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| RESEARCH ARTICLE

Dental Magnetic Field Ultra-Controlling System

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| ABSTRACT
The Dental Magnetic Field Ultra Controlling System represents a revolutionary shift in dental technology, propelling the boundaries of dentistry through its innovative options and treatments. Employing magnetic guidance and control, this groundbreaking system not only optimizes procedural efficiency but also obviatesthe necessity for multiple devices, thus creating a cohesive platform that integratestherapeutic modalities with traditional treatment methods. This paradigmatic transformation transcends the traditional reliance solely on the dentist's skill, introducing a collaborative approach through the amalgamation of technology, specialized equipment, and shared responsibilities. In doing so, it not only lowers costs for both patients and practitioners but also elevates treatment efficiency, fostering a more economically viable and infection-resistant dental practice. This pioneering system heralds a new era wherein dentistry embraces a holistic integration of advanced technologies, marking a decisive departure from conventional practices and unlocking unprecedented opportunities in the ever- evolving landscape of dental care.

| KEYWORDS

Dental Magnetic Field Ultra Controlling System; dental technology; dentistry

| ARTICLE INFORMATION

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1. Introduction

The Dental Magnetic Field Ultra Controlling System effectively surmounts inherent limitations found in conventional dental equipment, particularly addressing challenges associated with the brittleness of endodontic tools and the intricate accessibility issues encountered in certain regions of root canals. Traditional instruments, reliant on the limited manual dexterity of the dentist, impose constraints on cleaning motions, resulting in suboptimal efficacy.

This innovative device presents a compelling alternative to customary cleaning methods, adeptly clearing debris and dental filling residue from confined canals. Notably, it triumphs over the inadequacies of existing technologies, surpassing the limitations of ultrasonic scalers that struggle to navigate highly curved root canals. The system's adaptability emerges as a pivotal attribute, offering a solution to complications arising from broken endodontic instruments by enabling the remote treatment of root canals. In essence, the Dental Magnetic Field Ultra Controlling System stands as a technological leap, rectifying drawbacks associated with conventional dental tools and ushering in a paradigm shift in endodontic procedures.

By overcoming the constraints of conventional dental equipment, the Dental Magnetic Ultra Controlling System is a revolutionary development in the world of dentistry. This state-of-the-art system overcomes obstacles that have long beset traditional techniques, specifically those related to the brittleness of endodontic instruments and the complex accessibility problems that arise in particular root canal locations.

By utilizing magnetic fields for unmatched control and precision, the Dental Magnetic Field Ultra Controlling System introduces a paradigm change in dental tools by replacing physical dexterity with machine intelligence. This divergence from conventional

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techniques reduces the limitations imposed by restricted manual skills, therefore improving cleaning performance. In doing so, the device eliminates dirt and dental filling leftovers from even the narrowest canals with a level of precision that was previously unachievable, in addition to surpassing the inferior cleaning motions associated with manual procedures.

One remarkable feature of this novel tool is its versatility, which is a crucial resolution to the persistent problem of endodontic instrument breakage. The technology reduces difficulties caused by instrument breakage by eliminating the need for physical intervention in complex root canal treatments with its remote treatment capabilities. This is a demonstration of the system's technological complexity as well as its potential to transform endodontic operations because it can navigate extremely curved root canals with greater ease than traditional ultrasonic scalers can.

To put it simply, the Dental Magnetic Field Ultra Controlling System is a revolutionary advancement in dental technology that addresses the shortcomings of traditional instruments. It is a symbol of advancement in the field of endodontic operations because of its unmatched precision in navigating the complexities of root canals and its ability to handle issues resulting from damaged instruments. This system, which is a monument to its technological skill, not only demonstrates a mastery over current obstacles but also paves the way for a new era in which the limitations of conventional dental equipment are exceeded.

2. General Description of the Invention:

The transformative efficacy of the innovation lies in the conversion of electrical current into a magnetic field, harnessed for multifarious tasks within the Complete Root Canal Treatment Guided Magnetic Field Device (CRCT) and the Magnetic Hand piece, integral components comprising the overarching Magnetic Field Guiding Device. Unified under a singular control apparatus functioning as a sophisticated medical computer, compliant with stringent safety regulations and amenable to serialization using commonplace medical supplies like alcohol, this system embodies a pinnacle of medical technology. The Magnetic Hand piece, equipped with coils for generation and precise directionality, facilitates the shaping and directed application of the magnetic field. The incorporation of a versatile clamp enables the integration of the magnetic hand piece with diverse gadgets, engendering the creation of hybrid systems. A seminal advancement within this paradigm is the Endodontic Magnetic Field Transport Tip, facilitating remote guidance for the extraction of broken endodontic instruments.

The Complete Root Canal Treatment Guided Magnetic Field Device (CRCT) and its indispensable component, the Magnetic Hand piece, harness the shrewd use of electrical current transformation into a magnetic field to achieve remarkable efficacy. This versatility is unmatched in other devices. Together, these components create the Magnetic Field Guiding Device, an advanced collection of technological capabilities that revolutionizes the field of medical instruments.

The primary component of this technical marvel is a single control unit that serves as a complex medical computer. In addition to guaranteeing the smooth coordination of the different parts, this centralized control mechanism complies with strict safety standards, achieving an essential degree of compliance for medical applications. Furthermore, the system's capacity to adapt to serialization, which was made possible by the use of everyday medicinal materials like alcohol, highlights its usefulness and incorporation into accepted medical practices.

The centerpiece of this invention, the Magnetic Hand piece, features coils made specifically for the creation and precise directionality of the magnetic field. This advanced device not only makes it easier to shape the magnetic field, but it also enables unprecedentedly precise directed application of the field. The hand piece's functionality is further expanded by the inclusion of a multipurpose clamp, which allows for easy integration with a variety of devices. This flexibility leads to the development of hybrid systems, expanding the range and possible uses of the Magnetic Field Guiding Device.

Within this paradigm, the invention of the Endodontic Magnetic Field Transport Tip represents a revolutionary advance. This unique part, which offers remote supervision for the extraction of broken endodontic instruments, is evidence of the system's inventiveness. This tip represents a paradigm leap in endodontic operations by providing precise control and modulation of magnetic fields in complex settings, beyond the constraints of previous techniques.

This entire technical ensemble, in short, ushers in a new era of dental equipment. The Magnetic Field Guiding Device is a notable example of medical technology because of its flawless combination of accuracy, versatility, and adherence to medical norms. This invention, which makes use of the revolutionary potential of magnetic fields, not only solves current problems but also paves the way for a completely new method of doing dental operations that is more accurate and efficient.

3. Detailed Description of the Invention:

The conceptual core of this invention revolves around the conversion of electrical current into a magnetic field, subsequently harnessed to energize diverse devices within the Magnetic Field Guiding Device, exemplified by the Magnetic Hand piece and

CRCT sensors. These sensors interface with a singular control unit functioning as a medical-grade computer, meticulously designed to adhere to stringent safety regulations and medical specifications. The CRCT, employing computer-assisted methodologies, ensures meticulous root canal cleaning, while the Magnetic Hand piece, equipped with coils for generation and precision guidance, exemplifies the technological prowess inherent in this innovation. The inclusion of a versatile clamp further extends the utility, enabling the amalgamation of the magnetic hand piece with other devices to create hybrid systems. Introducing a paradigmatic advancement, the Endodontic Magnetic Field Transport Tip employs remote magnetic guidance, circumventing the challenges associated with devices possessing inadequate magnetic characteristics, thereby facilitating the extraction of broken endodontic instruments. This cohesive ensemble epitomizes a convergence of cutting-edge technology and precision in dental instrumentation, emblematic of a transformative era in dental care.

