferred version of the present invention the faceted fabrication is a monolithic block of transparent material whether or not including a plenum space therein.

According to a second preferred version of the present invention the faceted fabrication is made up of at least a pair of juxtaposed transparent members defining therebetween a plenum volume.

According to third preferred version of the present invention the faceted fabrication has the majority of the facets transparent and most or all of the transparent facets are coated with dichroic material.

According to a fourth preferred version of the present invention the faceted fabrication has a plurality of facets, each facet being in the form of a regular triangle, quadrilateral or polygon.

According to a fifth preferred version of the present invention the faceted fabrication house an object or means providing an image such as a video display unit.

According to a sixth preferred form of the present invention the member is of glass or plastics material.

In a seventh preferred form of the present invention the fabrication has some or all of its facets covered by a transparent sheet material.

The term 'facet' is used here to cover both a plane surface or a curved one in either case having a boundary serving to link the facet to a neighbouring facet or to some other part of the fabrication of which the facet is a part.

A tranparent or tranlucent facet having a layer of certain materials deposited on it (typically a layer with a thickness measured in angstroms deposited by evaporation in vacuum chamber) can be caused to act as a two way mirror depending on the relative degree of illumination on either side of the layer. With an observer on one side of the layer on the facet and an image or object on the other side of the layer light from the image or object can either pass to the observer or be subject to reflection back towards the

image or object or elsewhere typically in the case of a fabrication according to an aspect of the present invention to undergo further reflection. With the illumination on the observers side of the coated facet substantially less than that on the opposite, object or image, side the facet is virtually transparent with the layer freely allowing the passage of incident light to the observer. With the relative levels of illumination reversed, that is to say with the greater illumination on the observers side the observer will see a reflected rather than a transmitted image.

The nature of the transmitted light to an observer, and to some extent the reflected image, depends upon the thickness of the deposited layer. During the manufacturing process the appropriate thickness is built up by repeated deposition of a thin layer.

A layer of dichroic material imparts a characteristic coloured appearence to transmitted light. The colour tends to vary with differing angles of view since such changes serve to vary the thickness of the layer through which the incident light to the observer passes. The thickness of the layer governs the main colour imparted by the dichroic material to the incident light. With the thinnest layer a

bluish colour is obtained. With increasing thickness a colour variation from blue to red can be achieved. If necessary a given facet can have areas of different thickness so providing for the appearence od different colours from different parts of the facet.

A layer of titanium or aluminium metal for example differs from a dichroic material layer in that transmitted images are not multicoloured but provide an uncoloured transmitted image regardless of the observer's viewing angle.

Exemplary embodiments of th invention will now be described with reference to the accompanying drawings of decortive units of which:

Figure 1A is a plan view and Figure 1B an end view of a pentagonal unit;

Figure 2A is a plan view and Figure 2B an end view of a hexagonal unit;

Figure 3 is an assembly of hexagonal units of the type described in connection with Figure 2A, 2B;

Figure 4A is a plan view and Figure 4B an end view of an octagonal unit; and

Figure 5A is a plan view and Figure 5B an end view of a unit simulating a brilliant cut diamond.

Figures 1A and 1B show a decorative unit 10 made up of juxtaposed members 11, 12 which define between them a plenum volume 13. Member 11 (member 12 being of identical form) is made up of a plurality of edge linked triangular facets, typically facet 14, each of sheet glass. The facets are joined along their edges by a silicone rubber adhesive. The members 11, 12 are joined in the same way along equator 15 of the unit 10.

All the facets of the unit 10 have deposited upon their inward side, that is to say the side facing into the plenum volume 13, a layer of dichroic material. In this case the material is a mixture of magnesium fluoride and zinc sulphide. Other dichroic materials are available and can be used. To enable the unit 10 to be mounted on a support th apex of member 11 can be cut down to the level 16 shown in broken outline. No source of light is provided within the unit 10. Light from outside the unit passes into the interior and is then reflected from the inner surfaces of the facets. Given the appropriate relative illuminaton an observer of the unit will receive an image whose colour will vary with the direction of view. The level of illumination will giverne the intensity of the image seen.

