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(71) Applicant: **Janus S.R.L.**
37010 Sant'Ambrogio Valpolicella VR (IT)

(72) Inventor: **Fedrigoli, Pietro Lorenzo**
37010 Sant'Ambrogio di Valpolicella (IT)

(74) Representative: **Alagem Modiano, Lara S. et al**
Modiano & Associati
Via Meravigli, 16
20123 Milano (IT)

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(54) **Method for manufacturing lampshades with stonelike material**

(57) A method for manufacturing lampshades with stone-like material, which provides the steps that consist in providing, in a block (1) of stone-like material, a substantially cylindrical cavity (2); in applying a reinforcement element (3) made of substantially transparent material to the internal surface of the resulting cavity (2); and in removing material from the outer surface of the block (1) that is arranged laterally with respect to the axis (2a) of the cavity, in order to obtain, around the reinforcement element, a layer of stone-like material having a pre-set thickness.

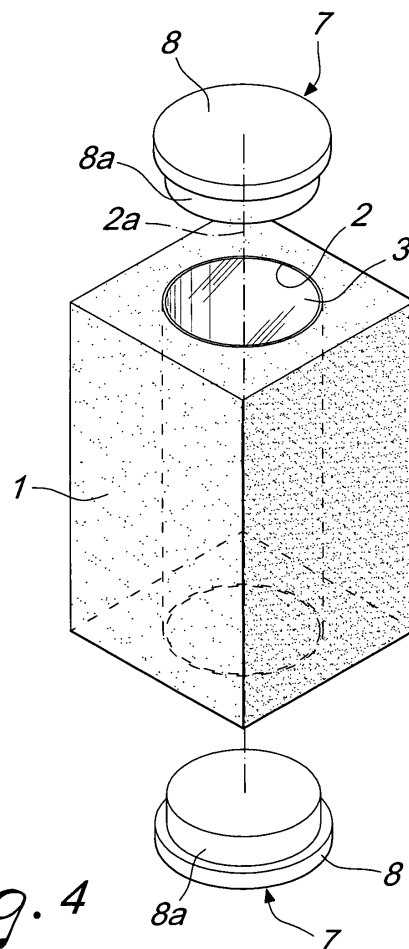


Fig. 4

Description

[0001] The present invention relates to a method for manufacturing lampshades with stone-like material.

[0002] It is known to use plates of marble or other suitable stone-like material to provide lampshades for lamps or other similar appliances.

[0003] To solve the drawback caused by the weight of such plates, which is in any case considerable and forces to oversize the body of the lamp, Italian patent applications no. VR2006A000086 and VR2006A000031 by the same Applicant proposed a lampshade which generally comprises at least one light screening element constituted by a panel which has a supporting layer, made of a transparent material which is not stone, such as glass or plastic material, and an at least partially transparent layer of stone-like material, which is constituted by a plate of stone-like material coupled to the supporting layer.

[0004] As can be easily understood, this solution allows to obtain lampshades which substantially have the same optical characteristics as those made exclusively of plates of stone-like material, but are considerably lighter and also much stronger for an equal thickness of the stone-like material used.

[0005] Apart from the unquestionable advantages, even this solution does not allow, however, to meet the demand, which is currently strongly felt in the field of interior decoration, to have available lampshades which have curved or very rounded shape, which is therefore different from the shape with flat faces which can be obtained by joining at the edges two or more panels as in the background art.

[0006] The aim of the present invention is to solve the problem described above by providing a method which allows to provide lampshades which have a curved shape and which at the same time have the optical characteristics that arise from the use of stone-like materials.

[0007] Within this aim, another object of the invention is to provide a method which allows to provide, by using stone-like materials, lampshades which are lightweight and at the same time strong.

[0008] Another object of the present invention is to provide a method for providing lampshades by using stone-like material which is suitable for mass production and at very low costs.

