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(54) Title: MOLDED TIP WEAR GAUGE

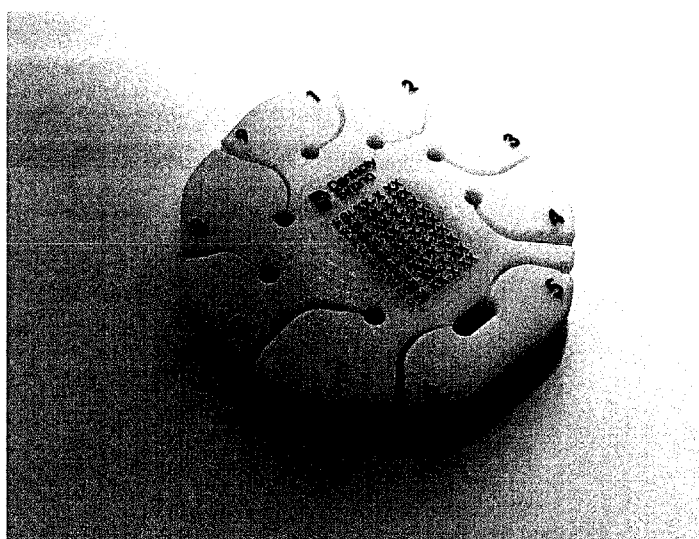


FIGURE 1

(57) Abstract: Described is a molded gauge used for both manual and automated inspection of the length of at least one ultrasonic scaler tip.



Molded Tip Wear Gauge

[0001] Disclosed herein is a molded gauge used for both manual and automated inspection of the length of at least one ultrasonic scaler tip.

[0002] A molded gauge may be designed to secure and present ultrasonic scaling tips so that the active portion of the tip (approximately the last 2 mm of length) can be visible in a through hole site window. The complex geometry of the tip gets captured in a molded profile that corresponds to the tip. This molded profile locates the tip, presents the working end in the site window, and identifies bent tips by preventing installation.

[0003] Figure 1 demonstrates an ultrasonic tip gauge that is suitable to determine the wear on multiple different ultrasonic scaling tips.

[0004] Figure 2 demonstrates another embodiment of an ultrasonic tip gauge where ultrasonic scaling tips are placed in the gauge and the tip is visible through a hole site window.

[0005] Figure 3 is a close up view of Figure 2.

[0006] Figure 4 is distant view of Figure 2.

[0007] Figure 5 is another embodiment of an ultrasonic tip gauge disclosed herein.

[0008] Figure 6 is yet another embodiment of an ultrasonic tip gauge disclosed herein.

[0009] Figure 7A and 7B demonstrate another embodiment of ultrasonic tip gauge disclosed herein where the gauge is arranged in a keychain form such that different sized ultrasonic tips fit within different cards as shown in Fig 7A and can be arranged in a stacked key chain manner as shown in Figur 7B.

[0010] The molded tip gauge can be made of a plastic material such as polypropylene, PEEK, Ultem, or the like, or any material that is suitable for steam autoclaving and chemical disinfection. Additionally the molded tip gauge can be made from an elastomeric material such as silicone rubber with a high durometer such as shore A 80-90. A rubber molded part may be present to provide flexibility for minor variation in tip profile.

[0011] Once an ultrasonic insert is mated to its respective profile the active portion, the approximately 2mm distal end of the instrument, should protrude into a site window. If the tip is visible in the site window it should be considered in proper working condition. However as

the tip wears it will no longer extend beyond the molded profile into the site window. The site window provides a simple and easily understood indication of tip length.

[0012] In addition to providing a manual tip wear indication the molded tip gauge can also be used in conjunction with a tip wear application on a smart phone or tablet or other suitable device. An image captured by the device camera can be post processed to determine the presence of the tip in the site window and the length of the tips extension into the site window. By intimately mating the tip to a molded tip gauge many advantages are realized. The tip gauge can provide fiducial markings, for example two or more site windows can be used to determine the scale of the image. The scale of the image is dependent on the distance that the device is held from the insert tip. By adjusting the scale, a more accurate measurement of tip wear can be made without the need for fixing the distance between the camera and the insert, such as with a fixture. Furthermore the tip gauge could provide visual cues, printed symbols or other molded features that the device can use to know which tip it is imaging. This will reduce post processing time and more quickly report the exact length of the tip.

