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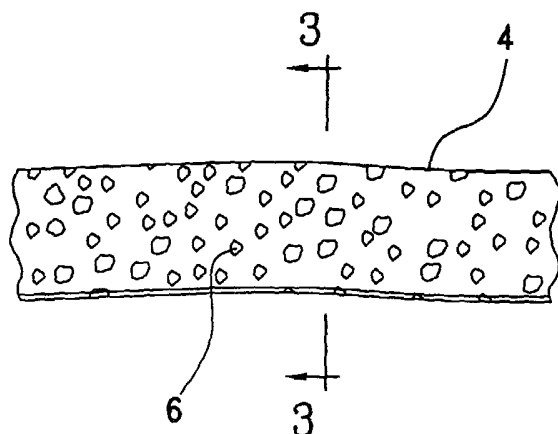
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(54) Title: DENTAL FLOSS WITH ABRASIVES



(57) Abstract: A dental floss (2) comprises a plurality of polyamide monofilaments (4) joined together to form a strand (5). A plurality of abrasive particles (6) integrated into each monofilament (4).



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DENTAL FLOSS WITH ABRASIVES

FIELD OF THE INVENTION

The present invention is directed to a dental floss containing abrasive particles for removing plaque, tooth stain and food debris between teeth.

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OBJECTS AND SUMMARY OF THE INVENTION

It is an object of the present invention to provide a dental floss containing abrasive particles for removing plaque, tooth stain and food debris between teeth.

In summary, the present invention is directed to a dental
15 floss comprising a plurality of polyamide monofilaments joined together to form a strand; and a plurality of abrasive particles integrated into each monofilament.

The present invention also provides a method for making dental floss, comprising:

a) mixing a polyamide resin with abrasive particles wherein the particles comprise about 2%-10% by weight of the mixture;

b) extruding the mixture to form a filament of about
5 0.002"-0.004" in diameter; and

c) joining a plurality of the filaments to form the dental floss.

This and other objects of the present invention will become apparent from the following detailed description.

10

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic perspective view of a dental floss made in accordance with the present invention.

Figure 2 is an enlarged schematic side elevational view of
15 a monofilament used to make the dental floss of Figure 1.

Figure 3 is a cross-sectional view taken along line 3-3 of Figure 2.

DETAILED DESCRIPTION OF THE INVENTION

A dental floss made in accordance with the present
20 invention for removing tooth stain is disclosed in Figure 1. The dental floss 2 is made from a plurality of monofilaments 4 joined together by conventional means to form a strand 5 of much larger cross-sectional area. The monofilaments 4 are preferably made of nylon, and includes abrasive particles 6 integrated into
25 the monofilament, as best shown in Figures 2 and 3. The

abrasive particles 6 are preferably made of aluminum oxide; however, other abrasive or polishing particles may be used. White aluminum oxide is a type of abrasive well known in the abrasive industry. The abrasive particles are advantageously
5 integrated into the filament during manufacture of the filament by mixing the resin with the particles prior to the extrusion process. The dental floss 2 may be round or flat in cross-section.

As an example, Nylon 612 resin is mixed with aluminum oxide
10 particles with average particle size of 10 microns, with a range of 4-27 microns. The abrasive particles preferably make up about 2%-10% by weight of the total mixture. The mixture is then extruded in a conventional way to form a monofilament, 0.002"-0.004" in diameter. It should be understood that some of
15 the abrasive particles will be disposed near the surface of the monofilament after extrusion and, thereby be exposed, as generally depicted in Figure 2. A plurality of the monofilaments, approximately 50-500 fibers, are joined together in a conventional way, such as by weaving, pleating or twisting,
20 to make a strand of dental floss. Nylon 612, available from DuPont, is a polyamide with desirable characteristics for use in making industrial brushes, paint brushes, etc.

The dental floss is sized to be inserted between the teeth. The abrasive particles are preferably sized and added in the
25 preferred weight ratios to effectively remove plaque and food

particles from the surfaces of teeth while maintaining the high tensile strength of the filament.

While this invention has been described as having preferred design, it is understood that it is capable of further
5 modification, uses and/or adaptations following in general the principle of the invention and including such departures from the present disclosure as come within known or customary practice in the art to which the invention pertains, and as may be applied to the essential features set forth, and fall within
10 the scope of the invention or the limits of the appended claims.

