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(54) Method of making products of precious meterials and wearable multicolor ornamental articles manufactured with such products

(57) A method of making a multicolor product (1, 11; 22, 23) with longitudinal development of precious material adapted to be used for manufacturing wearable ornamental articles such as armlets, necklaces, and the like is disclosed comprising the following steps: providing a coated wire (3) consisting of a central element (4, 17) of precious metal material covered by one or more external coaxial sheaths (5,18; 19), each of said sheaths being obtained by helical winding of a covering wire (5a) made of precious material of a different color relative to the color of the material of the central element (4, 17); manufacturing an unfinished product (7, 15, 21) with longitudinal development using the coated wire (3) on which one or more mechanical workings are carried out; removing material from one or more zones (10) of the unfinished product (7, 15, 21) for a depth sufficient to make visible one or more of the underlying materials of different colors constituting the sheaths of the coated wire (3).

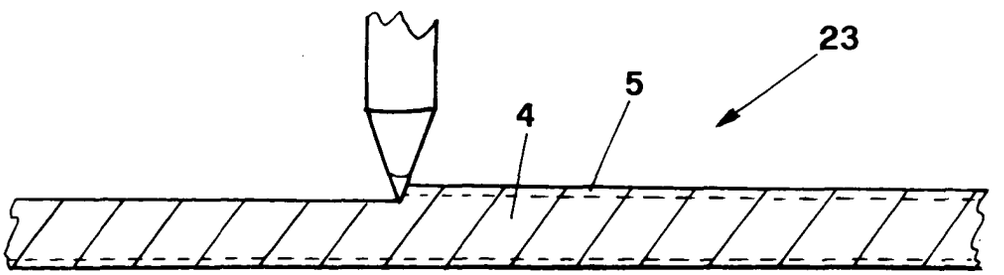

FIG.11

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Description

[0001] The present invention relates to a method of making a multicolor product with longitudinal development of precious material particularly adapted to be used for manufacturing wearable multicolor ornamental articles such as armlets, necklaces and the like.

[0002] Several techniques are known that are used in the jewelry field to make wearable ornamental articles such as armlets, necklaces and the like.

[0003] More particularly said techniques provide for making an unfinished product with continuous longitudinal development from which it is possible in some cases to make a plurality of rings that are linked together and, in other cases, a continuous strap which is spirally wound around a flexible core.

[0004] The recent fashion trends require that said ornamental articles have on the outer surface zones of different colors and/or material such as armlets with the opposite sides made of yellow gold and white gold respectively.

[0005] A first known technique to make such ornamental articles provides for covering some zones of the article with a galvanic deposition of precious metal such as gold, of a different color relative to the precious metal by which the article is made.

[0006] A first drawback of this technique consists in that the company manufacturing the product must have at disposal a suitable plant for galvanic treatment that involves installation and environment problems as it is well known by the persons skilled in this art.

[0007] Another drawback consists in that the introduction of the galvanic treatment within the product manufacturing cycle, involves an increase of the production times and an extension of the production time specially when the company outsources the galvanic treatment to specialized firms.

[0008] A further drawback of this technique consists in that by the galvanic process a thin layer of covering material is obtained that undergoes with time a wear process causing the underlying material to re-emerge with consequent deterioration of the ornamental features of the article.

[0009] In the particular case of ornamental articles consisting of the above mentioned covered flexible core, said drawbacks are solved by threading on the core a plurality of juxtaposed rings having surfaces of different colors to obtain the finished ornamental articles.

[0010] According to the prior art technique each ring is obtained cutting a multicolor tubular element obtained by shaping and coupling through weldings along the lateral edges, two or more blades of materials with different colors.

[0011] A drawback of such technique consists in that the operation of welding the blade edges requires high precision for positioning the blades and controlling the welding by which the blades are joined.

[0012] Another drawback consists in that the welded zones undergo mechanical stresses during the subsequent working stages, for instance the sectioning operation for cutting the tubular element, with possible failure of the weldings.

[0013] A further drawback consists of the long production time of the article, mainly due to the operation of threading the rings on the core.

[0014] The object of the present invention is to remove the above mentioned drawbacks by a method to obtain multicolor products for making wearable ornamental articles through mechanical workings comprising localized material removal.