CLAIMS

We claim:

1. An ultrasonic scaling tip measuring gauge comprising a hollow portion that fits and secures ultrasonic scaling tip, and a hole site window to better view the active portion of the ultrasonic scaling tip.
2. An ultrasonic scaling tip measuring gauge according to claim 1, wherein the gauge is made of a plastic material or an elastomeric material.
3. An ultrasonic scaling tip measuring gauge according to claim 1, where the measuring of the active portion of the ultrasonic device occurs manually or with an application on a device.

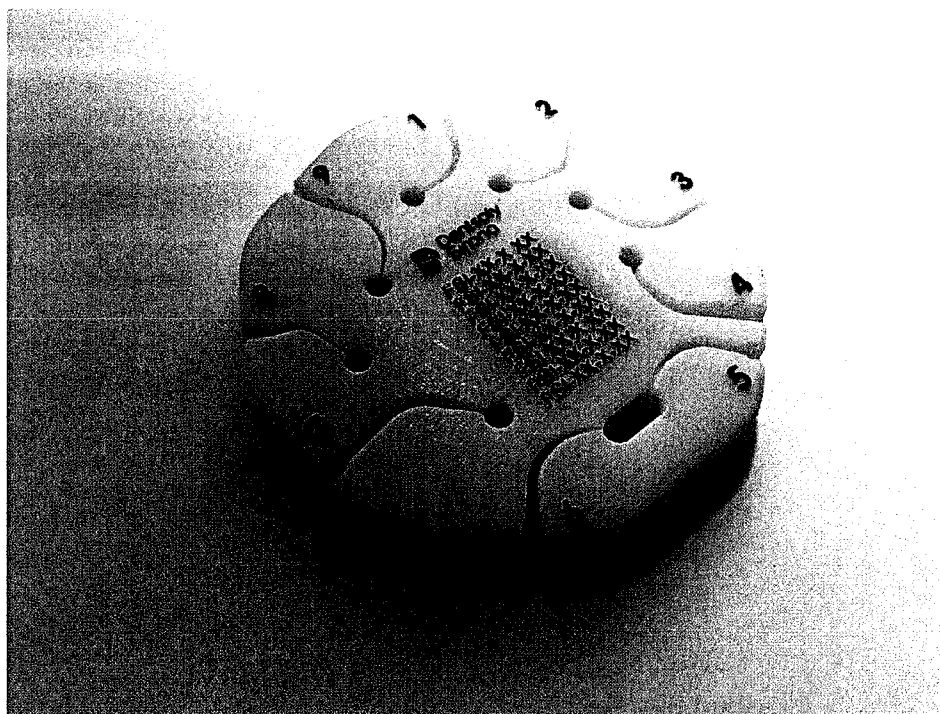


FIGURE 1

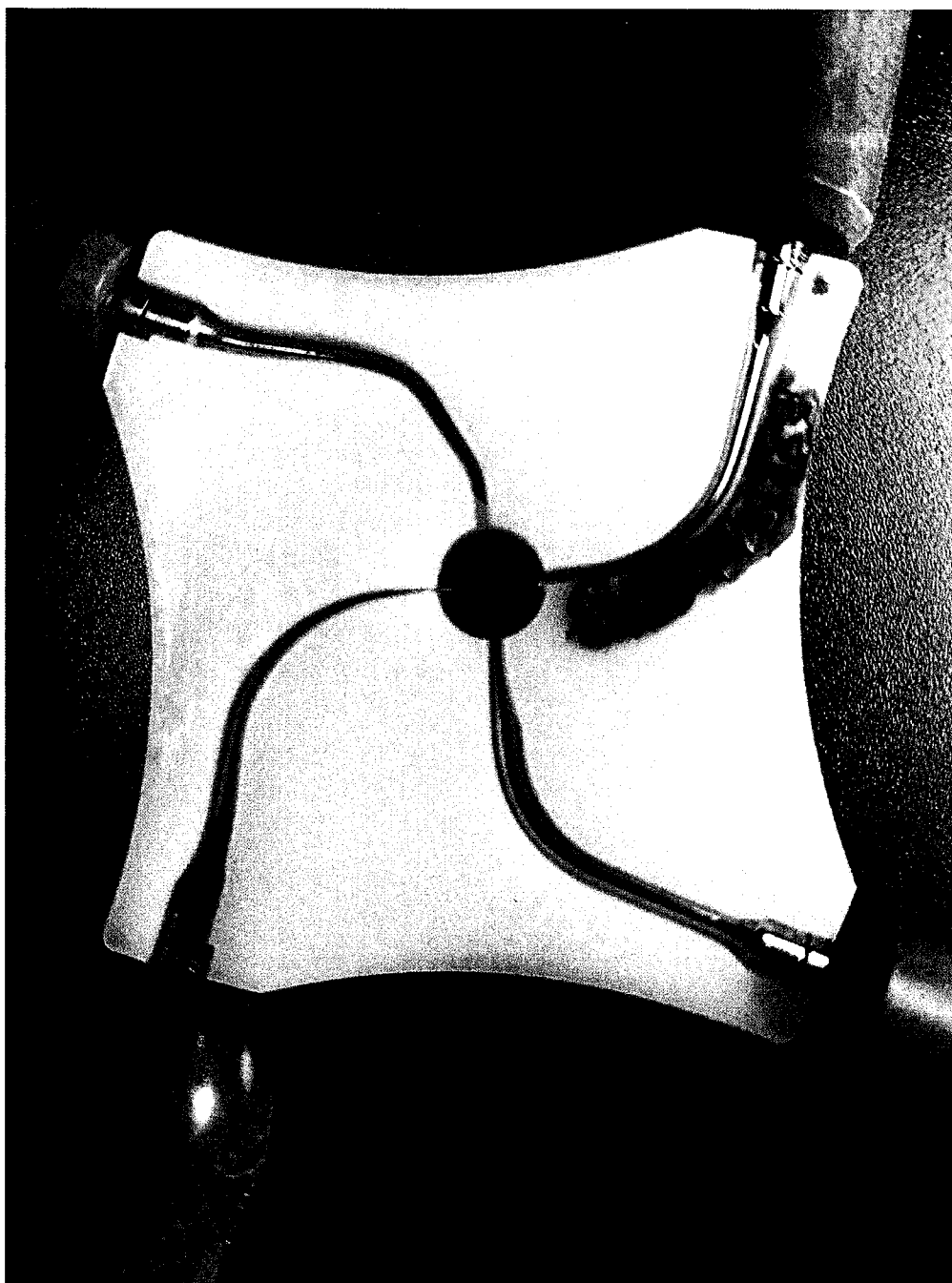


FIGURE 2

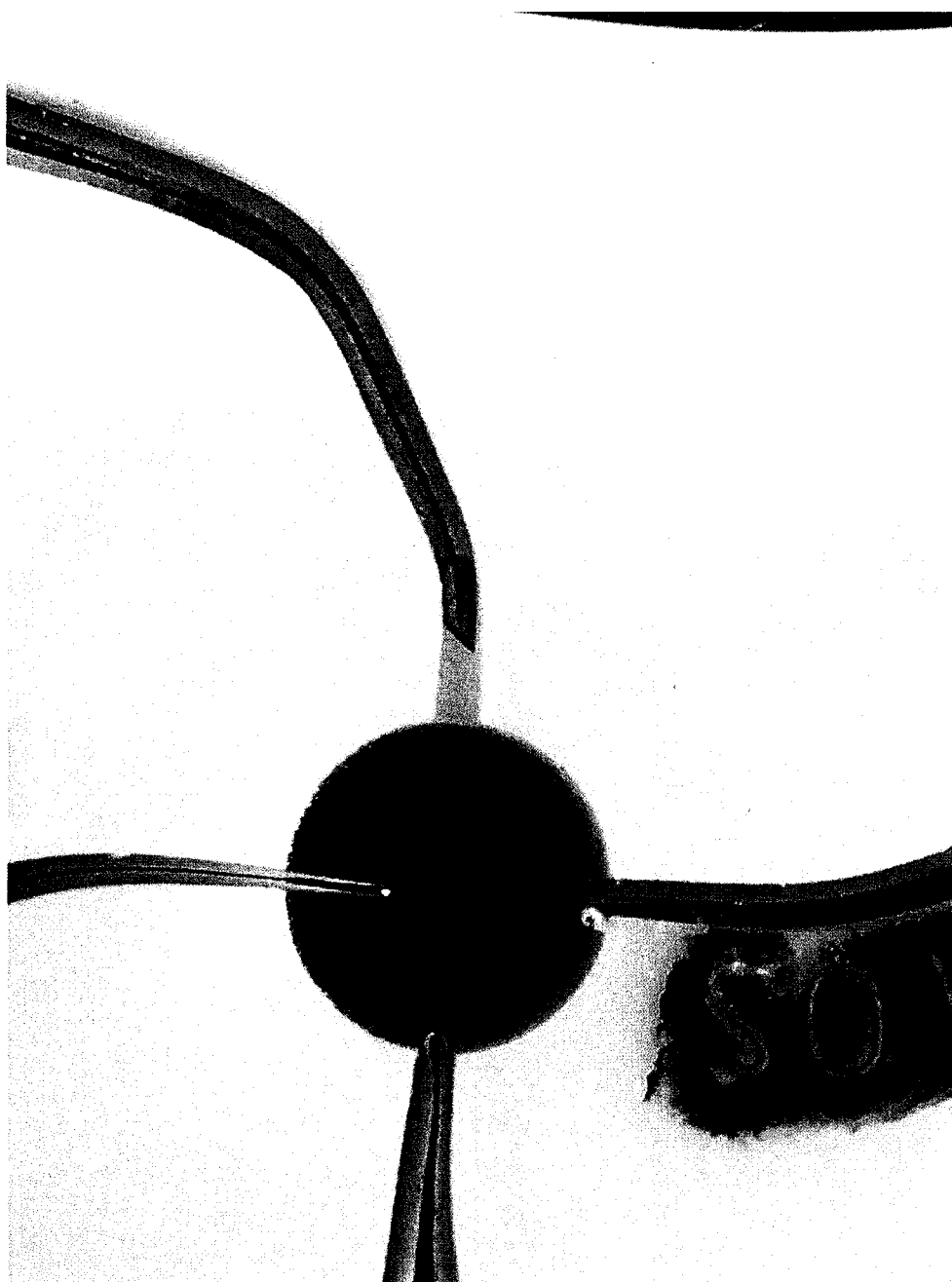


FIGURE 3

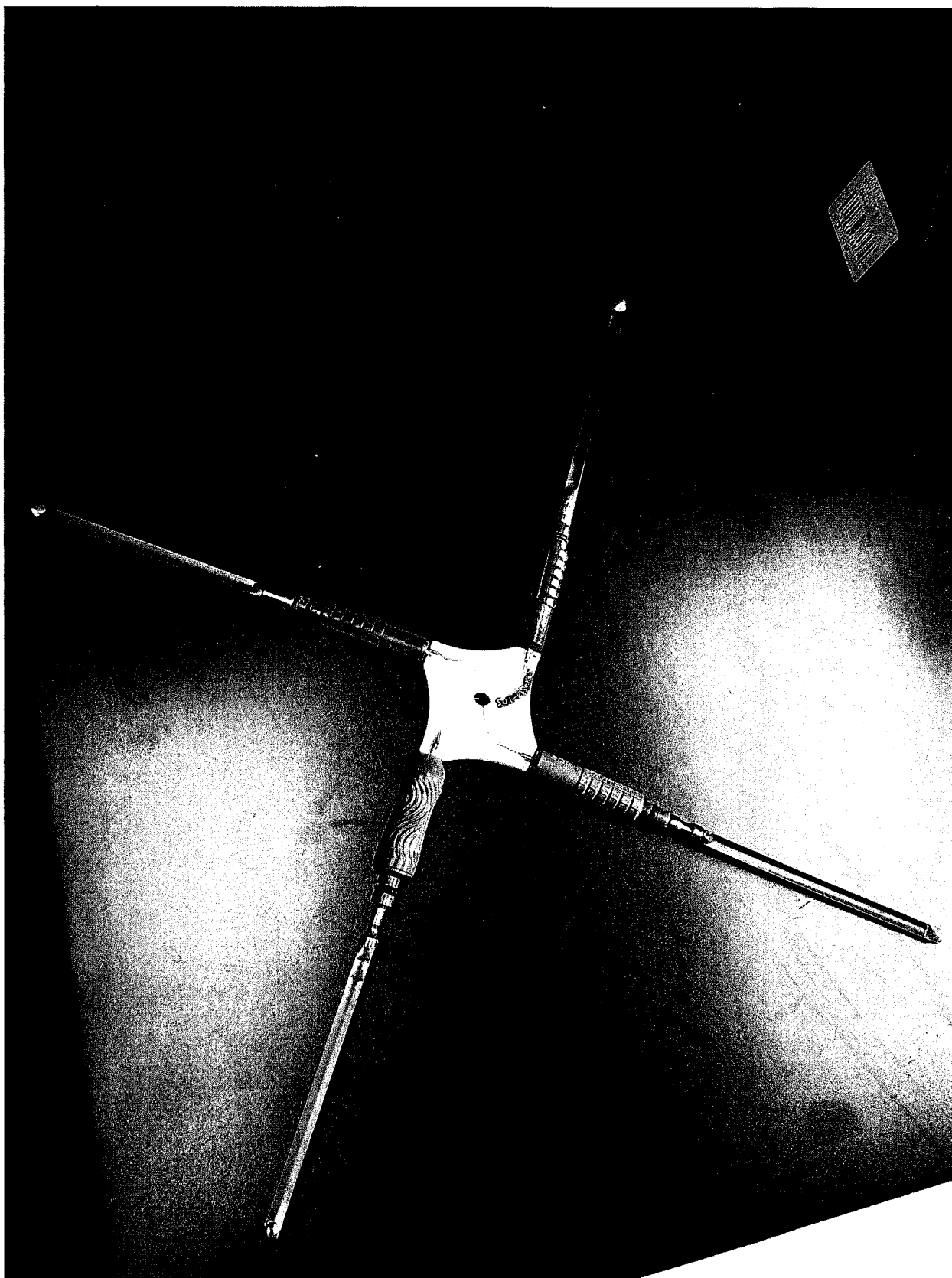


FIGURE 4

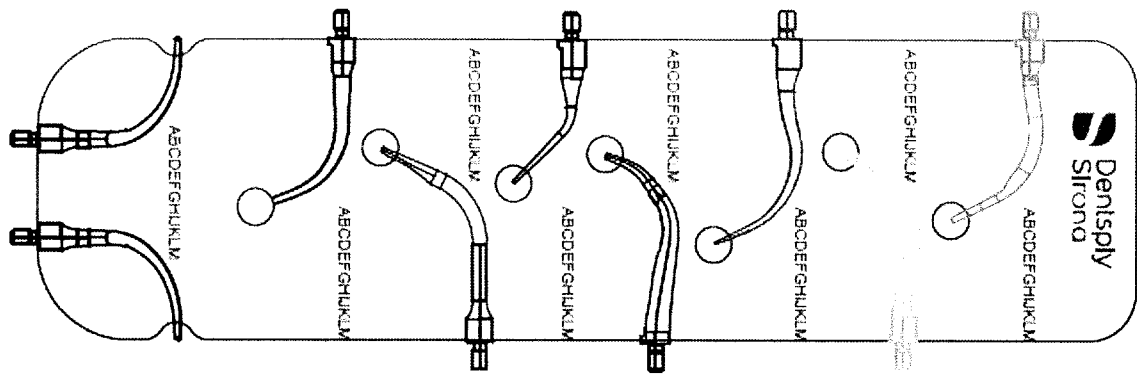


FIGURE 5

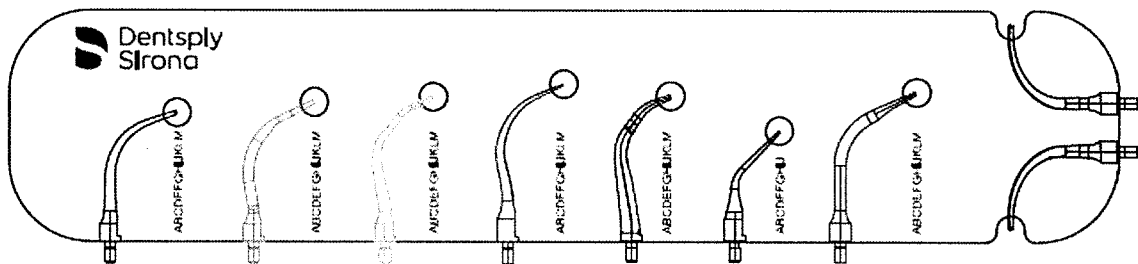


FIGURE 6

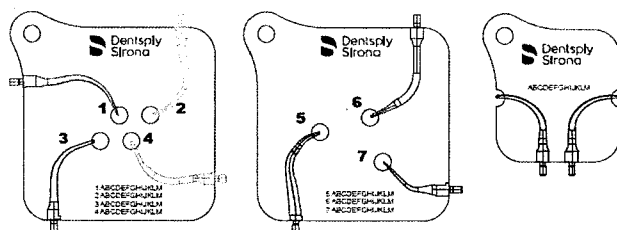


FIGURE 7A

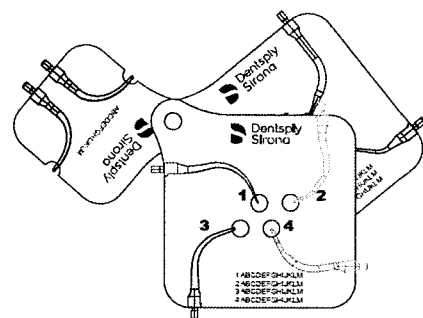


