

Description

Technical Field

This invention relates generally to an instrument that is necessary in the accurate measurement of tissue status and other clinical features such as the degree of inflammation of the various tissues in animals, particularly humans and more particularly periodontal tissues, tooth mobility and basic orthodontic criteria all of which are effective when used singularly or in combination in maintaining the soft and hard tissues of the oral cavity in a healthy state.

Background Art

It is well recognised that dental plaque is a major causative agent of caries and periodontal disease. Broadly, plaque consists of an adhesive mass of bacteria, mucins, food and other organic matter which if present for long enough on the teeth, calcifies to form calculus. Consequently, it is appreciated that the effective and complete removal of plaque is essential to the maintenance of good oral hygiene.

Unfortunately, the achievement of the goal of the removal of substantially all plaque from the oral tissues on a regular basis is not achievable by the vast majority of people, even when the individual recognises the need for plaque removal. It is therefore not unexpected that the WHO have stated that dental disease is the most common of all diseases affecting man throughout the world today.

The removal of plaque from the oral tissues at an early stage of its development may be achieved by brushing. However, if calcification occurs, then the resultant calculus may only be removed by vigorous mechanical action, usually performed by a dentist. It is therefore important to ensure plaque removal before calcification occurs.

Periodontal probes have been recognized in the prior art. Thus, in US3058225 (Ward) there is disclosed an instrument for automatically obtaining a measurement of attachment levels by means of a probe with a fixed sheath which engages the crown of a tooth when a measurement is made. A slidable needle is moved through the sheath into the periodontal pocket. The distance between the tip of the needle and the end of the sheath, being substantially the periodontal attachment level, is determined electrically by varying the resistance of a resistor in engagement with the needle.

In US3943914 (Grenfell et al.) there is disclosed a periodontal probe wherein pocket depth is measured using a stationary needle and a sheath which slides on the needle to the edge of the gingival margin of the pocket when the needle's tip

engages the bottom of the pocket. The distance between the end of the sheath and the tip of the needle is converted into an electrical signal to provide an indication of the depth of the periodontal pocket. The electrical signal is recorded on a chart recorder or other means to provide a visual, permanent record.

In US4677756 (Simon et al.) a probe is disclosed comprising a pair of probe elements moveable relative to one another to vary the spacing between sensing areas of each probe, means for producing a signal representing the spacing of said sensing areas, means for monitoring the rate of change of said signal, and means for recording and/or displaying a value representative of said signal upon the rate of change of said signal reaching a predetermined value.

It is to be noted that none of these patents in any way control the force at which probing is conducted.

In US4340069 (Yeaple) there is disclosed a probe in which the probing force used to determine pocket depth is predetermined. The probe comprises a magnetizable member mounted within the probe body. A movable lever is also mounted within the body and has a probe tip insertable into a periodontal pocket. The lever has a portion thereof formed from a magnetic material and is further movable between an "engaged" position in which the lever portion is attracted to and engages the member, and a "disengaged" position in which the lever portion is disengaged from the magnetizable member. The probe also comprises means for magnetizing the magnetizable member for releasably holding the lever in its "engaged" position with a preset magnetic force. In this position, the probe is adapted to be inserted into a periodontal pocket and a manual probing force applied thereto when the end of the probe engages the floor of the pocket. When the probing force is increased to the predetermined probing force value, it overcomes the preset magnetic force generated by the magnetizing means causing the lever portion to be moved to its "disengaged" position. The depth of the pocket can then be observed and read on a depth measuring scale on the probe tip for the predetermined probing force.

In PCT/US88/02749 (WO89/01314), there is disclosed a periodontal probe system for measurement, storage, and display of periodontal pocket depth, gingival level, and periodontal attachment level of the teeth. The periodontal probe instrument includes an elongate tip with a measurement arrangement that simultaneously measures periodontal pocket depth, gingival level, and periodontal attachment level at each of a plurality of probe sites around a tooth. A pressure sensor in the probe provides a pressure signal indicative of the

pressure acting on the tip of the probe. A periodontal measurement is made by inserting the tip of the probe into a gum pocket and gradually increasing the pressure on the probe tip after insertion. At a predetermined pressure level, the signal processing apparatus samples the depth signals and converts them into measurement signals corresponding to pocket depth and attachment level.