The core idea behind this creative project is the conversion of electrical current into a magnetic field, a game-changing procedure that can be used by a variety of devices inside the Magnetic Field Guiding Device. The Magnetic Hand piece and CRCT sensors, in particular, are noteworthy examples of this inventiveness that combine cutting-edge technology and accuracy in dental instrumentation. This complex system's coordination is supported by a single control unit that is considered a medical-grade computer. This control unit is the brain center that orchestrates the complex dance of magnetic fields in the service of dental care. It is painstakingly built to comply with strict safety requirements and precise medical specifications.

In terms of dental cleaning regimens, the Comprehensive Root Canal Treatment (CRCT) sensors are the best available. They work with computer-aided techniques. By incorporating them into the Magnetic Field Guiding Device, they provide more thorough and organized root canal cleaning than is possible with traditional techniques. Meanwhile, the Magnetic Hand piece becomes a technological marvel due to its coils that are specifically engineered to generate and direct magnetic fields. This part sets a new benchmark for the dentistry business by being incredibly inventive and improving the accuracy of dental treatments.

The versatility of the Magnetic Hand piece is further underscored by the inclusion of a dynamic clamp, a feature that extends its utility by facilitating integration with an array of devices. This adaptability paves the way for the creation of hybrid systems, emblematic of a progressive approach to dental instrumentation where interdisciplinary collaboration becomes seamlessly achievable.

One revolutionary development in this group of technologies is the Endodontic Magnetic Field Transport Tip, a device that overcomes traditional constraints related to insufficient magnetic properties. This tip solves problems by introducing remote magnetic guidance, which is a significant improvement in the industry, especially when it comes to extracting broken endodontic instruments. This ability to precisely and creatively navigate the complexities of dental operations is representative of the revolutionary period brought about by this well-coordinated ensemble of state-of-the-art technologies.

All things considered, the Magnetic Field Guiding Device is proof of the union of creativity and accuracy in dental treatment. The combination of computer-aided techniques, sophisticated magnetic field control, and flexible interface represents a paradigm change and the spirit of a revolutionary age in dental instrumentation— one marked by increased efficiency, accuracy, and flexibility.

Additionally, the innovation presents the Khraishah Bypass Technique, which allows material transfer into inflammatory cysts or abscesses by using contemporary magnetic procedures for root canal therapy. With a clockwise rotation, the Khraishah File Driver efficiently releases fractured files from dentalpulp thanks to its gear-driven mechanism.

With its unique instruments, computer-assisted technology, and magnetic guiding,this Dental Magnetic Field Ultra Controlling System offers a comprehensive and novel approach to dentistry that allows for expanded and distant treatment possibilities.

4. Summary

Figure-A elucidates the overarching design of the device, showcasing the magneticgrip and control center. Notably, it visually demonstrates the influence of the magnetic field on dental tools, exemplified by the ultrasonic scaling tip exhibiting a novel third axis. This configuration enables mechanical motions harnessing the magnetic field, serving as the foundation for converting rudimentary actions into sophisticated and efficiently functional motions customizable to the preferences ofthe dentist.

In Figure-b, the magnetic property-based capability of the device to extract fractured endodontic files is underscored, highlighting a pivotal advancement in endodontic procedures. Figure-c accentuates the device's proficiency in adding mechanical movements for multidimensional control in dental devices, facilitatingthe removal of endodontic files lacking inherent magnetic qualities and thereby economizing time, labor, and equipment resources.

Figure-d unveils the device's potential for advancing remote dental treatments, exemplified by magnetically guided micro files. Meanwhile, Figure-e provides a simplified insight into the internal structure of the magnetic hand-piece, elucidatingits intricate design that enables transformative functionalities. In Figure-f, the conversion of basic dental instruments into high-frequency oscillation-emitting devices is depicted, showcasing unidirectional rotating movements in root canals for enhanced precision.

Figure-g introduces the Complete Root Canal Treatment Guided Magnetic Field Device, offering a paradigm shift in remote dental care while reducing the workload for practitioners. Figure-h intricately details the diverse forms and applications of micro files directed by the magnetic field, encompassing directionalangles and size variations, exemplifying the versatility inherent in the system. In Figure-i, a succinct depiction outlines the ultra-guidance system, the rotary endodontic file system, and the K100 system, providing a comprehensive overviewof the device's multifaceted applications.

Figure-j investigates the magnetic needle's configuration, a component sensitive tothe magnetic field, further exemplifying the device's precision engineering. Figure-k showcases the Khraishah apex shaker, a pivotal element of the ultra-guidance system. Finally, Figure-n elucidates the types of guided files and the field guidancetechnique, while Figure-o unveils the groundbreaking Khraishah file driver, representing a pioneering addition to the device's repertoire. Together, these visual representations encapsulate the breadth and sophistication of the Magnetic Field Guiding Device, poised to redefine the landscape of contemporary dentistry.

5. Detailed Description

The innovation encompasses a sophisticated magnetically guided dental gadget system with the focal point being the magnetic field guiding device situated at its core. This device, housed in the center, achieves the generation of high-frequency and high-intensity magnetic fields by channeling electrical current through an intricate array of coils. The control panel affixed to the control center allows precise regulation of the field intensity, providing a degree of control critical for optimal therapeutic outcomes.

Through the strategic utilization of these coils, the device orchestrates the directed flow of electric current, resulting in the creation of a magnetic field that permeates both bone and tooth tissues. This magnetic guidance and regulation of dental devices within the intricate anatomical structures of teeth and bones represent a pioneering approach, affording remote control and mobility not achievable throughconventional therapeutic modalities.

The technological advancement introduces three distinct types of magnetic fields: pulsed, time-varying, and static. Each variant serves specific purposes in dental treatments, with created files optimizing magnetic field influence and guided files, utilizing magnetic fields, enhancing the overall usability of the device. The symbiotic interplay between the nature of the magnetic field and the current harmoniously contributes to material property modifications, where both direct andalternating magnetic fields exert discernible effects tailored to specific therapeutic objectives. In essence, this innovation presents a nuanced and versatile approach todental care, leveraging the intricate interplay of magnetic fields for optimized therapeutic outcomes.

The invention in question is a highly developed magnetically guided dental device system, and its essential element is the Magnetic Field Guiding Device, which is positioned at the center of its structural design. This central component achieves high-frequency and high-intensity magnetic field creation by complexly routing electrical current through a variety of coils. Attached to this core device is a control panel that is vital to maintaining the accuracy and control of the magnetic field strength—a parameter that is critical to obtaining the best possible therapeutic results during dental operations.

It is the purpose of these coils' strategic arrangement inside the Magnetic Field Guiding Device to direct the passage of electric current. Because of this careful planning, a magnetic field is created that penetrates the tissues of the tooth and the bone. One of the most innovative approaches in dental treatments is the capacity to guide and control dental devices inside the complex anatomical structures of teeth and bones. This provides a degree of remote control and mobility that is very different from traditional therapeutic modalities.

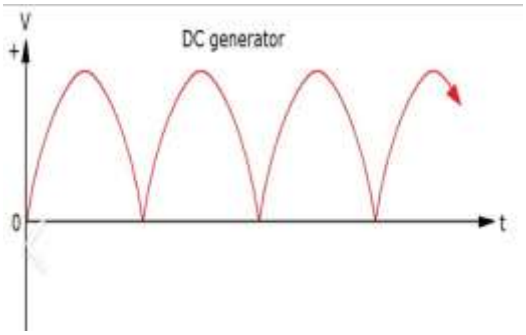
This scientific breakthrough is noteworthy for introducing three different kinds of magnetic fields: time-varying, static, and pulsed. Every variation has a distinct function in the field of dental treatments; for example, files that are designed to be magnetic field-influenced or guided files that use magnetic fields to improve the device's general usefulness. Modifications of material properties are a result of the harmonic interaction between the electric current and the magnetic field. Within this complex interaction, direct and alternating magnetic fields both have observable effects that are suited to particular therapeutic goals.

