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(72) Inventor: **Cortese, Fabrizio**  
**20052 Monza-Milano (IT)**

(74) Representative: **Cicogna, Franco**  
**Ufficio Internazionale Brevetti**  
**Dott.Prof. Franco Cicogna**  
**Via Visconti di Modrone, 14/A**  
**20122 Milano (IT)**

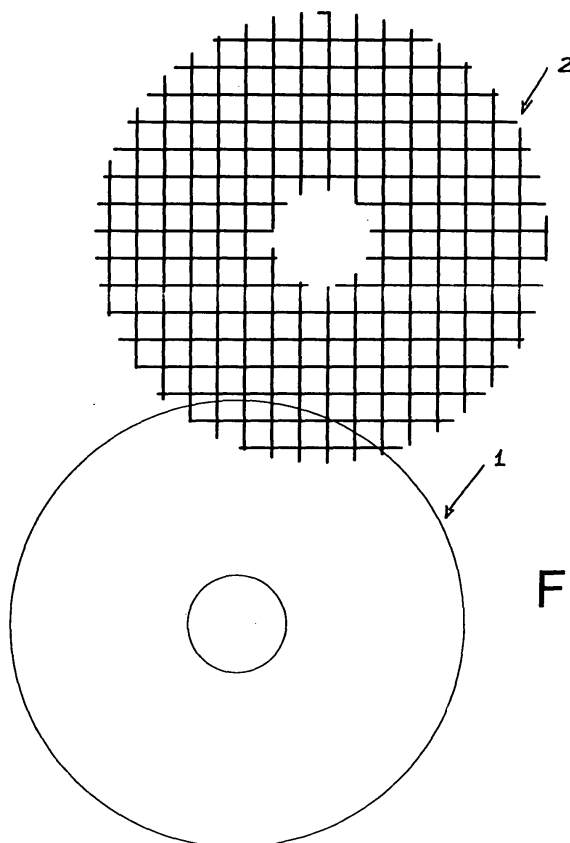
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(71) Applicant: **TAF Abrasivi S.P.A.**  
**20052 Monza (MI) (IT)**

(54) **Method for making abrasive discs and the abrasive discs made thereby**

(57) The present invention relates to a method for making abrasive discs, comprising the steps of coupling a vulcanized fiber or fiber paperboard or paperboard supporting layer (1) to a further layer (2) having at least a glass fiber net, hot pressing, in a pressing mold, the two

coupled layers, thereby forming a central bulged portion (4), fixing a central ring nut (5), spreading on the concave face a binding resin, applying fabric blade elements (11) coated by an abrading material and pressing the assembly in a heated oven.



**FIG. 1**

## Description

### BACKGROUND OF THE INVENTION

[0001] The present invention relates to a method for making abrading or abrasive discs, and the abrasive disc made thereby.

[0002] As is known, lamellar or blade-like abrasive discs are generally made by molding a plastics material, such as nylon, polycarbonate and the like, or said abrasive discs are made starting from a fiberglass material, by using fiberglass net layers, impregnated or embedded with synthetic resins, and then pressed and polymerized or cross-linked.

[0003] Other prior methods provide to make the supporting construction starting from a metal, such as stainless steel, aluminium and the like.

[0004] Thus, all the above prior abrasive discs are made starting from a single type of supporting element which must be constructed so as to resist against mechanical efforts applied as the abrasive discs are used, thereby it is necessary to provide complex sized arrangement, and to make specifically designed template, to resist against the generated efforts or stress.

[0005] It should be apparent that the above prior methods and constructions would involve a very high operating cost, negatively affecting the cost of the finished abrasive disc product.

### SUMMARY OF THE INVENTION

[0006] Accordingly, the aim of the present invention is to overcome the above mentioned drawbacks, by providing a method for making abrading or abrasive discs, allowing to easily provide constructionally very simple abrasive discs and, in which, they are achieved as individual finished products, of a comparatively low cost.

[0007] Within the scope of the above mentioned aim, a main object of the invention is to provide such a method allowing to make abrasive discs which, while being greatly resistant from a mere mechanic standpoint, also have a small weight, and can be used in a very safe and efficient manner.