Whilst it would appear that this probe system offers advantages over the prior art, on pages 3 and 4 it is taught that measurement of pocket depth and attachment level are made with reference to the top of the crown of a tooth. This is illustrated in Figure 2. The difficulty in using the top of the crown as a reference point is that because the crown wears with time, it is not a consistent reference point. In addition, phenomena such as tilting teeth, cusp fracture, restorative procedures and coronal fracture will affect the consistency of the crown as a reference point.

Furthermore, the crowning of a tooth will significantly alter the height of the reference point.

It is therefore evident that this probe system is not adapted to provide a reliable reference point or history of pocket depth development and level of attachments relative to an established permanent reference point.

Because the probe system uses transmission of light to activate light sensitive devices as a measure of pocket depth, any variation in transparency of gum tissue from patient to patient will cause a variation in depth measured. For example, there may be a substantial difference in transparency between the gums of a 5 year old child and the gums of a 65 year old adult. In addition, there are different amounts of melanin and/or keratin in various ethnic, racial and behavioural populations. Thus discrepancies are evident in the density of tissue amongst these groups and even at various sites in the same mouth.

From the foregoing discussion it is evident that all of the prior art probes mentioned are elaborate and sophisticated devices which compromise obvious requirements. Thus, these probes in use would tend to interfere with a dentist's need to carefully assess disease pattern and pathology in an effective, practical and economical way.

The diagnosis of periodontal disease and the determination of the presence of plaque and calculus, particularly in the cervical margins, gingival crevice, periodontal attachment and deeper advancing pockets, will be performed by the dentist. Currently, the World Health Organisation (WHO) recommends the use of a probe which is inserted into the periodontal pocket and the depth of penetration measured. The extent of penetration will be proportional to the degree of periodontal disease present.

To measure depth of penetration, the probe is provided with at least four marks indicating 3.5, 5.5, 8.5 and 11.5 mm depths. A range of other depths may be indicated. The total length of the probe should be 15 mm.

As the periodontal pocket consists of relatively soft tissue, the amount of force exerted on the probe should ideally be standardised. The WHO has recommended the use of 20-25 grams of force. A lower force may be indicated where the tissues are highly inflamed. However, the means by which this force is measured is highly subjective and is therefore quite variable.

The present inventor has recognised the desirability of being able to accurately exert a reproducible force of about 20-25 grams in the use of such a probe, or such other standard forces that may be chosen.

Statement of the Invention

Accordingly, the present invention provides a probe adapted for use as a clinical measuring instrument or gauge comprising a needle member, an upper end of which is mounted in a head, and a handle attached to the head by a resiliently deformable member, said head and said handle each having a mark thereon which when no force is exerted on the needle member are out of alignment but when a selected force is applied, will be aligned.

For use with such a probe the invention also provides a needle member which functions as a clinical measuring instrument or gauge, comprising an elongate member, a lower end of which has a spherical or hemispherical tip, and an upper end of which includes means for mounting said needle member in said probe, the elongate member having disposed thereon calibration marks.

As mentioned above, preferably the selected force will be from about 20-25 grams. Moreover, the needle member will preferably be provided with at least four marks at 3.5, 5.5, 8.5 and 11.5 mm distances from the end thereof to indicate corresponding periodontal pocket depth.

Advantageously, the tip of the needle member should be blunt and preferably spherical, 0.5 mm in diameter, to assist in the detection of calculus and plaque in the cervical margins and related deeper regions.

The resiliently deformable member will preferably comprise two substantially parallel elongate members.

As in use the probe may be disposed of after each individual's examination, which will generally comprise the probing of up to 32 teeth, each tooth being probed at 6 points, the robustness of the resiliently deformable member will be such as to

provide a reproducible force over at least 200 readings.