[0015] Said objects are attained by a method of making a multicolor product with longitudinal development of precious material adapted to be used for manufacturing wearable ornamental articles such as armlets, necklaces, and the like, that according to the contents of the main claim, is characterized by comprising the following steps:

- providing a coated wire consisting of a central elemental of precious metal material covered by one or more coaxial outer sheaths, each of them being obtained by helical winding of a covering wire made of precious metal material of a different color relative to the color of the material of the central element;
- manufacturing an unfinished product with longitudinal development using at least one said coated wire on which one or more mechanical workings are carried out;
- removing material from one or more zones of said unfinished product for a depth sufficient to make visible one or more of said underlying materials of different colors constituting said one or more sheaths of said coated wire.

[0016] According to an embodiment, the manufacture of the unfinished product provides for cutting to size the coated wire to obtain a plurality of cut pieces which are closed in the form of a ring and linked together.

[0017] According to another embodiment, the manufacture of the unfinished product provides for rolling the coated wire to obtain a strap which is then spirally wound thus obtaining a tubular element which is subsequently shaped according to the form of a mold.

[0018] According to another embodiment inside the said tubular element and before the shaping operation of the mold, a flexible core also of precious material may be inserted.

[0019] According to a further embodiment the manufacture of the unfinished product provides for cutting to size the coated wire to obtain a single piece on which the material is removed.

[0020] Advantageously the method of the invention does not require use of galvanic processes.

[0021] Still advantageously the ornamental article of the invention has greater features of mechanical

strength and resistance to abrasion relative to the ornamental articles made by the methods of the prior art.

[0022] The foregoing objects and advantages will be better understood by reading the following description of the method of the invention with reference to the accompanying sheets of drawings in which:

- FIG. 1 shows schematically some of the workings of the method of the invention to obtain the unfinished product;
- FIG. 2 shows the step of removing material from the unfinished product of FIG. 1;
- FIG. 2a shows an enlarged detail of FIG. 2;
- FIG. 3 is an isometric view of the multicolor product obtained by the method of the invention;
- FIG. 4 is an isometric view of the unfinished product obtained through a variation of the method of the invention;
- FIG. 5 is a plane view of the unfinished product of FIG. 4 with the flexible core inserted;
- FIG. 6 is a sectional view taken along the plane V-V of FIG. 5;
- FIG. 7 shows the step of removing the material from the unfinished product of FIG. 6;
- FIG. 8 is an isometric view of the unfinished product of FIG. 5 after the material removing step;
- FIG. 9 is a cross sectional view of a constructional modification of the unfinished product of FIG. 5;
- FIG. 10 shows the step of removing the material from the unfinished product of FIG. 9; and
- FIG. 11 shows the step of removing the material from a cut piece of coated wire obtained according to another modification of the method of the invention.

[0023] The method of the invention is described with reference to FIGs. 1 to 3 to make a multicolor product generally indicated with 1 in FIG. 3.

[0024] In the specific case herein described, the multicolor product 1 is provided with a plurality of rings linked together and may be used for constructing wearable ornamental articles such as armlets and necklaces, after cutting to size and applying suitable closures at their ends.

[0025] The first step shown by block 2 of FIG. 1, provides for making a wire 3 consisting of a central element 4 coated by a sheath 5.

[0026] The sheath 5 is obtained by winding on the central element 4 a covering wire 5a with a helical development through a machine tool 2 of a kind known per se. In the present embodiment the central element 4 consists of a generally cylindrical wire, while the covering wire 5a consists of a strap.

[0027] It is however clear that in different embodiments the form of the central element and of the covering wire may be different.

[0028] The central element 4 is preferably made of precious metal material and the material of the sheath 5 is also a precious metal material with different color relative to the central element 4.

[0029] After winding of the covering wire 5a on the central element 4, whose mutual adhesion is preferably improved by welding or gluing, the single color wire 3 is obtained, whose color is defined by the color of the material of the outer sheath 5.

[0030] The subsequent step shown by the broken line block 6 of FIG. 1, consists in working the wire 3 to make the unfinished product 7 and provides for cutting to size the wire 3 to obtain a plurality of cut pieces 8 that are then closed as a ring and at the same time linked together to obtain said unfinished product 7.

[0031] Preferably but not necessarily the steps of cutting the wire 3, making the rings and linking them together are carried out by chain making machines of known type that are commonly used by goldsmiths.

