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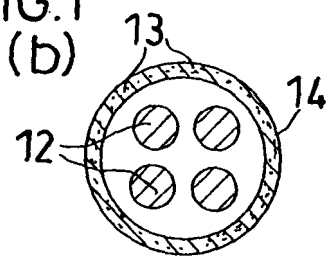
(54) **Brush material**

(57) A brush material (11) includes a resin brush bristle material (12a) that is composed of a bundle of plural resin brush bristles (12) each containing a coarse-grained abrasive (10) and having a circular or polygonal section, and a covering layer (14) that contains a powdered abrasive (13) and is provided on a surface of the resin brush bristle material.

FIG.1
(b)



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Description

BACKGROUND OF THE INVENTION

Field of the Invention:

[0001] The present invention relates to a brush material that can be used for polishing the surface of a workpiece or for polishing and grinding it for burring.

Description of the Related Art:

[0002] A conventionally known brush material that can be used for polishing the surface of a workpiece or for polishing and grinding it for burring is, for example, a brush material that includes as a core a plurality of synthetic fibers containing abrasive particles and as a covering a thin multifilament of synthetic fiber provided around the core (see JP-A SHO 63-318907).

[0003] However, in the case where the brush material including the covering of the thin multifilament of synthetic fiber is used for polishing the surface of a workpiece or for polishing and grinding it for burring, and used under severe conditions such as being brought into contact with the surface of the workpiece while being rotated at high speed, or being subjected to a strong pressing force, a burring effect or a polishing effect cannot be expected when a hard burr is formed on the surface or corner of the workpiece, and there is a need for improvement.

[0004] The present invention has been achieved to solve the above described problem, and has as an object to provide a brush material having wear resistance and durability so that a burring effect or a polishing effect can be expected even when a hard burr is formed on the surface or corner of a workpiece in the case where the brush material is used for polishing the surface of the workpiece or for polishing and grinding it for burring, and used under severe conditions such as being brought into contact with the surface of the workpiece while being rotated at high speed, or being subjected to a strong pressing force.

SUMMARY OF THE INVENTION

[0005] In order to achieve the object, the invention according to claim 1 provides a brush material including: a resin brush bristle material that is composed of a bundle of plural resin brush bristles each containing a coarse-grained abrasive and having a circular or polygonal section; and a covering layer that contains a powdered abrasive and is provided on a surface of the resin brush bristle material.

[0006] In the second aspect of the invention that includes the brush material of the first aspect, the covering layer has a resin coated thereon, a resin coat wound thereon in a spiral shape or a pipe member of thin resin film mounted thereon.

[0007] In the third aspect of the invention that includes the brush material of the first or second aspect, the coarse-grained abrasive has a grain size of F50 to F100, and the powdered abrasive has a grain size of #2,500 to #8,000.

[0008] According to the brush material of the present invention, the brush bristle material includes the covering layer provided on the surface of the resin brush bristle material that is composed of a bundle of plural brush bristles. Thus, the brush material has wear resistance and durability, and the burring effect or polishing effect can be expected even when a hard burr is formed on the surface or corner of a workpiece in the case where the brush material is used under severe conditions such as being brought into contact with the surface of the workpiece while being rotated at high speed, or being subjected to a strong pressing force.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1(a) is a schematic perspective view of a brush material of Embodiment 1 according to the present invention, and FIG. 1(b) is an enlarged sectional view of the brush material taken along line Ib-Ib in FIG. 1 (a) .

[0010] FIG. 2(a) is a schematic perspective view of a brush material of Embodiment 2 according to the present invention, and FIG. 2(b) is an enlarged sectional view of the brush material taken along line IIb-IIb in FIG. 2(a).

[0011] FIG. 3(a) is a schematic perspective view of a brush material of Embodiment 3 according to the present invention, and FIG. 3(b) is an enlarged sectional view of the brush material taken along line IIIb-IIIb in FIG. 3(a).

[0012] FIG. 4 (a) is a schematic perspective view of a brush material of Embodiment 4 according to the present invention, and FIG. 4(b) is an enlarged sectional view of the brush material taken along line IVb-IVb in FIG. 4 (a) .

