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## (54) A process for the production of an ornamental accessory having a metal frame and an internal decorative surface, and an ornamental accessory thereby obtained

(57) There is described a process for the production of ornamental accessories (1) having a metal frame (4) and internal decorative material (3) with the rim (6) incorporated in the frame (4). The decorative material may be made of fabric, lace, paper or plastic.

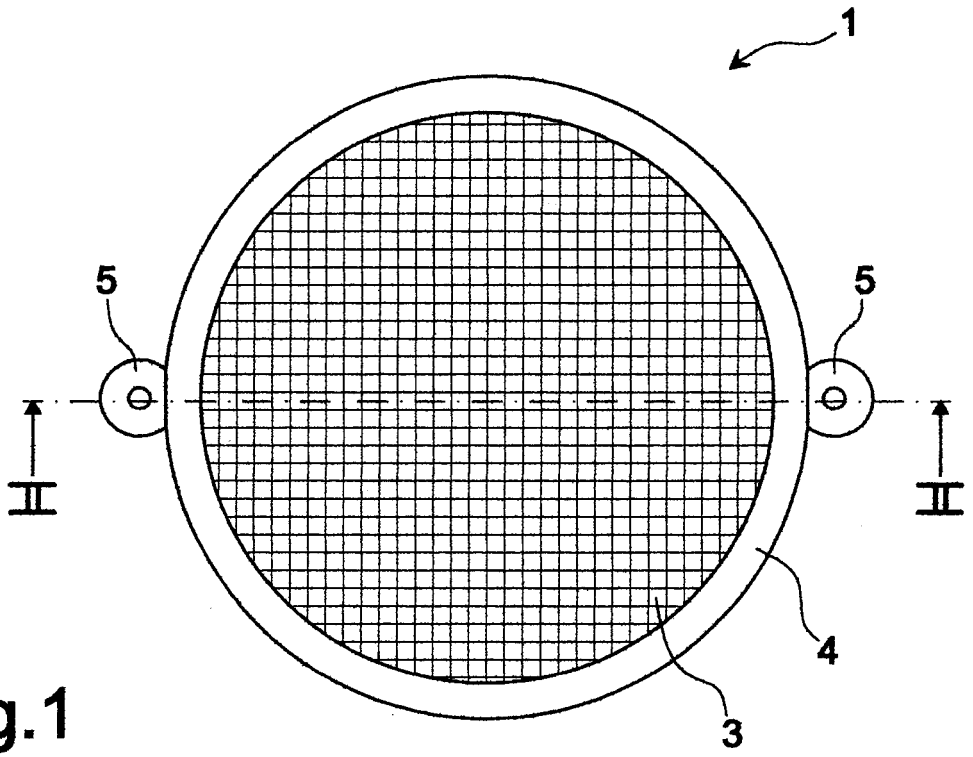


Fig.1

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## Description

**[0001]** The present invention concerns a process for the production of ornamental accessories having a metal frame and an internal decorative surface, and an ornamental accessory thereby obtained.

**[0002]** Ornamental accessories having a metal frame are known, which are made in various shapes, sizes and materials and are usable for clothes, personal use, furnishing and so on.

**[0003]** Said ornamental accessories often show a toroidal-shaped frame, similar to that of a ring; it may also be oval, rectangular or have the most varied shapes. The surface may be finely worked or maintained plain.

**[0004]** Such accessories often comprise additional holes or other means for the insertion of threads, strings, bands or other through-passing material, to allow the connection with other accessories or to the person or article they are intended to decorate.

**[0005]** The frames have no standard size; usually, they do not exceed ten centimetres.

**[0006]** Any type of metal material may be used, it indifferently being steel, copper, brass, silver, gold, nonferrous alloys or others.

**[0007]** The known technique for the production of such ornamental accessories comprises the use of a silicon rubber mould, normally having a cylindrical shape, comprising the following elements:

- an inlet hole for molten metal;
- moulding cavities obtained inside the mould, in a peripheral position;
- radial runners which connect the central hole to the moulding cavities.

**[0008]** The process generally occurs in three steps:

- a first step of preparing the mould;
- a second step of filling the mould: during said step molten metal is injected in the central hole; the mould is rotated about its axis and, by the effect of a centrifugal action which is exerted on the molten metal, this is forced to flow along the runners until the moulding cavities are filled;
- a third step of hardening, during which the metal cools down and hardens; finally, the end products may be extracted.