FIGURE 7B

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2017/062489

A. CLASSIFICATION OF SUBJECT MATTER INV. G01B3/00 G01B1/00 A61C17/20 ADD.		
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) G01B A61C		
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) EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 501 558 A (MALIGA JOACHIM H [US]) 26 February 1985 (1985-02-26) column 3, line 4 - column 4, line 12; figures 1-5 -----	1-3
X	DE 10 2008 013308 A1 (CARL MAHR HOLDING GMBH [DE]) 10 September 2009 (2009-09-10) paragraph [0001] paragraph [0021] - paragraph [0031]; figures 1-4 -----	1,3
X	DE 10 2014 214944 A1 (FRAUNHOFER GES ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E V [DE]) 4 February 2016 (2016-02-04) paragraph [0035] - paragraph [0040]; figures 1-4 ----- -/--	1,3
☒ 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 but 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 16 January 2018		Date of mailing of the international search report 29/01/2018
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Beyfuß, Martin

INTERNATIONAL SEARCH REPORT

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2016/247270 A1 (VANBIERVLIET JORIS [BE] ET AL) 25 August 2016 (2016-08-25) paragraph [0031] - paragraph [0062]; figures 1-13 -----	1-3

INTERNATIONAL SEARCH REPORT

Information on patent family members

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			01-09-2016 03-01-2018 25-08-2016 01-09-2016