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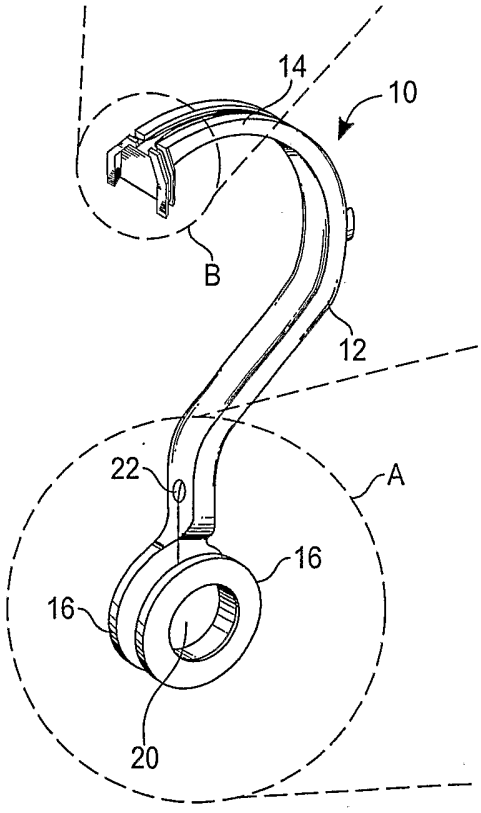
Declarations under Rule 4.17:
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations*

[Continued on next page]

(54) Title: DENTAL FLOSS TOOL DEVICE AND METHOD



(57) Abstract: A device to aid in flossing teeth including a jaw hook body (12), a pair of floss retaining projections (30a, 30b) on one end of the jaw hook body (12), and a grip handle (16) at an opposite end of the jaw hook body (12). The grip handle (16) may be a closed loop, an open loop, a padded structure, a pivoting structure, a decorative structure, a structure for holding the tool upright on a surface, or some combination of these features.

WO 2005/120284 A1

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*

Published:

— *with international search report*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Description

DENTAL FLOSS TOOL DEVICE AND METHOD

TECHNICAL FIELD

The present device relates to a device and method for using dental floss.

BACKGROUND ART

Flossing between teeth is recommended for proper dental hygiene. However, the use of dental floss may be difficult for some users. This problem is enhanced for users with poor finger dexterity, users who are missing fingers, or users that have had other hand disabilities.

A number of prior devices have been created to aid in flossing. For example, U.S. Patent No. 3,858,594 discloses a dental floss holder that dispenses floss through a hole in the main body of the device. A cavity within the body of the device holds a spool, which dispenses floss to this hole. The body has a curved shape terminating in a pair of forked tines extending from the device body and spaced far enough apart to allow user to introduce a length of floss into the user's mouth and between the user's teeth. The gap has to be sufficiently wide such that the tines can fit between the front and back of a user's teeth. These tines extend sufficiently far from the device's body and are curved to allow reaching teeth at the back of the mouth without inserting the user's hand into the mouth. The floss is strung by the side of the curved tool body between the two tines and along another side of the tool body to a retaining latch. When the user flosses with this device, the user's thumb grips both the floss and the tool,

thereby pressing the floss against the side of the tool and creating tension in the floss.

U.S. Patent No. 4,807,651 discloses a rigid sickle-shaped tool body having a finger handle at one end of the tool body. The floss is strung between projections on the device body. The projections are adapted to allow multiple strands or loops of floss to be held between a gap on the tool. The handle of the tool is a trigger-like ring though which a user inserts an index finder. The user's thumb rests on the top of the tool, holding a dental floss puller, and the user's middle finger is positioned below the device.

These prior art devices require that a user push the tool to floss between teeth. This pushing may be awkward and cumbersome for some users. Such motion requires at least gripping the floss and device with a number of fingers.

An alternative to the gripping-type devices and method is needed.

