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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	007087.00018
		Application Number	
Title of Invention	Orthodontic Repositioning Appliance		
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Application Information:

Title of the Invention	Orthodontic Repositioning Appliance		
Attorney Docket Number	007087.00018	Small Entity Status Claimed ☒	
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	37	Suggested Figure for Publication (if any)	

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Title of Invention	Orthodontic Repositioning Appliance		

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Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation in part of	11549506	2006-10-13
Prior Application Status	Expired	Remove	
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11549506	non provisional of	60822991	2006-08-21
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		Application Number	
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First Name	Bradley	Last Name	Van Pelt	Registration Number	59773

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ORTHODONTIC REPOSITIONING APPLIANCE

- [01] This application is a continuation-in-part of U.S. Application No. 11/549,506, filed on October 13, 2006, which claims the benefit of U.S. Provisional Application No. 60/822,991 filed August 21, 2006, both of which are incorporated herein by reference in their entirety.

BACKGROUND

- [02] Orthodontic treatments involve repositioning misaligned teeth and improving bite configurations for improved cosmetic appearance and dental function. Repositioning teeth is accomplished by applying controlled forces to the teeth over an extended period of time.
- [03] Currently, there are numerous techniques for orthodontic treatments for repositioning misaligned teeth and improving bite configurations. The conventional technique consists of requiring the patient to wear what are commonly referred to as "braces." Braces comprise a variety of appliances such as brackets, bands, arch wires, ligatures, and O-rings. After they are bonded to the teeth, periodic meetings with the orthodontist are required to adjust the braces. This involves installing different arch wires having different force-inducing properties or by replacing or tightening existing ligatures. Between meetings, the patient may be required to wear supplementary appliances, such as elastic bands or headgear, to supply additional or extra oral forces. Conventional braces are often a tedious and time consuming process requiring many visits to the orthodontist's office. Moreover, from a patient's perspective, they are unsightly and uncomfortable. Braces can be formed using a shape memory alloy ("SMA"). For example, George Andreasen in 1972 developed the nitinol archwire. The nitinol archwire can be used to exert a constant tooth-moving force on the teeth.
- [04] Another group of appliances are removable orthodontic appliances, which have been used since the early 20th century. One such appliance in this group is a tooth positioning appliance, as disclosed in U.S. Pat. No. 2,531,222. The tooth positioning appliance is one piece that moves the upper and lower teeth

simultaneously. This type of appliance is very demanding on patients as it is bulky, uncomfortable, and prevents patients from speaking. Also in this group are appliances known as spring-alignment appliances. These appliances are designed to correct minor incisor rotations. This appliance is constructed over a model of the repositioned teeth. Labial and lingual wires are formed and labial and lingual plates are formed over the wires. The acrylic plates apply the pressure to the teeth. These appliances cannot be adjusted and are not particularly effective for tooth movement.

- [05] Consequently, alternative orthodontic treatments have been developed. Recent patents, including U.S. Pat. No. 6,454,565 by inventor Phan and U.S. Pat. No. 6,790,036 by inventor Graham relies on the use of elastic positioning appliances for realigning teeth. In these alternative treatments an inner elastic modulus is significantly higher than the outer elastic modulus thereby creating greater potential for excess and localized force which in turn possesses greater propensity to cause iatrogenic damage to patient's teeth, dental roots, and periodontum. Although during routine orthodontic dental movement it is necessary to cause some resorption and apposition, otherwise teeth cannot move, one must limit such degradation of anatomical structure to thereby minimize the ultimate loss of teeth. The increased modulus to the inner aspect of the appliance does the opposite of what a periodontist (specialist in bone, soft tissue and dental health) wishes for any patient. Thus, there is a need in the art for an apparatus and method providing orthodontic treatments without causing periodontal destruction which is not necessary for dental movement.

SUMMARY

- [06] The summary is provided to introduce a selection of concepts in a simplified form that are further described below in the detailed description. This summary is not intended to identify key features or essential features of the subject matter, nor is it intended to be used to limit the scope of the subject matter.

- [07] An aspect of the invention relates to an invisible removable orthodontic repositioning appliance with a lower modulus inner lining for systematically aligning teeth from an initial tooth arrangement to a final tooth arrangement while minimizing propensity for root and bone resorption.
- [08] In another aspect of the invention relates to an invisible removable orthodontic repositioning appliance with an option to have incorporated in it Shape Memory Alloy (SMA) which is an alloy used in the aeronautic industry where once the material shape is set the material may be severely deformed and then returned to its original shape.
- [09] In another aspect of the invention, a repositioning appliance may be constructed from polymers with a lower elastic modulus inner lining than the outer lining. The lower elastic modulus on the inner layer may allow for greater patient comfort, less tooth, bone and root damage, and longer duration of tooth movement by the repositioning appliance thereby requiring less number of appliances to achieve the same or similar orthodontic alignment.
- [10] In another aspect of the invention, a separate scan may be required for a patient's upper, maxillary, teeth or for a patient's lower, mandibular, teeth. This is only required under conditions where the case does not fit and all other trouble shooting issues have been exhausted.
- [11] In an additional aspect of the invention, a separate mold may be taken of the patient's teeth at various intervals in the alignment process, and a new repositioning appliance may be made based on such molds. By creating numerous molds, a defect in one mold may not continue throughout the course of the patient's treatment. Each of the molds and associated appliances may be numerically identified to maintain uniformity of application from start of treatment to completion.
- [12] In a further aspect of the invention, the repositioning appliance may comprise one or more raised portions or surfaces that may provide greater force, control and