The inventive gauge, including the needle member, may be formed from a variety of synthetic plastics materials such as acrylic, polycarbonate and SAN. Alternatively, the probe may be formed wholly of metal such as aluminium or the needle member may be of metal whilst the remainder of the probe is plastic.

In addition to the measurement of periodontal pocket depth, the present inventor has recognised that there exists a need to measure the extent of gum recession in conjunction with pocket depth. The reason for this is that a receded gum will reduce the apparent pocket depth.

Accordingly, in a preferred embodiment, the handle of the probe is adapted to mount a second probe at its other end or a means for measuring the extent of gum recession. The gum recession measurement means may conveniently be calibrated in mm divisions. A further use being to record plaque and other indices; orthodontic features such as cross-bite, overjet and over bite etc, and indeed all clinical examination data such as tooth mobility, occlusion, and other clinical features.

In addition, a still further advantageous probe may be obtained by providing a handle that has at one end a means for receiving the head and at the other end a connection means that allows a like end of another such handle to be joined thereto. Alternatively, a handle having a connection means at one end and at the other end a means for receiving the gauge for measuring gum recession, or other features may be joined thereto.

Advantageously, the needle member is disposable or more preferably those portions of the probe coming into contact with the tissues of the oral cavity are able to be discarded thereby eliminating the possibility of transmission of microorganisms to a subsequent patient. These portions will generally comprise the head of the probe. Note that it is possible to produce a probe that is capable of steam sterilisation, that is, one not having a disposable head. However, because of the difficulty of cleaning, the WHO have recommended disposable heads.

Brief Description of the Drawings

In order to more fully understand the nature of the invention, there follows a description of a number of examples of the probe and needle aspects of which form part of the presently claimed invention, and in which:

Figure 1 shows in side view a first example of a gauge in the form of a dental probe of the invention;

Figure 2 shows in a side view, the probe of Figure 1 when a force of 25 grams is exerted;

Figure 3 is a perspective view of the head of a second example of a probe of the invention for use in periodontal pocket depth evaluation;

Figure 4 is a perspective view of the head of a gauge of the invention for use in the measurement of gum recession;

Figure 5 is a partial side elevational view of the head of the probe of Figure 1 mounted in a handle of the invention;

Figure 6A is an exploded side elevational view of the needle member of Figure 3 and 5;

Figure 6B is an exploded side elevational view of an alternative needle member;

Figure 7 is a side elevational view of a handle for use with the probe of Figure 3 and the gauge of Figure 4;

Figure 8 is a plan view of the handle of Figure 7;

Figure 9 are sectional views A-A, B-B and C-C about the gauge of Figure 4;

Figure 10 is a schematic view of the probe of Figure 3 in use;

Figure 11 is a schematic view of the gauge of Figure 4 in use; and

Figure 12A, B and C are schematic views of teeth showing varying loss of attachment.

As shown in Figures 1 and 2, a probe 40 comprises a needle member 41, a handle 42 and a resiliently deformable member 43. The needle 41 has a ball 44 at the end thereof having a diameter of 0.5 mm. Immediately behind the ball, the needle reduces to the vicinity of 0.3-0.4 mm in diameter tapering upwardly to 1 mm at the end in the head 45. The length of the needle is 15 mm from the centre of the ball to where it enters the head.

At reference numerals 46 and 47, there are marks on the needle 41 representing depths of 3.5 mm and 5.5 mm respectively, according to CPITN, superimposed upon the mm calibration marks.

The remainder of the probe is formed from acrylic.

The resiliently deformable member 43 comprises two elongate members which are visible in Figure 5. In Figure 4, plates 48 disposed either side of the members 43, to prevent sideways movement thereof, are shown.

On head 45, there is a mark 49 which when aligned with the mark 50 disposed on a plate 48, indicates that a particular predetermined force of is being exerted on the needle.

In Figure 3, there is shown as reference numeral 100, the head of a probe of the invention for use in the evaluation of periodontal pocket depth. The head 100 has a needle member 101 affixed orthogonally to an end 102 distal a shaped end 103 adapted to be mounted, as shown in Figure 11, in a correspondingly shaped opening 104 of a handle

105.

