This invention relates to a plurality of interchangeable electrical dental instrument assembly for use in various electrical dental functions such as tooth and oral examination, pulp testing and oral cautery.

It is the primary object of this invention to provide in a single dental installation, a plurality of different dental instruments each requiring for its operation a different type of electrical current and a single common head or body member to which each such instrument may be selectively and individually connected and by which each such connection supplies to the attached instrument the specific current that it requires.

Another object of this invention is to provide the common head or body member and each of the instruments to be attached thereto with a complementary interfitting multi-contact the casing connections wherein the contacts of each instrument and that of the head member engage each other in predetermined indexed registry; the contacts of the head member each supplying a different type of electrical current while in each instrument only one of the corresponding contacts is electrically connected to the operating part or tool of the instrument and the other contacts thereof are free of any connection, such that in the attachment of any selected instrument with the common head member all of the contacts will interengage in indexed registry with the electrically connected contact of the instrument engaging the specific contact of the head member supplying the current requisite for the operation of the tool on the selected instrument.

A further object of this invention is to provide a multi-conductor electric cable including a ground conductor and other conductors each supplying a different value of electrical current, the cable being connected to the common head member with each current carrying conductor connected to a predetermined contact thereof and with the ground conductor connected to a metal part of the head member.

Another object of this invention relates to forming at least one such instrument of metal with the electrical operating part or tool thereof ground thereto and in providing the complementary interfitting connection between each instrument and the common head member with a movable metal locking member that will ground the metal part of the instrument casing with the metal part of the head member to which the ground conductor is connected.

Still another object of this invention is to so design the common head member, the casing of each of the dental instruments and the movable locking member as to provide a slender, hand-held instrument of great simplicity that is light in weight, easy to assemble and to manipulate and that is practical and efficient.

A still further object of this invention relates to the safety feature arising from the indexed registry of the interengaging contacts in the connection of any one of the plurality of dental instruments with the common head member which is so constructed that the current is always supplied to the selected instrument when attached to the head member and the change from one instrument to another requires no manual adjustment of any voltage control or other electrical apparatus.

These and other objects and advantages of the invention will become apparent from the following detailed description of a preferred embodiment when taken in conjunction with the accompanying drawings in which FIG. 1 is a longitudinal sectional view of the common head or body member with attached electrical cable taken on line 1—1, FIG. 2.

FIG. 2 is an end elevational view of the common head member showing the arrangement of the contact pins.

FIG. 3 is a transverse sectional view taken on line 3—3, FIG. 1.

FIG. 4 is a cross-sectional view of the multi-conductor cable taken on line 4—4, FIG. 1.

FIG. 5 is a longitudinal sectional view of a pulp testing instrument with plug portion thereof taken on line 5—5, FIG. 6.

FIG. 6 is an end elevational view of the pulp testing instrument showing the contact socket arrangement as seen from the right-hand end of FIG. 5.

FIG. 7 is an elevational view showing the pulp testing instrument connected to the common head or body member.

FIG. 8 is a longitudinal sectional view of an examination light instrument with the plug portion thereof, taken on line 8—8, FIG. 9.

FIG. 9 is an end elevational view of the examination light instrument showing the contact socket arrangement as seen from the right-hand end of FIG. 8.

FIG. 10 is a longitudinal sectional view of a cautery instrument with the plug portion thereof, taken on line 10—10 of FIG. 11.

FIG. 11 is an end elevational view of the cautery instrument showing the contact socket arrangement as seen from the right-hand end of FIG. 10.

The plural electrical dental instrument assembly as illustrated in the drawings and described in detail hereinafter consists of a common head or body member 20, FIG. 1, to which is selectively attached one of a plurality of instruments such as a pulp tester, FIG. 5; an examination light, FIG. 8; or a cautery handpiece, FIG. 10. These instruments are selectively employed for individual connection to the common head member and each when connected becomes electrically operative for its intended purpose and together with the head member provides a manipulative hand-held instrumentality as shown in FIG. 7.

THE COMMON HEAD OR BODY MEMBER

The common head or body member 20 shown in FIGS. 1–4 comprises a tubular metal housing 22 that is slightly tapered toward its rear end as at 24 and is internally formed to provide a forward internally threaded portion 26, an intermediate cylindrical portion 28 and a rear passage portion 30 of a diameter less than the intermediate portion 28. The interior portions 26, 28, 30 of the housing are coaxial with the intermediate portion 28 of a greater length than the forward and rear portions. Provided at the adjacent ends of the intermediate and rear portions 28, 30 is a frusto-conical shoulder 32.