[0013] FIG. 5 (a) is a schematic perspective view of a brush material of Embodiment 5 according to the present invention, and FIG. 5(b) is an enlarged sectional view of the brush material taken along line Vb-Vb in FIG. 5 (a).

[0014] FIGS. 6(a), 6(b) and 6(c) are schematic perspective views of resin brush bristles having circular, triangular and quadrangular sections, respectively, used in Embodiments 1 to 5 according to the present invention.

[0015] FIG. 7 is a schematic view of examples of various sectional shapes of the resin brush bristle.

[0016] FIGS. 8(a) and 8(b) are schematic perspective views of other examples of resin brush bristles.

[0017] FIG. 9 is a schematic perspective view of another brush bristle material.

[0018] FIGS. 10(a) and 10(b) are schematic perspective views of examples of covering layers according to the present invention.

[0019] FIGS. 11(a) to 11(e) are schematic views of sectional shapes of other brush materials.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] Now, embodiments of the present invention will be described with reference to the drawings. In the drawings, like reference numerals denote like components.

[0021] FIG. 1(a) is a schematic perspective view of a brush material of Embodiment 1 according to the present invention, and FIG. 1(b) is an enlarged sectional view of the brush material taken along line Ib-Ib in FIG. 1(a).

[0022] In FIGS. 1 (a) and 1 (b), a brush material 11 includes a brush bristle material 12a that is composed of a bundle of four resin brush bristles 12 each containing a coarse-grained abrasive (at least one of the members selected from the group consisting of alumina, silicon carbide, cerium oxide and diamond) 10 and having a circular section, and a covering layer 14 of a resin coat that contains a powdered abrasive 13 and is provided on the surface of the brush bristle material 12a. The particle diameters or grain sizes of the coarse-grained abrasive 10 and the powdered abrasive 13 are specified by JIS R6001 (1998), and the coarse-grained abrasive 10 has a grain size of F50 to F100, and the powdered abrasive 13 has a grain size of #2,500 to #8,000.

[0023] FIG. 2 (a) is a schematic perspective view of a brush material of Embodiment 2 according to the present invention, and FIG. 2(b) is an enlarged sectional view of the brush material taken along line IIb-IIb in FIG. 2(a).

[0024] In FIG. 2, a brush material 21 includes a brush bristle material 22a that is composed of a bundle of four resin brush bristles 22 each containing a coarse-grained abrasive 10 and having a triangular section, and a covering layer 14 of a resin coat that contains a powdered abrasive 13 and is provided on the surface of the brush bristle material 22a.

[0025] FIG. 3(a) is a schematic perspective view of a brush material of Embodiment 3 according to the present invention, and FIG. 3(b) is an enlarged sectional view of the brush material taken along line IIIb-IIIb in FIG. 3 (a) .

[0026] In FIG. 3, a brush material 31 includes a brush bristle material 32a that is composed of a bundle of four resin brush bristles 32 each containing a coarse-grained abrasive 10 and having a quadrangular section, and a covering layer 14 of a resin coat that contains a powdered abrasive 13 and is provided on the surface of the brush bristle material 32a.

[0027] FIG. 4(a) is a schematic perspective view of a brush material of Embodiment 4 according to the present invention, and FIG. 4(b) is an enlarged sectional view of the brush material taken along line IVb-IVb in FIG. 4(a).

[0028] In FIG. 4, a brush material 41 includes a brush bristle material 42a that is composed of a bundle of three resin brush bristles each containing a coarse-grained abrasive 10, one resin brush bristle 12 having a circular section, another resin brush bristle 22 having a triangular section and the remaining one resin brush bristle 32 having a quadrangular section, and a covering layer 14 of a resin coat that contains a powdered abrasive 13 and is provided on the surface of the brush bristle material 42a.

[0029] FIG. 5(a) is a schematic perspective view of a brush material of Embodiment 5 according to the present invention, and FIG. 5(b) is an enlarged sectional view of the brush material taken along line Vb-Vb FIG. 5(a).

[0030] In FIG. 5, a brush material 51 includes a brush bristle material 54 that is composed of a bundle of plural resin brush bristles containing a coarse-grained abrasive 10 and consisting of one center resin brush bristle 52 having a circular section and a large diameter and a plurality of (twelve in FIG. 5) resin brush bristles 53 each having a circular section and a small diameter placed around the center resin brush bristle 52, and a covering layer 14 of a resin coat that contains an abrasive 13 and is provided on the surface of the brush bristle material 54.