SUMMARY OF THE INVENTION

The present device includes a jaw hook body having a set of spaced dental floss holding projections at a first end and a grip handle at the second end of the jaw hook body. A floss retainer is positioned on the tool such that dental floss strung between the set of spaced dental floss holding projections may be secured on the floss retainer. This tool allows the user to grip the grip handle with one or more curled fingers and, using an essentially vertical motion, pull the floss between the teeth. This device may include a spool on the handle or in the body of the tool for holding a spool of dental floss. This spool retainer may have a cover protecting the dental floss from contamination. The body of the tool may also include a floss cutter located on

the tool body. The grip handle may include specialized features, for example including a thumb grip or rubberized inner surface. Grooves along the body of the tool in the projections for holding the floss may aid in ensuring that the floss is retained in the tool. The method of using this tool includes applying a vertical (up and down) force above or below a user's jaw. The device may be rocked during use to facilitate the cleaning of the space between teeth. A bite surface on the tool's body may aid in applying the desired force. This pulling motion may be easier than the pushing motion required in prior devices.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a side perspective view of an embodiment of the floss aid tool.

Fig. 1 is a front view of detail A in Fig. 1, showing the handle/spool.

Fig. 3 is a detailed view of the projections shown in B of Fig. 1.

Fig. 4A is a front view of the floss aid tool of Fig. 1.

Fig. 4B is a partial back view of the floss aid tool of Fig. 1.

Fig. 5 is an exploded view showing the spool of dental floss.

Fig. 6 is a side view of the floss aid tool in use flossing the teeth in a user's upper jaw.

Fig. 7 is a side view of a user flossing the teeth of the user's lower jaw.

Fig. 8 is a side view illustrating the motion of the floss holding projections of the floss aid tool in use.

Fig. 9 is a perspective view of the tool body showing a cut-away with an internal compartment a dental floss spool.

Fig. 10 is a side perspective view of an alternative handle including a thumb grip.

Fig. 11 is a side perspective view of an alternative embodiment of the tool, including rubberized gripping surfaces.

Fig. 12 is a side view of an alternative embodiment of the tool including an open loop grip.

Fig. 13 is a side view of an alternative grip which is freestanding.

Fig. 14 is a side view of an alternative grip embodiment.

DETAILED DESCRIPTION

With reference to Fig. 1, the dental floss tool 10 is shown including a tool body 12 having a top section 14 at one end of the tool body 12 and a handle 16 at an opposite end of the tool body 12. The curved, generally half-circular shape of the tool body 12 allows a user to insert the tool into the user's mouth. Floss secured between projections at one end of the tool body 12 is able to reach even the back teeth in the user's mouth. This shape is referred to as a "jaw hook body". This body generally has a question mark shape.

The handle 16 includes a through hole 20 through which a user can place one or more fingers. In this embodiment, a spool of dental floss 18 may be mounted on handle 16. As show in Fig. 2, spool 18 holds floss 24. A recessed surface 26 allows simplified access to floss spools at this location. Returning to Fig. 1, the floss fed from spool 18 is fed through hole 22 on the tool body.

With reference to Fig. 3, the head of the tool, detail B from Fig. 1, shows the floss 24 on projection 30A. A groove 38 on projection 30A retains floss 24. These grooves aid to ensure that the floss remains on projection 30A during flossing. Other structures, such as a hook or loop on the projection, could also be used.

With reference to Fig. 4A, the front to the tool shows the floss 24 being fed from spool 18 through hole 22. The view in Fig. 4B shows the floss 24 emerging from hole 22 and being positioned along the body of the tool in a handle groove defined by ridges 25. The floss moves past additional ridges 27 in a floss retaining groove to the projections forming the head of the tool. The floss on the return path is wound around a floss retainer 32. Before being wound around floss retainer 32, the floss may be cut by floss cutter 34. Retainer 32 may be a clip, knob or other floss retaining structure. In some embodiments, the floss may be first retained by floss retainer 32 prior to the floss being fed to the head of the tool. This may allow greater tension to be placed on the floss.