Connected to the tapered end 24, is a multi-conductor electric cable 38 which includes a ground conductor 40, a pulp test conductor 42, a cautery conductor 44 and an examination light conductor 46, see FIG. 4. Preferably the cable 38 is covered with a nylon braid covering 48. One end portion of the cable 38, with a short length of the terminal end of each of the conductors exposed, is initially inserted through the tubular housing 22, and thus fitted therein a rubber sleeve 50 is provided with a forward enlarged flanged head 52 and a rear tapered end 54. Disposed between the cable 38 and the inside diameter of the flanged head 52 is a metal ring 56 for a purpose to be hereinafter described. As seen in FIG. 1, the terminal end 56 of the cable 38 projects forwardly beyond the rubber sleeve flange 52 and the forward edge of the metal ring 56 lies flush with the forward face of the flange 52,
the metal ring 56 preferably engaging both the cable 38 and flange 52 in a friction-tight fit. Positioned over the cable terminal end 58 is a metal collar 60 having a rearwardly extending thin walled sleeve 62 which completely receives therein the enlarged flanged head 52 of the rubber sleeve, with the forward face of the flanged head abutting the inside face of the collar. The free terminal end of the extended sleeve 62 is crimped as at 64 over the rear edge of the flange 52 which is of frusto-
conical shape, the metal ring 56 serving as an abutment anchor for the compression of the flanged head and re-
lieving the cable of any compressive forces. The crimped end 64 of the sleeve 62 thus provides a metallic shoulder 
complemental to the shoulder 32 and has seating engage-
ment for a purpose hereinafter described. It will be noted that the metal collar 60 with sleeve ex-
tension 62 has an outside diameter such as to have an easy sliding fit within the intermediate cylindrical portion 28 of the housing 22 and that when the crimped end 64 is seated on the shoulder 32 the tapered end portion 54 of the collar 60 will protrude from the housing 22. The tapered end 54 of the rubber sleeve functions as a guard for the cable 38 preventing undue flexure and possible breaking of the cable at the tapered end of the housing.

Provided in the forward face of the metal collar 60 is an annular groove 66 and a subaxially radial connecting 
groove 68 for receiving therein the exposed terminal end 
70 of the ground conductor 40, see FIG. 3, which is per-
manently secured to the metal collar by soldering.

Carried within the intermediate cylindrical portion 28 of the housing 22 is a cylindrical insulator body 76 formed of any suitable plastic such as melamine and of an out-
side diameter such as to have a sliding fit within and in-
termediate portion. Provided at the rear end of the in-
sulator body 76 is a cylindrical recess defining a pocket 
78 for receiving the terminal ends of the current-carrying 
conductor 42, 44, 46 of the cable 38. Formed in the insulator body 76 are three longitudinal bores 80, 82, 84, parallel to the axis of the insulator body 76, and which extend completely therethrough as shown. Each bore is formed with increased diameter end portions to provide a front and rear shoulder, and the bore 80 is of a larger diameter than the other two bores 82, 84 which are of the same diameter.

Deposited respectively within the bores 80, 82, 84 are metal contact pins 86, 88, 90, pin 86 being of a larger diameter than the others. Each contact pin includes base 94 corresponding in diameter to its respective bore and is provided with a flange 96 adjacent its rear end adapted to seat on the rear shoulder of its associated bore, see FIG. 3. Provided at the forward end of the insulator body 76, a spring lock 100 is fitted between the flange 98 of each contact pin and the front shoulder of its associated bore for locking the contact pin against axial movement rela-
tive to the insulator body. It will be noted that the con-
tact pins 86, 88, 90, 120, 122, 124 are each of a length such as to project forwardly from the insulator body into the forward interiorly threaded portion 26 of the housing and slightly beyond the terminal forward end of the housing 22.

Prior to placement of the contact pins within their re-
spective bores each has secured thereto the exposed ter-
mal end of a current conductor of the cable 38. Thus, provided axially in the base 94 of each contact pin is a hole 102 into which is inserted the exposed terminal end of a current conductor which is soldered therein to effect a permanent connection. Accordingly it will be seen that the cauter conductor 44 is connected to the larger con-
tact pin 86, the pulse test conductor 42 is connected to the contact pin 88 and the examination light conductor 46 is connected to the contact pin 90.