[0031] The covering layer 14 is formed of a resin coat containing as the powdered abrasive 13 at least one member selected from the group consisting of alumina, silicon carbide, cerium oxide and diamond. When the resin coat contains plural members as the powdered abrasive 13, it contains 1 to 10% by weight of diamond and 90 to 99% by weight of other members.

[0032] The covering layer 14 may contain aromatic powder or deodorant powder together with the powdered abrasive 13. The aromatic powder or deodorant powder contained together with the powdered abrasive can give an aromatic property or a deodorant property to the brush bristle material 12a during polishing of a workpiece.

[0033] FIGS. 6(a), 6(b) and 6(c) show the resin brush bristles 12, 22 and 32, respectively, each containing the coarse-grained abrasive (at least one member selected from the group consisting of alumina, silicon carbide, cerium oxide and diamond) 10 having a grain size of F50 to F100. FIG. 6(a) shows the resin brush bristle 12 having a circular section, FIG. 6(b) shows the resin brush bristle 22 having a triangular section, and FIG. 6(c) shows the resin brush bristle 32 having a quadrangular section.

[0034] FIG. 7 is a schematic view of examples of various sectional shapes of the resin brush bristle. The resin brush bristles 12, 22 and 32 shown in Embodiments 1 to 4 have the circular, triangular and quadrangular (square) sections. Besides, the resin brush bristle may have a section of a polygonal shape, such as a hexagonal shape 33 or an octagonal shape 34, an oval shape 35, a cross shape 36, a shape of glasses like a gourd 37, a shape of a four-leaved clover 38 (or a shape of a three-leaved clover not shown) or a rectangular shape 39.

[0035] The resin brush bristles 12, 22 and 32 are linear members. Instead, a twisted resin brush bristle 22c as shown in FIG. 8(a), or a finely corrugated resin brush bristle 22d as shown in FIG. 8(b) may be used.

[0036] When two or more resin brush bristles 12, 22 or 32 are bound to form a brush bristle material, the plurality of resin brush bristles 12 having various line shapes may be bound as they are to form a brush bristle material, or a plurality of (three in FIG. 9) resin brush bristles 12 having various line shapes may be woven to form a brush bristle material 60 as shown in FIG. 9.

[0037] The covering layer 14 can be formed by coating resin, but a covering layer 14a may be formed by winding a resin coat in a spiral shape as shown in FIG. 10(a), or a covering layer 14b may be formed by mounting a pipe member of thin resin film as shown in FIG. 10(b).

[0038] FIGS. 11(a) to 11(e) are schematic views of sectional shapes of other brush materials. The covering layer 14 of each of the shown brush materials 11, 21, 31, 41 and 51 in Embodiments 1 to 5 has a section of a circular ring shape, but the covering layer of the brush material may be formed to have a section of a quadrangular ring shape 61 with a circular hole as shown in FIG. 11(a), a triangular ring shape 62 as shown in FIG. 11(b), a hexagonal ring shape 63 as shown in FIG. 11 (c) , an octagonal ring shape 64 as shown in FIG. 11 (d), or an oval ring shape 65 as shown in FIG. 11(e).

[0039] The present invention is not limited to the embodiments described above, but may be implemented in any manner without changing the configuration described in appended claims. For example, three or four resin brush bristles are provided inside the covering layer in Embodiments 1 to 5, but other plural number of resin brush bristles may be provided.

Claims

1. A brush material comprising:

a resin brush bristle material that is composed of a bundle of plural resin brush bristles each containing a coarse-grained abrasive and having a circular or polygonal section; and
a covering layer that contains a powdered abrasive and is provided on a surface of the resin brush bristle material.

2. The brush material according to claim 1, wherein the covering layer has a resin coated thereon, a resin coat wound thereon in a spiral shape or a pipe member of thin resin film mounted thereon.

3. The brush material according to claim 1 or 2, wherein the coarse-grained abrasive has a grain size of F50 to F100, and the powdered abrasive has a grain size of #2,500 to #8,000.