This innovation presents a paradigm where the complex interaction of magnetic fields is utilized for optimal treatment effects, essentially embodying a subtle and adaptable approach to dental care. The degree of accuracy provided by manipulating the strength of the magnetic field, along with the deliberate use of different kinds of magnetic fields, creates an advanced framework

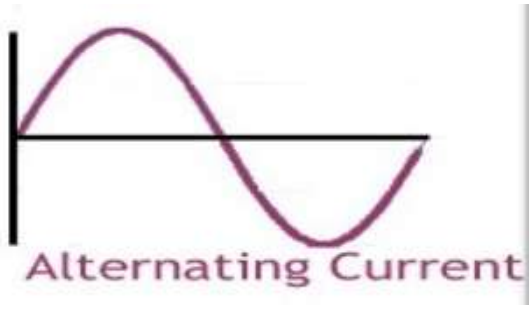
for improving the effectiveness and versatility of dental operations. This paradigm shift not only signals a break from the status quo but also ushers in a new era of dental treatments characterized by increased accuracy and adaptability in the use of magnetic fields for therapeutic purposes.

Direct current

Unidirectional Alternating CurrentPulsed Direct Current



Alternating Current



The intricate arrangement of numerous coils within the device serves a dual purpose—enhancing the generation of high frequencies and facilitating the efficient flow of current. These coils collectively produce the magnetic field essential for therapeutic control and direction within the Magnetic Field Guiding Device, as illustrated in the simplified rendition depicted in Figure E. The Magnetic Hand-piece, an integral component denoted as 4-e and 3-e, consists of a metallic rod capable of aggregating magnetic field bundles. This device, endowed with a cooling system and customizable features, utilizes materials such as silicon steel, iron, amorphous metals, ferrite ceramics, and other magnetic field- transmitting materials, ensuring adaptability to specific production needs.

Comprising essential elements like the Complete Root Canal Treatment Guided Magnetic Field Device (Figure G), the Magnetic Hand-piece (8-a), and the Control Center (1-a), the device's architecture is delineated with precision. The Control Center boasts connectors for external peripherals, a touch-controlled display (2-a), buttons regulating field intensity and frequency (3-a and 4-a), and port A-22 for data gathering and apex locating. Orchestrating treatment procedures, the Control Center also gathers and organizes pertinent data.

Within the Magnetic Hand-piece (8-a), components such as generator coils (9-a), guiding coils (10-a), power source (6-a), effective magnetic field focus (11-a), receiver magnetic field focus (A-20), and a regulating switch (A-25) collectively enable streamlined

magnetic field operation by the dentist. The clamp (12-a), a vital inclusion, facilitates the integration of the Magnetic Hand-piece with various dental devices, promoting versatility in dental procedures.

Figure A elucidates the magnetic field direction for both sonic and ultrasonic tips, introducing novel orientations for enhanced performance. This innovation allows for sub-gingival utilization, facilitating improved curettage and application at sharper angles without inducing micro-cracks, as evident in Figure 19-a. Figure N provides comprehensive insights into the application procedure, exemplifying the device's enhanced performance in dental treatments.

In Figure B, the Endodontic Magnetic Field Transport Tip (5-b) takes center stage, constructed from materials with considerable magnetic field transport capabilities like cobalt, nickel, or iron. This tip, instrumental in navigating root canals, proves effective in attracting and extracting embedded or broken devices (4-b), ranging in size from 0.10 mm to 1 mm. Its utility extends beyond endodontic treatments, finding application in challenging anatomical locations like periodontal pockets and nasal sinuses through a remote magnetic guidance approach.

The complex arrangement of several coils in the apparatus accomplishes two functions, working together to improve the production of high frequencies and promote effective current flow. As the simpler version shown in Figure (E) illustrates, this arrangement of coils collectively plays a crucial role in creating the magnetic field necessary for therapeutic control and guidance within the Magnetic Field Guiding Device. The key element, designated 4-e and 3-e, is the Magnetic Hand piece, which is a metal rod that can collect magnetic field bundles. This advanced device uses materials including silicon steel, iron, amorphous metals, ferrite ceramics, and other magnetic field-transmitting materials, ensuring adaptability to individual production needs. It also has a cooling system and configurable features

The device's composition, which includes crucial components like the Control Center (1-a), the Magnetic Hand piece (8-a), and the Complete Root Canal Treatment Guided Magnetic Field Device (Figure G), reveals the architectural perfection of the design. Connectors for external peripherals, a touch-controlled display (2-a), buttons to adjust field intensity and frequency (3-a and 4-a), and port A-22 for data collection and apex location are all located in the Control Center, the center of orchestration. The Control Center is more than just an interface; it is essential for collecting and arranging relevant data, which makes treatment processes more efficient.

A world of complex parts, including generating coils (9-a), directing coils (10-a), a power source (6-a), an effective magnetic field focus (11-a), a receiver magnetic field focus (A-20), and a regulating switch (A-25), emerges from the Magnetic Hand piece (8-a). The dentist can operate the magnetic field more efficiently and precisely thanks to the assembly's combined efforts. One important detail that becomes apparent is the addition of the clamp (12-a), which allows the Magnetic Hand piece to be seamlessly integrated with a variety of dental instruments, increasing procedure adaptability.

The magnetic field direction for both sonic and ultrasonic tips is shown in Figure A, which also introduces new orientations for improved performance. This invention allows for the use of sub-gingivals, which allows for better urettage and application at angles that are sharper without creating micro-cracks, as shown in Figure 19-a. In the meantime, Figure N offers detailed information about the application process and illustrates how the device performs better during dental treatments.

Highlighted in Figure B is the Endodontic Magnetic Field Transport Tip (5-b), which is made of materials like cobalt, nickel, or iron that have significant magnetic field transport properties. This guide, which is useful for navigating root canals, works well for drawing in and removing embedded or fractured devices (4- b), which have a size range of 0.10 mm to 1 mm. Its use goes beyond endodontic treatments; using a remote magnetic guidance technique, it can be applied in difficult anatomical areas such as nasal sinuses and periodontal pockets.

In summation, the device's intricate design, as depicted in these detailed visual representations, underscores its multidimensional functionality, precision, and adaptability. These components collectively signify a paradigm shift in dental care, showcasing an innovative integration of advanced materials and magnetic field manipulation techniques for optimized therapeutic outcomes.

The device's innovative approach to releasing shattered components involves the application of a unipolar alternating magnetic field from outside the tooth (3-b), followed by the deployment of the endodontic magnetic field transport tip (5-b). This process induces vibrations that initially release the broken component horizontally, followed by vertical attraction, showcasing the device's prowess in precision and non-invasive therapeutic interventions.

The Khraishah bypass approach, depicted in Figure C, offers a strategic recourse when the device within the root proves resistant to or unresponsive to the remote magnetic guidance technique. Utilizing an endodontic file exposed to a magnetic field (6-c) or

any other ultra-controlling system device, this technique precisely locates the endodontic file within the canal. The ultra-controlling tool (c-6), governed by the magnetic grip (c-3), generates a magnetic field contingent on the guiding coils, affording the dentist increased flexibility and alternatives. This approach minimizes the risk of root perforation and ensures the controlled liberation of the endodontic file.