To secure the insulator body 76 with attached contact 
pins in position within the housing 22 there is provided 
an externally threaded metal sleeve 106 that is threaded into the forward interiorly threaded portion 26 of the housing. The sleeve 106 is an internally directed radial rear flange 108 and at its outer 
end with an outwardly directed radial forward flange 110, the sleeve 106 being of such a length that when the rear 
flange 108 abuts the forward face of the insulator body to clamp the same along with metal collar 60 to the hous-
ing 22, see FIG. 1, the forward flange 110 will be axially 
spaced from the forward terminal end of the housing 22. It will be noted that the contact pins extend partly into the sleeve 106 which provides a socket for the reception of an instrument plug as will be hereinafter described.

Carried by the socket sleeve 106 is a metal coupling nut 
114 of cylindrical form provided with a central threaded 
portion 116 and having at its rear end a radial flange 118 of a width corresponding to the thickness of the housing 22 and of an inside diameter such as to slidably and 
rotatably fit on the sleeve 106. The nut 114 includes a rear 
shroud 120 that overlaps the exterior cylindrical surface of the housing 22 for all positions of the nut on the sleeve 106, the sleeve flange 110 and the forward terminal end of the housing 22 serving as limit stops engageable by the nut flange 118. A shorter nut-like shroud 122 ex-

tends forwardly of the threaded portion 116 to overlie a cylindrical portion of the casing surface of an instru-
ment as will be hereinafter described. To facilitate manip-
ulation of the coupling nut 14, the extension surface thereof is fluted as at 124.

The multi-conductor cable 38 at its other end is con-
nected to a power unit 126, see FIG. 1, which will supply between 500 and 1000 volts to the pulp tester conductor 42, about 3½ volts to the cauter conductor 44, and about 2 to 2½ volts to the examination light conductor 46, all for a purpose as will hereinafter be described with regard to the corresponding instruments.

THE PULP TESTER

Illustrated in FIGS. 5 and 6 is a pulp test instrument 130 which has for its purpose the testing of the vitality of a tooth. In an instrument of this type and purpose a high voltage is necessary because of the possibility of classifying a non-vital pulp as vital, a common occurrence in pulp testers employing a low voltage. In the herein de-
scribed pulp testing instrument, an exemplary average operating current of about 600 volts is required for its

normal operation but higher voltage is available. In the construction shown, the pulp test instrument 130 includes a tool consisting of an elongated tapered probe tip 132 of plastic such as melamine or any other suitable plastic material provided with a stainless steel core rod 134 pro-
jecting outwardly as at 136 from the probe tip.

Fitted over the rear end portion of the probe tip is a tapered tubular metal front body 138 which in turn car-
ries at its rear end the forward end portion of a tubular Plexiglas member 140 having an intermediate annular lens portion 142. A tapered tubular metal rear body or sheath 144 having an internally threaded portion 146 is fitted over the rear portion of the Plexiglas member 140 with the threaded portion 148 of the Plexiglas member 140. As will be seen from FIG. 5, the adjacent terminal ends of the front and rear metal bodies abut the annular lens 142, the outer surface of which extends slightly beyond the tapered outer surface of the front and rear metal bodies.

Continued within the Plexiglas member 140 is a neon bulb 152 having two leads 154, 156. Lead 154 extends forward from the sleeve 106 and is connected to a helical compression spring 158 which engages the inner 
terminal end of the stainless steel core rod 134. The other lead 156 is soldered to a metal block 159 that fits within and seats on the rear terminal end of the Plexi-
glas member 140 in the manner shown. The probe tip 132 and Plexiglas member 140 are secured in any desired
manner as by an epoxy adhesive to the front metal body 138.

The rear end portion of the rear metal body 144 is provided with an outer cylindrical portion 160 and an outer threaded end portion 162 for a purpose to be hereinafter described. The metal block 159 provides an end wall of a cylindrical recess 164 at the end of the rear metal body 144.

A plastic base member or plug adapter 168 of melamine or other suitable plastic, provided with an intermediate annular flange 170, is secured in position within the cylindrical recess 164 by an epoxy adhesive or in any other desired manner, the end portion 162 as shown. The portion of the plug adapter extending rearwardly of the flange 170 constitutes a plug 172 that is dimensioned to fit within the socket sleeve 106 of the head member 20. Fixedly secured within the plug 172 in a manner similar to that of the contact pins 86, 88, 90 are three metal contact sockets 176, 178, 180 arranged 120° apart, each is parallel to the axis of the plug adapter.