Extending between the end 103 and the end 102 are two parallel, planar, relatively thin resilient members 106. These members are adapted to transmit an appropriate force to the tip of the needle member 101.

The head is preferably formed from a synthetic plastics material.

Handle 105 has at one end shaped opening 104 to receive the head 100. At the same end, there are two plates 107, each extending from opposing sides of the handle. These plates are spaced sufficiently apart to accommodate the width of the resilient members 106 and have a length such that an outer face of the end 102 lies proximate the ends of the plate 107. They function to protect the resilient members 106 and to bear an appropriate mark to indicate when a selected force is applied to the needle member 101.

In order to facilitate the measurement of pocket depth, the needle member 101 is calibrated along its length in mm divisions 108. This is best seen in Figure 9A. At a lower end, there is a spherical tip 109 which is 0.5 mm in diameter. Immediately behind the tip, the needle reduces to about 0.3-0.4 mm in diameter tapering upwardly to a width of 1 mm where it enters the head at end 102. The overall length of the needle is 15.5mm.

At reference numeral 110, there is a widened or otherwise marked portion of the needle, the lower edge of which is 3.5 mm from the tip 109, whilst the upper edge is 5.5 mm from tip 109.

A second portion 111 is similarly widened or marked, the lower edge being at 8.5 mm whilst the upper edge is 11.5 mm from the tip. It has been found in use that measurements to + or - 0.5mm are possible. Note that it is important these zones be visually recognisable. Features which provide this include colour, polish, finish or other visible features.

In Figure 6B there is shown an alternative needle member which in all respects is the same as the needle member shown in Figure 6A except that the tip 126 is not spherical. Tip 126 is hemispherical at its lower end with an angular bevel towards the body of the needle member, thus creating an equatorial rim 127. This rim 127 is advantageous in detecting the detail of subgingival anatomy, calculus adhesions, root anatomy or any other features.

The needle is preferably formed from stainless steel or other appropriate materials, whilst the divisions 108 are created by etching, machining, spark erosion or other means. By appropriate material, it is meant that the needle member must be capable of transmitting tactile sensation for the detection of calculus and general anatomy.

As is best seen in Figure 5, when the head 100 is placed in the handle 105, by sliding end 103 into opening 104, a portion of the shaped end 103, shown as 112, will project above an upper surface of the handle. As a consequence of the taper of the shaped end 103 and the taper of the opening 104 increasing upwardly, appropriate pressure exerted downwardly at 112 will cause the head to be ejected from the handle. This facilitates the easy disposal of the head.

As is shown in Figures 7 and 8, the handle 105 may have an opening 113 at its other end to receive a plug 114 thus facilitating its connection to a second handle 115 having a like opening 116 to receive the plug.

In the embodiment shown in Figures 7 and 8, the handle 115 has a shaped opening 117 to receive a gauge for measuring gum recession. The gauge 118 is best seen in Figure 4. In that figure, the gauge 118 is shown to have a shaped end 119 adapted to slide into the shaped opening 117 in the handle. The end 119 has a portion 120 that projects above an upper surface of the handle 115. This permits the head 118 to be ejected from the handle by exerting appropriate pressure at 120.

The gauge 118 has a portions extending away from end 119 and then a measurement portion 121 extending orthogonally downwardly. As shown in Figures 9A, B and C, this portion of the gauge is triangular in section.

As was previously stated, pocket depth measurements are to be taken when a force of 25 gms was exerted on the tip 109 of the needle member 101. A reproducible 25 gm force may be achieved by a variety of means of which one is to have a mark on end 102 which when it is aligned with the mark on plate 107 will correspond with a force of 25 gm. However, this may be so designed to operate at 20 gm or any other appropriate force.

In Figure 5 the head is shown in two positions, solid lines representing at rest and broken lines representing force applied to the tip. The measurement shown is approximately 4 mm.