Figure D showcases modern root canal technology designed to address challenges posed by C-shaped canals and various anatomical complexities. Leveraging sound waves produced by a magnetic field and micro files guided by the same, this remote treatment ensures uniform cleaning and shaping of the root canal. The Endodontic Magnetic Field Transport Tip, guided by a magnetic field, allows for the selection of micro file measurements (7-d, 8-d, 9-d representing Z, Y, and X) and final channel width, offering a wide range of options (ranging from 0.25 to 0.80 mm). This adaptability enables the dentist to tailor the procedure to the specific curvature and size of the root canal.

The intricate details of the root canal treatment procedure are elucidated in the subsequent paragraph. Y, representing the ultimate channel diameter (4-d), is chosen based on design measurements, allowing for a tailored selection of micro files to achieve the desired results. The micro files, directed by the magnetic field, traverse the root canal at a 60-degree angle, adapting to the size, shape, and medical requirements. The helical path created by variations in functional degree angles (h-3) allows the micro file to alter its vertical position. The tapering (h-2) introduces diverse file configurations, including non-tapered, tapered, and functional-degree variants, each tailored to specific anatomical nuances. This intricate system ensures precision, efficacy, and adaptability in root canal procedures.

The K-bypass method, channel widening, retrieval, cleaning, and shaping may all be done with this micro file. It is an essential component of the magnetic retrieval method, which uses reverse functional degree to guide the file toward the apex while drilling around damaged files to extract them with the least amount of dentin loss possible.

In Figure H, an innovative category of micro-files is introduced, exemplifying vertical micro-files that operate in a withdrawing motion under the guidance of a magnetic field. Particularly advantageous in phase 3 of endodontic treatments, these micro-files facilitate the simultaneous use of multiple treatment files, eliminating the need for repetitive addition and removal during the cleaning and shaping processes across all three phases. The composition of these micro-files, incorporating highly magnetizable metals or intrinsic magnetism, is outlined in design specifications, emphasizing their role in enhancing guidance and control. The simplified internal design in Figure e reveals the intricate coil bundles of the device, showcasing their magnetic transport capabilities.

Figure f delves into the device's impact on the irrigation needle within the root canal, generating vibrations through a unipolar alternating magnetic field. This vibrational action is integral to clearing secondary root canals, with a focus on the directed file (n-3) and the magnetic needle. The magnetic stopper (f5) ensures stability during equipment placement, utilizing a magnet enclosed in a rubber cover, complete with North and South pole labels.

Figure g presents a simplified depiction of the Complete Root Canal Treatment (CRCT) equipment, highlighting its prowess in channel cleaning and washing through computer control, magnetic field manipulation, and connection to a magnetic field guiding device. This holistic dental system comprises various components, each assigned a specific function during endodontic procedures, from tooth implantation (G-2) to energy source (G-1), the tooth under treatment (G-4), and the anchored tooth or tooth attached to the apparatus (G-3). G-5 and G-6 represent irrigation or drying tubes and suction or drying tubes, respectively, while G-7 signifies magnetic field generators. G-8 denotes the common angle inaccessible to coils due to tooth alignment, and G-9 and G-10 represent the angles of coil B and coil A, respectively, with G-11 indicating the effective area of the magnetic field.
To conclude, this state-of-the-art dental technology presents a comprehensive approach to root canal treatment, leveraging magnetic field guidance for precise and controlled file movement, ultimately enhancing the efficacy and efficiency of endodontic procedures. The system, operating with the assistance or complete supervision of artificial intelligence, adheres to a pre-prepared treatment plan, seamlessly integrating the micro-file family of equipment ranging from sizes 25 to 80. This amalgamation of artificial intelligence and physician analysis allows for ameticulous study of root types and canals, facilitating three-dimensional control with minimal exertion from both patient and doctor alike.

A crucial component of the dental device in question, the micro file is essential to the K-bypass technique, channel widening, retrieval, cleaning, and shaping inside the complex root canal anatomy. Its importance is especially noticeable when using the magnetic retrieval method, where the reverse functional degree directs the micro file in the direction of the apex and drills strategically around damaged files to extract them with the least amount of dentin loss. This methodological accuracy, which achieves effective file movement under the influence of a magnetic field, represents a paradigm leap in endodontic operations.

A new class of micro-files is presented in Figure H: vertical micro-files that move in a retreating direction when guided by a magnetic field. These micro-files are incredibly helpful in the third stage of endodontic treatments because they allow several treatment files to be used simultaneously, eliminating the need for repeated additions and removals during the cleaning and shaping procedures in all three stages. The composition of these micro-files, which contain intrinsic magnetism or highly magnetizable metals, is described in detail in design requirements, highlighting their critical function in improving navigation and control. Figure e's simplified internal design reveals the device's complex coil bundles, offering a visual representation of its magnetic transport capabilities.

Figure f explores the device's deep effect on the irrigation needle in the root canal by using a unipolar alternating magnetic field to create vibrations. With special attention to the directed file (n-3) and the magnetic needle, this vibrational action plays a crucial role in cleaning secondary root canals. The magnetic stopper (f5) uses a magnet with a rubber cover and labeling for the North and South poles to provide stability while equipment is being placed. The device's dedication to accuracy and safety in dental procedures is highlighted by this careful attention to stability.

Figure g presents a simplified depiction of the Complete Root Canal Treatment (CRCT) equipment, emphasizing its prowess in channel cleaning and washing through computer control, magnetic field manipulation, and connection to a magnetic field guiding device. This holistic dental system comprises various components, each assigned a specific function during endodontic procedures, from tooth implantation (G-2) to energy source (G-1), the tooth under treatment (G-4), and the anchored tooth or tooth attached to the apparatus (G-3). G-5 and G-6 represent irrigation or drying tubes and suction or drying tubes, respectively, while G-7 signifies magnetic field generators. G-8 denotes the common angle inaccessible to coils due to tooth alignment, and G-9 and G-10 represent the angles of coil B and coil A, respectively, with G-11 indicating the effective area of the magnetic field.
Finally, by using magnetic field guidance to accomplish precise and controlled file movement, this cutting-edge dental technology offers a full and all-encompassing approach to root canal therapy, thereby improving the effectiveness and efficiency of endodontic procedures. The system follows a pre-established treatment plan whether it is working with assistance or under the whole supervision of artificial intelligence. The micro-file family of equipment is smoothly integrated over a range of sizes, from 25 to 80. A new era of precision and sophistication in dental care is being ushered in by this combination of artificial intelligence and physician analysis, which enables a thorough examination of root types and canals and facilitates three-dimensional control with minimal effort from the patient and doctor alike.

G7-A or G7-B plays a pivotal role in directing and transferring kinetic energy to the endodontic file as a magnetic field-generating file. The central metal rod, consisting of G17 for motion and G18 for magnetic field creation, facilitates the passage through G13 and connection to small motors (G14) controlling movement around teeth. Fluid transmission to and from teeth is managed by G22 and G23 via the fluid filter (G24), while fluid withdrawal is handled through the square- sectioned channel G21. The square-sectioned channel G20 facilitates fluid transfer. The NiTi alloy blend's unique flexibility, attributed to ferromagnetic elements, makes the K100 endodontic file system distinctive. Its three main file types (I-16,5, and I-17) adapt to various canal conditions and deviations, selected based on the location of significant deviations within the root canal.

The cross-sectional shape defined by I-4, I-12, and I-22 features a 60-degree cutting wall, debris vents (I-11), a supporting cusp (I-10), and a 100-degree cutting angle. I-2 signifies the magnetic interaction portion. Sigmoidal curves in I-14 and I-13 reduce resistance during counter-clockwise movement, preventing file entrance into the dentin. Each file's magnetic component is both reactive and cutting, with I-16 having a non-cutting or cutting tip (I-9, I-18, or I-19) to reduce hazards, while I-15 and I-17 feature a balanced guiding tip.