surface to surface retention over a patient's teeth. For example, the appliance can be provided with one or more raised surfaces. As discussed above, the raised surfaces may possess various sizes, depths and shapes on the internal aspect of the aligner depending on the type of orthodontic tooth movement required such as a rectangular or bar shape, a circle shape, or a star shape at perpendicular to the tooth long axis, parallel, diagonal or a combination thereof to cause the desired force for proper tooth alignment. Other shapes are also contemplated. Additionally, a space may be created on the opposing side of the raised surfaces by pulling back on the tooth of the digital file where indentations were placed. Upon aligner fabrication, this will create a space on the opposing side of the raised surface to provide an area for the tooth to move into as the raised portion decompresses. The raised portions causes increased: pressure, control and retention when the aligner is inserted over the patient's teeth. Once the appliance is inserted over the patient's dentition, the raised surfaces contact with the patient's teeth and begin to recover causing one or more of the patient's teeth to move in a predetermined controlled manner.

- [13] In a further aspect of the invention, traditionally clear aligners are intended for adults since children are in mixed dentition and the loss and eruption of teeth would alter the overall patient's dental arch each time there is a change. Therefore, the repositioning appliance may comprise "window(s) relief areas" on the occlusal surface of the aligner for areas which patient still possesses primary dentition. Therefore, the aligner will not affect or alter the areas of the patient's arch which are in transition phase, i.e.: mixed dentition where primary teeth fall out and permanent teeth erupt in their place. These windows will enable much less impression requirements to achieve accurate aligner fabrication and orthodontic tooth movement.
- [14] Following the insertion of the indentations in areas where tooth movement is required and associated pull backs of the teeth on the opposing sides of the indentation, the orthodontic aligner can be fabricated using various CAD/CAM techniques.

- [15] In a first process, a model of the digital file is printed using rapid prototype 3D printers. A polymer sheet is heated and vacuumed over the printed model. The internal aspect of the polymer sheet adapts into the indentations of the printed model which translate into raised surfaces on the internal aspect of the orthodontic aligner. On the opposing side of the indentations, space is provided by pulling the tooth back, such that when the polymer sheet is vacuumed over the model, it creates additional room on the opposing side for tooth to move into.
- [16] In a second alternative process, fabrication of aligner and associated indentations on the internal aspect of the aligner may also be accomplished by directly milling the aligner off of the modified digital file which consists of the indentations and pull backs on the opposing side of the indentations.

BRIEF DESCRIPTION OF THE DRAWINGS

- [17] Figure 1 illustrates an occlusal view of a maxillary impression taken from a patient with anterior crowding prior to any treatment in accordance with an aspect of the invention.
- [18] Figure 2 illustrates an occlusal view of a maxillary stone model which has been poured from the maxillary impression in accordance with an aspect of the invention.
- [19] Figure 3 illustrates an occlusal view of a maxillary repositioning appliance which has been fabricated from the modified stone model referenced in Figure 2 in accordance with an aspect of the invention.
- [20] Figure 4 illustrates an occlusal view of the repositioning appliance on the maxillary model referenced in Figure 2 in accordance with an aspect of the invention.
- [21] Figure 5 illustrates an occlusal view of the maxillary stone model in Figure 2, where the anterior teeth have been sequentially modified toward their idealized tooth position in accordance with an aspect of the invention.

- [22] Figure 6 illustrates an occlusal view of a mandibular impression taken from a patient with anterior crowding in accordance with an aspect of the invention.
- [23] Figure 7 illustrates an occlusal view of the mandibular stone model which has been poured from the mandibular impression, referenced in Figure 6 in accordance with an aspect of the invention.
- [24] Figure 8 illustrates an occlusal view of the mandibular repositioning appliance which has been fabricated from the modified stone model in accordance with an aspect of the invention.
- [25] Figure 9 illustrates an occlusal view of the repositioning appliance on the mandibular model referenced in Figure 7 in accordance with an aspect of the invention.
- [26] Figure 10 illustrates an occlusal view of the mandibular stone model in Figure 7, where the anterior teeth have been slightly modified toward their idealized positions in accordance with an aspect of the invention.
- [27] Figure 11 illustrates an occlusal diagrammatic view of a patient's maxillary teeth where the anterior teeth have been sequentially aligned in accordance with an aspect of the invention.
- [28] Figure 12 illustrates an occlusal diagrammatic view of a patient's maxillary teeth of Figure 11 following use of the repositioning appliance where the anterior teeth have been partially aligned from a subsequent patient impression in accordance with an aspect of the invention.
- [29] Figure 13 illustrates an occlusal diagrammatic view of a patient's mandibular teeth of where the anterior teeth have been partially aligned, in accordance with an aspect of the invention.
- [30] Figure 14 illustrates an occlusal diagrammatic view of a patient's mandibular teeth of Figure 13 following the use of the repositioning appliance where the anterior

teeth have been partially aligned from a subsequent patient impression in accordance with an aspect of the invention.