**[0009]** The fact that ornamental accessories are hardly visible, precisely because they are perforated, often interferes with their use. Their ornamental function is thereby diminished.

**[0010]** In this respect, an interesting innovation would be due to the possibility of filling the holes of such accessories with decorative material, such as e.g. lace, paper or fabric.

**[0011]** The ornamental accessories thereby obtained would be easily visible, identifiable and would represent an innovation in the fashion industry.

**[0012]** Unfortunately, this kind of accessories are difficult to produce: it is difficult for laces, paper or fabrics to adhere to small metal elements by means of simple and cost-effective technological processes.

**[0013]** It would be difficult, for instance, to cover a part of the surface of the frames with an adhesive and to apply the edge of the decorative material thereto; furthermore, the decorative material could detach from the frames after a short time because the adhesion surface is limited.

**[0014]** Therefore, the need arises for the frames of such ornamental accessories to incorporate the edge of the surfaces of the decorative material.

**[0015]** It is the object of the present invention to obtain an ornamental accessory having a metal frame and internal decorative material by means of a production process allowing the frame to incorporate the edge of said decorative material.

**[0016]** According to the invention, such an object is achieved by a production process for ornamental accessories having a metal frame and an internal decorative surface, characterised in that it comprises a first step of preparing a mould, provided with moulding cavities having the shape of said frames, and interposing decorative surfaces so that the edges of said decorative surfaces are contained, at least partially, in said moulding cavities, a second step of filling said moulding cavities with molten metal so that said molten metal incorporates the edges of said decorative surfaces, and a third step of hardening said metal, at the end of which the end products are extracted from the mould.

**[0017]** A possible embodiment of the process of the invention comprises the use of a cylindrical silicon rubber mould comprising an inlet hole for molten metal, moulding cavities in a peripheral position and connection runners. In this manner, an innovative product is produced without using resources in addition to those used for the production of traditional pendants.

**[0018]** Therefore, the working steps are as follows:

- a first step of preparing the mould with a central hole, moulding cavities and connection runners, and interposing a decorative surface so that the edges of said surface are, at least partially, contained in the moulding cavities;
- a second step of filling the moulding cavities with molten metal: the mould, filled with molten metal, is rotated inducing the outflow of the molten metal by centrifugal force from the central hole to the moulding cavities through the runners; said second step, operatively identical to the second step occurring in the known technique, displays the additional feature of the edges of the decorative surface being incorporated in the molten metal inside the moulding cavities;
- a third step of hardening by cooling, operatively identical to the third step occurring in the known technique; at the end of said step, the ornamental acces-

sory comprises a solid metal frame and a decorative surface connected thereto; the stability of the connection is ensured by the fact that the edges of the decorative surface are incorporated in the metal frame;

- finally, there follows the opening of the mould for the extraction of the accessories obtained in this manner.

**[0019]** Usually, the mould is subdivided in two half-moulds by the appropriately worked surfaces; as an effect of the appropriate juxtaposition, said surfaces form the mould comprising the moulding cavities, the runners and the central hole. The central hole is usually obtained in one of the two half-moulds.

**[0020]** These and other features of the present invention will become more apparent from the following detailed description of an examplary embodiment of the process according to the invention, given with reference to the accompanying drawings, in which:

figure 1 shows a plan view of an accessory, by way of example in the form of pendant, produced by the process according to the invention;
figure 2 shows a section view along line II-II in figure 1.
figure 3 shows a perspective view of a mould according to an embodiment of the invention;
figure 4 shows a top plan view of the upper half-mould of the mould in figure 3;
figure 5 shows a bottom plan view of the upper half-mould in figure 4;
figure 6 shows a section view along line VI-VI in figure 4;
figure 7 shows a top plan view of the lower half-mould of the mould in figure 3;
figure 8 shows a bottom plan view of the lower half-mould in figure 7;
figure 9 shows a section view along line IX-IX in figure 7;
figure 10 shows the same view as figure 9, in which the way the decorative surface should be stretched out is highlighted;
figure 11 shows the way the half-moulds should be arranged to form the mould in figure 3 with an interposed decorative surface.

**[0021]** Figure 1 shows a pendant produced by a process according to the present invention. The above said pendant 1 comprises a metal frame 4 and is connectable to other items by means of two additional perforated elements 5.