[0009] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a method for manufacturing lampshades with stone-like material according to the invention, which is characterized in that it comprises the steps that consist in:

- providing, in a block of stone-like material, a substantially cylindrical cavity;
- applying a reinforcement element made of substantially transparent material to the internal surface of said cavity;
- removing material from the outer surface of said block that is arranged laterally with respect to the

axis of said cavity, in order to obtain, around said reinforcement element, a layer of stone-like material having a preset thickness.

[0010] Further characteristics and advantages of the invention will become better apparent from the description of some preferred but not exclusive embodiments of the method according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figures 1 to 6 are schematic perspective views of the different steps of the method in a possible embodiment;

Figure 7 is a schematic perspective view of a tubular body which can be obtained with the method according to the invention and can be used as a lampshade; Figure 8 is a perspective view of a frustum-shaped lampshade which can be obtained with the method according to the invention;

Figure 9 is a perspective view of a lampshade which can be obtained by cutting the tubular body of Figure 7;

Figure 10 is a schematic perspective view of a possible alternative embodiment of a step of the method according to the invention.

[0011] With reference to the figures, the method for providing lampshades with stone-like material according to the invention begins with a step which consists in providing, in a block 1 made of stone-like material, a substantially cylindrical cavity 2, for example by drilling, milling or other processes which are similar to the preceding ones.

[0012] It should be noted that the block 1 can be constituted by a single block of marble or, as shown schematically in Figure 1, can also be constituted by two or more separate blocks 1a, 1b, 1c, which are made of a different stone-like material and are mutually coupled, preferably by using connecting materials of any known type, such as cement, epoxy resins or other equivalent materials.

[0013] Preferably, the cavity 2 passes completely through the block 1 and has for example a substantially circular or elliptical transverse cross-section.

[0014] If one wishes to provide a lampshade which is conical or frustum-shaped, the cavity 2 can have a configuration which tapers toward one of its ends.

[0015] Once the cavity 2 has been provided, a substantially transparent reinforcement element 3 is applied to the internal surface of said cavity.

[0016] Conveniently, as shown in particular in Figure 3, said reinforcement element 3 can be provided by means of a tubular element 4 which has a shape which is complementary to the cavity 2 and is made of a substantially transparent material, such as glass or plastic material, such as for example methacrylate, polycarbonate, PVC or the material known by the trade name

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[0017] In this case, the reinforcement element 3 is applied to the internal surface of the cavity 2 in practice by axially inserting the tubular element 4 into the cavity 2 and then fixing the tubular element 4 inside such cavity 2.

[0018] Advantageously, the tubular element 4 is fixed inside the cavity 2 by interposing a bonding material between the outer lateral surface 4a of the tubular element 4 and the inner lateral surface of the cavity 2.

[0019] A bonding material suitable for this purpose can be constituted for example by an epoxy or polyurethane resin.

[0020] It should be noted that the side wall of the tubular element 4 preferably has a thickness ranging substantially from 1 to 8 mm.

[0021] According to a possible constructive variation, shown in Figure 10, the application of the reinforcement element 3 can also consist in lining the internal surface of the cavity 2 with one or more layers 5 formed by woven glass fibers impregnated with epoxy resin, which is then left to cure so that the layers 5 provide the reinforcement element 3.

[0022] Once the reinforcement element 3 as described above has been applied, material is removed from the outer surface of the block 1 which is arranged laterally with respect to the axis 2a of the cavity, so as to leave around the reinforcement element 3 a layer of stone-like material 6 which has a preset thickness.

[0023] Conveniently, said removal of material consists in turning, which is performed about an axis which is substantially parallel to the axis 2a of the cavity 2 and is advantageously performed by using a numeric-control machine tool.

[0024] It should be noted that before the block 1 to be machined is fixed between the headstock 100 and the tailstock 101 of the spindle of the machine tool, the axial ends of the cavity 2 are conveniently closed by means of supporting plugs 7, which allow to position the block 1 so that the axis 2a of the cavity 2 substantially coincides with the rotation axis formed by the spindle of the machine tool, which passes through the headstock 100 and the tailstock 101 of said spindle.