The inventive probe is shown in use in Figure 13 to measure a periodontal pocket depth of 5.5 mm. The needle member 101 has been pushed into the pocket 122 between the gum 123 and the tooth 124 until a force of 25 gms has been achieved on the tip. At that point the resilient member 106 has been displaced upwardly until a mark (not shown) on end 102 is aligned with a mark (not shown) on plate 107. The divisions on the needle member have then been read off to give a depth of 5.5 mm.

The gum recession gauge 118 is shown in use in Figure 11. In this instance, the lower end of the measurement portion 121 has been aligned with the gingival margin whilst the neck 125 of the tooth

124, or more specifically the cemento-enamel junction, has been aligned against the scale. A reading of 5 mm is shown. This measurement may be referred to as the "gingival recession factor".

In order to facilitate the taking of measurements, handles 105 and 115 are each provided with a raised portion 126, 127 respectively. These allow the thumb and index fingers to be placed either side of the handle, whilst the middle finger supports the handle from the underside. This represents the conventional pen grip.

In order to allow the measurement of the gingival recession factor at a particular force, the probe 101 and gauge 118 are interchangeable. Likewise, handles 105 and 115 are also interchangeable.

In Figure 12, there are shown three teeth A, B and C exhibiting varying loss of attachment (LOA). Loss of attachment is the sum of pocket depth (PD) and gingival recession (GH). It is therefore obvious that the recording of pocket depth and gingival recession are essential elements in calculating the loss of attachment of a particular tooth. It is this loss of attachment which represents a critical value in assessing the longevity, prognosis or status of a tooth in situ.

The importance of the calculation of LOA from PD and GH measurements is illustrated in Figure 12. Thus, in tooth A, 1 and 2 have identical LOA, although 1 has a 50% deeper pocket than 2. In tooth B, 3 and 4 have identical PD but 4 has a 50% greater LOA than 3. In tooth C, 5 has twice the pocket depth of 6 but 6 has twice the LOA of 5.

Although the foregoing description has been directed towards a probe for use in the assessment of the periodontal region of the mouth, it will be recognised that with appropriate force calibration, a probe could be used to determine the health of a variety of tissues by measuring an "oedematous inflammatory factor". This would be achieved by measuring needle displacement at a selected force for a variety of healthy tissues and then comparing these with results obtained from suitably diseased tissue.

Claims

1. A probe (40) adapted for use as a clinical measuring instrument or gauge comprising a needle member (41), an upper end of which is mounted in a head (45), and a handle (42) attached to the head by a resiliently deformable member (43), said head and said handle each having a mark (49, 50) thereon which when no force is exerted on the needle member are out of alignment but when a selected force is applied, will be aligned.

2. A probe as in Claim 1 wherein it is adapted for use as a periodontal pocket probe.

3. A probe as in Claim 2 wherein the resiliently deformable member is adapted to align the marks at a force of up to 25 grams.

4. A probe as in Claim 3 where the needle member is provided with a series of marks (46, 47) along its length to permit depth measurement.

5. A probe as in Claim 2 wherein the needle member has a spherical tip (44).

6. A probe as in Claim 2 wherein the needle member has a tip which is hemispherical at its lower end with an angular bevel towards the body of the needle member to create an equatorial rim.

7. A probe as in Claim 2 wherein the handle is adapted at an end opposing the head to mount a second probe or a means for measuring the extent of gum recession.

8. A probe as in Claim 7 wherein the handle has at end opposing the head a connection means that allows a like end of another such handle to be joined thereto.

9. A probe as in any one of Claims 1 to 8 wherein the needle member is disposable.

10. A probe as in Claim 9 wherein the head and needle member are disposable.

11. A probe as in Claim 10 wherein the handle has a shaped opening adapted to receive the head, comprising two plates (48) each extending from opposing sides of the handle and spaced apart to accommodate the resilient members.

12. A probe as in Claim 11 wherein at least one of the plates (48) bears a mark (50) for alignment with a corresponding mark (49) on the head (45) to indicate when a selected force has been applied to the needle member.