In Fig. 4A, the head of the tool is shown including spaced projections 30A and 30B. Extending between projections 30A and 30B is dental floss 24. The projections are spaced with sufficiently wide spacing such that the projections may be positioned on either side of two teeth of a user.

The various designs shown by the various embodiments allow a user to apply a pulling force to floss, using only a single finger or thumb in some embodiments. Even using a single finger, a significant improvement in control of the floss aid is achieved. This tool may be especially useful to people with limited manual dexterity.

An embodiment of the handle with a spool retainer is illustrated in Fig. 5, which shows handle 16 including a spool mount area 40. A replacement spool of dental floss 18 may be positioned over retaining area 40. One end of dental floss 24 is fed through hole 44 on snap on cover 42. Cover 42 may be securely snapped over handle 16 and either functionally retained or retained on latches. This cover prevents tangling of the dental floss and allows the dental floss to be kept clean during storage of the tool. Given that many commercially available dental flosses are sold on similar types of spools having known spool dimensions, this particular design allows such commercially available dental floss to be used in the present tool.

In Fig. 6, a user is illustrated using tool 10. The tool is positioned such that teeth in a user's jaw 1B may be cleaned. A user's lower jaw 1A may be subsequently cleaned. A user's thumb 45 extends through handle 16. Handle 16 may be designed such that a single finger or multiple fingers may be extended through the handle.

With reference to Fig. 7, the teeth of lower jaw 1A are shown being flossed by the tool 10. Finger 47 is extended through handle 16. The body of the tool presents a surface 7 onto which a user might bite down to help control motion of the tool and to provide additional leverage for inserting the floss between teeth. It may be desirable to rubberize surface 7 to increase comfort during such a bite down procedure. The tool may be used with a up and down motion or in rocking side to side.

With reference to Fig. 8, such a rocking motion is illustrated. Arrow 5 indicates the direction of this rocking motion. Tooth 3 is cleaned on one side by floss 24. Projections 30A and 30B are on the front and back side of the tooth 3, respectively. When moving between

positions A and B, the floss is scraped between tooth 3 and a adjacent tooth, aiding in the cleaning of the space between teeth. Such a rocking motion may help to both clean the teeth and to remove or insert the floss from between teeth as the floss is moved from tooth to tooth during a flossing process. This rocking motion provides additional leverage.

With reference to Fig. 9, a device body 12 is shown having a internal cavity 53 in which a spool of floss 50 is placed. The floss 24 is fed through opening 51 in the body. A cover (not shown) provides access to this internal cavity 53.

With reference to Fig. 10, an alternative handle is shown including a handle grip 60 having a thumb grip 62. This embodiment also includes a pivot attachment to the tool body 12 at pivot 64. The pivot attachment could allow 100° rotation of the handle.

With reference to Fig. 11, the handle 16 is shown having an internal rubberized surface 66. This surface may aid in the user in moving the tool in the pivoting motion shown in Fig. 8. In addition, the top rubberized surface may act as a biting surface, as described above. The exterior surface 68 of handle 16 may also be rubberized, as may be the surface 67 of tool body 12.

Another alternative embodiment of the device is shown in Fig. 12 where tool body 12 is attached at its lower end to a open loop handle 72. In this version, an amount of floss is dispensed from a floss spool within a cavity inside body 12. On body 12, the floss is held in a groove 70.

Alternative handles are shown in Figs. 13 and 14. Fig. 13 includes a handle positioned such that handle 74 rests flat on a surface when the device is not

in use. This may be useful for a possible display of the handle.

Fig. 14 shows tool body 12 joined to handle 16 which is covered by cap 78. This provides an attractive and whimsical aesthetic appearance to the device, while also providing a shield from germs for the user's hand during use. A number of alternative decorative designs of the handle and/or the body of the device may be used. For example, animal shapes, toy images, moon shapes, a scorpion shape, or a banana shape could all be adapted to the device body and/or the grip.