[0025] Conveniently, the supporting plugs 7 are constituted by disk-like elements 8 which are preferably made of polyethylene or other similar material and have an axial extension 8a which can be coupled by pushing with the cavity 2.

[0026] If one wishes to provide a lampshade which is conical or frustum-shaped, the removal of material from the outer lateral surface of the block 1 can be performed by conical turning, which is performed by entrusting the numeric control of the machine tool with the correct movement of the tool with respect to the surface of the block 1 being machined.

[0027] It should be noted that during machining on the machine tool, the reinforcement element 3 in practice acts as a support for the stone-like material and in particular gives the block 1 being machined an adequate

mechanical strength to withstand the shearing stresses which act thereon during machining on the machine tool.

[0028] Moreover, again due to the presence of the reinforcement element 3, it is possible to provide the layer of stone-like material 6 with a very low thickness.

[0029] In particular, it is preferable to provide the layer of stone-like material 6 with a thickness ranging substantially from 1 to 3 mm, so as to ensure optimum optical characteristics of the final lampshade.

[0030] Once the chosen thickness for the layer of stone-like material 6 has been obtained, the lampshade can be substantially complete, and optionally it is possible to provide further finishing processes of a known type, such as grinding or polishing, on the outer surface of the layer of stone-like material 6.

[0031] In practice, with the method according to the invention it is possible to obtain a lampshade which substantially has the appearance of a tubular body 10 which has a substantially circular or elliptical transverse cross-section and has, on its inner side, a reinforcement element 3 made of substantially transparent material and, on its outer side, a layer of stone-like material 6 which is fixed to the reinforcement element 3.

[0032] Optionally, the tubular body 10 of the lampshade may also be provided with a progressive taper toward one of its axial ends, so as to be substantially conical or frustum-shaped, as in the example shown in Figure 8.

[0033] Finally, it should be added that the tubular body 10 can also be subjected to cutting along diametrical or radial planes, so as to obtain two or more lampshades which have a curved shape like a portion of a cylindrical wall, as shown in the example of Figure 9.

[0034] In practice it has been found that the invention achieves the intended aim and objects in all of its embodiments, and in particular the fact is stressed that by way of the method according to the invention it is possible to provide, by using stone-like material, lampshades which have a shape with curved surfaces.

[0035] Another advantage of the method according to the invention resides in that it allows to obtain an extremely lightweight lampshade which at the same time is adequately strong for use on lamps or the like, due to the fact that it is provided with a reinforcement element which allows to use very low thicknesses of stone-like material.

[0036] It should be added to the above that the method according to the invention lends itself easily to being performed by means of automatic equipment, such as numeric-control machine tools, and therefore can be performed with industrial-type productions.

[0037] All the characteristics of the invention indicated above as advantageous, convenient or the like may also be omitted or be replaced with equivalents,

[0038] The individual characteristics described with reference to general teachings or to particular embodiments may all be present in other embodiments or may replace characteristics in these embodiments.

[0039] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

[0040] In practice, the materials used, so long as they are compatible with the specific use, as well as the shapes and the dimensions, may be any according to requirements.

[0041] All the details may further be replaced with other technically equivalent elements.

[0042] The disclosures in Italian Patent Application no. VR2006A000093, from which this application claims priority, are incorporated herein by reference.