13. A probe as in Claim 11 or Claim 12 wherein a portion of the head projects above an upper surface of the handle such that when force is exerted downwardly on this portion, the head is ejected from the handle.

14. A needle member adapted for use in a probe according to Claim 1 and which functions as a clinical measuring instrument or gauge, comprising an elongate member, a lower end of



124, or more specifically the cemento-enamel junction, has been aligned against the scale. A reading of 5 mm is shown. This measurement may be referred to as the "gingival recession factor".

In order to facilitate the taking of measurements, handles 105 and 115 are each provided with a raised portion 126, 127 respectively. These allow the thumb and index fingers to be placed either side of the handle, whilst the middle finger supports the handle from the underside. This represents the conventional pen grip.

In order to allow the measurement of the gingival recession factor at a particular force, the probe 101 and gauge 118 are interchangeable. Likewise, handles 105 and 115 are also interchangeable.

In Figure 12, there are shown three teeth A, B and C exhibiting varying loss of attachment (LOA). Loss of attachment is the sum of pocket depth (PD) and gingival recession (GH). It is therefore obvious that the recording of pocket depth and gingival recession are essential elements in calculating the loss of attachment of a particular tooth. It is this loss of attachment which represents a critical value in assessing the longevity, prognosis or status of a tooth in situ.

The importance of the calculation of LOA from PD and GH measurements is illustrated in Figure 12. Thus, in tooth A, 1 and 2 have identical LOA, although 1 has a 50% deeper pocket than 2. In tooth B, 3 and 4 have identical PD but 4 has a 50% greater LOA than 3. In tooth C, 5 has twice the pocket depth of 6 but 6 has twice the LOA of 5.

Although the foregoing description has been directed towards a probe for use in the assessment of the periodontal region of the mouth, it will be recognised that with appropriate force calibration, a probe could be used to determine the health of a variety of tissues by measuring an "oedematous inflammatory factor". This would be achieved by measuring needle displacement at a selected force for a variety of healthy tissues and then comparing these with results obtained from suitably diseased tissue.

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1. A probe (40) adapted for use as a clinical measuring instrument or gauge comprising a needle member (41), an upper end of which is mounted in a head (45), and a handle (42) attached to the head by a resiliently deformable member (43), said head and said handle each having a mark (49, 50) thereon which when no force is exerted on the needle member are out of alignment but when a selected force is applied, will be aligned.
2. A probe as in Claim 1 wherein it is adapted for use as a periodontal pocket probe.
3. A probe as in Claim 2 wherein the resiliently deformable member is adapted to align the marks at a force of up to 25 grams.
4. A probe as in Claim 3 where the needle member is provided with a series of marks (46, 47) along its length to permit depth measurement.
5. A probe as in Claim 2 wherein the needle member has a spherical tip (44).
6. A probe as in Claim 2 wherein the needle member has a tip which is hemispherical at its lower end with an angular bevel towards the body of the needle member to create an equatorial rim.
7. A probe as in Claim 2 wherein the handle is adapted at an end opposing the head to mount a second probe or a means for measuring the extent of gum recession.
8. A probe as in Claim 7 wherein the handle has at end opposing the head a connection means that allows a like end of another such handle to be joined thereto.
9. A probe as in any one of Claims 1 to 8 wherein the needle member is disposable.
10. A probe as in Claim 9 wherein the head and needle member are disposable.
11. A probe as in Claim 10 wherein the handle has a shaped opening adapted to receive the head, comprising two plates (48) each extending from opposing sides of the handle and spaced apart to accommodate the resilient members.
12. A probe as in Claim 11 wherein at least one of the plates (48) bears a mark (50) for alignment with a corresponding mark (49) on the head (45) to indicate when a selected force has been applied to the needle member.
13. A probe as in Claim 11 or Claim 12 wherein a portion of the head projects above an upper surface of the handle such that when force is exerted downwardly on this portion, the head is ejected from the handle.
14. A needle member adapted for use in a probe according to Claim 1 and which functions as a clinical measuring instrument or gauge, comprising an elongate member, a lower end of



which has a spherical or hemispherical tip, and an upper end of which includes means for mounting said needle member in said probe, the elongate member having disposed thereon calibration marks.