- [31] Figures 15 and 16 illustrate schematic drawings representing the difference between low modulus (softer) inner aspects of the appliance compared to a higher modulus (harder) appliance at the tooth - appliance interface in accordance with an aspect of the invention.
- [32] Figure 17 illustrates stress distributions in laminated and un-laminated repositioning appliances in accordance with an aspect of the invention.
- [33] Figure 18 illustrates grooves that may be used in various embodiments of a repositioning appliance in accordance with an aspect of the invention.
- [34] Figure 19A depicts an exemplary embodiment of an appliance.
- [35] Figure 19B depicts another exemplary embodiment of an appliance.
- [36] Figure 20A shows an isometric view of a model used to form an appliance.
- [37] Figure 20B shows an isometric view of another model used to form an appliance.
- [38] Figures 21A and 21B depict an exemplary embodiment of modeling software used to form various appliances.
- [39] Figure 22 depicts another exemplary embodiment of modeling software used to form various appliances.
- [40] Figure 23 depicts a rapid prototyping printer used to create various models and appliances.
- [41] Figure 24 depicts a schematic illustrating an exemplary embodiment of an appliance compared to a conventional orthodontic spring.
- [42] Figure 25 depicts a graph comparing an exemplary embodiment of an appliance to a conventional orthodontic spring.

- [43] Figure 26 depicts a conventional orthodontic spring in a patient's mouth used for realigning the patient's teeth.
- [44] Figure 27 depicts a patient's mouth where the appliance is used for realigning the patient's teeth.
- [45] Figures 28A and 28B depict schematics of tooth and aligner according to another embodiment.
- [46] Figure 29 depicts an aligner according to another embodiment.
- [47] Figure 30 depicts an assortment of exemplary raised surfaces that may be used in conjunction with an aligner.
- [48] Figure 31 depicts an aligner according to another embodiment.
- [49] Figure 32 depicts an impression another embodiment.
- [50] Figure 33 depicts an aligner formed from the impression depicted in Figure 32.

DETAILED DESCRIPTION

- [51] Figure 1 illustrates an occlusal view of a maxillary impression 100 taken from a patient with anterior crowding. A maxillary impression 100 is an impression made of a patient's upper teeth. Anterior crowding is crowding of the front teeth. The maxillary impression 100 may be removed from the patient's mouth using tab 102.
- [52] A maxillary stone model 200 of the patient's maxillary teeth may be made using the maxillary impression 100, as seen in Figure 2. The stone model 200 of the maxillary impression 100 may be modified to create an appliance that will alter and align the patient's teeth. In Figure 2, the anterior teeth 202, 204, 206, 208, 210, 212, 214, 216, and posterior (rear) tooth 220 are not aligned.
- [53] Figure 3 illustrates maxillary repositioning appliance 300 that may be fabricated from a maxillary stone model. Maxillary repositioning appliance 300 may be the

first repositioning appliance in a series of appliances that may be used to reach the alignment goal. Repositioning appliance 300 may be comprised of a single sheet of material that may be formed from a variety of materials, such as polymers and plastics including polycarbonates, polyacetates, polyolefins, polyamides, polystyrenes and epoxy resins among others. These materials may range in thickness from 0.020 inch to 0.20 inch, depending upon the material's physical characteristics. In an aspect of the invention, repositioning appliance 300 may be 0.030 inch thick polycarbonate with a lower modulus inner lining which has been thermo vacuum-formed over a model 406 of a patient's teeth. The polycarbonate with a lower modulus inner lining is tissue compatible and invisible making it aesthetically appealing to the patient during use. Those skilled in the art will realize that materials such as polycarbonates, polyacetates, polyolefins, polyamides, polystyrenes and epoxy resins among others also may be provided in clear forms. The 0.030 inch repositioning appliance 300 may be firm enough to move the patient's teeth and may be flexible enough to adapt to the patient's misaligned teeth. These characteristics may provide a sequential adjustment of the teeth from a new impression at each and every phase toward the ideal that will move the patient's teeth from misalignment to alignment on an incremental basis with each and every new impression taken at each treatment interval of about six weeks. Those skilled in the art will realize that treatment intervals may be shorter or longer than six weeks depending upon a variety of patient and treatment factors.

- [54] Figure 4 illustrates maxillary repositioning appliance 300 over modified maxillary stone model 406. As shown in Figure 4, maxillary repositioning appliance 300 does not have to extend over all maxillary teeth 400. Repositioning appliance 300 may be formed over a patient's teeth 402 and adjacent soft tissue 404. In an aspect of the invention, repositioning appliance 300 may have its best use when only the anterior teeth 202, 204, 206, 208, 210, 212, 214, 216 require aligning and the posterior teeth 220, 222, 224, 226, 228, 230, requiring no alignment, become an anchor for the repositioning appliance 300. In an alternative embodiment, with

other teeth acting as an anchor, the repositioning appliance 300 may be used to align posterior teeth 220, 222, 224, 226, 228, 230.