**[0022]** Said pendant 1 comprises a lace 3 represented as a square mesh weaving of threads. In figure 2 the incorporation of the edge 6 of said lace 3 in said frame 4 may be noted.

**[0023]** Figure 3 shows a mould 20 having a cylindrical shape, made of a silicon rubber, intended to produce pendants 1.

**[0024]** At the centre of said mould 20 there is a central hole 21 for the inflow of the molten metal. Said mould 20 is formed by an upper half-mould 30 and a lower half-mould 40. Inside said mould 20 there are moulding cavities and runners which are not visible.

**[0025]** To describe the structure of said mould 20, there is described the structure of said half-moulds 30 and 40, which form said mould 20 when juxtaposed; in this manner, it is also possible to highlight said moulding cavities and said runners.

**[0026]** Figures 4-6 show said upper half-mould 30. It displays a through-hole 31 in a central position, adapted to form said inlet hole 21 by the juxtaposition of said half-moulds 30 and 40.

**[0027]** On said lower surface 33 of said upper half-mould 30 working has been carried out by which half-runners 32 and moulding half-cavities 301 have been obtained.

**[0028]** By juxtaposition of said half-moulds 30 and 40, said moulding half-cavities 301 are adapted to form said lower part of the moulding cavities, within which said pendants 1 are formed and of which they take the shape; therefore, said moulding half-cavities 301 comprise half-cavities 304 within which said frames 4 are formed and half-cavities 305 within which said additional perforated elements 5 are formed.

**[0029]** By juxtaposition of said half-moulds 30 and 40, said half-runners 32 are adapted to form the lower part of runners connecting the central hole to the moulding cavities. Said runners are intended to allow the flow of the molten metal by centrifugal force from said central hole 21 to said moulding cavities, and therefore take a somewhat radial or circular shape.

**[0030]** Figures 7-9 show said lower half-mould 40, the only differences of which with respect to said upper half-mould 30 are:

- said lower half-mould 40 has a central blind cavity 41 (which is not through-passing as said central hole 31);
- the orientation of said lower half-mould 40 is opposite with respect to said upper half-mould 30, whereby the upper surface 44 of said lower half-mould 40 corresponds to said lower surface 33 of said upper half-mould.

**[0031]** By juxtaposition of said half-moulds 30 and 40, the surfaces 33 and 44 form the above said central hole, runners and moulding cavities. Therefore, on said upper surface 44 of said lower half-mould 40 working has been carried out to obtain half-runners 42 and moulding half-cavities 401, 404 and 405 serving to respectively complete said half-runners 32 and said moulding half-cavities 301, 304 and 305.

**[0032]** The lower surface 43 of said lower half-mould 40 is completely plain. As the second working step provides the rotation of said mould 20, said lower surface

43 is put on a rough support surface (not shown in the figures), which is rotated by a controlled mechanism. In other examples of embodiment, said lower surface 43 may be provided with instrumentation adapted to improve the adhesion and containment to said support surface and other possible devices.

**[0033]** Figure 10 shows the way said laces 3 are placed on said lower half-mould 40: said laces 3 are stretched out on said surfaces 403, surrounded by said moulding half-cavities 404; the rims 6 of said laces 3 hang within said moulding half-cavities 404.

**[0034]** Figure 11 shows the way said half-moulds 30 and 40 need to be juxtaposed to form said mould 20, central hole 21, runners 22 and moulding cavities 25, with said laces 3 inside, as provided by the process according to the invention.

**[0035]** At this point, the way the steps comprised in the process according to the invention make use of said mould may be understood.

**[0036]** During the first working step said half-runners 32 and said half-cavities 301, 304, 305 are obtained on the lower surface 33 of said upper half-mould 30, and said half-runners 42 and said cavities 401, 404 and 405 are obtained on the upper surface 44 of said lower half-mould 40. Laces 3 are placed on the surfaces 403 of said lower half-mould 40, so that the rims 6 of said laces 3 protrude from said surfaces 403 and are contained inside said half-cavities 404. Finally, said upper half-mould 30 is juxtaposed on said lower half-mould 40 so as to form said mould 20, said central hole 21, said runners 22 and said moulding cavities 25.