15. A needle member as in Claim 14 wherein the elongate member tapers from the upper end to the lower end.

16. A needle member as in Claim 15 wherein the calibration marks constitute mm divisions.

Patentansprüche

1. Sonde (40), ausgelegt zur Verwendung als klinisches Meßinstrument oder Meßgerät, die folgendes umfaßt: ein Nadelglied (41), von dem ein oberes Ende in einem Kopf (45) angebracht ist, und ein Griff (42), der über ein elastisch verformbares Glied (43) am Kopf befestigt ist, wobei der Kopf und der Griff jeweils eine Markierung (49, 50) aufweisen, die nicht aufeinander ausgerichtet sind, wenn auf das Nadelglied keine Kraft ausgeübt wird, aber aufeinander ausgerichtet sind, wenn eine ausgewählte Kraft aufgebracht wird.
2. Sonde nach Anspruch 1, die zur Verwendung als Zahnfleischtaschensonde ausgelegt ist.
3. Sonde nach Anspruch 2, bei der das elastisch verformbare Glied zur Ausrichtung der Markierungen bei einer Kraft von bis zu 25 g ausgelegt ist.
4. Sonde nach Anspruch 3, bei der das Nadelglied entlang seiner Länge mit einer Reihe von Markierungen (46, 47) versehen ist, um Tiefenmessung zu gestatten.
5. Sonde nach Anspruch 2, bei der das Nadelglied eine kugelförmige Spitze (44) hat.
6. Sonde nach Anspruch 2, bei der das Nadelglied eine Spitze aufweist, die an ihrem unteren Ende halbkugelförmig ist, wobei eine winkelförmige Abschrägung zum Körper des Nadelglieds hin verläuft, um einen äquatorialen Rand zu bilden.
7. Sonde nach Anspruch 2, bei der der Griff an einem dem Kopf gegenüberliegenden Ende so ausgelegt ist, daß eine zweite Sonde oder ein Mittel zur Messung des Ausmaßes von Zahnfleischtaschenschwund angebracht werden kann.

8. Sonde nach Anspruch 7, bei der der Griff an dem dem Kopf gegenüberliegenden Ende ein Verbindungsmittel aufweist, das es erlaubt, daß ein ähnliches Ende eines anderen derartigen Griffs damit verbunden werden kann.

9. Sonde nach einem der Ansprüche 1 bis 8, bei der das Nadelglied wegwerfbar ist.

10. Sonde nach Anspruch 9, bei der der Kopf und das Nadelglied wegwerfbar sind.

11. Sonde nach Anspruch 10, bei der der Griff eine geformte Öffnung aufweist, die zur Aufnahme des Kopfes ausgelegt ist, und wobei die Sonde zwei Platten (48) umfaßt, die sich jeweils von gegenüberliegenden Seiten des Griffs erstrecken und voneinander beabstandet sind, um die elastischen Glieder aufzunehmen.

12. Sonde nach Anspruch 11, bei der mindestens eine der Platten (48) eine Markierung (50) zur Ausrichtung auf eine entsprechende Markierung (49) am Kopf (45) trägt, um anzuzeigen, wann eine ausgewählte Kraft auf das Nadelglied ausgeübt wird.

13. Sonde nach Anspruch 11 oder 12, bei der ein Teil des Kopfes über eine obere Fläche des Griffs derart vorragt, daß der Kopf aus dem Griff gestoßen wird, wenn eine Kraft von oben nach unten auf diesen Teil ausgeübt wird.

14. Nadelglied, das zur Verwendung in einer Sonde nach Anspruch 1 ausgelegt ist und als klinisches Meßinstrument oder Meßgerät fungiert, wobei das Nadelglied ein längliches Glied umfaßt, von dem ein unteres Ende eine kugel- oder halbkugelförmige Spitze aufweist und von dem ein oberes Ende ein Mittel zur Befestigung des Nadelglieds in der Sonde enthält, wobei an dem länglichen Glied Kalibriermarkierungen angeordnet sind.