The contact sockets 176, 178, 180 are each complementary to the contact pins 86, 90 and 88 respectively of the common head member 20. Contact socket 180, see FIG. 5, includes a spring loaded metal butt 182 that bears against the face of metal block 159, and will thus conduct current to the neon bulb 152. In this respect contact socket 180 is a “live” socket and will hereinafter be referred to as such. The other two contact sockets 176 and 178 have no electrical connection whatsoever with the operating parts of the pulp tested instrument and are in this respect “neutral” and will hereinafter be referred to as such.

Thus, it will be seen that, with the plug 172 plugged into the socket sleeve 106 of the head member 20, there can only be one predetermined position thereof with respect to the head member 20 by virtue of the mating engagement of the larger diameter contact pin 86 with the larger diameter contact socket 176, and accordingly only the requisite exemplary current of about 600 volts supplied by the pulp test instrument 242 will be transmitted from contact pin 86 to the “live” contact socket 180 to effect operation of the pulp test instrument. The other two contact sockets 176, 178 being “neutral,” their mating engagement with current carrying contact pins 86 and 90 respectively will have no effect.

It is seen that the described contact pins and contact sleeves make up a patterned arrangement, with the corresponding contact pin 86 and contact socket 176 being of larger size than the other providing for an indexed registry of the pulp test instrument 130 with respect to the head member 20 in its connection thereto.

It is to be understood that, with plug 172 plugged into socket sleeve 106 of the head member 20, both the pulp test instrument 130 and head member 20 are securely held together by the threaded engagement of the coupling nut 114 with the threads 162 on the rear metal body 144, the forward shroud 125 of the nut riding on and overlapping the cylindrical portion 160 of the rear body 144; the jointed pulp test instrument and head member being shown in FIG. 7. It will be apparent that the combined instrument of FIG. 7 is so dimensioned as to be easily hand-held and is manipulatable to any desired position in the use thereof. In the connecting together of the pulp test instrument with the head member 20 by threading of the metal coupling 114 and 162 of the rear metal body 144, which in effect constitutes a handle for the pulp test instrument, is grounded to the ground conductor 40 through the metal-to-metal contact of nut 114, sleeve 106, housing 22 and metal collar part 60 of the head member, see FIG. 1.

In the use of the pulp test instrument the circuit is completed by the dentist or operator holding the instrument against the tooth to be tested and touching the patient bodily. To indicate that the pulp test instrument is operative the neon bulb 152 will light up and the light will thus be visible through the annular lens 142. This construction is but one of a number of different types of indicating means which may be used for purposes of permitting ready and visual observation that the circuit in the instrument has been completed and that the instrument is functioning.

THE EXAMINATION LIGHT INSTRUMENT

In FIGS. 8 and 9, there is illustrated an examination light instrument 190 that requires for its operation an exemplary current of about 2 or 2 ½ volts. The examination light instrument 190 consists of an elongated internally tapered tubular metal casing or sheath 192 having a central bore 194 therein extending longitudinally from the forward end inwardly, merging with additional stepped bores 196 and 198. Supported at the forward end of the casing 192 is a mirror mount 198 which carries a magnifying mirror 200 disposed at an inclination in forwardly spaced relation to the front end of casing 192. The rear end of the casing 192 is enlarged and exteriorly threaded as at 202 and formed with a short cylindrical portion 204.

Between stepped bores 196 and 198 is an annular shoulder 212 which receives an insulating plug 214 provided with an axial opening 216 which receives and supports the inner end of a contact rod 218 having a stepped bore 214a with plug 214 to limit the movement of said rod in one direction. Preferably press-fitted onto the forward end of rod 218 is an insulating bushing 221 which is movable, guidably, relatively to the interior of a metallic lamp socket sleeve 222 which is press-fitted or otherwise secured to the outer end of casing 192 so as to project beyond the end thereof for a purpose to be described. An internally threaded lamp socket 223 is secured within the outer end of sleeve 222, such as by press-fitting it therein, to receive the threaded end of a suitable miniature size electric lamp bulb 224.

Positioned and secured within the rear terminal portion of the casing 192, by suitable cement or the like, is a base member or plug adapter 168c which is substantially identical in all respects to the plug adapter 168 of the pulp test instrument shown in FIGS. 5 and 6, and has contact sockets 176a, 178a and 180a carried by plug 172 in which correspond in dimensions and arrangement with the contact sockets 176, 178 and 180 carried by plug 172 of plug adapter 168. In the examination light instrument 190, contact socket 178a is the “live” contact socket while the other two contact sockets 176a and 180a are “neutral.”