**[0037]** The second working step comprises the injection of molten metal in said central hole 21 and the rotation of said mould 20 about its axis. In this manner the molten metal flows to a peripheral position along said runners 42 by centrifugal action, thus reaching said moulding cavities 25.

**[0038]** During the third working step pendants 1 are formed by hardening of the metal within said moulding cavities 25.

**[0039]** At the end of said third working step the pendants 1 may be extracted from said mould 20.

**[0040]** As an alternative to the above described pendant, any other ornamental accessory having similar features, for instance buttons, brooches, buckles, studs, key rings, rings, earrings etc. may be made by the same process.

## Claims

1. A production process for ornamental accessories (1) having a metal frame (4) and an internal decorative surface (3), **characterised in that** it comprises a first step of preparing a mould (20), provided with moulding cavities (25) having the shape of said frames (4), and interposing decorative surfaces (3) so that the edges (6) of said decorative surfaces (3) are contained, at least partially, in said moulding cavities (25), a second step of filling said moulding cavities (25) with molten metal so that said molten metal incorporates the edges (6) of said decorative surfaces (3), and a third step of hardening said metal, at the end of which the end products are extracted from the mould (20).

2. A process according to claim 1, based on the use of a mould (20) comprising at least one central hole (21), moulding cavities (25) in a virtually peripheral position and runners (22) which connect said central hole (21) to said moulding cavities (25), **characterised in that** during said second step said central hole (21) is filled with molten metal and said mould (20) is rotated, thus forcing the flow of the molten metal by centrifugal action from said central hole (21) to said moulding cavities (25) along said runners (22).

3. A process according to claim 2, **characterised in that** said first step comprises that said mould (20) is formed by two half-moulds (30, 40), each of which displays cavities (31, 41) on the surface, which are suitable to form said central hole (21), said runners (22) and said moulds (25) as an effect of an appropriate juxtaposition, and that said decorative surfaces (3) are applied on at least one of the two said half-moulds (30, 40) in a manner suitable to bring edges (6) of said decorative surfaces (3) inside said moulds (25), so that said rims (6) are incorporated in the metal frames (4) at the end of the three above said working steps.

4. A process according to any of the preceding claims, **characterised in that** said decorative surface (3) is made of fabric.

5. A process according to any of claims 1-4, **characterised in that** said decorative material is made of lace.

6. A process according to any of claims 1-4, **characterised in that** said decorative surface (3) is made of paper.

7. A process according to any of claims 1-4, **characterised in that** said decorative surface (3) is made of plastic.

8. A process according to any of claims 1-4, **characterised in that** said decorative surface (3) is made of flexible material.

9. A process according to any of claims 1-4, **characterised in that** said decorative surface (3) is comprised of a combination of different and heterogeneous materials.

**10.** An ornamental accessory **characterised in that** it is comprised of a metal frame (4) and an internal decorative surface (3) having an edge (6) incorporated in said frame (4).

**11.** An ornamental accessory according to claim 10, **characterised in that** it comprises perforated elements (5) integral with said frame (4).

**12.** An ornamental accessory according to any of claims 10-11, **characterised in that** said decorative surface (3) is made of fabric.

**13.** An ornamental accessory according to any of claims 10-11, **characterised in that** said decorative surface (3) is made of lace.

**14.** An ornamental accessory according to any of claims 10-11, **characterised in that** said decorative surface (3) is made of paper.

**15.** An ornamental accessory according to any of claims 10-11, **characterised in that** said decorative surface (3) is made of plastic.

**16.** An ornamental accessory according to any of claims 10-11, **characterised in that** said decorative surface (3) is made of flexible material.

**17.** An ornamental accessory according to any of claims 10-11, **characterised in that** said decorative surface (3) is comprised of a combination of different and heterogeneous materials.