[0032] The unfinished product 7 so obtained then undergoes a further working with diamond machine tools or equivalent devices such as brushing machines which, as shown in FIG. 2, provide for removing material at one or more zones of the surfaces of the unfinished product 7, said zones being generally indicated with 10, through a rotary tool 9 provided in the illustrated case, with a diamond tool 9a.

[0033] Removal of material occurs for a depth sufficient to make visible the central element 4 of a different color relative to the sheath 5 as shown in the detail of FIG. 2a.

[0034] It is clear that according to the depth by which the material is removed from the surface of the unfinished product 7, the width 10a of the band of different color visible on the finished multicolor product 1 will be varied.

[0035] After removal of the material the product 1 takes the desired multicolor outlook, particularly highlighted in FIG. 3, that will perform all its ornamental features on the armlet, necklace or any finished article that will be made thereby.

[0036] The multicolor product 1 shown in FIG. 3 just described is advantageously obtained by using only coated wire 3.

[0037] It is however clear that to obtain different ornamental features, the manufacture of the unfinished product may provide for using different coated wires or even non coated wires, combined together according to the manufacturers choice.

[0038] A constructional variation of the method of the invention is described with reference to FIGs. 4 to 8 for manufacturing a multicolor product of the wound type generally indicated with 11 in FIG. 8.

[0039] More particularly the wire 3 which is obtained through the same coating steps herein before described, is worked to obtain a strap 12 that in the described embodiment has a generally rectangular section.

[0040] It is to be noted that the strap section may also be of any shape.

[0041] The strap 12 is then wound to define a tubular element generally indicated with 13 consisting of a plurality of mutually juxtaposed spirals 13a.

[0042] Inside the tubular element 13 a flexible core 14 is inserted, shown in FIG. 5 and consisting for instance of a mesh of precious metal material or any continuous flexible element.

[0043] The flexible core 14 is inserted inside the tubular element 13 to give peculiar stiffness characteristics to the final article.

[0044] In constructional variations of the invention that are neither described nor illustrated, the step of inserting such a flexible core may also be omitted.

[0045] The tubular element 13 and the core 14 are then shaped by molding or other working process according to a profile that in the described embodiment and as shown in FIGs. 6 and 7 is of a rectangular shape.

[0046] Such a profile may however take different forms according to the customer taste and the market demand.

[0047] In such a way an unfinished product generally indicated with 15 is obtained, whose color corresponds to that of the outer sheath 5.

[0048] As shown in the cross sectional view of FIG. 6, the unfinished product 15 so obtained is constituted by the core 14 that may also be dispensed with, perimetrally covered by an edge of composite material formed by the central element 4 externally coated with the sheath 5 that at the inside covers the core 14.

[0049] On the outer surface of the unfinished product 15 the material removing process is carried out for a depth sufficient to cause the material of different color of the central element 4 to re-emerge.

[0050] The material removal as in the previously described case, is obtained through diamond machine tools with a rotary tool 16 provided with a diamond 16a, or through brushing machines allowing to obtain the desired product 11 shown in FIG. 8, in this case of two colors.

[0051] The two opposite surfaces 11a and 11b of the multicolor product 11 take different colors and the ornamental article obtained by said multicolor product 11 may be indifferently worn either with the surface 11a or the surface 11b facing to the outside.

[0052] In FIGs. 9 and 10 another constructional variation of the method of the invention is shown, which is different from the previously described method of FIGs. 4 to 8, only for the different configuration of the wire used for making the unfinished product.

[0053] More particularly the wire consists of a central element 17 coated by a couple of coaxial sheaths 18, 19 having different colors from each other and relative to the central element 17.

[0054] Proceeding in the already described way, the strap obtained from working the wire, is spirally wound thus obtaining a tubular element inside which the flexible core 20 is possibly inserted, defining for the unfinished product 21 the cross section shown in FIG. 9.

[0055] The material removing step from the outer surface of the unfinished product 21 allows to obtain the product 22 with several zones of different colors corresponding to the colors of the materials constituting the central element 17 and sheaths 18 and 19.

[0056] A further constructional variation of the method of the invention is shown in FIG. 11 where the unfinished product consists of a single piece 8 obtained by cutting to size the wire 3 as shown in FIG. 1.

[0057] On the outer surface of the unfinished product the material removing process is then carried out for a depth sufficient to cause the material of different color of the central element 4 to re-emerge to obtain the product 23 with two colors.