Plug adapter 168a has a plurality of bores formed in the inner end thereof and into which the various contact sockets 176a, 178a and 180a are pushed for firm seating therein. Within one of such bores 225, a movable contact 226 is mounted for projection from the inner end of plug adapter 168a. A suitable coil spring 228 within bore 225 urges contact 226 outwardly into contact with head 222 of contact rod 218, whereby a circuit is established to supply current from the “live” contact socket 178a to lamp bulb 224 through the interengaging spring 228, contact 226, head 222, and contact rod 218, the outer end of which is urged by spring 228 forwardly into contacting engagement with the bottom of base of lamp bulb 224. The shell of the base of lamp bulb 224 is grounded through metal casing 192, thereby completing the lamp circuit.

Accordingly, when plug 172a is inserted into socket sleeve 106 of the common head member 20, the indexing registry of the contact sockets with the contact pins will provide that the 2–2 ½ volt current supplied by the illumination light conductor 46 of multi-conductor cable 38 will be transmitted through the mating interengagement of contact socket 178a with contact pin 90 to transmit the current through coil spring 228 and the circuit-completing members described above resulting from said spring to lamp bulb base 220, thereby energizing lamp bulb 224. The contact sockets 176a and 180a are “neutral” and thus the corresponding mating engagement of the same with contact pins 86, 88 will be of no effect. Mirror 200 in-
cludes a split sleeve 230 which frictionally engages sleeve 222 for support thereby. When the plug 172a of instrument 190 is plugged into the socket sleeve 106 of the common head member 20, the casing 192 and the head or base member 20 are connected together by the coupling nut 114, the threads 116 of which threadably engage the outer threads 210 of the housing sleeve 206, with the forward shroud 122 of the coupling nut 114 over and overlapping the cylindrical surface portion 204 of the casing 192. As with the pulp testing instrument 130, the connection of the coupling nut 114 to the casing 192 will effect grounding of the metal casing 192 to the ground conductor 40. Also, as with the pulp testing instrument 130, the joining together of the examination light instrument 190 with the common head member 20 will provide a hand-held assembly similar to that of FIG. 7 and easily manipulable in all directions.

THE CAUTERY INSTRUMENT

In FIGS. 10 and 11 there is illustrated a cautery instrument 240 that requires for its operation an exemplary current of 3½ volts. The cautery instrument 240 consists of a tubular forwardly tapered metal casing or sheath 242 carrying at its forward end an elongated slightly tapered plastic nose piece 244 made of melamine or any other suitable plastic material. A pair of transversely spaced small diameter metal tubes 246, 248, is positioned and soldered within the forward end of each metal tube are metal socket members 250, 252, respectively, the outer ends of which lie flush with the terminal end of the nose piece. A removable end member 256 of like plastic material carries two rearwardly extending contact pins 258, 260 adapted to respectively mate within the socket members 250, 252. A tool comprising an exemplary nickel-chromium resistance wire loop provides a cautering tip 264, the end of the wire being each rigidly secured to a base of the contact pins 258, 260 by brazing or otherwise.

As will be apparent from FIG. 10, the end member 256 is removable to permit tip 264 to be replaced, the shape and dimensions of the end member 256 being such as to be coextensive with the outer surface of the nose piece 244 when abutting the terminal end thereof. The inner end of the nose piece 244 is of reduced diameter and is secured within the forward end portion of the casing 242 by means of an epoxy adhesive or the like. The two metal tubes 246, 248, preferably lie in the same vertical plane and are extended rearwardly beyond the inner end of the nose piece 244 into the casing 242. The end of the upper metal tube 246 is flattened as at 266 to provide a contact and is held spaced from the end 268 of the lower metal tube 248 by an insulating sleeve 270 surrounding the same.

The rear end portion of the casing 242 is formed internally with a cylindrical bore 272 larger in diameter than the central cylindrical chamber 274 to define a shoulder 276. Seated against the shoulder 276 at the inner end of bore 272 is a metal ring 278 that is secured in place by solder or otherwise. The wall of the casing 242 opposite the flattened end 266 is slotted as at 280 to receive therein a switch button 284 having on its underside a metal contact bar 286. A leaf spring 288 is secured at one end by soldering or otherwise to the metal ring 278 and its other end is secured in metal to metal contact with the metal contact bar 286 in the resting in combination acting to normally hold the switch button 284 spaced from the flattened end 266 which as indicated serves as a mating contact. Provided exteriorly at the rear end portion of the casing 242 is a cylindrical portion 290 and a threaded portion 292.