The unit shown in Figures 2A, 2B are broadly similar in function to that described in connection with Figure 1A and 1B.

Figures 2A and 2B show a unit 20 made up of members 21, 22 which each ahve a hexagonal boundary joined at equator 23 and defining plenum volume 24. The members 21, 22 are of identical form and made up of triangular facets (typically facet 25) each with an inner coating of dichroic material.

Figure 3 shows an array 30 made up of units 31 identical with those descibed in connection with Figures 2A, 2B. The hexagonal boundary of each unit (as typifies by equator 32) being a regular polygon enables the units 31 to be close packed leaving no spaces between them. Arrows on each unit indicate the direction of its apex. A typical size for the unit 31 would be an overall width from one flat face on the equator to the opposite side of ten centimetres.

While Figure 3 is concerned with an array mounted on a flat base structure display units can be based in the form of a three dimensional structure so that different parts of the same array face in different directions.

Figure 4A and 4B show a solid unit 40 with upper part 41 and lower part 42 bounded by equator 43. The facets (typically facet 45) are each coated with dichroic material.

Figure 5A and 5B show a unit 50 which reproduces the appearance of a brilliant cut diamond. Decorative units according to the present invention particularly lend themselves to reproducing the characteristic cuts of precious stones. The unit 50 is made up of members 51, 52 which are not of identical form though each has an axis of symmetry (respectively axes 51A, 52A) which are themselves co-axial.

Member 51 is of pyramidal shape having an apex 53 defined by diamond shaped facets (exemplified by facet 54) spaced around their lower end along equator 55 by triangular shaped facets (such as facet 56). member 52 is made up of facets of several shapes. Typically square facet 57, triangulat facet 58 and diamond shape 59. In every case the facets of both members 51, 52 are coated internally with dichroic material.

The angle between facets, typically bewteen the facets disposed on either side of the equator shown in Figure 1B,

2B, 4B and 5B can be selected to achieve a particular viewed image.

In the described embodiments all facets are transparent and all are coated with dichroic material (on the inner side in the case of sheet material and on their outer side in the case of solid material). There are a variety of of ways of using the effect arising form the dichroic material.

Only some of the facets need be coated with the dichroic material the remainder being either uncoated, coated with a layer of metal such as titanium or aluminium referred to above or by material which is outwardly opaque but capable of internal reflection into the unit (typiaclly a conventional one way mirror material).

If necessary dichroic and other materials can be introduced into a decorative unit according to the invention by disposing a sheet or other object coated with the material into the unit such as into the plenum volume of a hollow unit. Light passing through the sheet or object will be subject to colouring and the coloured light will thereafter be reflected internally and eventually pass out of a transparent facet to be viewed, as before, by an observer from outside the unit.

By using a separate location for the dichroic material the facets acn be coated with a material providing a two way mirror effect without intorducing an additional colouration. Alternatively the two different dichroic materials can be used, or two different thicknesses of the same material, disposed in different parts of the same material, disposed in different parts of the unit so that light reaching the eye of an obserever can have passed through one or both dichroic materials so enabling the possible visual effects to be varied yet further.

With the hollow units the plenum volume can be used to contain an object or image of an object which will then be illuminated by rhe internally reflected light. The object can be a single item (such as a promotional or advertising display) or a plurality of items including particulate or flake material. The or each item can be opaque, transparent or translucent. A plenum can contain liquid. Either solely or in combination with any of the aforesaid a plenum can be adopted to take a light sorce or an image projected by way of a screen (typically of a video display unit or a projection screen). In any given version the appearence of images or objects involved will be subject to the effects of reflection and transmission arising within the unit.