Diagram i5 illustrates the file attachment location in the Endo motor. Diagram J introduces the magnetic needle (j-1), syringe connector (j-2), and durable cannula (J-3). The "magnetic stopper" (j–6) ensures consistent liquid distribution, and the magnetic tip (j-5) imparts movement for effective cleaning in various dental procedures. J7 serves as an indicator for the magnetic north pole, guiding vibrations to the magnetic needle. The Khraishah apex shaker, depicted in Diagram K, is crucial for root canal cleaning, featuring elements like k-1 (guide), k-2 (handle), k-3 (clamp or lock), k-4 (neck with magnetic stopper), and k-6 (head with R-edge and penetrating tip). It facilitates endodontic medication and solution transfer, easing sterilization and administering growth-stimulating or anesthetic ingredients. This invention's standout features include intensity, frequency, and oscillations enabled by the magnetic field guiding mechanism in the center.

The Khraishah apex shaker operates in various sizes, matching or slightly smaller than root canals, corresponding to the medical task's requirements. It doubles as an endodontic ultrasonic activating instrument, cleaning the external portion of the root, eliminating bacterial colonies, and mechanically sterilizing the root exterior with the support of the ultra-controlling system.

Diagram O illustrates a first-generation component of the improved guiding system, the Khraishah file driver. This device, which consists of multiple parts—o- 1, the handle; o-2, the inactive shank; o-3, the weakest point intended for controlled breakage; and o-4, the magnetic portion responsible for the ultra- controlling system—makes it possible to retrieve broken files from root canals.

The Khraishah file driver, which works on the basis of gears, moves with the broken file to ensure effective dentin extraction. This process is facilitated by the guiding imbalanced tip (o-11), creating a path for the device, and functional grooves (o-7) and blades (o-8), which facilitate the attachment and retrieval of the broken file. The controlled memory NiTi composition (o-2) enhances maneuverability within root canals.

The relationship between the magnetic field and the movement of the Khraishah file driver in the initial stage involves both the motion type and the magnetic field type:

The guiding uneven tip (o11) is essential during the initial stage, which concentrates on putting the file into the canal. Because of its imbalance, it can rotate in different directions and interact with the magnetic field in the magnetized region (o4). As a result, the north pole pushes back against the device's created north pole, exerting simultaneous forces of attraction and repulsion on the Khraishah file driver. This dynamic interaction helps to improve the search procedure.

The magnetic field is still used in the second stage, but it rotates at an angle of 90 degrees after a gap has been formed. Long-term repulsive conflicts with the Khraishah file driver are avoided by this modification. The file is drawn to the broken file with the help of the magnetic field, which causes it to turn like a gear (o15). o15 indicates which way the north pole is.

The vacuum cannula system, an add-on device for the Khraishah file driver, is shown in Figure Z. Using a needle, this device cleans, extracts, and suctions the area around the damaged file. Important parts are z1 (the part attached to the Endo motor), z2 (the needle blade, which is z3), z4 (the part of the needle blade that is sharp and makes a passage around the broken file), and z5 (the part of the needle blade that is wider). Specifically, z6 denotes the needle bevel, which guides the device into the canal, and z7 denotes the device's movement direction, which aids in attachment and removal.

The magnetic field-guided ultrasonic system, which includes endodontic and periodontal scaler tips, is shown in Figure L. It adds a mechanical vector brought about by the magnetic field and a new dimension of movement created by the ultrasonic scaler. The combined action produces movements in many dimensions, improving the functionality of the mechanical device. With its more perpendicular angle than traditional devices, the device works especially well below the gum line. In different parts of the oral cavity, the different tips (L12 to L6) have diverse functions in terms of cleaning.

The Khraishah apex shaker is a multipurpose tool made to satisfy the unique needs of medical and dental tasks. It is built in various sizes that match or slightly smaller than root canals. Its dual purpose as an endodontic ultrasonic activation tool increases its importance by removing bacterial colonies and mechanically sterilizing the outside of the root in addition to cleaning the external part of the root. Endodontic instrumentation has advanced significantly as a result of the synergy with the ultra-controlling system, which guarantees precision in its operation.

In Diagram O, the first-generation component of the enhanced guiding system, the Khraishah file driver, takes center stage. Comprising multiple integral parts, including the handle (o-1), the inactive shank (o-2), the weakest point intended for controlled breakage (o-3), and the magnetic portion responsible for the ultra- controlling system (o-4), this device is designed with the explicit purpose of retrieving broken files from root canals. Operating on the basis of gears, the Khraishah file driver moves with the broken file, ensuring effective dentin extraction. The guiding imbalanced tip (o-11), functional grooves (o-7), and blades (o-8) contribute to the attachment and retrieval of the broken file, demonstrating a meticulous approach to addressing the challenges associated with broken endodontic instruments. The incorporation of a controlled memory NiTi composition (o-2) enhances maneuverability within the intricate confines of root canals.

The nuanced relationship between the magnetic field and the movement of the Khraishah file driver unfolds in two distinct stages. In the initial phase, the guiding uneven tip (o-11), marked by its imbalance, interacts dynamically with the magnetic field in the magnetized region (o-4), enabling rotation in different directions. This interaction results in simultaneous forces of attraction and repulsion, enhancing the efficiency of the search procedure. In the second stage, the magnetic field, while still in use, rotates at a 90-degree angle after a gap has been formed, strategically avoiding long-term repulsive conflicts with the Khraishah file driver. The file is drawn to the broken file, causing it to turn like a gear (o-15). This sophisticated interplay exemplifies the precision and control achieved through magnetic field guidance in endodontic procedures.

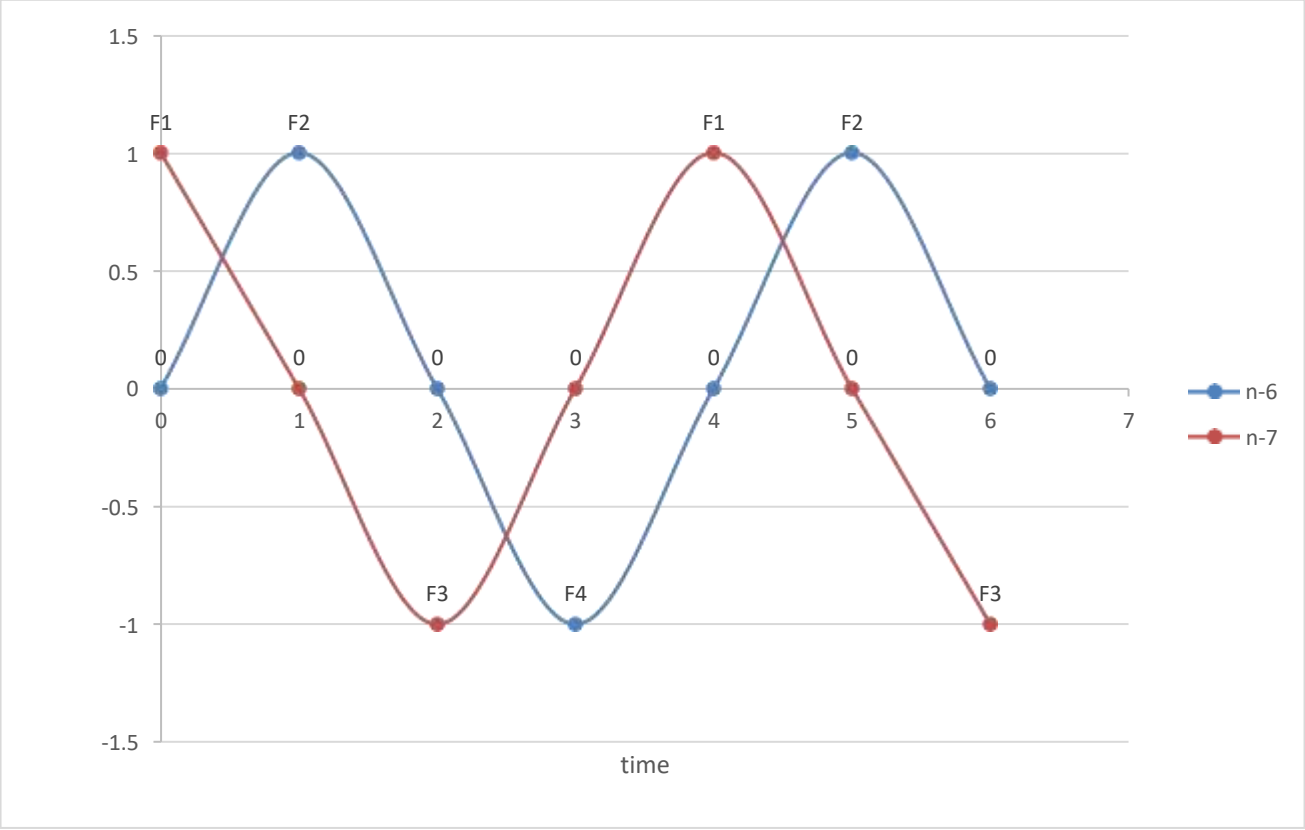
As an add-on accessory for the Khraishah file driver, the vacuum cannula system is shown in Figure Z. It uses a needle-based mechanism to clean, extract, and suction the area surrounding the damaged file. This auxiliary device's precision and efficiency are attributed to its various components, including z1 (which is attached to the Endo motor), z2 (needle blade), z3 (sharp part of the needle blade creating a passage around the broken file), z4 (wider part of the needle blade), z6 (needle bevel guiding the device into the canal), and z7 (movement direction aiding in attachment and removal).