Positioned within the bore 272 at the rear end of casing 242 is a base member or plug adapter 168, identical in all respect to the hereinbefore described plug adapter 168 of the pulp test instrument of FIGS. 5 and 6, with the contact sockets 176b, 178b and 180b carried by plug 172 of plug adapter 168. In the cautery instrument 240, contact socket 176b is the "live" contact socket while the other two contact sockets 178b and 180b are "neutral." Thus, a conductor 296 positioned within casing chamber 274 and passing above leaf spring 288 has one terminal exposed and a second terminal connected to contact socket 176b in any suitable manner and its other terminal exposed end 300 inserted into the rear end 268 of lower metal tube 248 and secured therein by soldering or otherwise.

Accordingly when plug 172b is inserted into socket sleeve 106 of the common head member 20, the indexing of the contact sockets 176, 178, 180 carried by plug 172b of plug adapter 168. In the cautery instrument 240, contact socket 176b is the "live" contact socket while the other two contact sockets 178b and 180b are "neutral." Thus, a conductor 296 positioned within casing chamber 274 and passing above leaf spring 288 has one terminal exposed and a second terminal connected to contact socket 176b in any suitable manner and its other terminal exposed end 300 inserted into the rear end 268 of lower metal tube 248 and secured therein by soldering or otherwise.

Accordingly when plug 172b is inserted into socket sleeve 106 of the common head member 20, the indexing of the contact sockets 176, 178, 180 carried by plug 172b of plug adapter 168. In the cautery instrument 240, contact socket 176b is the "live" contact socket while the other two contact sockets 178b and 180b are "neutral." Thus, a conductor 296 positioned within casing chamber 274 and passing above leaf spring 288 has one terminal exposed and a second terminal connected to contact socket 176b in any suitable manner and its other terminal exposed end 300 inserted into the rear end 268 of lower metal tube 248 and secured therein by soldering or otherwise.
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ried respectively by said base members in similar patterns comprising indexing means to insure similar positioning of all said base members of said different dental instruments with said body member,

(d) a multi-conductor flexible electric cable connected at one end to said body member with the corresponding ends of said conductors connected to the contacts on said body member and the opposite ends of said conductors respectively being connectable to suitable sources of different types of current respectively of the type required by said different dental instruments, and

(e) a different one of the contacts of the patterned arrangement of contacts carried by each of said base members of said instruments being connected to the electrical means in said instruments and the other contacts thereon being unconnected with said electrical means, whereby connection of each dental instrument to its intended type of current carried by said electric cable is insured.

2. A dental instrument assembly for a plurality of interchangeable electrical dental instruments wherein each instrument is used individually and each requires current of a different type for its operation, comprising in combination:

(a) a common body member having a metal part secured thereto,

(b) a plurality of electrical contacts mounted within said body member in a patterned arrangement,

(c) means for insulating said contacts from said body member,

(d) a plurality of dental instruments each having a different electrical dental tool at one end and a base member at the other end thereof,

(e) a plurality of contacts mounted within each base member in a patterned arrangement complementary to the contacts in said body member and adapted to be engaged therewith, a different selected one of the contacts of each base member being electrically connected to the tool on that instrument and the other contacts on each base member being unconnected with said tool and having only a guiding and positioning function whereby connection of each instrument to the required type of current for its tool is insured,

(f) a plural conductor flexible electric cable connected at one end to said body member, one of said conductors being connected to said metal part and thus serving as a ground connection for said instruments, the remaining conductors in said cable being connected one to each of said body member contacts, the other ends of said remaining conductors being connected respectively to suitable sources of electrical current, each of said sources of current supplying a different type of current to each contact as required respectively by said different dental instruments,

(g) the patterned arrangement of contacts on said body member and the corresponding patterned arrangement of contacts on said base members constituting an indexing and aligning means to insure similar positioning of all said different dental instruments with respect to said body member and its contacts, and

(h) means on said body member for interchangeably securing the said instruments thereto with each instrument thus adapted to receive only its required type of current by interengagement of the "live" selected contact element thereof with its corresponding mating contact in the body member.