The multiplicity of possible arrangements enable a very wide range of decorative effects to be provided in units capable of use either individually or in combination for architectural, commercial, promotional or domestic contexts. A typical promotional application would be for advertising the products of a brewer in a bar or restaurant.

CLAIMS

1 A decorative unit comprising a faceted fabrication substantially of transparent material, at least two facets being transparent, characterised in that at least one facet or an object disposed within the fabrication has a surface coated with a dichroic material, at least one remaining facet being adopted to reflect light within the fabrication; the disposition of the facets being such that when the interior of the fabrication, or an object or image within it is sufficiently illuminated relative to ambient illumination about the fabrication an observer looking into the fabrication by way of a facet sees a plurality of images due to multiple reflection between the facet and other facets reflecting light within the fabrication.

2 A faceted fabrication as claimed in Claim 1 characterised in that it is an monolithic block of transparent material whether or not including a plenum space therein.

3 A faceted fabrication as claimed in Claim 1 characterised in that it is made up of at least a pair of juxtaposed transparent members defining therebetween a plenum volume.

4 A faceted fabrication as claimed in any preceding claim characterised in that the majority of the facets are transparent and most or all of the transparent facets are coated with dichroic material.

5 A faceted fabrication as claimed in any preceding claim characterised in that each facet is in the form of a regular triangle, quadrilateral or polygon.

6 A faceted fabrication as claimed in any preceding claim characterised by the inclusion therein of an object or means providing an image such as a video display unit.

7 A faceted fabrication as claimed in any preceding claim characterised in that the fabrications is of glass or plastics material.

8 A faceted fabrication characterised in that some or all of its facets are covered by a transparent sheet material.

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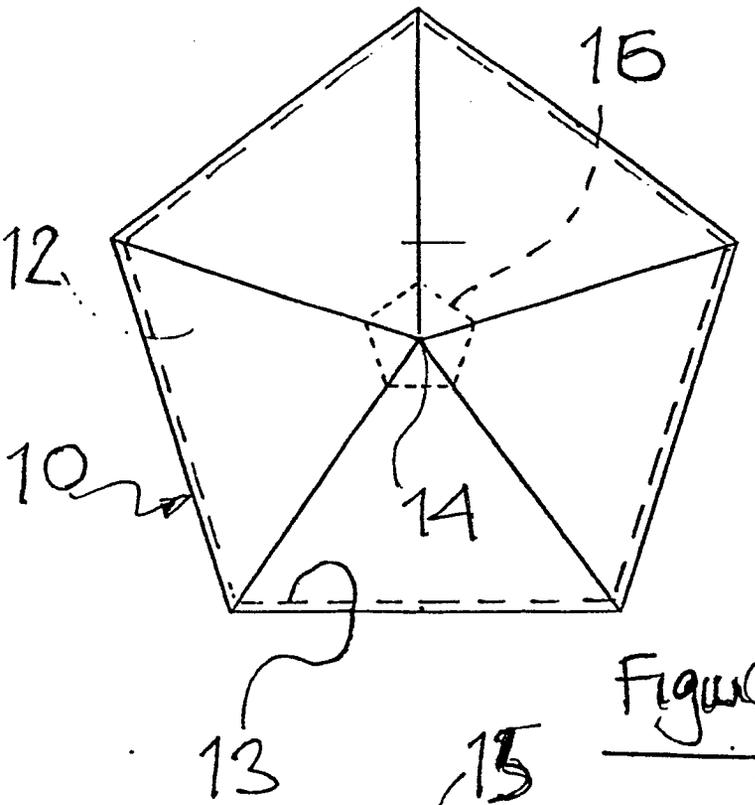