[0043] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A method for manufacturing lampshades with stone-like material, **characterized in that** it comprises the steps that consist in:
 - providing, in a block of stone-like material, a substantially cylindrical cavity;
 - applying a reinforcement element made of substantially transparent material to the internal surface of said cavity;
 - removing material from the outer surface of said block that is arranged laterally with respect to the axis of said cavity, in order to obtain, around said reinforcement element, a layer of stone-like material having a preset thickness.
2. The method according to claim 1, **characterized in that** said removal of material is performed by means of a numeric-control machine tool.
3. The method according to one or more of the preceding claims, **characterized in that** said application of said reinforcement element provides for the step of lining the internal surface of said cavity with at least one layer of woven glass fibers impregnated with epoxy resin.
4. The method according to one or more of the preceding claims, **characterized in that** said application of said reinforcement element provides for the step of inserting axially in said cavity a tubular element, made of said substantially transparent material and shaped complementarily with respect to said cavity, and of fixing said tubular element inside said cavity.
5. The method according to one or more of the preceding claims, **characterized in that** said tubular element is fixed inside said cavity by interposing bonding material between the outer lateral surface of said tubular element and the inner lateral surface of said cavity.
6. The method according to one or more of the preceding claims, **characterized in that** said substantially transparent material is constituted by glass or transparent plastic material.
7. The method according to one or more of the preceding claims, **characterized in that** said cavity has a shape which tapers toward an axial end.
8. The method according to one or more of the preceding claims, **characterized in that** said layer of stone-like material has a thickness ranging substantially from 3 to 5 mm.
9. The method according to one or more of the preceding claims, **characterized in that** the side wall of said tubular element has a thickness ranging substantially from 1 to 8 mm.
10. The method according to one or more of the preceding claims, **characterized in that** said block comprises at least two blocks made of different stone-like material which are mutually coupled.
11. The method according to one or more of the preceding claims, **characterized in that** it provides, after said step for removing material, a step for cutting the resulting tubular body.