- [55] The process of taking a maxillary impression, creating a stone model, modifying that stone model to form a more ideal teeth alignment model, and creating a maxillary repositioning appliance may occur about every six weeks until the patient's teeth are in alignment but other durations and variations are also contemplated.
- [56] In an aspect of the invention, the repositioning appliance may be created using a 3-D scanner and printer. When using 3-D technology to fabricate a repositioning appliance, there may be greater accuracy using laminated aligners with soft inner lining then un-laminated aligners as the repositioning appliance with laminated soft liners demonstrates less stress in the supporting bone then un-laminated aligners when inserting over an un-orthodontically altered model.
- [57] A further aspect of the invention is that, the increased flexibility of the internal lining allows for a greater tolerance of error. In other words, the greater flexibility will be more forgiving than an unlaminated aligner, which is stiffer throughout and does not have the ability to flex or adapt to the patient's dentition.
- [58] In an aspect of the invention, posterior teeth 220, 222, 224, 226, 228, 230 which may not require alignment may act as anchors for repositioning appliance 300 for use in aligning anterior teeth 204, 206, 208, 210, 212, 214, and 216.
- [59] Figure 5 illustrates a maxillary stone model 500, which has been sequentially modified from an impression made subsequent to use of a number of repositioning appliances, each designed to increasingly align the patient's teeth. As shown on stone model 500, the patient's teeth 202, 204, 206, 208, 210, 212, 214, 216, 220 are much more aligned than they had been in the initial modified maxillary stone model 200. Maxillary stone model 500 has been modified to a more ideal alignment, and it may be used to create a subsequent maxillary repositioning appliance.

- [60] The entire process may also be done to the mandibular (lower) teeth. Figure 6 illustrates an occlusal view of a mandibular impression 600 taken from a patient with anterior crowding. A mandibular impression 600 is an impression made of a patient's lower teeth. Anterior crowding is crowding of the front teeth. The mandibular impression 600 may be removed from the patient's mouth using tab 602.
- [61] A mandibular stone model 700 of the patient's mandibular teeth may be made using the mandibular impression 600, as shown in Figure 7. The mandibular stone model of the mandibular impression 600 may be modified to create an appliance that may alter and align the patient's teeth. Figure 7 illustrates that the patient's teeth 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728 are not aligned.
- [62] Figure 8 illustrates a mandibular repositioning appliance 800 that may be fabricated from a mandibular stone model. The repositioning appliance 800 may be the first repositioning appliance in a series of appliances that may be used to reach the alignment goal. The repositioning appliance 800 may be comprised of a single sheet of material that may be formed from a variety of materials, such as polymers and plastics including polycarbonates, polyacetates, polyolefins, polyamides, polystyrenes and epoxy resins among others. These materials may range in thickness from 0.020 inch to 0.20 inch, depending upon the material's physical characteristics.
- [63] In an aspect of the invention, the repositioning appliance 800 may be 0.030 inch thick polycarbonate with a lower modulus inner laminate which has been thermo vacuum-formed over a model 906 of a patient's teeth. The polycarbonate with a lower modulus inner laminate is tissue compatible and invisible which making it aesthetically appealing to the patient during its use. Those skilled in the art will realize that materials such as polycarbonates, polyacetates, polyolefins, polyamides, polystyrenes and epoxy resins among others may also be provided in clear forms. The 0.030 inch repositioning appliance 800 may be firm enough to

move the patient's teeth and may be flexible enough to adapt to the patient's misaligned teeth. These characteristics provide a sequential adjustment of the teeth from a new impression at each and every phase toward the ideal that will move the patient's teeth from misalignment to alignment on an incremental basis with each and every new impression taken at each treatment interval of about six weeks. Those skilled in the art will realize that treatment intervals may be shorter or longer than six weeks depending upon a variety of patient and treatment factors.

- [64] Figure 9 illustrates mandibular repositioning appliance 800 over modified maxillary stone model 906. Repositioning appliance 800 may be formed over a patient's teeth 902 and adjacent soft tissue 904.
- [65] The process of taking a mandibular impression, creating a stone model therefrom, modifying that stone model into a more ideal alignment, and creating a mandibular repositioning appliance may occur at an interval of six weeks until the patient's teeth are in ideal alignment. Those skilled in the art will realize that the interval may be longer or shorter depending upon a variety of patient and treatment factors.
- [66] Figure 10 illustrates a mandibular stone model 1000, which has been sequentially modified from an impression made subsequent to use of a number of repositioning appliances, each designed to increasingly align the patient's teeth. As seen on stone model 1000, the patient's teeth 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728 are much more aligned than they had been in the initial modified maxillary stone model 700. Mandibular stone model 1000 has been modified to a more ideal alignment, and it may be used to create a subsequent mandibular repositioning appliance.
- [67] Figures 11 and 12 are diagrammatic views of a patient's maxillary teeth at sequential stages in the process of aligning the teeth to the ideal position. The diagram of the initial teeth 1100 shows unaligned teeth. Teeth 1102, 1104, 1106, 1108, 1112, 1114, 1116, 1118, 1120, 1122 are protruding and crooked. In the

subsequent diagram 1110, the patient's teeth show improved alignment. The anterior incisor central teeth 1112, 1114 are less protruding, and anterior teeth 1102, 1104 are more aligned. Furthermore, anterior teeth 1116, 1118 show less overlap. In another more subsequent diagram 1200, the patient's teeth show further improvement. The teeth are in alignment and there is less overlap in anterior teeth 1114, 1116.