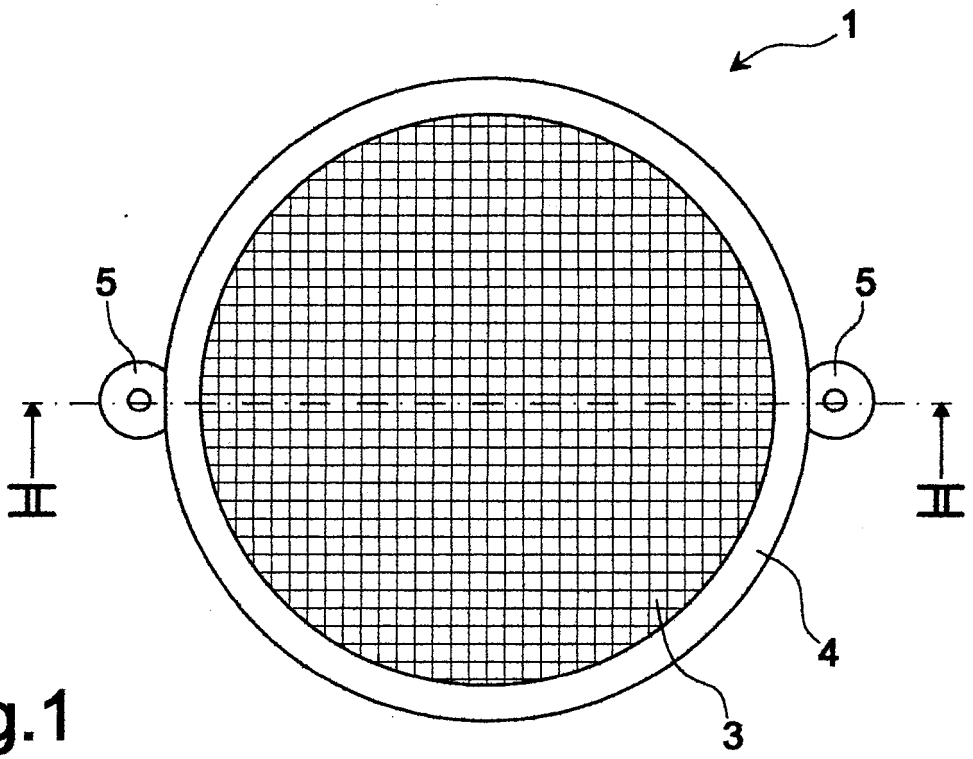


Fig.1

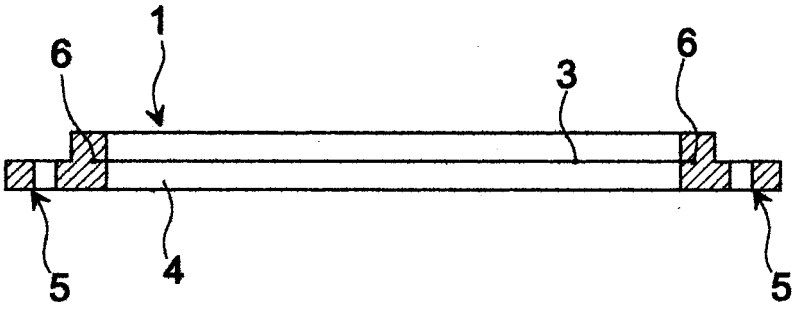


Fig.2

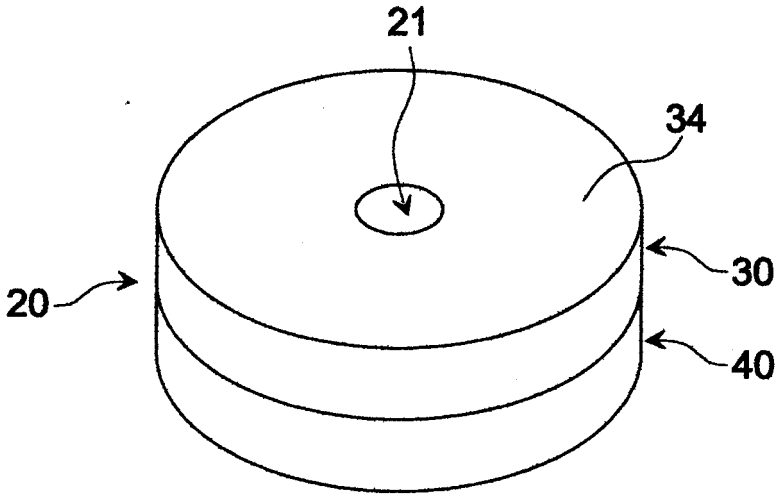


Fig.3

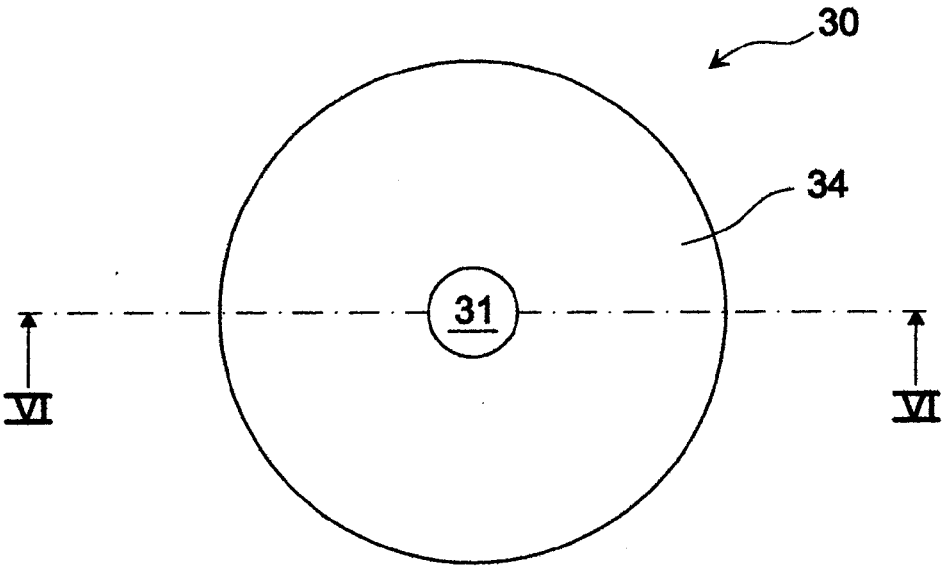


Fig.4

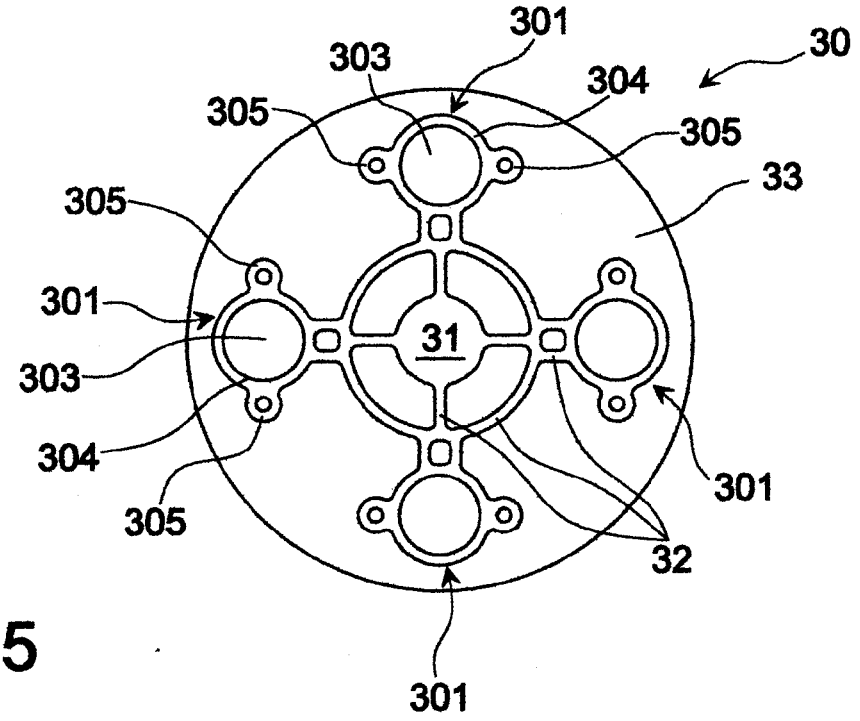


Fig.5

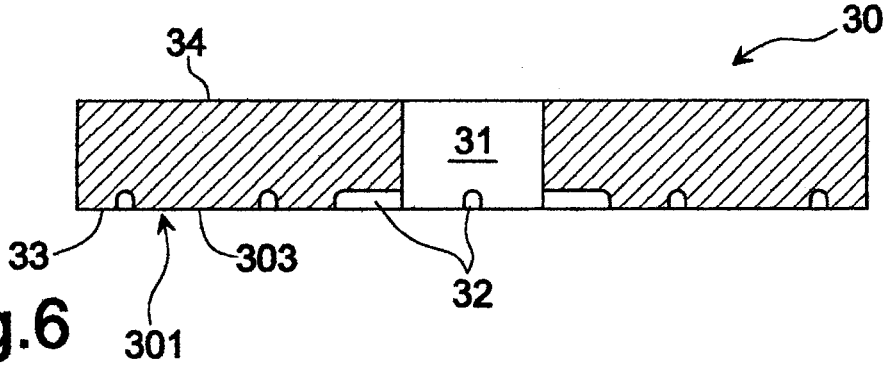