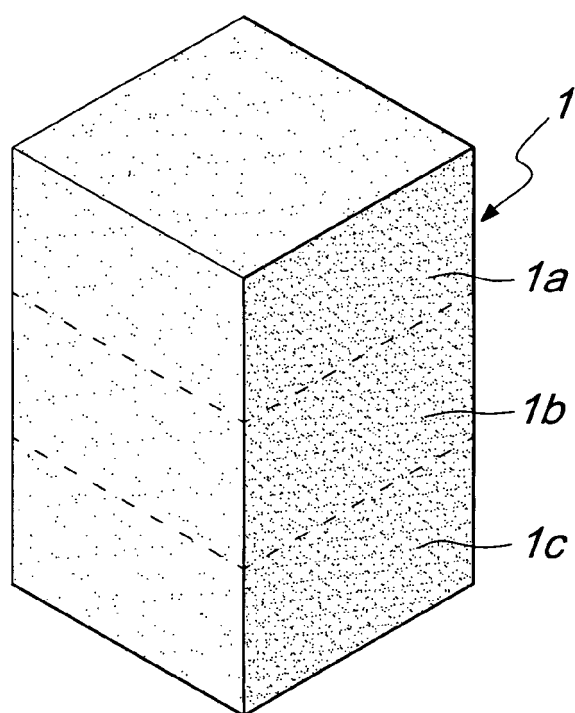


Fig. 1

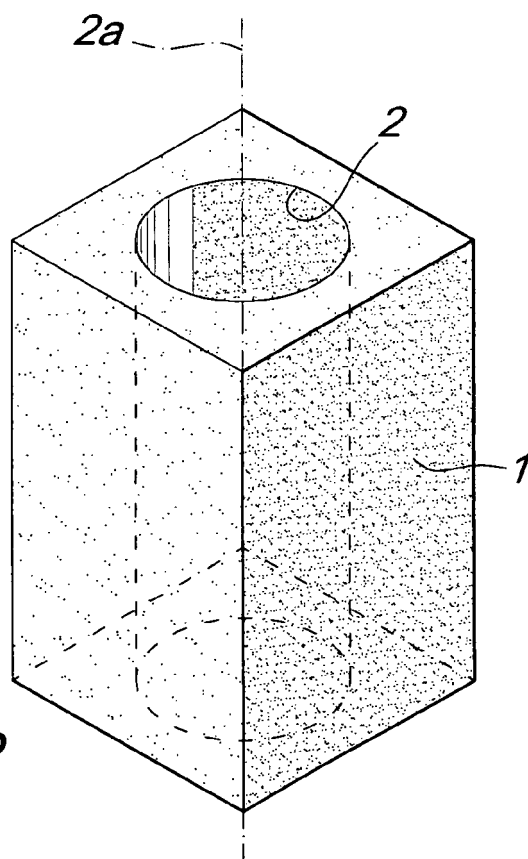


Fig. 2