[68] Figures 13 and 14 are diagrammatic views of a patient's mandibular teeth at sequential stages in the process of aligning the teeth to the ideal position. The diagram of the initial teeth 1300 shows unaligned teeth. Teeth 1302, 1304, 1306, 1308, 1311, 1312, 1314, 1316, 1318, 1320 are overlapping and crooked. In the subsequent diagram 1310, the patient's teeth show improved alignment. Teeth 1308, 1311, 1312, 1314, 1316 are less overlapping, and tooth 1320 is significantly more aligned with the other teeth. In another more subsequent diagram 1400, the patient's teeth show further improvement. The teeth are in alignment and there is even less overlap in teeth 1308, 1311, 1312, 1314, 1316.

[69] Figures 15 and 16 illustrate the benefits of having an inner layer with a lower elastic modulus than the outer layer. The elastic modulus of a material is the ratio of the increment of unit stress to an increment of unit deformation within the elastic limit. When a material is deformed within the elastic limit, the coiled polymer chains are stretched reversibly. The magnitude of the elastic modulus may be indicative of the atomic and molecular bonding forces. When the stress is relieved, the material returns to its original shape and therefore the deformation is nonpermanent. Different materials may have different elastic moduli based on their molecular structures. Some materials, such as certain polymers including polycarbonates, polyacetates, polyolefins, polyamides, polystyrenes and epoxy resins among others, may be specially produced to have different elastic moduli while retaining similar chemical compositions by using additives such as silicates, other polymers or fillers among other materials. In an embodiment, the liner may be a polymer such as Thermoplastic Polyurethane that is an aromatic polyether based grade, such as TEXIN® 990R resin with a shore hardness of approximately

90A. The TEXIN® 990R resin may offer outstanding abrasive resistance, impact strength, toughness, structural memory and flexibility. Furthermore, the resin may also provide good hydrolytic stability, microbial resistance, teeth whitening, oral freshness, varied color materials, and exceptional mold release characteristics. Although in one embodiment a polycarbonate outer layer and a polyurethane inner layer is used, the composition could consist of any type of polymers with higher modulus outer layer and a lower modulus inner layer.

- [70] In the final appliance the elastic moduli of the different parts will generally range from 0.1 to 10 GigaPascal (GPa), although some parts of the appliance may be outside of this range. The elastic modulus of one part may differ from another part by 10% to 500%, or more.
- [71] As shown in Figure 15, if an appliance 1510 has a higher modulus on the inner layer than the outer layer, the pressure on the tooth 1500 is localized 1502, thereby increasing the propensity for tooth and bone damage. Also, the harder material 1510 is less elastic thereby causing greater load for a shorter period of time with less tooth movement by each appliance.
- [72] Figure 16 demonstrates the effect on tooth 1500 with use of a repositioning appliance 1600 with an inner layer having a lower elastic modulus than the outer layer. The lower modulus inner layer repositioning appliance 1600 allows for the same amount of load to be distributed to a greater surface area of the tooth for less bone and root resorption. Additionally, the lower modulus inner layer repositioning appliance 1600 will give less force for a longer period of time. Therefore, not only is the lower modulus inner lining safer for the patient's teeth, but also, may allow the repositioning appliance to maintain a longer life.
- [73] For example, Figure 17 illustrates the stresses developed at a crestal bone between central incisors with repositioning appliance having an inner layer with a lower elastic modulus than the outer layer as compared to a repositioning appliance without an inner layer (liner).

- [74] Polyvinyl siloxane impressions were made and poured up in stone. The central incisors were modified to represent desired orthodontic movement. Two types of repositioning appliances were fabricated from the modified model. The first repositioning appliance was fabricated from a polycarbonate sheet. The second repositioning appliance was fabricated from a polycarbonate sheet laminated with lower modulus polyurethane. The laminated and un-laminated repositioning appliances were inserted on the model and resulting stresses observed in the field of the polariscope and photographed. Stress data for the two repositioning appliances was analyzed using a computer graphics program to quantify stress intensity by fringe number counting.
- [75] As shown in Figure 17, similar stress distributions were developed at the crestal bone between the central incisors with both repositioning appliances. However, the level of stress was significantly lower using the laminated repositioning appliance 1702 as compared to the un-laminated repositioning appliance 1704.
- [76] The stresses associated with the laminated repositioning appliance were of lower intensity as compared to the un-laminated repositioning appliance, which may alleviate problems of patient discomfort and difficulty during insertion and removal of un-laminated repositioning appliances.
- [77] In another aspect of the invention relates to an invisible removable orthodontic repositioning appliance with an option to have incorporated in it Shape Memory Alloy (SMA) which is an alloy where once the material shape is set the material may be severely deformed and then returned to its original shape. SMAs have good memory characteristics. As the load is decreased on a SMA, the alloy will reshape itself back to its original position. Additionally, when subjected to increased temperatures, SMAs will flex in the direction of their formed position. In one aspect of the invention, an SMA can be incorporated to adapt a newly modified tooth position and inserted into a lingual (inner) aspect of the aligner which seats against the inside portion of the teeth. Once the aligner is inserted, the increased oral temperature activates the SMA to move back to its original

position, or the position of the modified dentition. As a result, this added force aids in moving the teeth toward an ideal orthodontic tooth position.