FIG.1 (a)

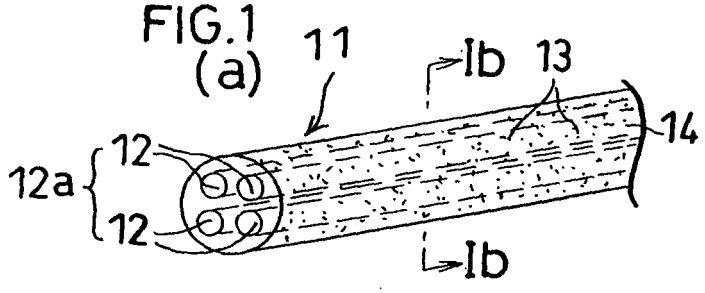


FIG.1 (b)

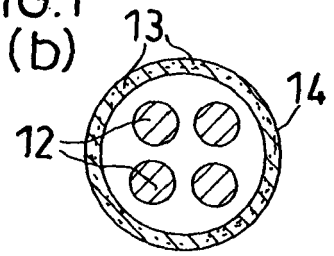


FIG.2 (a)

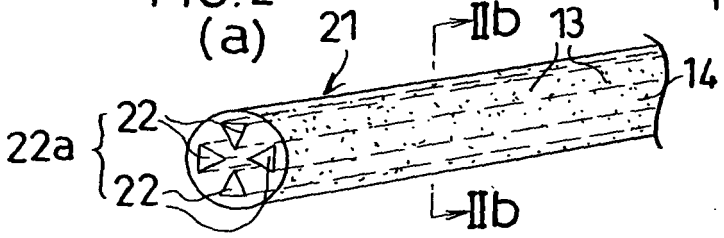


FIG.2 (b)

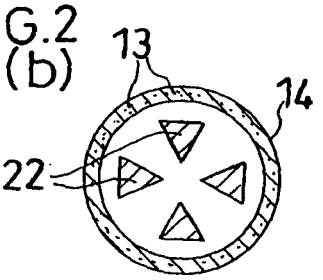


FIG.3 (a)

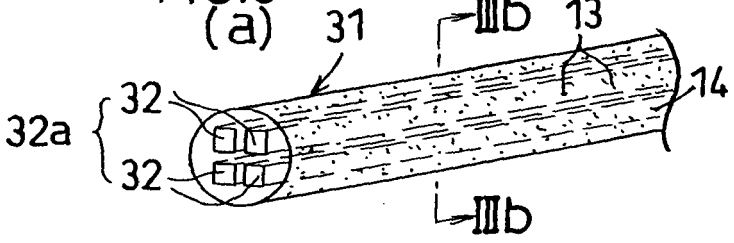


FIG.3 (b)

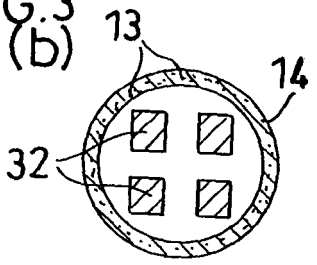


FIG.4 (a)

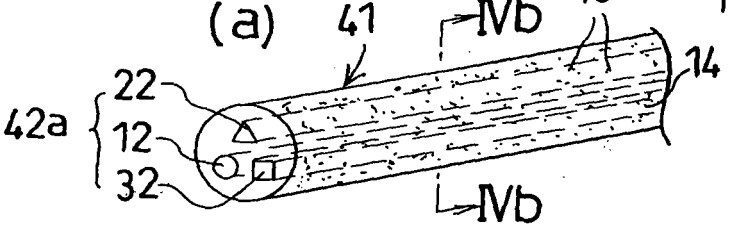


FIG.4 (b)

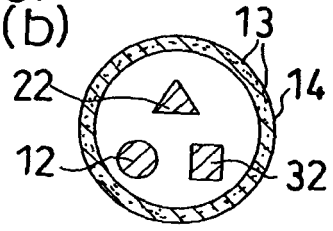


FIG.5 (a)