The magnetic field-guided ultrasonic system with periodontal and endodontic scaler tips is shown in Figure L. This method creates multi-dimensional movements that improve the mechanical device's functioning by introducing a mechanical vector through the magnetic field and a new dimension of movement through the ultrasonic scaler. This technology works particularly well below the gum line since it has a more perpendicular angle than conventional devices.

Different tips (L12 to L6) perform different tasks when cleaning different areas of the oral cavity, demonstrating the adaptability and diversity of this creative method.

All things considered, these developments in dental technology—such as the vacuum cannula system, magnetic field-guided ultrasonic system, Khraishah file driver, and apex shaker—combine to offer a complex and all-encompassing method of endodontic treatments. The accuracy attained by magnetic field guiding, along with creative designs and features, highlights a revolutionary period in dental care characterized by increased efficacy, flexibility, and patient welfare.

In Figure n, the types of guided files and their magnetic field orientation are depicted. Notably, n-1 represents the first guided file, providing a magnetic field over a wide tissue area. Other guided files (n-2, n-3, and n-4) possess the ability to concentrate the magnetic field in a smaller space. These files can be linked with the Endodontic magnetic field transport tip using the corresponding attachment parts (n8 and n-5). The third type of guided file (n-3 and n-4) is distinguished by its capability to form magnetic field swirls by combining the frequencies produced by the first and second peaks (n-6 and n-7).



The accompanying figure demonstrates the potential for creating a vortex-like pattern in the working region of n-3 and n-4. The alternating magnetic fields generated by the first and second peaks initiate the process. The magnetic field N1,directed towards the magnet or guidance device by the n-7 peak, induces tilting in the direction of the magnetic field F1 due to repulsion between identical poles N0 and N1. Subsequently, the manipulated device or magnet N2 receives the field from n–6, causing it to tilt in the direction of the applied magnetic field F2. This results in the creation of a magnetic field S1, opposite to the initial field generated by n-7. The interplay of forces, including attraction (F3) and counter-directional field production (S2) by n-6, forms a continuous circular pattern referred to as "magnetic field swirls." The figures in the diagram are representative indicators adjustable in frequency and value to meet specific requirements.

Figure m introduces the Magnetic Induction Heating Tip-Model gadget, designedbased on the induction heating concept. The system comprises two levels: programming and material. The programming level involves transferring temperature and magnetic field intensity data to the hot tip (m6), representing theheated portion, displayed on the device's screen. The temperature rise halts upon reaching the target temperature, achieved by ceasing the magnetic field or reducingits strength or frequency. Positive and negative feedback mechanisms mediate the interaction among the heated tip, magnetic field, and sensor.

The material part of the system features the stabilizer (m9), the primary componentholding the system in place on the magnetic grasp. Information regarding the hot tip is conveyed through the vertical arm (m7) and horizontal arm (m8). The receiver (2m) facilitates reception, while wires (4m) transmit data from -6m to the control center via the connection (3m). Constructed with materials unaffected by magnetism, such as plastic, this gadget remains impervious to induction or magnetic fields. The hot tip can be made from materials exhibiting high magnetic induction sensitivity.

The distinctive horizontal arrangement of m10, in conjunction with m7, aids in data transfer to the control center and provides heat insulation. This versatile toolfinds utility in dentistry and broader medical sectors, serving purposes like tissueexcision, gingival cutting, surgical procedures, and tooth filling removal.

The presented figure illustrates the intriguing potential for generating a vortex-like pattern in the working region, specifically in n-3 and n-4. The initiation of this process is facilitated by the alternating magnetic fields generated during the first and second peaks.

Due to the repulsion between identical poles N0 and N1, the magnetic field N1, which is directed towards the magnet or guidance device by the n-7 peak, causes tilting in the direction of the magnetic field F1. The controlled object, or magnet N2, then tilts in the direction of the applied magnetic field F2, after receiving the field from n-6. A magnetic field S1 is created as a result of this complex interaction, which is opposite to the original field that n-7 formed. The forces that interact dynamically to produce attraction (F3) and counter-directional field creation (S2) by n-6 result in a perpetual circular pattern that is known as "magnetic field swirls." The diagram's figures depict movable indicators that can be adjusted in frequency and value to match particular needs.

Based on the idea of induction heating, the Magnetic Induction Heating Tip-Model device, shown in Figure m, is a significant advancement in dental technology.

Programming and material make up the two separate tiers of the system's organization. The temperature and magnetic field intensity data are sent to the hot tip (m6), the heated area that is clearly visible on the device's screen, at the programming level. When the temperature reaches the desired level, which can be attained by varying the magnetic field's strength or frequency or by stopping it altogether, temperature elevation stops. The interaction between the heated tip, magnetic field, and sensor is delicately mediated by positive and negative feedback mechanisms.

The stabilizer (m9), a crucial component that secures the system in position on the magnetic grab, is a part of the material part of the system. Both the horizontal arm (m8) and the vertical arm (m7) transmit information about the hot tip. While wires (4m) carry data from -6m to the control center via the connection (3m), the receiver (2m) enables effective data receiving. This device is resistant to induction or magnetic fields since it is made of materials that are not magnetic, such plastic. High magnetic induction sensitivity materials can be used to create the hot tip, which is essential for induction heating.

Together with m7, m10's distinctive horizontal design helps with heat insulation and facilitates data transfer to the control center. This multipurpose instrument is used in dentistry and other medical fields for a variety of tasks, including tissue excision, gingival cutting, surgical procedures, and the removal of dental fillings. This device promises precision and flexibility in therapeutic interventions, marking a paradigm shift in the use of induction heating technology in dental and medical professions.
To sum up, the complex dynamics of interactions between magnetic fields and the creative application of the Magnetic Induction Heating Tip-Model device highlight the sophistication and revolutionary possibilities of modern dental technology.