- [78] In an embodiment, the SMA may be adapted to an idealized dental alignment and then realigned to the present misaligned dental position and adhered to the polymeric orthodontic shell to allow continual inherent movement of the teeth or adjusted by the dentist. SMA and polymeric technology may allow for two types of cooperating forces toward optimal tooth movement. SMA may be utilized under conditions needing greater force, more rapid movement and or severe cases.
- [79] In an aspect of the invention, orthodontic shape memory alloy wire having properties may be adapted to the lingual aspect of a stone model prior to adaptation of the repositioning appliance 1600 thereby allowing continual inherent movement of the patient's teeth. The orthodontic wire may be comprised of an alloy having shape memory properties such as NiTi, CuZnAl, and CuAlNi. Moreover, the orthodontic wire may be adjusted to assist in repositioning of teeth to an optimal position. This adjustment may be a self adjustment or an adjustment based on temperature change.
- [80] As shown in Figures 32 and 33 an SMA wire 2032 can be adapted on the lingual aspect of the digital file and can be incorporated into the aligner 2036 during fabrication. The wire 2032 provides a force causing orthodontic tooth movement. Once an impression is taken of a patient's dentition, the teeth are moved toward an ideal position on the digital file. The wire 2032 can be adapted to the modified digital file on the lingual aspect of the aligner. Upon aligner insertion, the wire 2032 initially adapts to the patient's teeth in the present position. The increased oral temperature activates the SMA wire causing the SMA wire to move toward an ideal position to provide for orthodontic tooth movement.
- [81] In yet another aspect of the invention, a micro-implant which may be approximately 1-5 mm in diameter may be utilized. The micro-implant may withstand immediate load unlike traditional implants which may require 6 months of bone integration (healing). The micro-implant may be attached or connected to

the polymeric shell or a component of the shell for added orthodontic tooth movement. Micro-implant for orthodontic movement may be achieved by either attachment for example using a Hader-bar, male–female (ball and socket) or magnets to allow for greater force and greater control of orthodontic forces. This may allow for greater options under various orthodontic conditions. A technique for greater orthodontic force and or control may be with magnet attachment at the head (coronal aspect of the micro-implant). The micro-implant may be positioned with the positive pole of the magnet positioned into the bone or tooth for anchorage. The negative pole of the magnet may be imbedded into the SMA, a bracket or component of the polymeric shell or the polymeric matrix of the appliance to allow for greater control and force for orthodontic tooth movement.

- [82]** In a further aspect of the invention, the repositioning appliance may comprise one or more raised portions or surfaces that may provide greater control and attachment over a patient's teeth. For example, as shown in Figures 19A and 19B, the appliance 1900 can be provided with one or more raised surfaces 1902, 1904, 1906. The raised surfaces can be formed as a rectangular or bar shape 1902, a circle shape 1904, or a star shape 1906. Other shapes are also contemplated. Although the raised surfaces are shown as configured to contact the vestibular surfaces (outer portion) of the teeth, the raised surfaces may also be placed on the lingual surfaces (inner portion) of the teeth. The raised surfaces can be composed of the lower modulus inner layer material of the laminate sheet.
- [83]** As shown in Figure 30, the compressible raised surface can be fabricated on the internal aspect of the aligner with varied depth, length, and width depending on the degree and direction of force required for orthodontic tooth movement.
- [84]** Additionally, a space may be created on the appliance to provide an area for the tooth to move into as the raised portion decompresses. The raised portions increase control of and provide for increased attachment over the patient's teeth. The raised portions are formed of the same material as the inner layer and are configured to compress upon contact with the patient's teeth. Once in contact

with the patient's teeth, the raised surfaces will begin to recover causing one or more of the patient's teeth to move in a predetermined controlled manner.

- [85] In another exemplary embodiment, the aligner, as shown in Figure 31 can also be provided with a window on the occlusal surface of the aligner, which can allow for natural changes of the teeth during treatment, such as primary teeth loss followed by the eruption of the permanent dentition.
- [86] To form the appliance, the technician may outfit the patient's stone model with grooves in areas, which require greater control of force. Figure 18 illustrates the placement of various grooves such as an oblique groove 1802, a vertical groove 1804, a horizontal groove 1806, and a lingual vertical groove 1808. Those skilled in the art will realize that other geometric shaped grooves such as longitudinal, diagonal, or horizontal grooves may also be used depending upon the type of orthodontic movement. Upon fabrication of the appliance, the grooves become extensions on the appliance to allow for greater control during orthodontic tooth movement.
- [87] In another embodiment, as shown in Figures 20A and 20B, depending on the desired direction of and amount of movement, the technician may outfit the patient's stone model 2000 with any one of: a circle 2002A, 2002B, a horizontal rectangle 2004, a vertical rectangle 2006A, 2006B, or a star 2008A, 2008B indent(s) on either the vestibular surfaces (outer portion) or the lingual surfaces (inner portion) including combinations thereof on the patient's model. When the model is used to form the appliance, the indents provide correspondingly shaped and sized raised portions on the appliance.
- [88] Figures 21A, 21B, and 22 depict a process in which indentations or grooves can be placed on the patient's digital file. The technician may outfit the indent(s) on either the vestibular surfaces (outer portion) or the lingual surfaces (inner portion) including combinations thereof on the patient's digital file 2010 depending on the desired movement of the teeth or tooth. As shown in Figures 21A and 21B material 2012A, 2012B can be added on the opposing sides of the raised surfaces

on the appliance. This creates spaces for the teeth to move into as the raised surfaces compress and move the teeth. This process is completed without capturing or moving the tooth on the digital file in anyway. Upon fabrication of the aligner of the model with indentations or grooves, a laminate sheet may be used, which adapts into the indentations and becomes raised surfaces.