[0058] The removal of the material is obtained as in the preceding cases through diamond machine tools with a rotary tool provided with diamond or equivalent machines.

[0059] From the foregoing it is clear that the method of the invention attains all the intended and stated objects.

[0060] Additional variations neither described nor shown in the drawings may be made to the method of the invention in the constructional stage.

[0061] Such variations may for instance consist of a different number of sheaths forming the wire, a different shape of the multicolor product, or even a different combination of removal depth and zones where the removal is effected.

[0062] It is however to be understood that such additional variations either described or non described, when falling within the scope of the appended claims, are to be considered protected by the present patent.

Claims

1. A method of making a multicolor product (1; 11; 22, 23) with longitudinal development of precious material adapted to be used for manufacturing wearable ornamental articles such as armlets, necklaces and the like, **characterized in that** it comprises the following steps:

   - providing a coated wire (3) consisting of a central element (4, 17) of precious metallic material covered by one or more external coaxial sheaths (5, 18; 19), each sheath being obtained by helical winding of a covering wire (5a) made of precious material of a different color relative to the color of the material of the central element (4, 17);
   - manufacturing an unfinished product (7, 15, 21) with longitudinal development using at least one of said coated wires (3) on which one or more mechanical workings are carried out;
   - removing material from one or more zones (10) of said unfinished product (7, 15, 21) for a depth

sufficient to make visible one or more of said underlying materials of different colors constituting said one or more sheaths of said coated wire (3).

2. The method according to claim 1) **characterized in that** said manufacturing step of said unfinished product (7, 15, 21) provides for use of one or more of said coated wires (3) jointly with said non coated wire.

3. The method according to claim 1) **characterized in that** said manufacturing step of said unfinished product comprises the step of cutting to size said coated wire (3) to obtain a cut piece (8).

4. The method according to claim 1) **characterized in that** said manufacturing step of said unfinished product (7, 15, 21) comprises the following stages:

- cutting to size at least said coated wire (3) to obtain a plurality of cut pieces (8); and
- closing each of said cut pieces (8) to form a ring linking them together to obtain a chain (7).

5. The method according to claim 1) **characterized in that** said manufacturing step of said unfinished product (7, 15, 21) comprises the following stages:

- rolling said coated wire (3) to obtain a strap (12) with generally polygonal section;
- winding said strap (12) to define a tubular element (13) formed by a plurality of mutually juxtaposed spirals;
- shaping said tubular element (13) according to the form of a mold.

6. The method according to claim 5) **characterized in that** after said winding stage of said strap (12) and before said shaping stage of said tubular element (13), the operation of threading a flexible core (14, 20) into said tubular element (13) is carried out.

7. The method according to claim 1) **characterized in that** said material removing step consists in a milling operation with a rotary tool (9, 16) provided with a diamond (9a, 16a).

8. The method according to claim 1) **characterized in that** said material removing step consists in a brushing operation through a rotary tool.

9. An ornamental article made by using said multicolor product (1, 11, 22, 23) with longitudinal development obtained by the method according to claim 1), **characterized in that** it comprises one or more cut pieces of said multicolor product (1,11 22, 23) with longitudinal development, to be closed as a ring through closure elements to be mutually connected and arranged at the ends of said one or more cut pieces.

10. The ornamental article according to claim 9) **characterized in that** said multicolor product (1) is a chain of the gourmet type.

11. The ornamental article according to claim 9) **characterized in that** said multicolor product is a chain of the type with marine link.

12. The ornamental article according to claim 9) **characterized in that** said multicolor product (11, 22) is a wound string.