These developments, with their accuracy, adaptability, and multifunctionality, usher in a new era of dental care marked by improved therapeutic capacities and refined precision in a range of clinical applications.

6. Protective Elements

1. A remote magnetic field-guided steering device, utilizing various types ofmagnetic fields to control and guide equipment for enhanced performanceand efficiency.
2. The device includes a control center providing power, readings, scientific research services, patient file archives, and magnetic sensors. Wires for energy transfer may range from simple to complex, constructed from materials like copper, plastic, rubber, and other metals to improve efficiency.
3. The device's operation is governed by specialized software developed by themanufacturing company, responsible for temperature transfer, magnetic fieldintensity, and frequency onto the hot tip.
4. The control center uses an apex locator device to read the length of root canals, as shown in element 2, and integrates this data with patient data andX-ray images. The technology offers an adaptable treatment plan called theComplete Root Canal Treatment Guided Magnetic Field Device and keeps an extensive treatment record that documents scientific and academic features.
5. The control center mainly provides power to the sensors, acting as the primary director in the process. It comprises a computer with a display screen, a keyboard, control indicators, and slots for peripheral connectionssuch as other computers and input devices.
6. The control center consists of a motherboard, power supply, and a conversion and modification panel responsible for generating the magneticfield. It transforms the current into required functionalities based on performance needs.
7. As explained in element 2, one of these sensors is the magnetic grip device,which produces magnetic fields under the guidance and prescription of the physician. It is made up of directing and generating coils, the most of the magnetic field being created by the generating coils.
8. It is constructed of medical-grade plastic, has connectors for adding devicesoutside of the effective magnetic field, and has both recipient and effective magnetic field focus points. Highly conductive metals including silver, copper, gold, and copper alloys make up the connectors.
9. To turn common gadgets into highly programmable ones, a new dimension of movement must be added, and this requires modification. Using a clamp tool, which attaches the gadget to the magnetic grip, the physician can link and control the device. The clamp is mainly made of two parts: the clamp body and the fixing arm. It is made of medical-grade materials such as medical polymers or plastics, stainless steel, NiTi, and nickel. The expansionof the clamp from the center enables the physician to select appropriate separations between the additional device and the modified device.
10. Magnetic grip utilization involves selecting the appropriate guided coil andsubsequently choosing the suitable magnetic field. The effective focal pointis then directed towards the device intended for influence.
11. Materials that can effectively transfer the magnetic field, such as iron, cobalt, nickel, gadolinium, neodymium, and ferromagnetic stainless steel, make up the Endodontic Magnetic Field Transport Tip. Its job is to move themagnetic field through the root canals so that any damaged or stuck devices are drawn to the roots.
12. This tip comes in various sizes and attachment locations, depending on the type of directed file intended for device attachment. The sizes correspond todental file sizes (ISO) ranging from 10 to 80, and the lengths follow the ISOsystem, including 21mm, 25mm, 31mm, and 35mm.
13. Technique involves the remote impact anddisengagement of equipment, freeing it from the surrounding area using the Endodontic Magnetic Field. To complete this process, the attached tool mustbe capable of interacting with the magnetic field.
14. The process commences by directing a unipolar alternating magnetic field to the broken part from outside the tooth to either loosen or heat it, causing expansion, such as with NiTi alloys. Subsequently, the same magnetic field.
15. Using the ultra-controlling system over the largest feasible region, the Khraishah Bypass Technique directs and stimulates it with the use of a magnetic field to prevent the root from being open. This makes it possible to move the fractured endodontic file by applying ultrasonic scalar or magnetic field vibrations. This method works very well in extremely curved canals.
16. The Khraishah Bypass Technique is the most effective method for controlling the system from any position or viewpoint. The Khraishah Bypass Technique is a critical protective component where the device guidesand moves equipment within the dental root canals by using the magnetic field to manipulate the equipment inside.
17. The device operates on the principle of using the magnetic field fortherapeutic purposes, enhancing muscle growth and tissue healing.
18. Utilizing the magnetic field for equipment control.
19. Employing the magnetic field to create hybrid devices.
20. Using the magnetic field to generate oscillations.
21. Utilizing the magnetic field for heating and tissue ironing.
22. A metallic chip known as Micro Files Guided by Magnetic Field (MFGMF)is composed of elements like iron, cobalt, nickel, gadolinium, neodymium, and ferromagnetic stainless steel that are highly responsive to magnetic fields. Another possibility

is that it's a polarized magnet. With different designs for different functions, the chip can be operated by the Complete Root Canal Treatment Guided Magnetic Field Device or the Metallic Grip.

23. Non-Tapered No Functional Degree results in a cylindrical-shaped channelused in the lower part of the canal, with a length equal to the apical third ofthe file (phases one and two).
24. Tapered No Functional Degree produces a conically shaped channel with alength equal to the file's length. It can be used in the lower part of the canal,specifically the apical third (phases one and two).
25. Non-tapered with Functional Degree Positive can be used for tasks in non-uniform areas in canals, as it moves in multiple places, resulting in movement from apical to coronal. This creates a spiral or ascending helicalmovement, preparing a consistently measured channel.
26. Non-tapered with Functional Degree Negative is used for removing broken files, opening channels that have suffered impacts or deformities like ledges,or treating closed canals with debris. It creates a cylindrical path in the Khraishah Bypass Technique.
27. Tasks in difficult areas of the canals can be carried out using both tapered and non-tapered devices with positive functional degrees. These files travel in several directions at once, which adds up to a cumulative movement fromthe apical to the coronal regions. As a result, they create a canal with uniform dimensions that rotates in a spiral or upward direction.
28. Tapered off to a negative degree of functionality Files are used in operationslike releasing damaged files and opening channels (like ledges) that have been hit or deformed. They are also used to generate a conical trajectory, clear a passage in the Khraishah Bypass Technique, and treat closed canals with debris.
29. A very unique micro-file is vertical with a functional degree. It works efficiently in all directions and under all circumstances, making it easier forblocked channels to open up with debris. Moreover, it is an essential component of the Khraishah Bypass Technique, which removes damaged nodules. It can be applied to stages 1, 2, and 3 channel widening.
30. Vertical micro-files, both with and without functional degree, are quiteunique and work well in all directions and circumstances. They make it easier to clear debris from blocked channels and apply the Khraishah BypassTechnique to remove fractured nodules. They are adaptable and useful in phases 1, 2, and 3 widening channels.
31. The micro-file can be composed of either magnetized material or alloyshighly responsive to the magnetic field.
32. The Complete Root Canal Treatment Guided Magnetic Field Device(CRCT) is a device representing the second sensor, playing a role in directing the operation of MFGMF.
33. As shown in the device description in Figure G, the sensor is made up of multiple main components, such as the power source, irrigation and dryingtubes, the tooth fixation site, tubes for carrying canal irrigation materials, and magnetic field generators that draw and direct micro-files inside the canals.
34. The analysis of the canals, taking into account canal lengths, tooth type, number of canals, and X-ray images—which might be two- or three- dimensional—are all part of the CRCT operating principle. The equipment,under the dentist's supervision, compares the image with data and starts working without the dentist's intervention. The device then suggests treatment regimens that are either pre-made by the device or the dentist, or they are taken from the World Endodontic Library. The tool makes treatment plans and their processes clear, enabling the dentist to proceed asnecessary.
35. Using all types of magnetic fields, such as continuous, unipolar, and bipolaralternating magnetic fields, for therapeutic purposes, tissue stimulation and healing, equipment guidance and movement, heating, oscillation transmission, and improving other devices' efficiency in the fields of medicine and dentistry.
36. The K100 system from Endodontic Files stands out for its exceptional flexibility and capacity to interact with the magnetic field. This is because the metals nickel, cobalt, and ferromagnetic stainless steel, among others, are blended with NiTi alloy, which is very responsive to the magnetic field.
37. The file's adaptability to different operating environments and canal curvatures is what distinguishes the system. There are three primary file types in this system: I-16, which varies in length and tapering and is in charge of the canal's maximum extension in the coronal and medial thread ofthe root area. As such, it is in charge of maintaining the coronal and medial third of the root clean.
38. The upper portion of the apical third of the root is cleaned by the I-15 file, while the lower portion is cleaned by the I-17 file. Whether the greatest deviation is in the upper or lower portion of the apical third of the canal willdetermine this. Because of their distinct sizes, lengths, and taper, the I-15 and I-17 files can be used to finish the lower portion of the canal without requiring the other. Additionally, they are distinguished by their attraction tomagnetic fields, which lowers the possibility of perforation caused by uneven shaping and cleaning or apical movement.
39. The design of the files is aimed at their capability to be used in the Khraishah Bypass Technique, salvaging broken equipment, and also in highly curved channels to achieve motion balance. Both the I-2 and I-15components are responsive to the magnetic field.
40. The device's cross-sectional view, as shown in the figure, shows the cuttingtip i-4 at a 100-degree angle i-12 and the cutting angle with the neighboring wall i-22 being 60 degrees. In order to minimize resistance during counterclockwise movements for file retrieval, it has debris vents (i-11), a supporting ledge (i-10) to support the cutting tip, and a reduction in the angle between the cutting edge and the root wall. The angle of contact with the interior walls of the canal is 20 degrees, and the sigmoidal curve, represented by i-14, is designed to prevent the file from entering the dentin in a way that exposes it to tearing