- [89] The CAD Software can be designed so that when an indentation is inserted into the digital file, there is tooth structure added on the opposing side of the digital tooth to allow room for tooth movement when the aligner is inserted over the patient's dentition automatically. For example, if the indentation is placed on the outer portion of a tooth at a depth of 2 mm, then 2 mm is added on the opposing side of the tooth. Upon aligner fabrication, the laminated sheet adapts into the indentation of the digital file and becomes a 2 mm raised surface. Further, since the opposing side of the digital file is also 2 mm thicker, the aligner will have 2 mm of additional room on the opposing side of the raised surface for the tooth to move into during realignment.
- [90] Figures 28A and 28B demonstrate a pulling out on the facial aspect 2024 of the tooth on the digital file. The digital file of the patient's dentition 2020 is unaltered at the incisal and gingival margins 2022 to minimize memory relapse by the post orthodontically positioned dentition. The facial aspect 2024 of the tooth is pulled with margins at the incisal, gingival and mesial and distal marginal ridges to allow space for added formulation to be in contact with the teeth.
- [91] Figure 29 shows an aligner 2026 formed by the digital file shown in Figure 28. Upon fabrication of the aligner over this digital file, the internal aspect of the aligner will possess a space 2028 when inserted over the patient's mouth. The space 2028 is sealed at all peripheral margins, and the formulation can be incorporated for interaction with the dentition. This space can be utilized for immersing various formulations such as bleaching material, health and or oral freshness compositions, etc. The formulation can be incorporated into the

aligners either by introducing it into the pre-made reservoir or by imbedding it into the laminate material during the manufacturing of the laminate sheet.

- [92] Once the digital file with indentations is created, it is saved and exported as an STL file for printing as a 3D model. The model can be created by a 3D rapid prototyping printer 2014 with the indentations as shown in Figure 23. However other methods for forming the appliance are contemplated such as 3D scanning, milling, and vacuum suck down.
- [93] Additionally the final aligner can act as a retainer and may possess a space for tooth movement. This can be fabricated from the final position of the digital file without any modification and is intended to maintain the position of the teeth in its final stage. Teeth have what is referred to as positional memory. As a result, even though they can be moved, since they have been in their original position for a long duration, they have a tendency to move back to their original position. Therefore, they need to be maintained in the final position for a period of time in the range of 1 to 3 years and sometimes longer in order for the teeth to be habituated to this new position. This is achieved by the use of the final retainer. One or several final retainers can be fabricated for patient's use until the teeth are habituated to the new position. The characteristics of the aligner material will be more rigid than that of the preceding aligners. A further aspect of the final aligner is that it can have added space on the facial aspects of the teeth in the form of reservoirs. This space will allow room for additional composition(s) to be in contact with the dentition for health and or esthetic purposes (e.g., to bleach teeth as a whitening process and or antimicrobial, fluoride and other compositions for bacterial prevention and or to enhance the health of the dentition and oral cavities). In addition, the composition may possess flavoring components such as spearmint and or other known agents for enhanced oral freshness. These materials may be added after the fabrication of the aligners and its associated reservoir or they may be imbedded within the aligner material.

- [94] In a further aspect various colors can be added to the aligner to increase visibility of the aligner when it is not in use. In particular, the patient may remove the aligner and not be able to visibly see the aligner if placed on a table top, bathroom sink, restaurant, etc. Providing color to the aligner may aid in helping the patient identify the retainer and prevent against accidental loss, which might otherwise occur if the aligner is clear. Additionally, adding colors to the aligner provides for tracking purposes of the orthodontic phases of treatment. The aligner can be provided with any color such as the patient's favorite color, birthday color, seasonal color, fashion, etc. to help attract greater patient use and enhanced patient compliance. Various colors of orthodontic aligners can be fabricated by using pre-colored sheets if utilizing the rapid prototype 3D printer and vacuum or the aligner can be directly milled from the digital file of the patient's impression. In addition the aligner can be fabricated through the use of a pre-milled polymer blocks, which can possess various colors.
- [95] Figure 24 depicts a schematic diagram comparing the appliance having raised portions 2018 with a conventional dental appliance 2016. Figure 25 shows a graph comparing a conventional spring 2016 with an appliance 2018 having raised portions. Upon insertion of the aligner over patient's dentition, the raised portions initially compress. Recovery of the raised portions creates force for orthodontic tooth movement. The graph illustrates that the appliance having a raised portion provides a higher force over a longer period of time during the recovery phase than a conventional spring. In other words, the compressible raised portions allow for longer duration of tooth movement at higher levels of force as compared a conventional orthodontic spring.
- [96] Figure 26 shows a patient's mouth having a conventional spring 2016 with a bracket 2020 bonded to a tooth. Figure 27 depicts a patient's mouth where an appliance 2018 with a raised surface is implemented. The use of raised surfaces on an appliance as compared to cementing brackets on patient's teeth may eliminate the need for invasive attachments to teeth such as clasps or brackets. This may provide for better hygiene as clasps or brackets have a tendency to act

as traps for bacteria. The use of raised surfaces also provides for improved esthetic appearance for the patient by eliminating unsightly structures on the teeth.