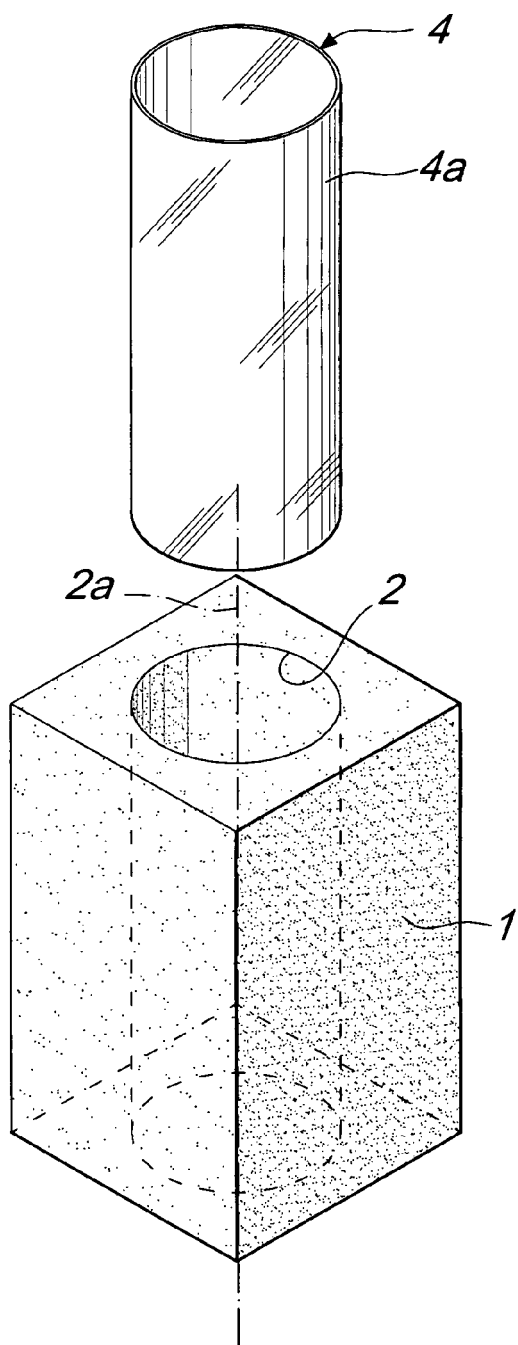


Fig. 3

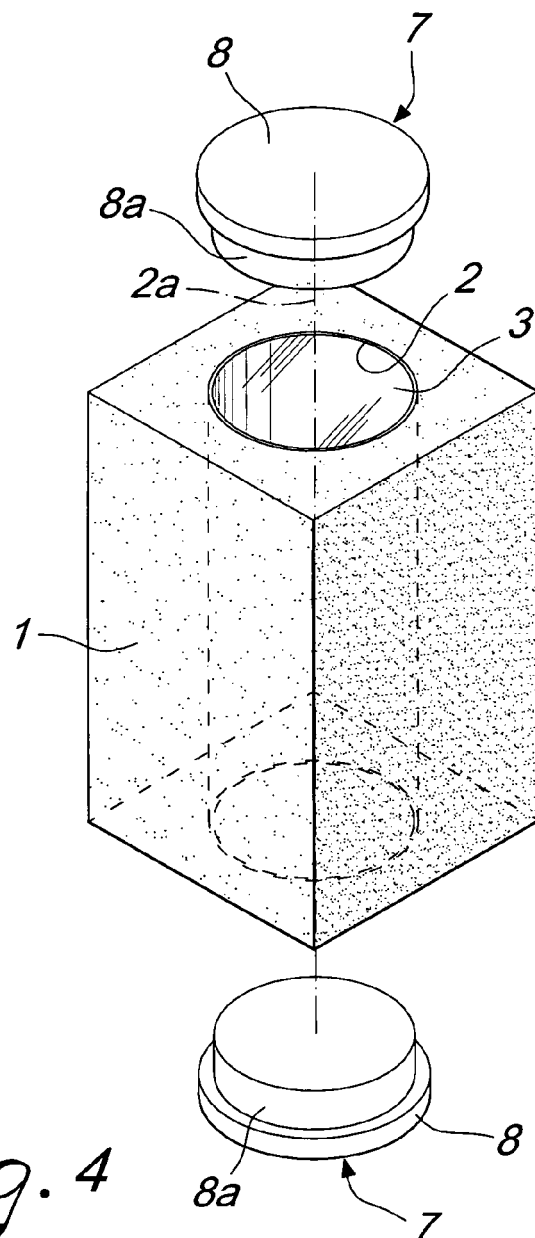
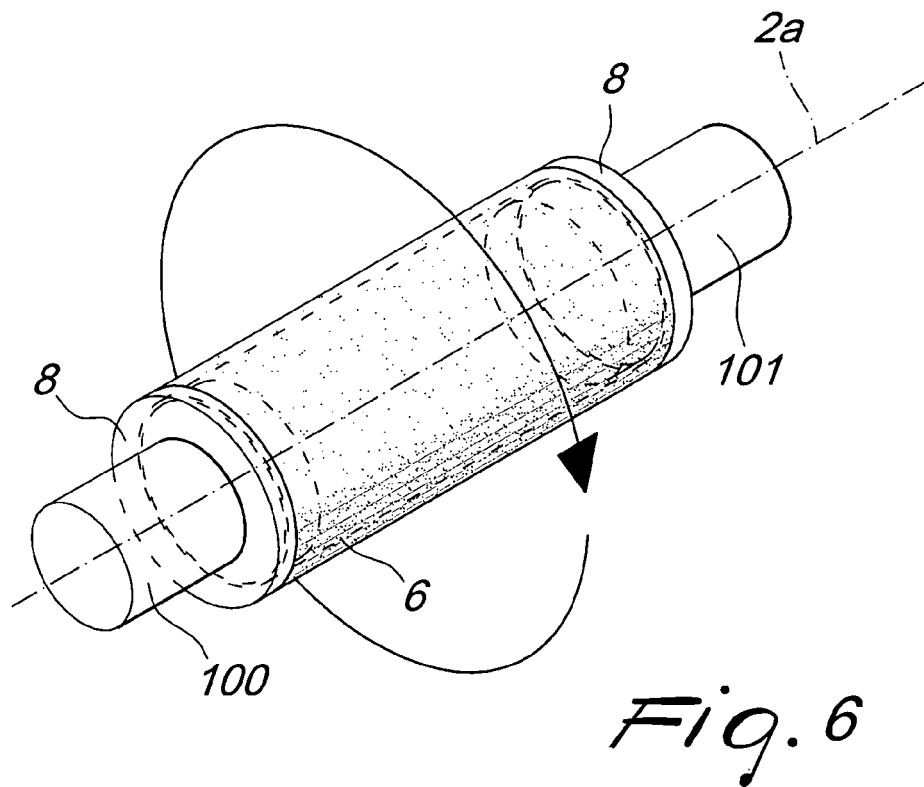