[0008] Another object of the present invention is to provide a method for making abrasive discs, and the related made abrasive discs, which, owing to their specifically designed constructional features, are very reliable and safe in operation.

[0009] Another object of the present invention is to provide abrasive discs which can be easily constructed and which, moreover, are very competitive from a maintenance, servicing and operating standpoint.

[0010] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a method for making abrasive discs, characterized in that said method comprises the steps of coupling a vulcanized or cured fiber, or fiber pa-

perboard material, or a paperboard material supporting layer, to a further layer including at least a fiberglass net, hot pressing, in a hot pressing mold, the two coupled layers to form a central bulged portion, and fixing a central ring-nut, spreading on the concave face a coupling or binding resin, applying fabric material blade elements coated by an abrasive material, and further pressing in a heated pressing oven.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of a method for making abrasive discs, according to the invention, which is illustrated, by an indicative and not limitative example, in the accompanying drawings, where:

Figure 1 is a schematic exploded view showing the supporting layer and fiberglass net arrangement; Figure 2 is a further exploded view showing the supporting layer and fiberglass material, as seen in elevation;

Figure 3 shows the coupling of a fiberglass layer and a supporting layer;

Figure 4 is a side elevation view showing the obtained coupling;

Figure 5 is a front view showing the forming of the supporting layer and fiberglass layer, as coupled to one another, and seen in plan;

Figure 6 is an elevation view showing a contoured coupled or laminated arrangement;

Figure 7 shows the laminated arrangement as seen from its convex face;

Figure 8 is a cross-sectional view showing the laminated or coupled arrangement;

Figure 9 shows an applying step for applying a binding resin layer;

Figure 10 shows a further operating step for initially partially applying fabric material blade elements, as coated by an abrasive material;

Figure 11 shows the laminated construction and the abrasive fabric material blade elements coupled thereto; and

Figure 12 is a schematic cross-sectional view showing an end pressing step, for pressing the laminated construction in a heated pressing oven.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

[0012] With reference to the number references of the above mentioned figures, the method for making abrasive discs, according to the invention, provides the step of coupling a supporting layer 1 to a fiberglass net layer, generally indicated by the reference number 2.

[0013] The support layer 1 is advantageously made starting from a vulcanized or cured fiber material, or a

fibrized paperboard material, or a simple paperboard material, made starting from a regenerated paper material, and with a thickness varying from 0.8 to 3 mm.

[0014] More specifically, said support or supporting layer can be advantageously impregnated or embedded with synthetic resins or animal glue materials.

[0015] The fiberglass layer 2 is made of a fiberglass net construction, having a weight varying from 200 to 500 g/m<sup>2</sup>.

[0016] The layer 2 can be impregnated by phenolic resins, Novolac, epoxydic resins, polyurethane resins or other like synthetic resins.

[0017] The thus obtained laminated construction, generally indicated by the reference number 3, is made by molding operation in a mold designed for binding or coupling the layer 1 and layer 2 through a combined use of pressure and at a temperature of about 100-130°C.

[0018] In this laminating or coupling step, performed by a pressing operation, in the central portion a bulging or bulged portion is obtained, generally indicated by the reference number 4, where a central hole for receiving a ring nut 5 anchored to the laminated construction is formed.

[0019] After having made the laminated construction 3, is applied a binding or coupling resin, including preferably a single component epoxydic resin material.

[0020] More specifically, said resin is applied by a spreading operation, thereby providing circular region 10 affecting the concave surface or face, where fabric blade elements 11, coated by an abrasive material, are applied.

[0021] The thus made assembly is pressed, and the made disc elements are in turn pressed and conveyed, as supported on a rod element 15, to a heated oven, which is heated to a temperature from 110°C to 130°C.

[0022] The disc elements are held in the oven 11 from about one to three hours, thereby causing the resin materials used for making the abrasive discs to be perfectly cured or polymerized.

[0023] According to a different embodiment of the method, it is possible to provide a supporting layer, of the above disclosed type, derived from a web or strip material, and a fiberglass layer, also obtained from a web or strip material, which are coupled to one another by causing them to pass through a calander, including calandering heated rollers, at a temperature from 100°C to 120°C; and, after having been subjected to a heating and cooling step, said coupled or laminated layer being rolled on.

[0024] The thus made web is cut through to provide desired diameter disc elements.