Claims

1. A dental floss tool comprising:

a jaw hook body;

a set of spaced dental floss holding projections at a first end of said jaw hook body;

a grip handle at a second end of said jaw hook body; and

a floss retainer positioned such that dental floss strung between said set of dental floss holding projections may be secured on said floss retainer.

2. The device of claim 1, further including a means for retaining a spool of floss on said tool.

3. The device of claims 1 or 2, further including a spool retainer on said grip handle.

4. The device of claim 3, further including a cover on said spool retainer.

5. The device of claims 1-4, further including a floss cutter positioned on said jaw hook body.

6. The device of claim 1, further including a spool retaining cavity within said jaw hook body.

7. The device of claims 1-6, further including a thumb grip on said grip handle.

8. The device of claims 1-7, wherein said grip handle is attached to said jaw hook body such that the handle may pivot.

9. The device of claims 1-8, wherein said grip handle includes a rubberized inner surface.

10. The device of claims 1-9, wherein said jaw hook body includes a floss groove.

11. The device of claims 1-10, wherein said grip handle is substantially perpendicular to a plane of the jaw hook body.

12. A method of flossing teeth using a floss aid device comprising:

placing dental floss on a floss aid tool;

introducing a head of said tool into a mouth of a user of the tool; and

applying a vertical force to said tool from directly above or below a user's jaw such that said dental floss moves between teeth of said user.

13. The method of claim 12, further including a subsequent step of rocking a body of the floss aid tool.

14. The method of claims 12 or 13, wherein applying a vertical force includes gripping a handle with one curled finger and moving said finger up and down.

Fig._3

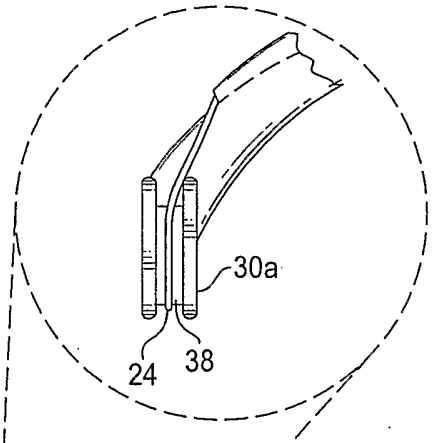
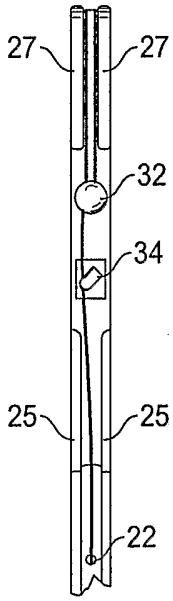