Figure 1A

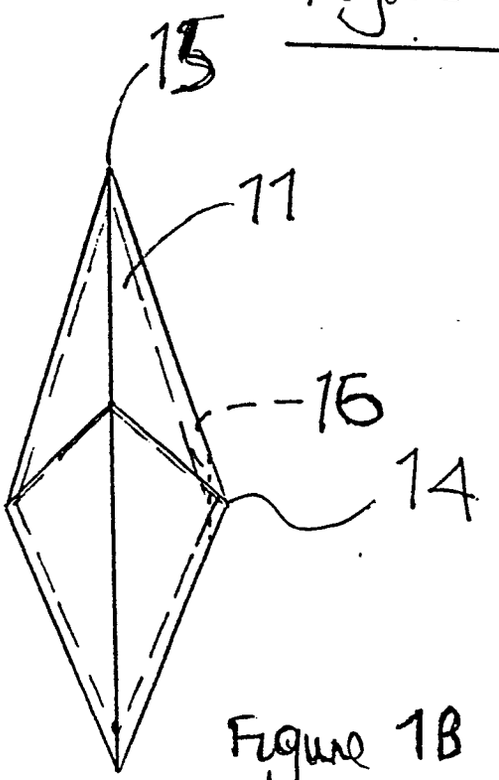

Figure 1B

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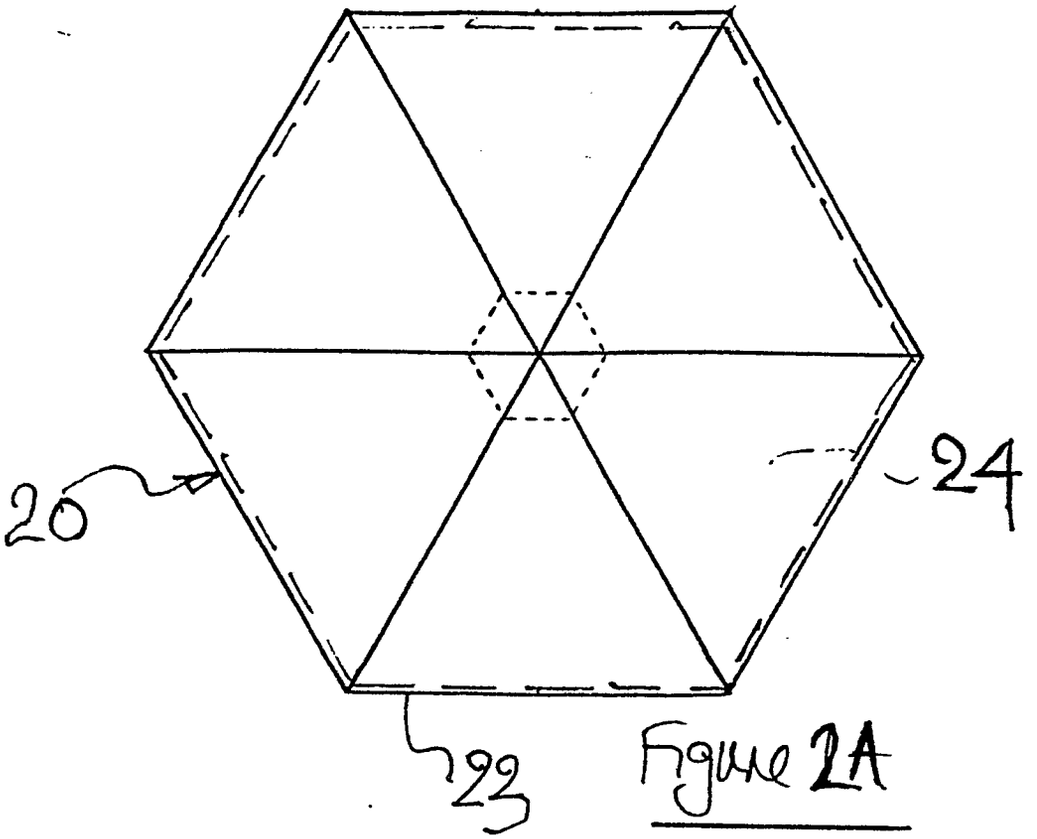