[0025] Then, by causing said disc element to pass through a hot pressing apparatus, heated to about 100°C, the desired depressed center shape is achieved, to connect with the central metal ring nut element.

[0026] The thus obtained disc product has a very small cost.

[0027] In particular, the product made by the first making method can be produced in a single making line, start-

ing from component elements to fully achieve a finished abrading disc.

[0028] The above disclosed method allows to eliminate the comparatively long and complex operations of the prior art, thereby allowing to achieve a saving of 30% with respect to conventional like products.

[0029] The invention, as disclosed, is susceptible to several modifications and variations, all of which will come within the inventive idea scope.

[0030] Moreover, all the constructional details can be replaced by other technically equivalent elements.

[0031] In practicing the invention, the used materials, provided that they are compatible to the intended application, as well as the contingent size and shapes, can be any, depending on requirements.

## Claims

1. A method for making abrasive discs, **characterized in that** said method comprises the steps of coupling a vulcanized or cured fiber, or fiber paperboard material, or a paperboard material supporting layer, to a further layer including at least a fiberglass net, hot pressing, in a hot pressing mold, the two coupled layers to form a central bulged portion, and fixing a central ring-nut, spreading on the concave face a coupling or binding resin, applying fabric material blade elements coated by an abrasive material, and further pressing in a heated pressing oven.
2. A method, according to claim 1, **characterized in that** said paperboard layer is made starting from a regenerated paper material, having a thickness varying from 0.8 to 3 mm.
3. A method, according to the preceding claims, **characterized in that** said support layer is impregnated by synthetic resins or animal glue materials.
4. A method, according to one or more of the preceding claims, **characterized in that** said fiberglass net has a weight variable from 200 to 500 g/m<sup>2</sup>.
5. A method, according to one or more of the preceding claims, **characterized in that** said fiberglass layer is impregnated by phenolic resins, Novolac resins, epoxydic resins, polyurethane resins, ureic resins and the like.
6. A method, according to one or more of the preceding claims, **characterized in that** said layers are coupled or laminated at a temperature from 100°C to 130°C.
7. A method, according to one or more of the preceding claims, **characterized in that** said binding or coupling resin is applied by spreading it in substantially

circular regions.

8. A method, according to one or more of the preceding claims, **characterized in that** the end pressing step is performed in a pressing heated oven, which is heated to a temperature from 110°C to 130°C. 5
9. A method, according to one or more of the preceding claims, **characterized in that**, in said heated oven, said disc elements are applied to a supporting rod. 10
10. A method, according to one or more of the preceding claims, **characterized in that** in a thermoforming end step, said disc elements are held in said heated oven for a period from 1 to 3 hours. 15
11. A method for making abrasive or abrading disc elements, **characterized in that** said method comprises the steps of coupling or laminating a vulcanized fiber or fibrized paperboard or paperboard support layer to a continuous layer with at least a fiberglass net, cutting through said laminated web according to disc-like shapes, hot pressing in a hot pressing mold said cut disc elements while forming a central bulged portion and clamping a central ring nut, spreading on the concave face a binding or coupling resins, applying fabric material blade elements coated by an abrasive material and further pressing in a heated pressing oven. 20 25 30
12. An abrasive disc, **characterized in that** said abrasive disc comprises a vulcanized fiber, or fibrized paperboard, or paperboard material support layer, coupled or laminated to at least a fiberglass net, and that said laminated or coupled layer is hot pressed while forming a central bulged portion and clamping a central ring nut element; on the concave face being applied by spreading a binding resin for binding fabric material blade elements, coated by an abrasive material. 35 40