Fig.6

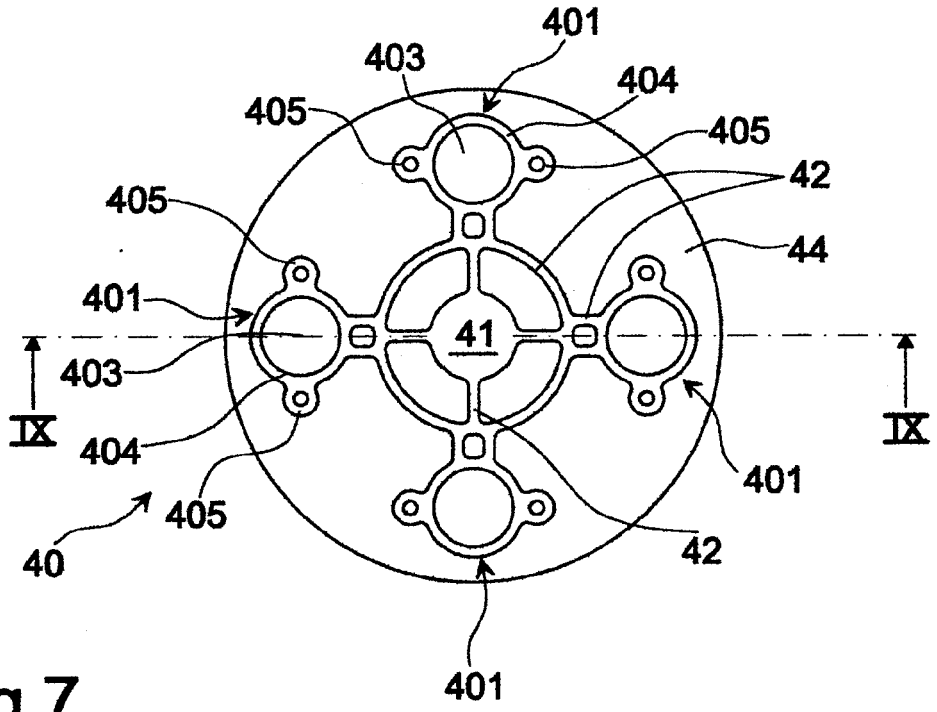


Fig.7

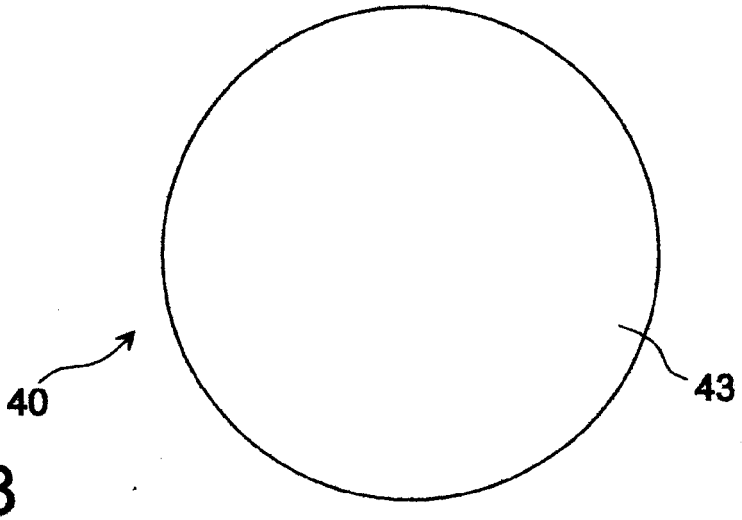


Fig.8

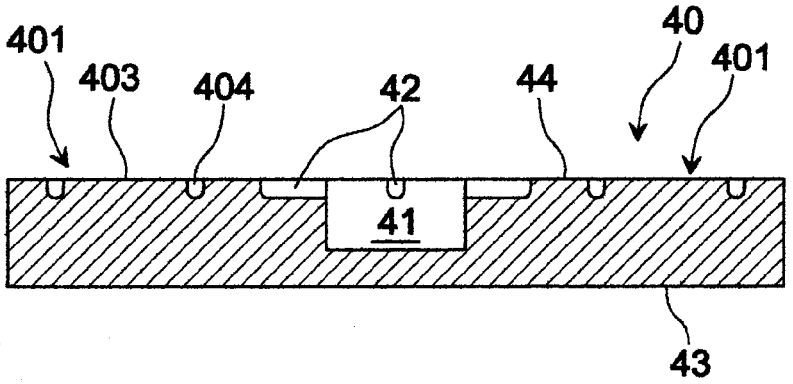


Fig.9

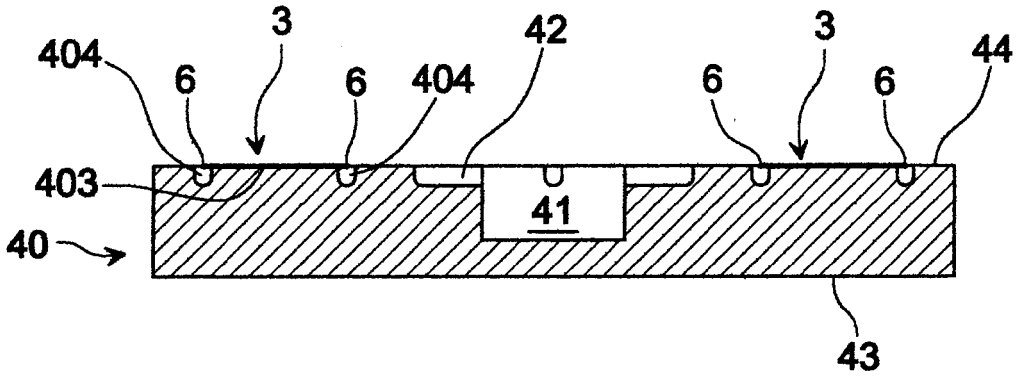
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Fig.10