Figure 2A

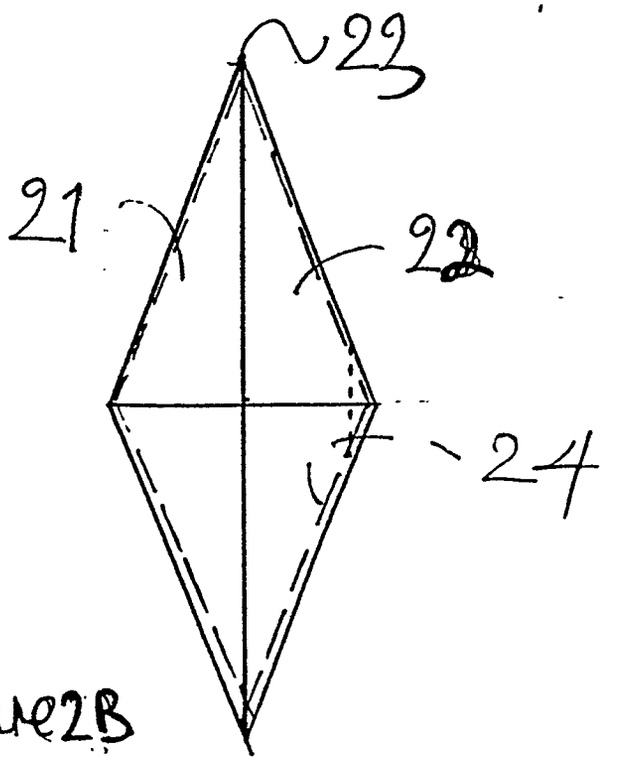

Figure2B

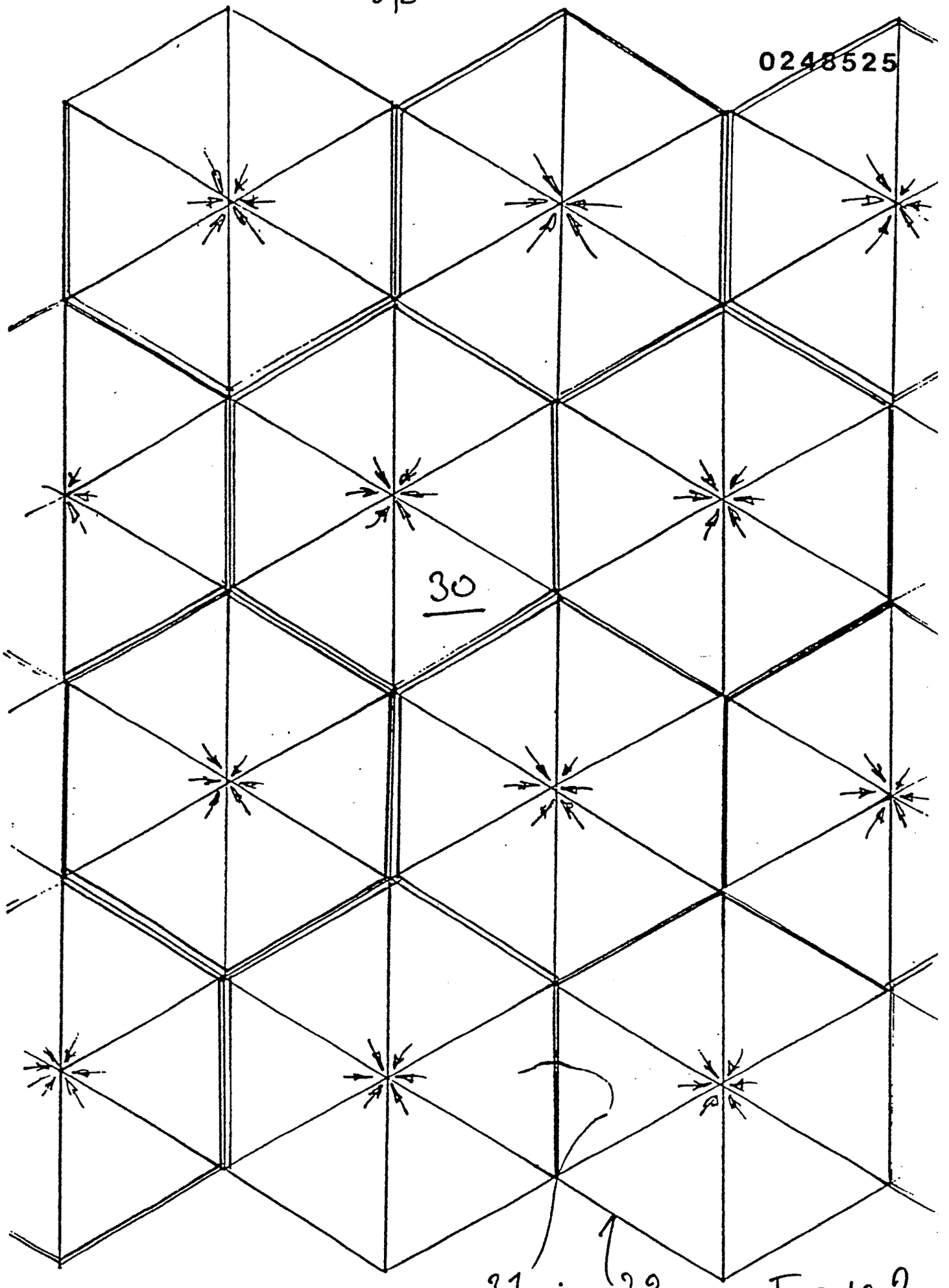