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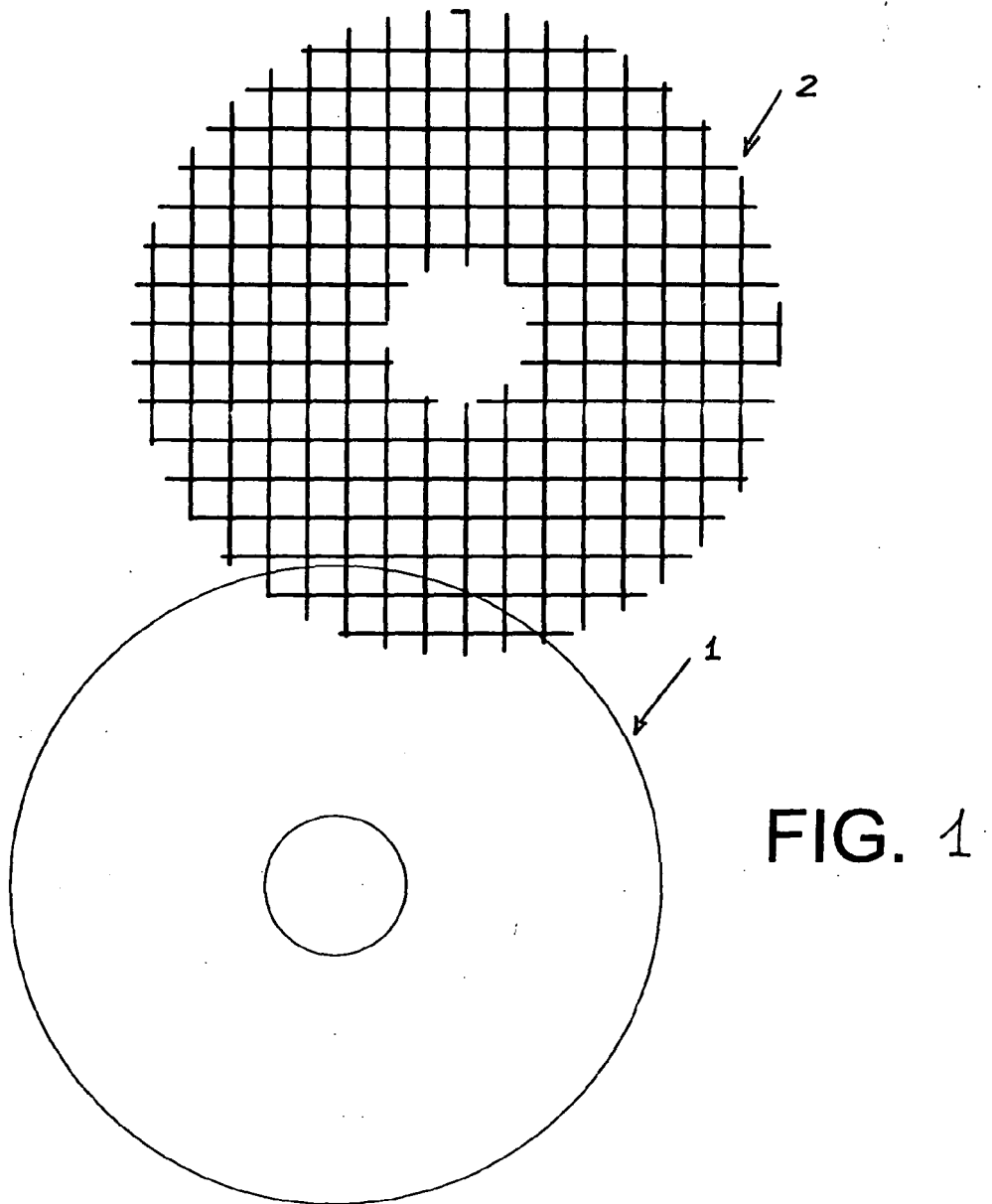
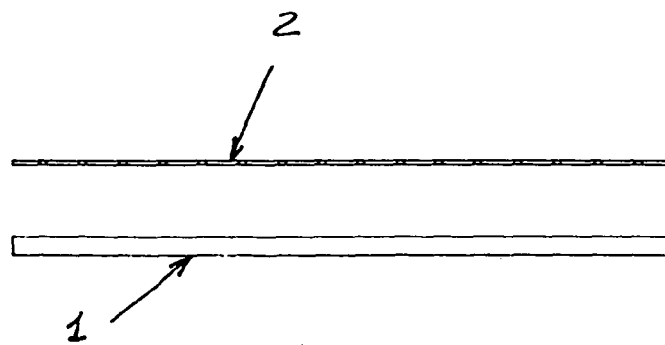