15. Nadelglied nach Anspruch 14, bei dem das längliche Glied vom oberen Ende zum unteren Ende konisch zuläuft.

16. Nadelglied nach Anspruch 15, bei dem die Kalibriermarkierungen Teilstrichabstände in mm darstellen.

Revendications

1. Sonde (40) adaptée pour l'utilisation comme instrument ou jauge de mesure clinique comprenant une pièce en aiguille (41), dont une extrémité supérieure est montée dans une tête



- (45), et une poignée (42) attachée à la tête par une pièce (43) déformable par élasticité, ladite tête et ladite poignée comportant chacune un repère (49, 50) qui lorsqu'aucune force n'est exercée sur la pièce en aiguille sont désalignés mais lorsqu'une force choisie est appliquée, seront alignés.
2. Sonde selon la revendication 1, caractérisée en ce qu'elle est adaptée pour l'utilisation comme sonde à cavité gingivale. 10
 3. Sonde selon la revendication 2, caractérisée en ce que la pièce déformable par élasticité est adaptée pour aligner les repères à une force allant jusqu'à 25 grammes. 15
 4. Sonde selon la revendication 3, caractérisée en ce que la pièce en aiguille est formée avec une série de repères (46, 47) le long de sa longueur pour permettre la mesure de profondeur. 20
 5. Sonde selon la revendication 2, caractérisée en ce que la pièce en aiguille comporte une pointe sphérique (44). 25
 6. Sonde selon la revendication 2, caractérisée en ce que la pièce en aiguille comporte une pointe qui est hémisphérique à son extrémité inférieure avec une conicité décroissante en direction du corps de la pièce en aiguille pour créer un rebord équatorial. 30
 7. Sonde selon la revendication 2, caractérisée en ce que la poignée est adaptée à une extrémité opposée à la tête pour monter une deuxième sonde ou un moyen pour mesurer l'étendue de la régression gingivale. 35
 8. Sonde selon la revendication 7, caractérisée en ce que la poignée comporte à une extrémité opposée à la tête un moyen de connexion qui permet à une extrémité similaire d'une autre poignée semblable d'y être accouplée. 40
 9. Sonde selon l'une quelconque des revendications 1 à 8, caractérisée en ce que la pièce en aiguille est remplaçable. 45
 10. Sonde selon la revendication 9, caractérisée en ce que la tête et la pièce en aiguille sont remplaçables. 50
 11. Sonde selon la revendication 10, caractérisée en ce que la poignée comporte une ouverture façonnée adaptée pour recevoir la tête, comprenant deux plaques (48) chacune dépassant de côtés opposés de la poignée et espacées pour accommoder les pièces élastiques. 55
 12. Sonde selon la revendication 11, caractérisée en ce qu'au moins une des plaques (48) porte un repère (50) pour l'alignement avec un repère correspondant (49) sur la tête (45) pour indiquer quand une force choisie a été appliquée à la pièce en aiguille.
 13. Sonde selon la revendication 11 ou la revendication 12, caractérisée en ce qu'une portion de la tête dépasse au-dessus d'une surface supérieure de la poignée en sorte que quand une force est exercée vers le bas sur cette portion, la tête est éjectée de la poignée.
 14. Pièce à aiguille adaptée pour l'utilisation dans une sonde selon la revendication 1 et qui fonctionne comme un instrument ou une jauge de mesure clinique, comprenant une pièce allongée, dont une extrémité inférieure comporte une pointe sphérique ou hémisphérique, et dont une extrémité supérieure comporte un moyen pour monter ladite pièce à aiguille dans ladite sonde, la pièce allongée comportant des repères de calibration.
 15. Pièce à aiguille selon la revendication 14, caractérisée en ce que la pièce allongée va en diminuant de diamètre depuis l'extrémité supérieure jusqu'à l'extrémité inférieure.
 16. Pièce à aiguille selon la revendication 15, caractérisée en ce que les repères de calibration constituent des divisions en mm.