13. The ornamental article according to claim 9) **characterized in that** it consists of a necklace.

14. The ornamental article according to claim 9) **characterized in that** it consists of an armlet.

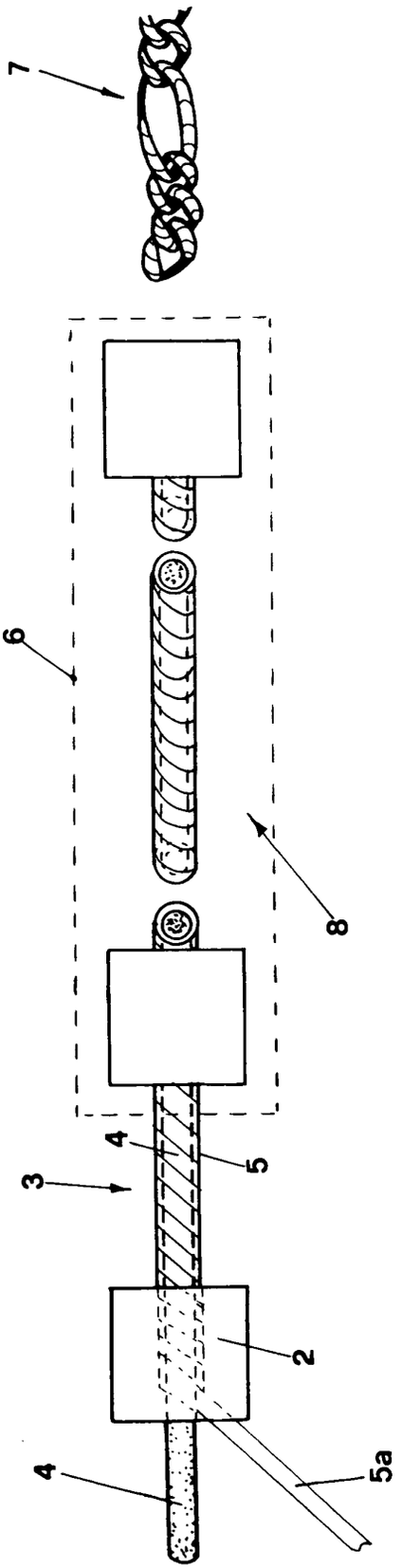