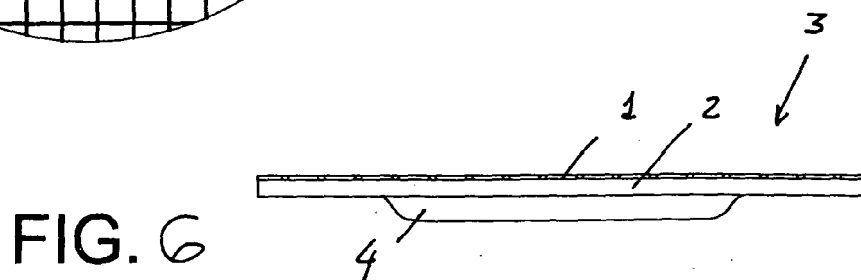
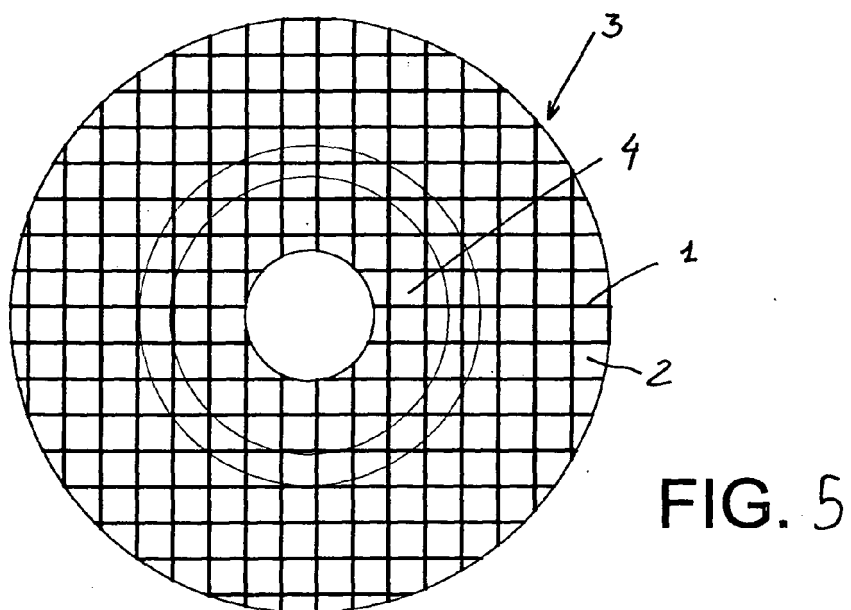
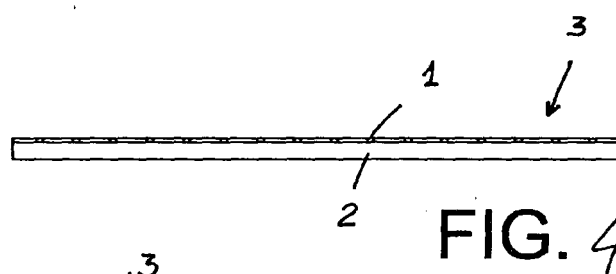
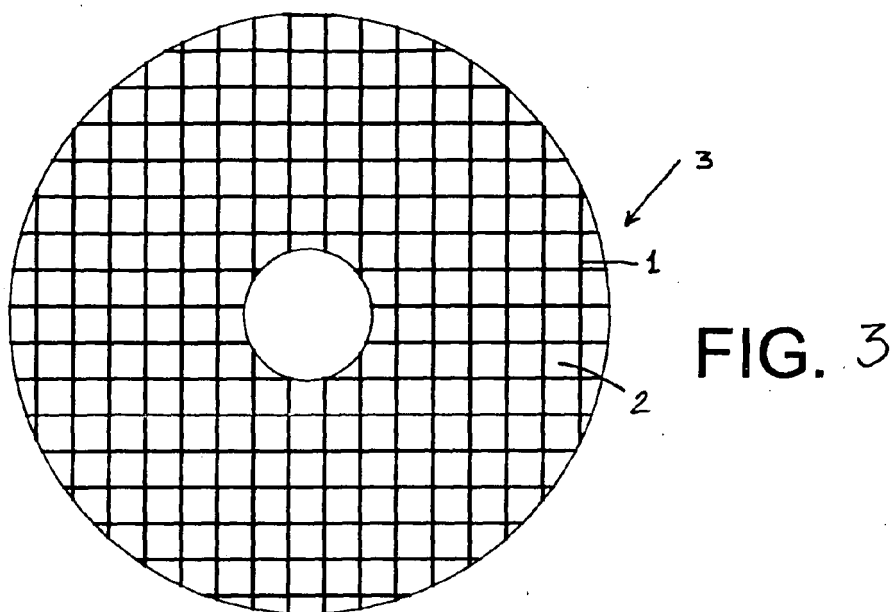