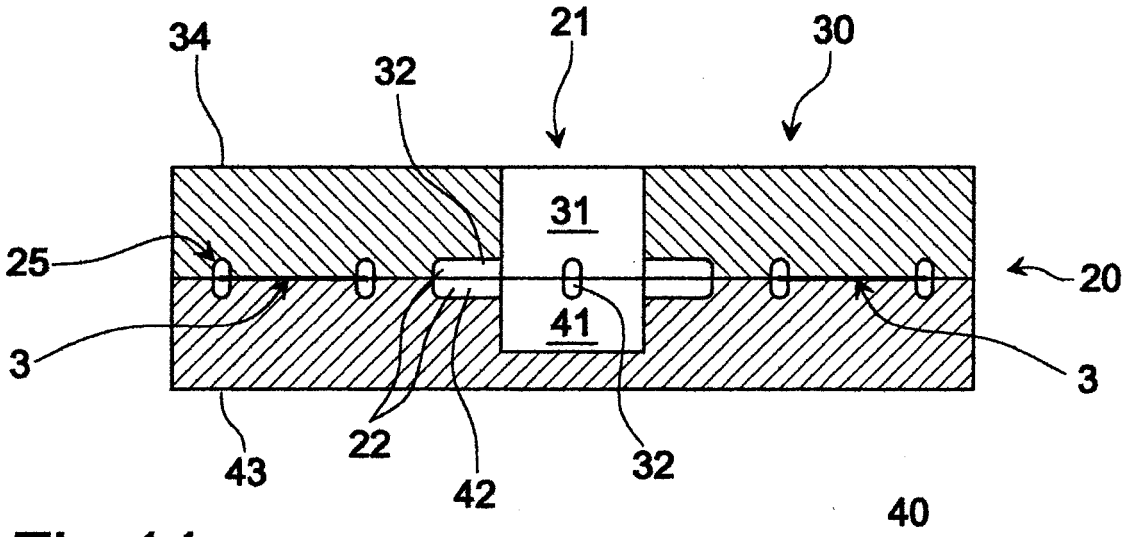
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Fig.11

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# EUROPEAN SEARCH REPORT

Application Number
EP 07 10 4471

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The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 28 June 2007 | Sartor, Michele |

CATEGORY OF CITED DOCUMENTS

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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 10 4471

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