I CLAIM:

1. A dental floss, comprising:
 - a) a plurality of polyamide monofilament joined
5 together to form a strand; and
 - b) a plurality of abrasive particles integrated into each monofilament.
2. A dental floss as in claim 1, wherein said abrasive particles include aluminum oxide.
- 10 3. A dental floss as in claim 1, wherein said abrasive particles include white aluminum oxide.
4. A dental floss as in claim 3, wherein said abrasive particles have sizes of about 4-27 microns.
5. A dental floss as in claim 1, wherein said abrasive
15 particles have average particle size of about 10 microns.
6. A dental floss as in claim 1, wherein said abrasive particles are about 2%-10% by weight.
7. A dental floss as in claim 1, wherein said monofilament is about 0.002"-0.004" in diameter.
- 20 8. A dental floss as in claim 1, wherein said monofilament is Nylon 612.
9. A dental floss, comprising:
 - a) a plurality of nylon monofilaments joined together to form a strand;
 - 25 b) a plurality of abrasive particles integrated into each monofilament during manufacture of said monofilament;

c) said abrasive particles comprise about 2%-10% by weight of each monofilament; and

d) said monofilament is about 0.002"-0.004" in diameter.

5 10. A dental floss as in claim 9, wherein said monofilament is nylon 612.

11. A dental floss as in claim 9, wherein particles have an average size of about 10 microns.

12. A method for making dental floss, comprising:

10 a) mixing a polyamide resin with abrasive particles wherein the particles comprise about 2%-10% by weight of the mixture;

b) extruding the mixture to form a monofilament of about 0.002"-0.004" in diameter; and

15 c) joining a plurality of the monofilaments to form a dental floss.

13. A method as in claim 12, wherein said abrasive particles are aluminum oxide.

20 14. A method as in claim 12, wherein said resin is nylon 612.

15. A method as in claim 12, wherein said abrasive particles have average size of 10 microns.

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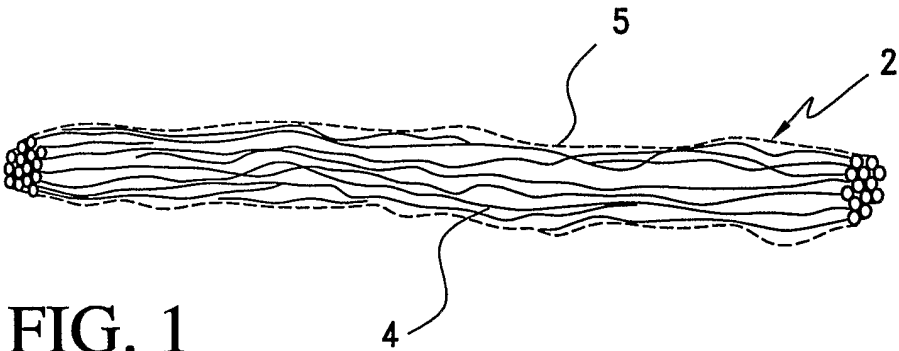


FIG. 1

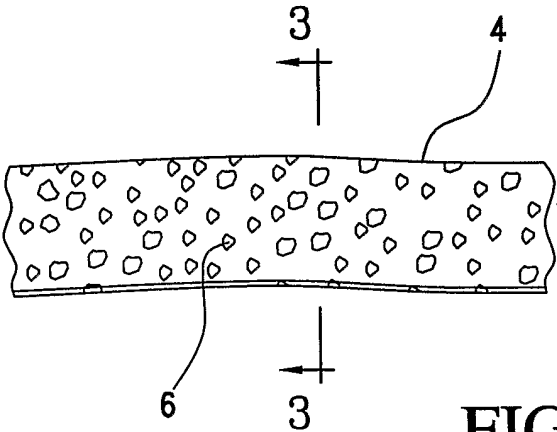


FIG. 2

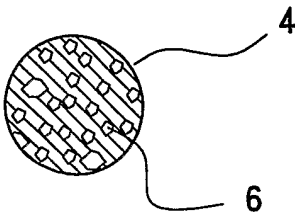


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/08244

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :A61C 15/00

US CL :132/321

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 132/321, 322, 323, 324, 326, 327, 328, 329; 424/50

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3,699,979 A (MUHLER et al.) 24 October 1972, see entire document.	1-15
A	US 3,838,702 A (STANDISH et al.) 01 October 1974, see entire document.	1-15
A	US 4,986,288 A (KENT et al.) 22 January 1991, see entire document.	1-15

☐ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:		"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

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