Figure 3

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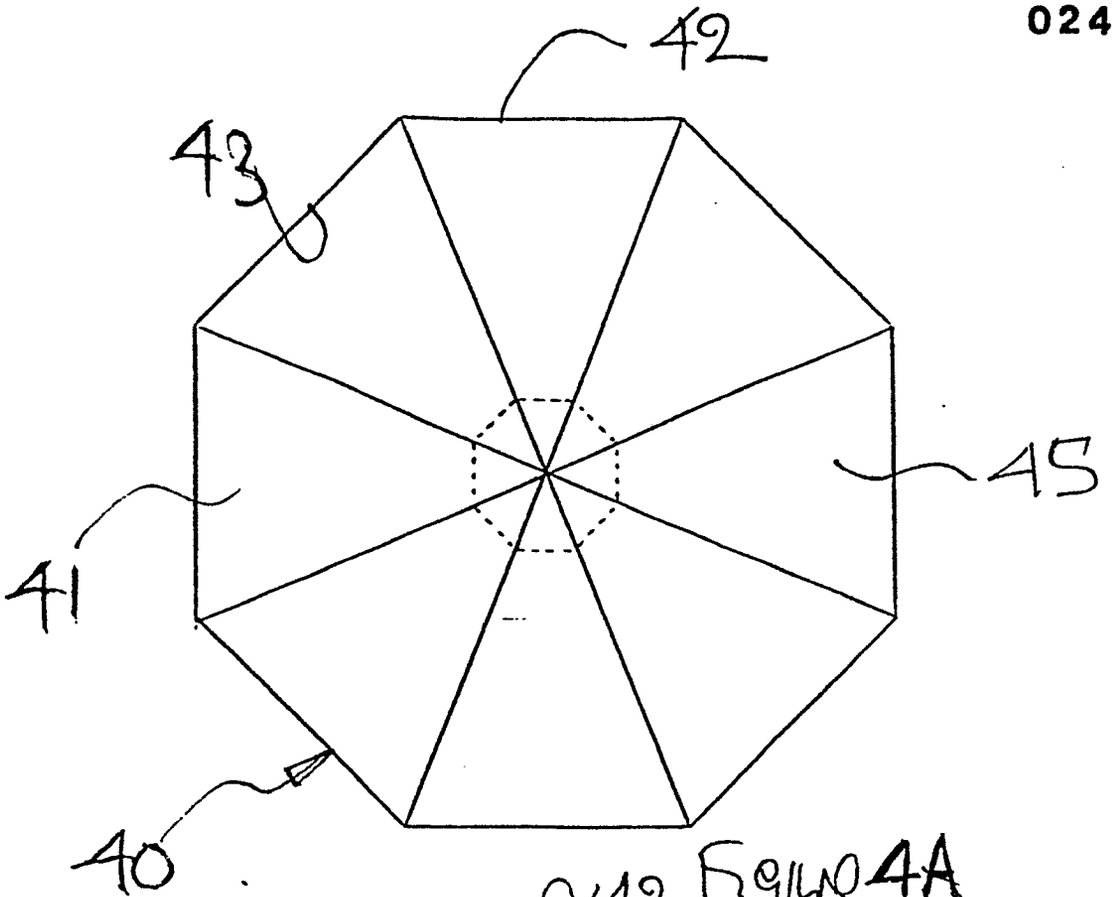