Fig._4B



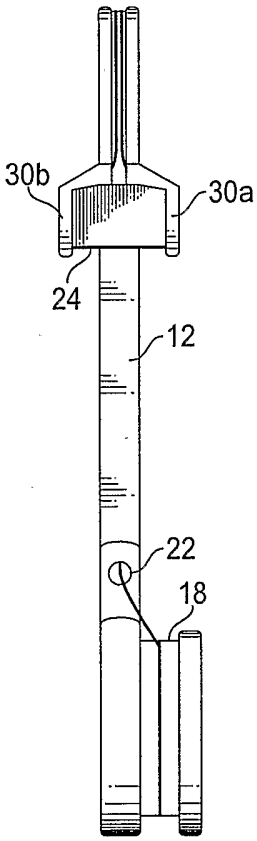


Fig._4A

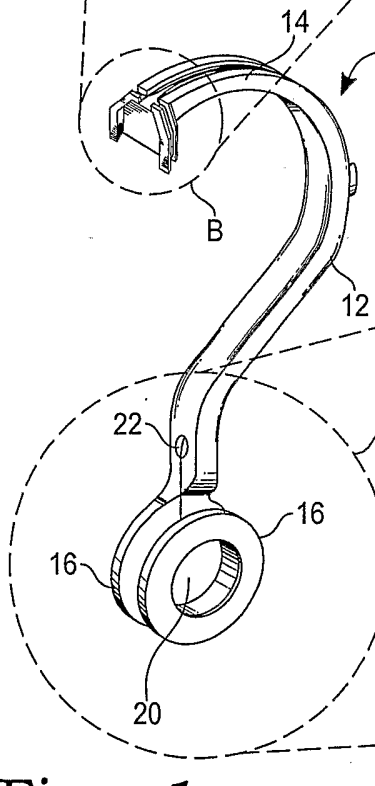


Fig._2

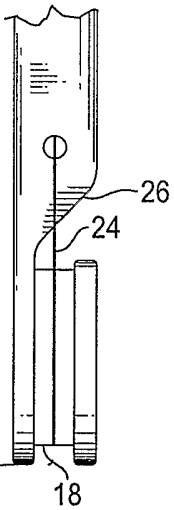


Fig._1

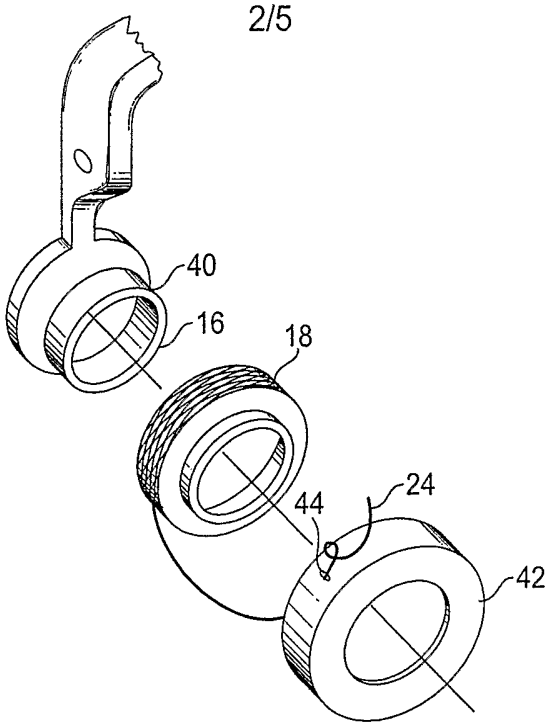


Fig._5

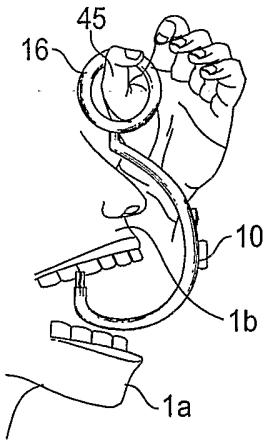


Fig._6

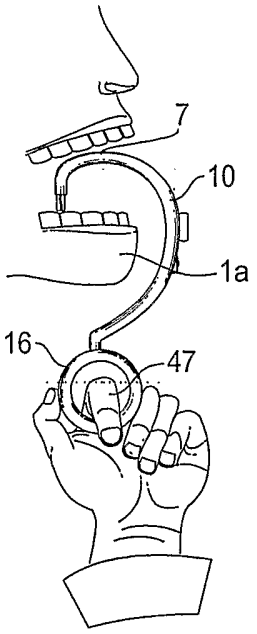


Fig._7

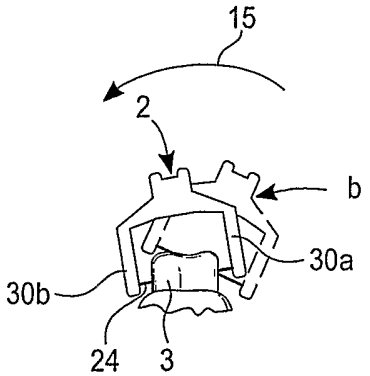


Fig._8

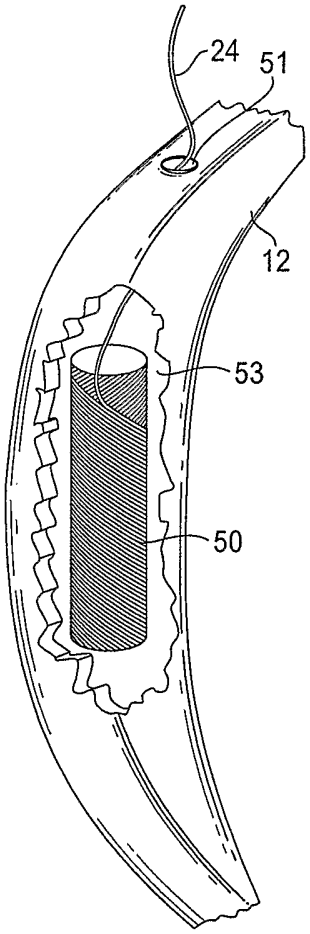


Fig._ 9

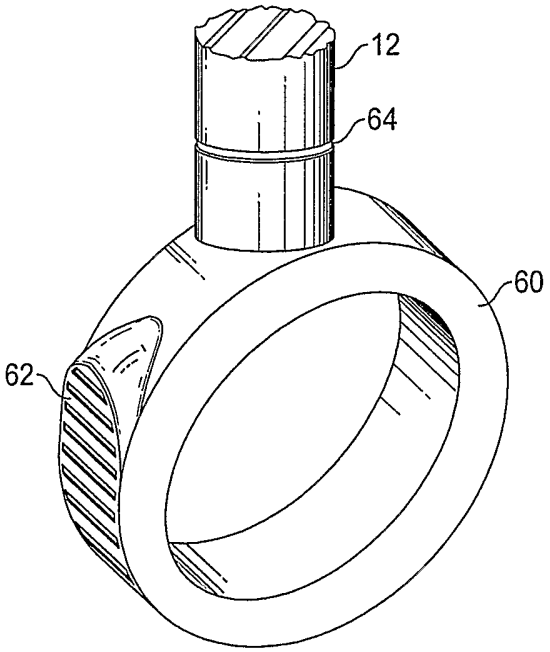


Fig._ 10

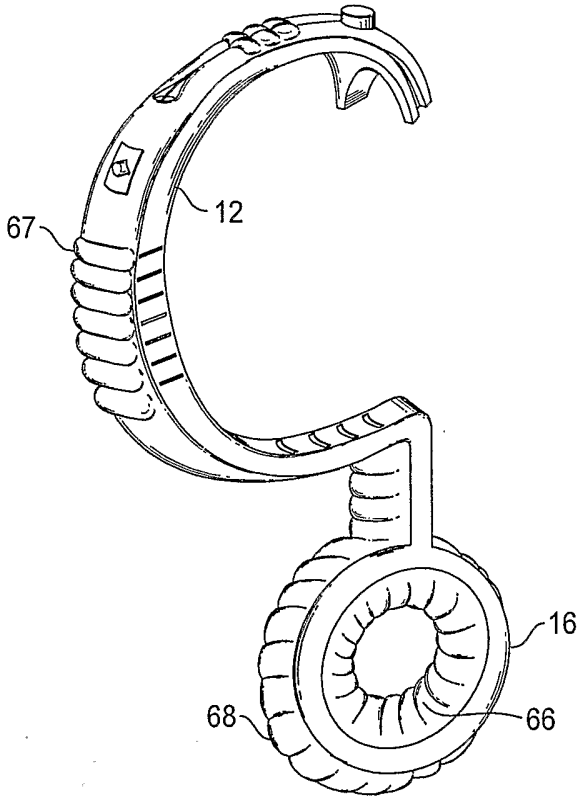


Fig._ 11

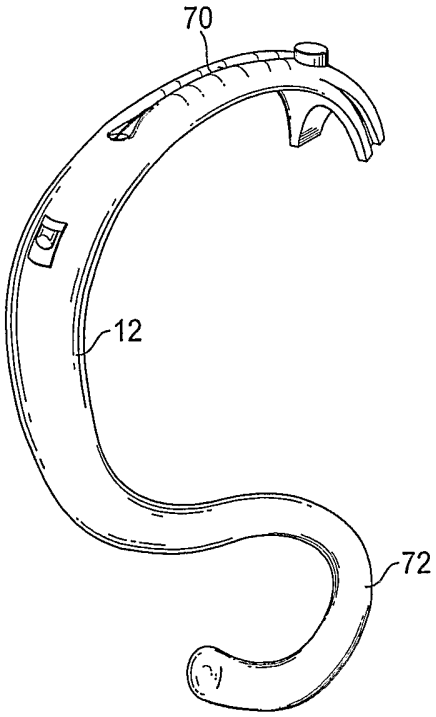


Fig._ 12

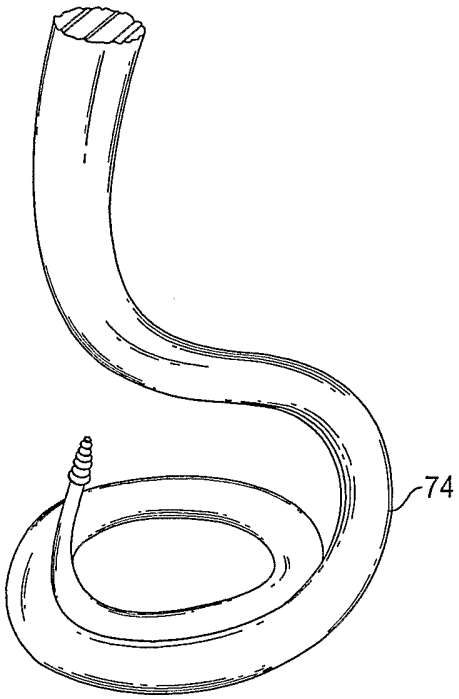


Fig._ 13