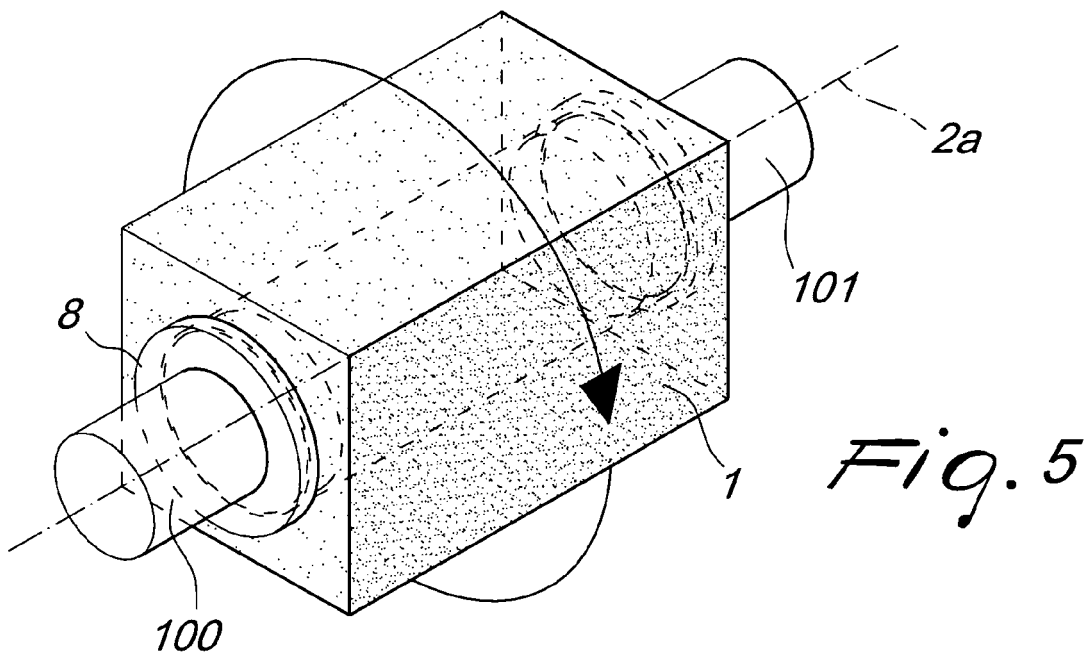
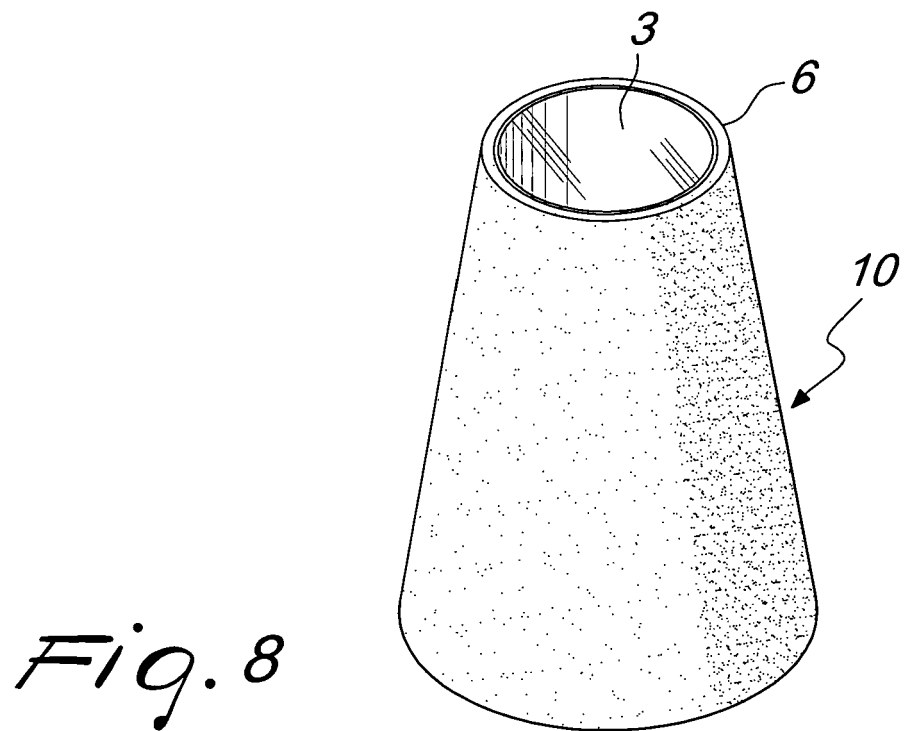
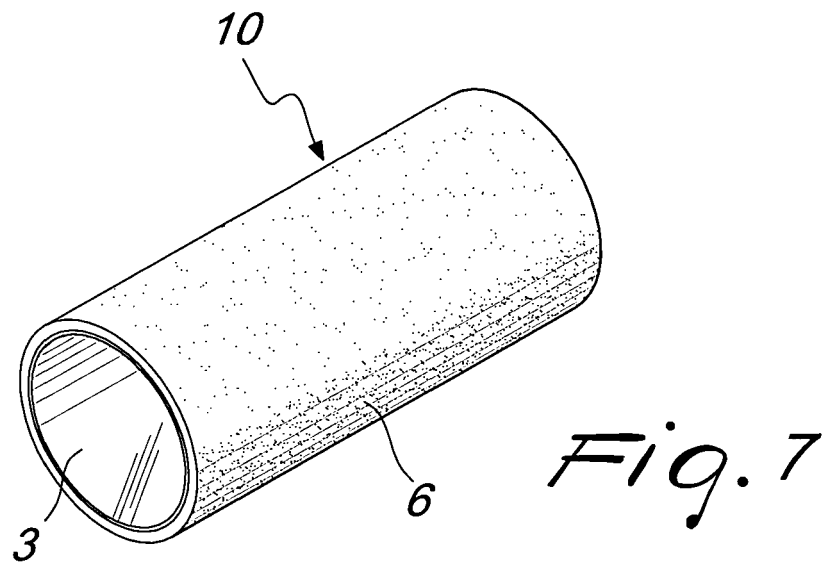