FIG. 2





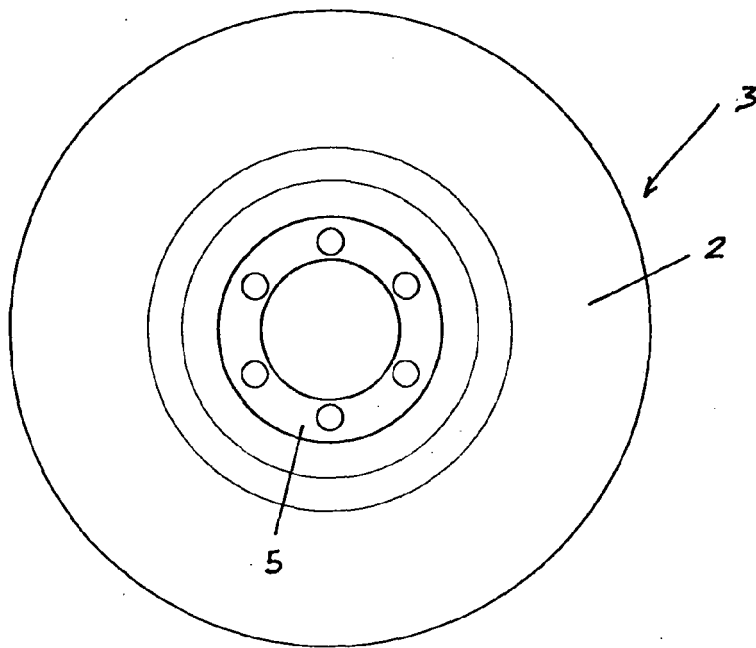


FIG. 7

FIG. 8

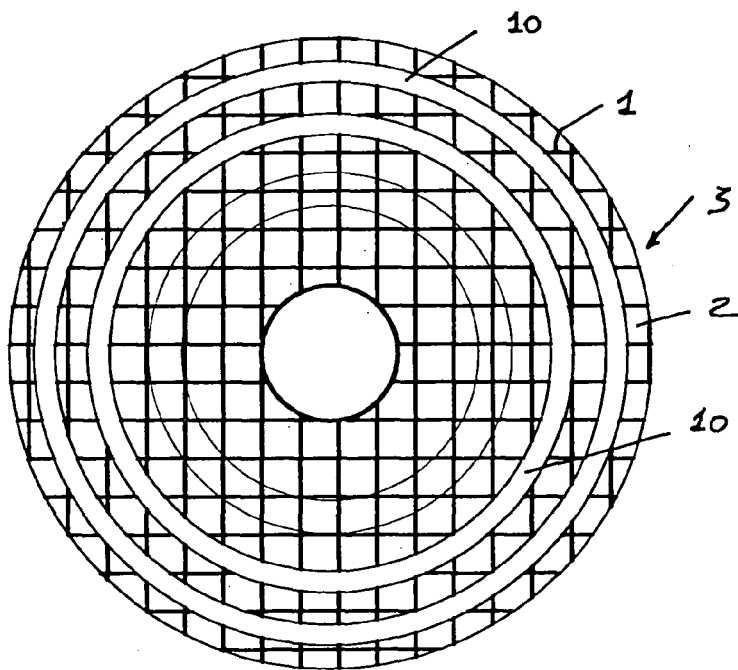
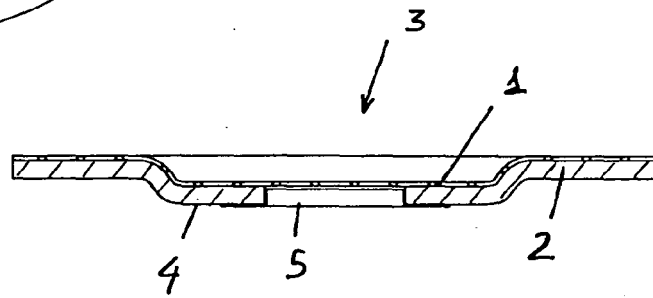