FIG.1

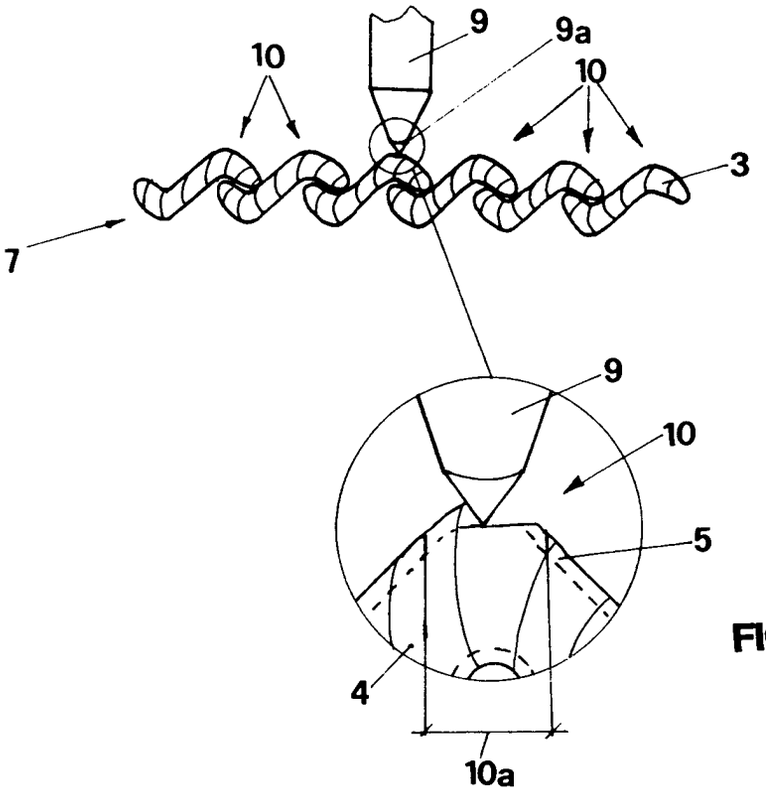

FIG.2

FIG.2 a

FIG.3

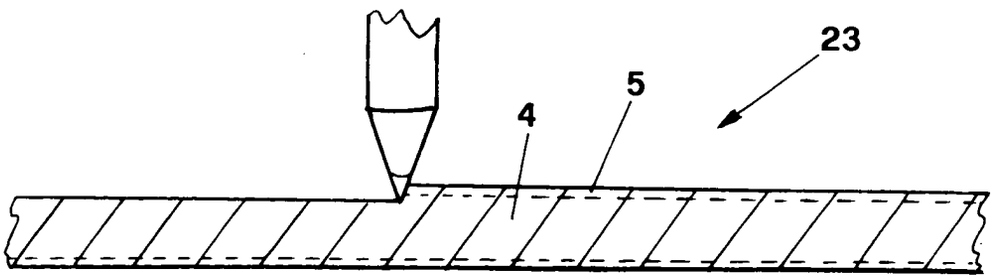

FIG.11

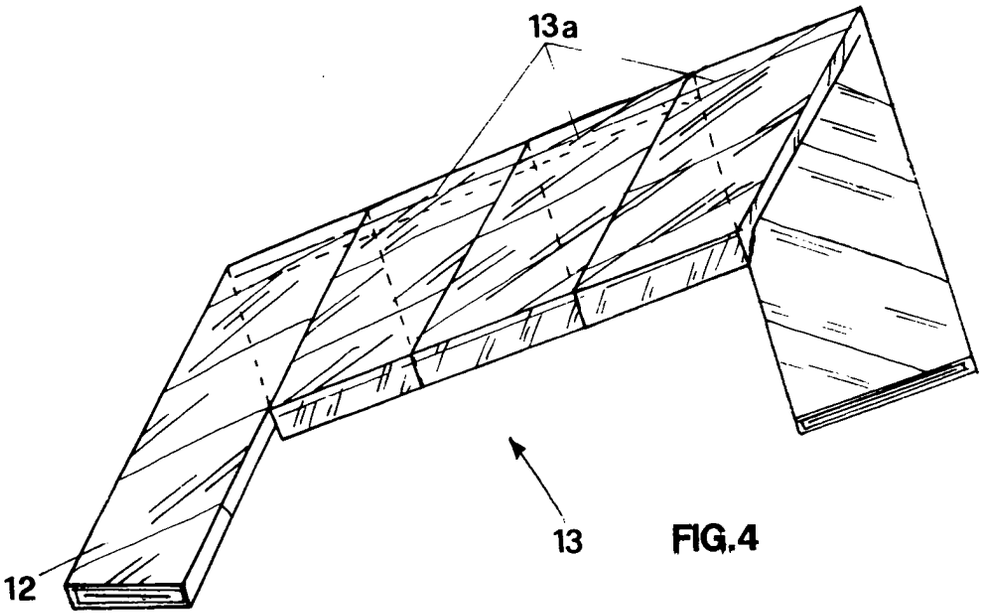

FIG.4

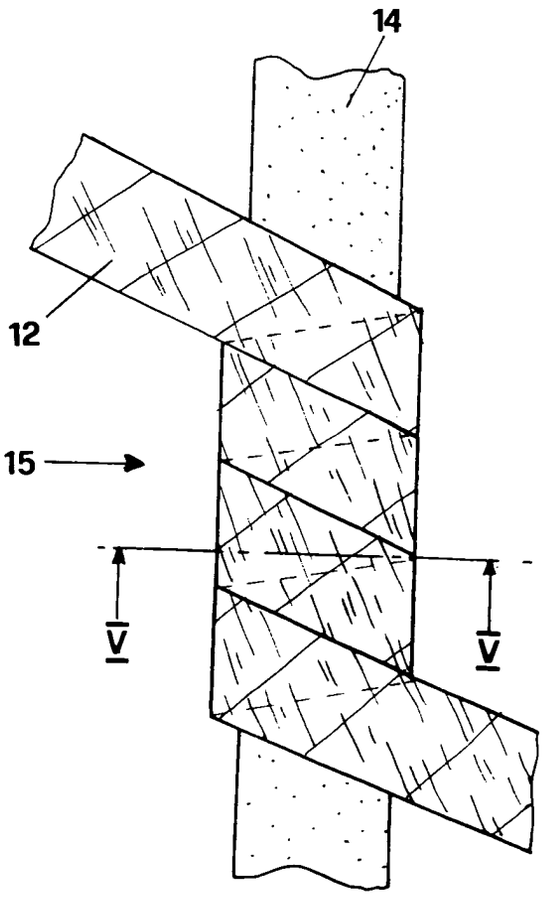

FIG.5