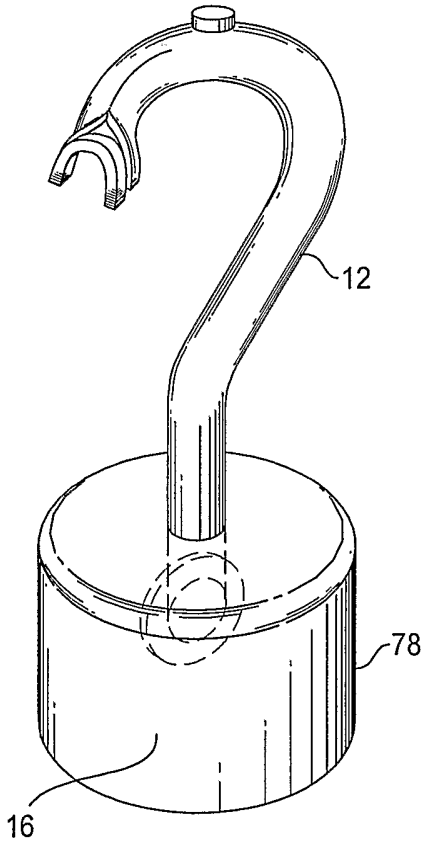


Fig._ 14

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/19209

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : A45D 24/00; A61C 15/00
US CL : 132/200,323,324,325,326,327
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. : 132/200,323,324,325,326,327

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.
X	US 2004/0040572 A1 (Chodorow) 04 March 2004 (04.03.2004), column 2, lines 10-30.	1,12-14
X	US 1,161,043 A (Gallas) 23 November 1915 (23.11.1915), column 1, lines 40-50.	1-4,6,12-14
A	US 3,311,116 A (Foster) 28 March 1967 (28.03.1967), column 1, lines 30-50.	1-4,6,12-14
A	US 5,222,510 A (Zuehlsdorf) 29 June 1993 (29.06.1993), column 1, lines 5-20.	12-14

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"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)

"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

"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search
14 October 2005 (14.10.2005)

Date of mailing of the international search report
15 NOV 2005

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Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/19209

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☒ Claims Nos.: 5, 7-11
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.