3. A plural interchangeable electrical dental instrument assembly wherein each instrument is used separately and requires current of a different type from the others, comprising in combination:

(a) a common body member having a socket at one end thereof,

(b) a plurality of electrical contacts and an insulating body supporting said contacts in fixed position within said socket in a patterned arrangement,

(c) a plural conductor flexible electric cable secured to the other end of said body member, one of said conductors serving as a ground connection, the remaining conductors in said cable being connected one to each of said contacts,

(d) a source of electric current, means for connecting the opposite ends of said remaining conductors to said source of current and current supply means interposed between said flexible cable and said source of electric current for supplying each conductor with a different type of electric current as required respectively by said different dental instruments,

(e) a plurality of dental instruments each having a different electrical dental tool at one end thereof and a plug member at the other end thereof for engagement with said socket, a plurality of contacts mounted in each plug member in a patterned arrangement complementary to the contacts in said socket member and adapted to be engaged therewith, the patterned arrangement of contacts constituting an indexing and aligning means to insure similar positioning of all said different dental instruments with respect to said socket,

(f) only one contact element in the plug of each instrument being "live" and in electrical connection with the tool on said instrument and the "live" contact element for each plug being a different one,

(g) the other contact elements in each plug being neutral, whereby upon selection of any one instrument for use and the insertion of the plug thereof into said socket, the engagement of the "live" contact element therein with its complementary mating contact will provide the required current for operation of the tool on said instrument.

4. The plural interchangeable electrical dental instrument assembly of claim 3 wherein the patterned arrangement of contacts in said socket includes at least one contact of a shape distinct from the others, so that said distinctly shaped contact when engaged with a corresponding contact element carried by an instrument plug serves to identically position the plug of each instrument in said socket.

5. The plural interchangeable electrical dental instrument assembly of claim 3 wherein a metal collar is seated in contact with said common body member and wherein said ground connection conductor in said flexible cable has a terminal end thereof connected to said metal collar.

6. The plural interchangeable electrical dental instrument assembly of claim 5 wherein said common body member includes an elongated housing at least a portion of which is metallic, each said instrument includes an elongated sheath at least a portion of which is metallic and there is provided a metallic coupling means for joining said body member selectively to each instrument, the said housing, sheath and coupling means being in metal-to-metal contact to provide a ground connection for said instruments.

7. The plural interchangeable electrical dental instrument assembly of claim 3 wherein said contacts of said body member and plug members of said dental instruments are of the pin and socket types frictionally engageable with each other and all of said pin type contacts are carried by said body member within the socket thereof to protect the same and all of the socket type contacts being carried by said plug members for frictional reception of said pin type contacts when the plug member of a selected dental instrument is inserted within the socket of said body member for operative connection thereto.

8. The plural interchangeable electrical dental instrument assembly of claim 7 wherein the outer ends of said pin type contacts do not project beyond the walls defining the socket of said body member and the outer ends of said
socket type contacts not projecting substantially beyond the outer ends of said plug members of said instruments.

9. A receptacle assembly for a plurality of interchangeable electrical dental instruments each requiring a different electric current for its operation, comprising in combination:
(a) a body member having a metal part secured thereto,
(b) a plurality of electrical contacts mounted in said body and exposed at one end thereof in position for mating engagement with corresponding contacts on said dental instruments,
(c) means for insulating said contacts from said body member,
(d) a composite, flexible electrical cable having a plurality of separate electrical conductors extending throughout its length, said cable being connected at one end to said body member, one of said conductors being connected to said metal part and thus serving as a ground connection for said instruments, the remaining conductors being connected one to each of said contacts, the other ends of said remaining separate conductors being connected respectively to suitable sources of electrical current, each of said sources of current supplying a different type of current to each contact as required respectively by said different dental instruments.

10. The receptacle assembly of claim 9 wherein said body member has a socket at one end thereof and wherein said contacts comprise contact pins within said socket.

11. The receptacle assembly of claim 9 wherein one of said contacts is of a configuration distinct from the others for mating engagement with a corresponding contact element carried by an instrument whereby to insure similar positioning of all said instruments with respect to said body member.

12. The receptacle assembly of claim 9 wherein said body member includes a housing at least a portion of which is metallic and wherein said metal part comprises a collar seated within said housing in metal-to-metal contact therewith thereby providing a ground connection for said instruments when they are in mating engagement with said body member.

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