Fig. 4





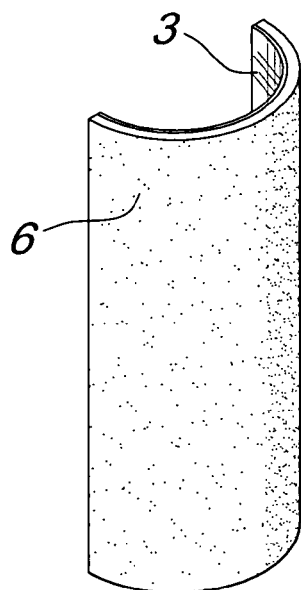


Fig. 9

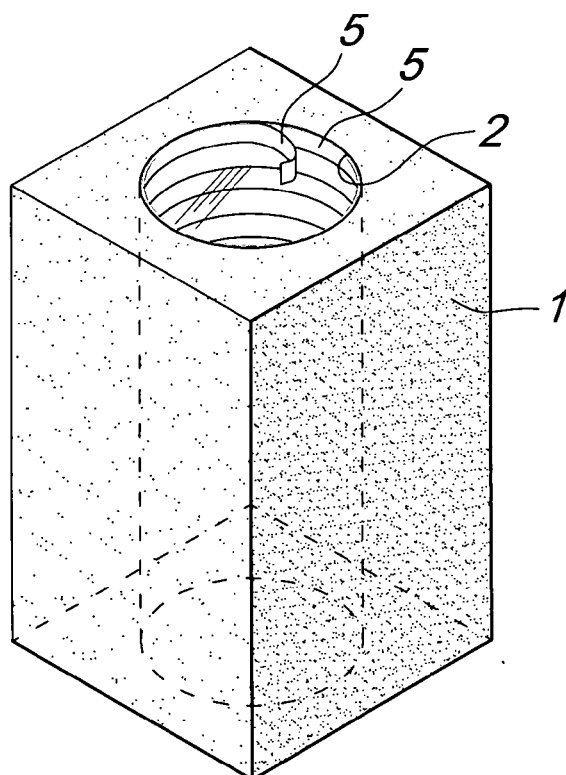


Fig. 10

REFERENCES CITED IN THE DESCRIPTION

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