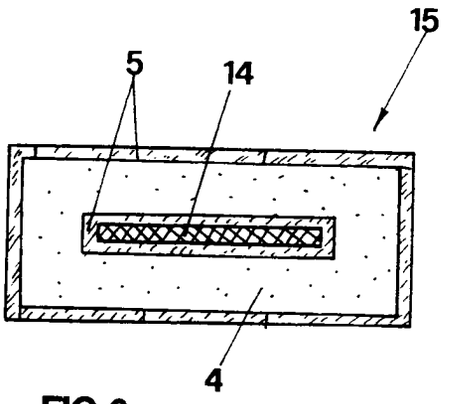

FIG.6

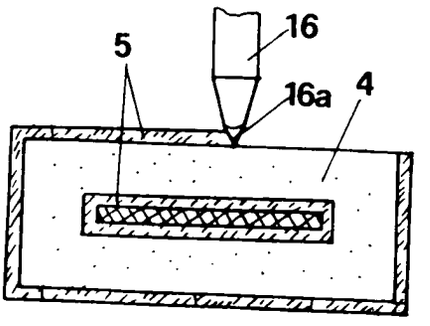

FIG.7

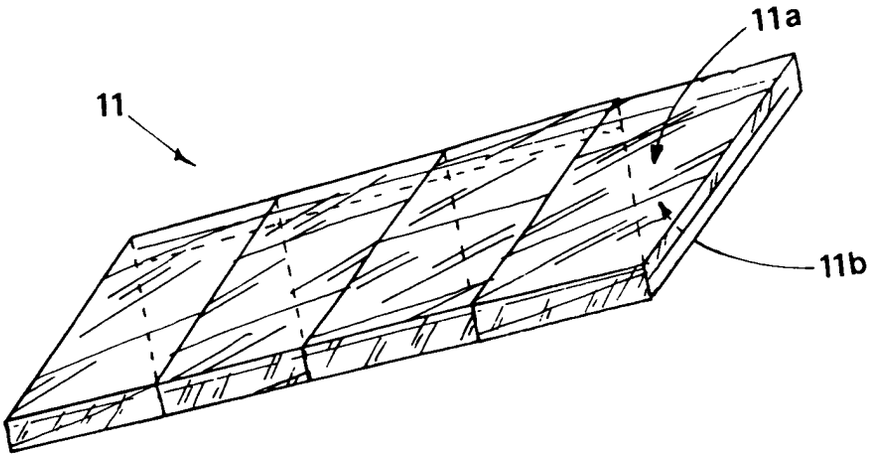

FIG.8

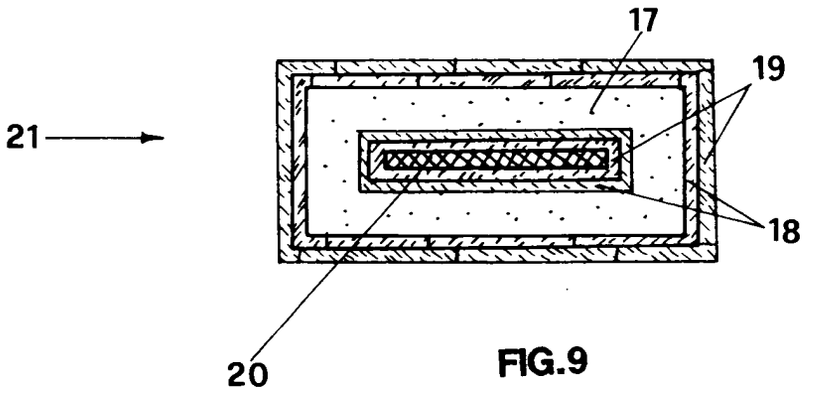

FIG.9

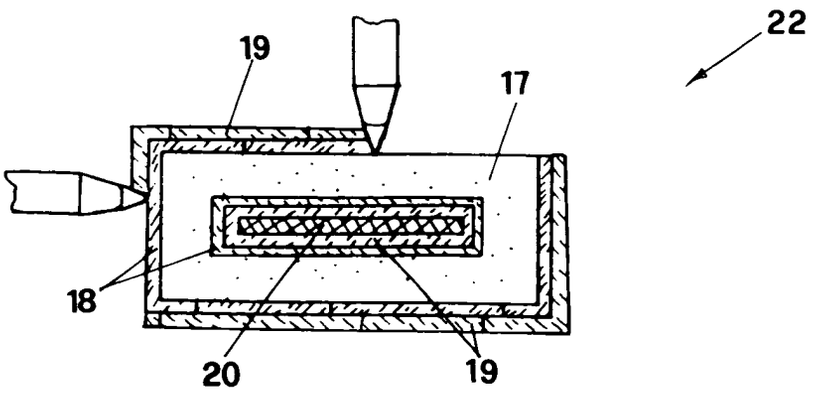

FIG.10