Figure 4A

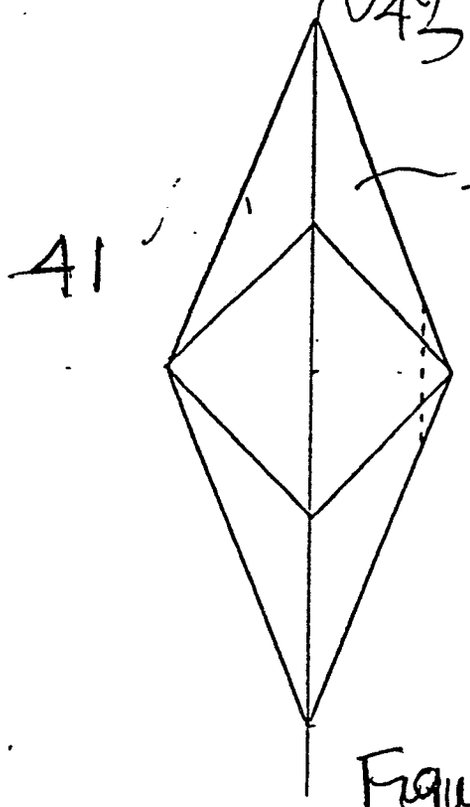

Figure 4B

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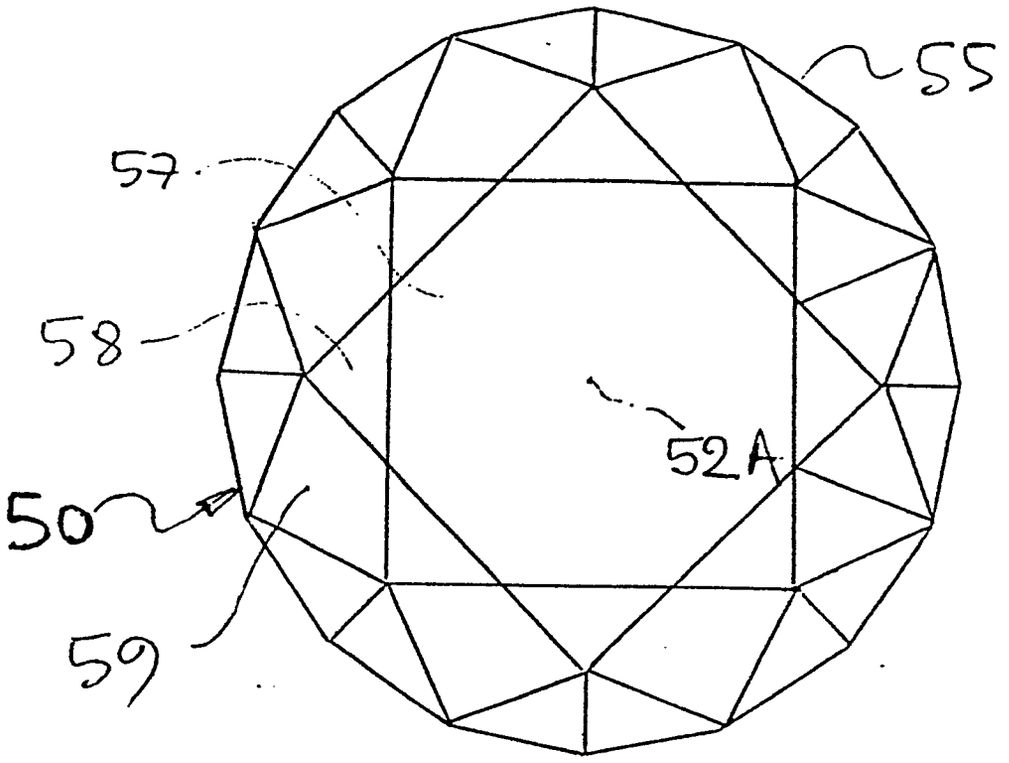

Figure 5A

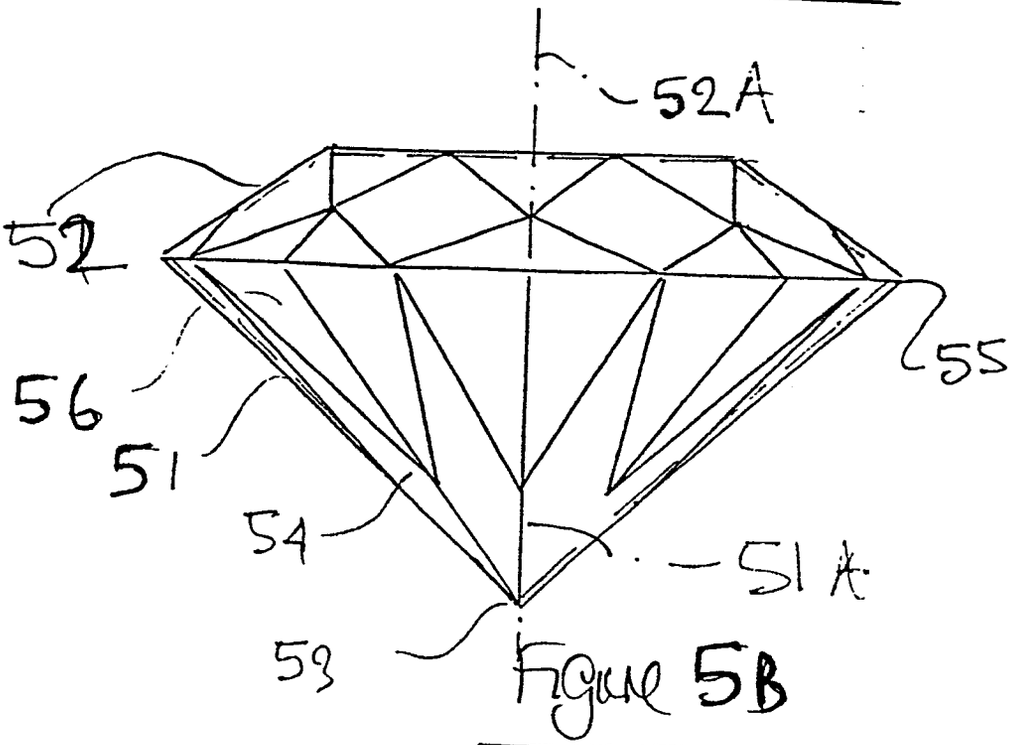

Figure 5B