FIG. 9

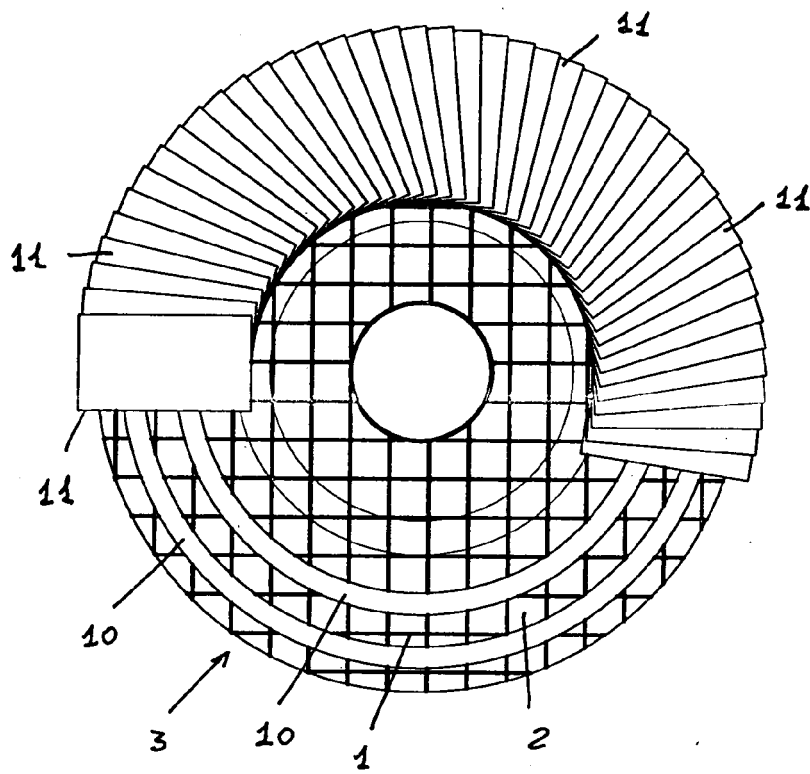


FIG. 10

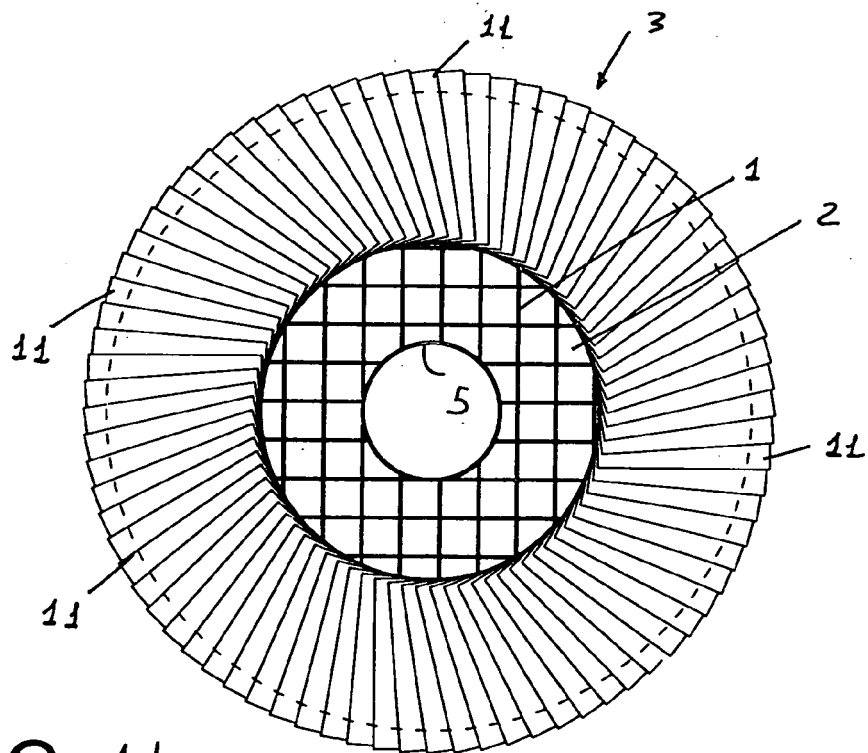


FIG. 11

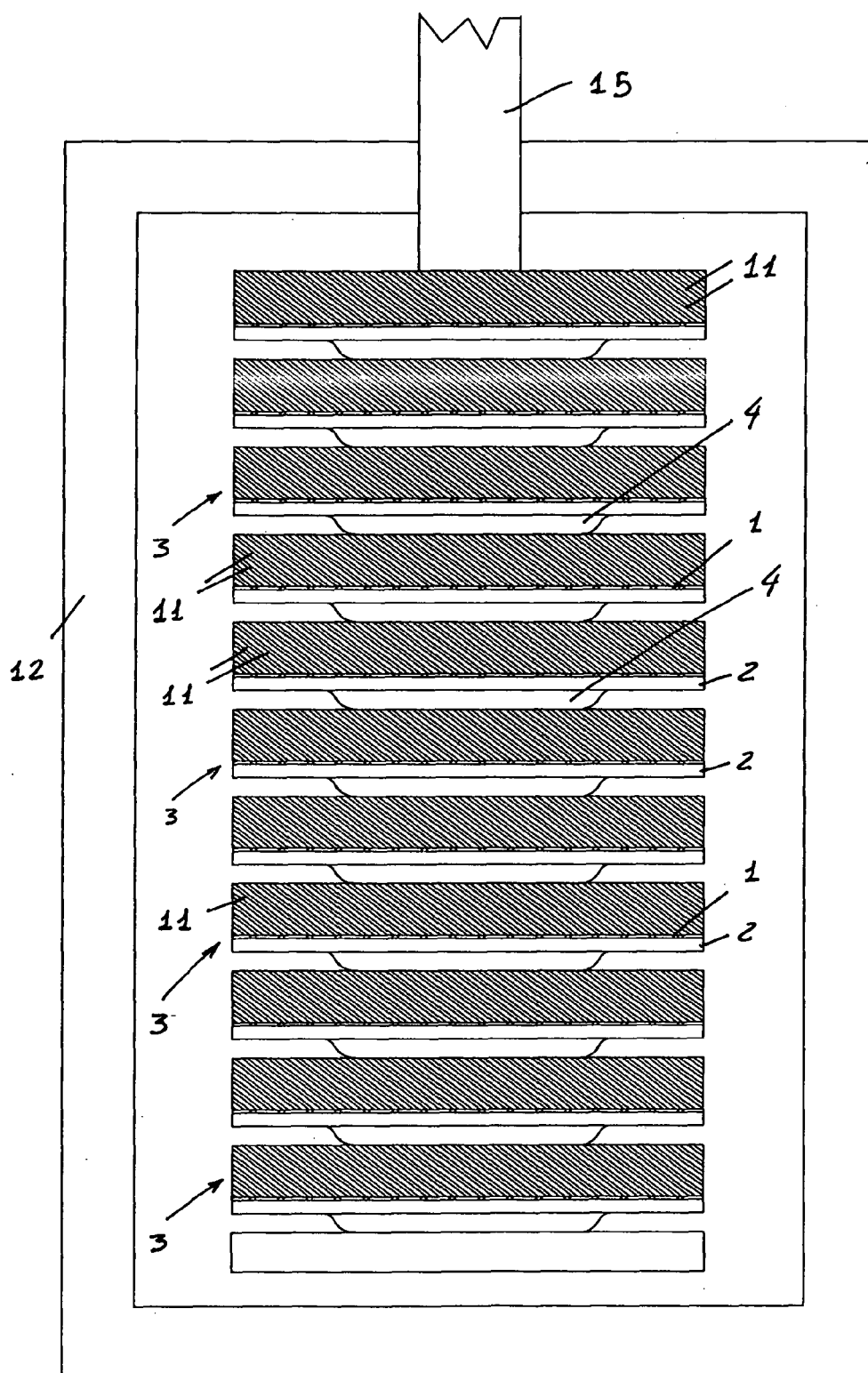


FIG. 12



European Patent  
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Application Number  
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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