forces and subsequent molecular structureloss owing to micro-cracks. The magnetic part of each file is both capable ofcutting and interacting with the magnetic field.

41. The i-16 features a precise non-cutting tip i-9, a cutting tip i-18, or an arch-like tip i-19.
42. Both i-15 and i-17 have a balanced guidance tip, meaning they cut and guide the file within the canal to avoid ledge formation, perforation, andapex transportation. This tip is referred to as the "pathfinder." i-17, in particular, interacts with the magnetic field, unlike i-15, which is non- reactive.
43. These files can be used with either continuous motion or reciprocatingmotion.
44. The i-8 part of the i-17 file is magnetically guided. It is useful in bypass situations in narrow and less visible areas, providing guidance for adding each region of the apical third. However, in cases with high canal deviations,it is recommended to use both i-15 and i-17.
45. The NiTi alloy content of the i-7 portion of the i-15 file gives it great flexibility despite not being magnetically guided. It offers instructions for adding each region of the apical third in bypass scenarios in small, less noticeable places. However, using both i-15 and i-17 is advised in situationswith significant canal deviations.
46. The i-19 is the guiding tip designed to explore the canal for irregularities and pathways. It can freely determine its path, and with magnetic guidance,it excels as both a guiding and magnetically interactive part.
47. The i-5 figure represents the connection point of the files with the Endomotor.
48. The files have various sizes and attachment locations, matching the sizes ofdental files (ISO 10 to 80) and lengths (ISO 21mm, 25mm, 31mm).
49. The magnetic needle excels in attaching to various types of syringes, including the endodontic syringe, characterized by a lock-like feature at itsend.
50. Because the hup is designed to withstand high vibrations, it is covered withadditional layers of materials such as plastic, aluminum, and stainless steel.
51. A magnetic part at the end of the magnetic needle provides movement whenthe needle reaches the end, used for washing canals and wounds after extraction.
52. A magnetic stopper, j-6, between the last third and the middle third, can beadded or removed. It is crucial in adding vibrational frequencies by interacting with the magnetic field, generating vibrations in the needle's middle part.
53. Used for washing canals, wounds after extraction, cleaning gingivalpockets, and remote areas covered with tissue.
54. Khraishah Apex Shaker consists of main parts: the handle, the lock, the neck, the head, and the guiding tip. It is used for treating odontogenic lesionsby pressure differences and vibrations.
55. The magnetic part of the file consists of stainless steel or metals with properties of magnetic attraction, minimizing resistance to the magnetic field. The rest of the parts are made from NiTi, titanium, or stainless steel.
56. The first, second, third, and fourth directed files (n-1, n-2, n-3, and n-4) have different capabilities in magnetic field concentration, allowing them tocreate various movements.
57. The L shape illustrates the magnetic field-guided ultrasonic, featuring periodontal scaler and endodontic scaler tips, a magnet (L11), a scaling tip(L-13), and the cross-sectional view of L-14.
58. The L11 shape introduces a new movement and dimension to regular devices by incorporating a magnet. This enhances the performance of themechanical device, making it applicable in surgical procedures.
59. The magnetic field-guided ultrasonic periodontal scaler can have themagnetic attached and replaced.
60. The water spray exit is L12; the long L2 cleans the periodontal pockets; theshort L3 removes calculus above the gum line; and the long shank of L3 allows it to be utilized below the gum line. Calculus between anterior and posterior teeth on the tongue side is cleaned by L5, calculus above the gum line for crowding upper anterior teeth is cleaned by L6, and all areas above the gum line are cleaned by L6, which can also be utilized several millimeters below the gum line.
61. L7 (endodontic ultrasonic tips) for all teeth, especially upper anterior teeth,L9 (endodontic ultrasonic tips) for all teeth, especially lower teeth, each featuring a cutting edge (L15 for L8 and L16 for L10).
62. Magnets can be added or removed from endodontic ultrasonic tips mechanically. They come in various sizes and attachment locations matching dental files (ISO sizes 10 to 80, lengths 21mm, 25mm, 31mm).
63. Figure n shows the magnetic field's direction as well as other kinds of guided files. The first guided file, n-1, offers a wide magnetic field. The magnetic field is concentrated in a smaller area by n-2. Magnetic field swirlsare produced by n-3 and n-4, which combine the frequencies of the first and second peaks.
64. Based on the induction heating concept, Figure m shows how the MagneticInduction Heating Tip-Model is designed. It is composed of physical parts (such as the hot tip) and programming (which shows temperature and magnetic field intensity).
65. The hot tip (m6) is heated through magnetic induction, with feedback between the sensor and the magnetic field controlling temperature. Thephysical part includes a stabilizer (m9) and arms for transmitting information.
66. m10 differs from m7 as it is positioned horizontally. Both insulate heat and transfer information to the control center. The device can be used in tissue ablation, gingival cutting, surgical procedures, and removal of excess filling material.
67. m10 or m7 can be used to insulate heat and transfer information to the control center, suitable for tissue ablation, gingival cutting, surgical procedures, and removal of excess filling material.

68. The hot tip can be coated to prevent oxidation and withstand high temperatures. Properly chosen raw materials may eliminate the need forcoating.

7. Conclusion

In conclusion, the Dental Magnetic Field Ultra Controlling System represents a groundbreaking advancement in dental technology. By harnessing magnetic guidance and control, this innovative system revolutionizes dental procedures, overcoming limitations of conventional tools and introducing new therapeutic modalities. The system's ability to streamline operations, eliminate the need for multiple devices, and support traditional treatments heralds a transformative shift in dentistry. This integration of technology, equipment, and shared responsibilities not only enhances treatment efficiency but also reduces costs for both patients and dentists. Noteworthy features include the system's adaptability in addressing challenges like broken endodontic instruments and its potential for remote guidance, making it a comprehensive solution for managing infectious conditions and improving overall dental care. The detailed components, mechanisms, and applications discussed underscore the system's erudite design and its potential to redefine dental practices, offering a more sophisticated and efficient approach to oral healthcare.

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