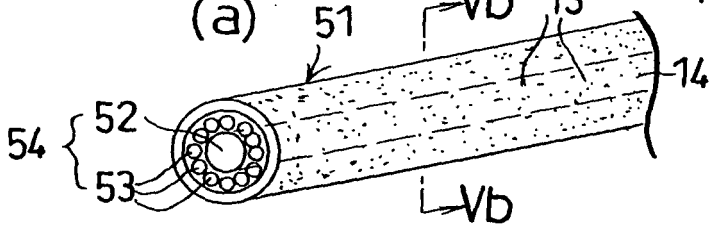


FIG.5 (b)

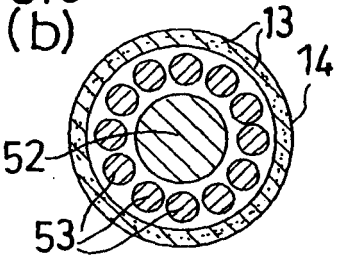


FIG.6 (a)

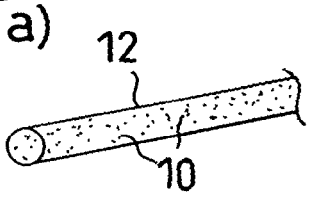


FIG.6 (b)

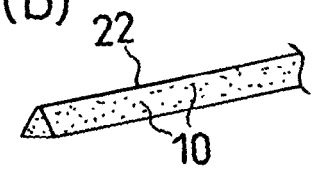


FIG.6 (c)

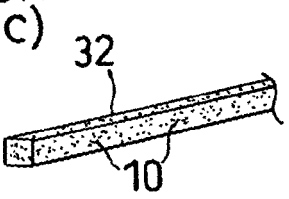


FIG.7

FIG.8(a)

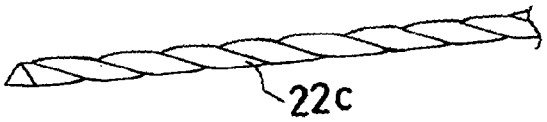


FIG.8(b)

FIG.9

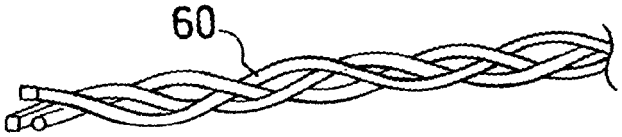


FIG.10(a)

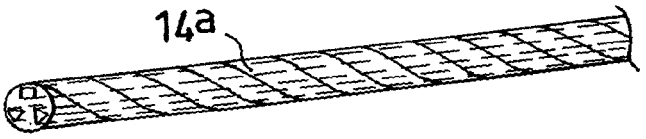


FIG.10(b)

FIG.11 (a)

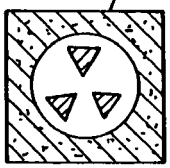


FIG.11 (b)

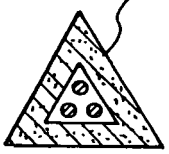


FIG.11 (c)

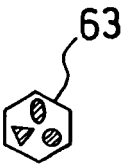


FIG.11 (d)

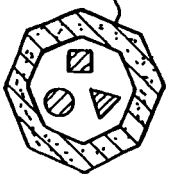
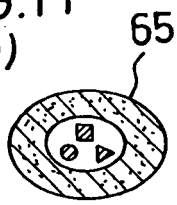


FIG.11 (e)



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EUROPEAN SEARCH REPORT

Application Number
EP 07 25 4106

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 5 491 025 A (PIHL RICHARD M [US] ET AL) 13 February 1996 (1996-02-13) * column 10, lines 11-17; claim 1; figure 3 *	1-3	INV. B24D13/10 B24D13/14
A	FR 2 624 773 A (COUSIN FRERES SA [FR]) 23 June 1989 (1989-06-23) * abstract; figure 1 *	1-3	
A	US 3 577 839 A (CHARVAT VERNON K ET AL) 11 May 1971 (1971-05-11) * column 5, lines 39-49; figures 2,3 *	1-3	
A	JP 08 168968 A (HOTANI KK) 2 July 1996 (1996-07-02) * abstract; figures 1,2 *	1-3	
			TECHNICAL FIELDS SEARCHED (IPC)
			B24D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 February 2008	Zeckau, Jochen

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 25 4106

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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25-02-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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