[97] Additionally, the use of raised portions eliminates the need to create an intentional mismatch between an attachment on the tooth and the attachment on the internal aspect of the aligner to cause realignment. The raised surfaces are exact for the desired tooth movement, which translates into more accurate tooth movement. In addition the raised surface can be applied for a longer duration in providing a more flexible internal lining. The raised surfaces may also eliminate the propensity for damage to teeth during application of cement or during grinding of the brackets during removal.

[98] Additionally, the internal lining of the aligner may be formed of a lower modulus of elasticity than the outer shell. The lower modulus material has a tacky, sticky, surface due to its flexible material characteristic. Because of its increased flexibility, the laminate sheet adapts into the digital groove created on the digital file during aligner fabrication. This tacky, flexible characteristic allows greater surface to surface contact which results in lower localized stress and increases the retention of the raised portions to the tooth surface for less slippage when the aligner is inserted over the patient's teeth. This feature may eliminate the need for invasive attachments such as brackets, buttons, nipples, etc.

I claim:

1. An orthodontic repositioning appliance comprising:
an inner layer configured to engage a portion of a patient's teeth;
an outer layer secured to the inner layer; and
wherein the inner layer comprises at least one raised portion which provides increased control and attachment over at least one of the patient's teeth and is configured to compress upon contact with the at least one of the patient's teeth and is configured to recover causing the at least one of the patient's teeth to move.
2. The orthodontic repositioning appliance of claim 1, wherein the inner layer and outer layer comprise elastic moduli in the range of 0.1 to 10.0 GPa.
3. The orthodontic repositioning appliance of claim 1, wherein the outer layer comprises a polycarbonate and the inner layer comprises a thermoplastic polyurethane resin.
4. The orthodontic repositioning appliance of claim 1, further comprising a shape memory alloy.
5. The orthodontic repositioning appliance of claim 1, wherein the repositioning appliance is configured to be attached to a micro-implant to allow for increased control and force for orthodontic tooth movement.
6. The orthodontic repositioning appliance of claim 5, wherein the micro-implant further includes an attachment for securing the repositioning appliance.
7. The orthodontic repositioning appliance of claim 6, wherein the attachment comprises a male-female connection, or a magnet attachment.
8. The orthodontic repositioning appliance of claim 1, wherein the inner and outer layer comprise one or more of: a bacterial resistant material, a teeth whitening material, an oral freshness material, and a varied color material.

9. The orthodontic repositioning appliance of claim 1, wherein the at least one raised portion is selected from the group consisting of: a star shape, a rectangular shape, a circle shape, and a bar shape.

10. The orthodontic repositioning appliance of claim 1, wherein the raised portion consists of one of the following: a lingual vertical bar, a horizontal bar, and a diagonal bar.

11. The orthodontic repositioning appliance of claim 1 wherein the outer layer has a higher elastic modulus than the inner layer and wherein the inner layer comprises a continuous layer having a lower elastic module than the outer layer.

12. A method of repositioning misaligned teeth comprising:

- a) taking an impression of the patient's teeth and forming a model based on the impression of the patient's teeth;
- b) adding at least one indentation to the model; and
- c) creating a repositioning appliance from the model, wherein the repositioning appliance is formed with an inner layer having at least one raised surface corresponding in shape and size to the at least one indentation formed in the model.

13. The method of claim 12 wherein the indentation is selected from the group consisting of: a star shape, rectangular shape, circle shape, and a bar shape.

14. The method of claim 12 wherein step (b) further comprises adding at least one additional indentation to the model of a different shape or size than the at least one indentation and wherein step (c) further comprises forming the appliance with at least one additional raised surface corresponding in shape and size to the additional indentation on the model.

15. The method of claim 12 wherein the repositioning appliance is formed by one or more of: 3D scanning, milling, printing, and vacuum suck down.

16. The method of claim 12 wherein step (b) further comprises adding material in the area opposing the indentation in the model and wherein step (c) further comprises

forming a space in the appliance corresponding in shape and size to the added material in the model.

17. The method of claim 14, further comprising repeating steps a) through c) at periodic intervals using at least one different indentation on at least the same or an additional model so as to form at least one different raised surface on an at least one additional appliance.

18. The method of claim 16, wherein the periodic interval comprises six weeks.

19. The method of claim 14, wherein the outer layer comprises a polycarbonate and wherein the inner layer comprises a thermoplastic polyurethane resin.

20. An orthodontic repositioning appliance comprising:
an inner layer configured to engage a portion of a patient's teeth;
an outer layer laminated to the inner layer; and
wherein the inner layer comprises a plurality of raised portions which provide increased control and attachment over at the portion of patient's teeth and wherein the raised portions are configured to compress upon contact with one or more of the patient's teeth and recover causing one or more of the patient's teeth to move to a desired position.

ABSTRACT

An invisible removable orthodontic repositioning appliance with a lower modulus inner lining for systematically aligning teeth from an initial tooth arrangement to a final tooth arrangement while minimizing propensity for root and bone resorption due to the lower modulus is disclosed. The aligning of the teeth may be accomplished by taking impressions at various intervals for greater accuracy in the event of a distorted impression. Patient impression and/or model may then be digitally scanned. Using 3D software, tooth position may be incrementally modified toward idealized position and associated stress analyzed. Final modified model and associated appliance may be fabricated for orthodontic movement using 3D printing. Each appliance may be numerically identified to maintain uniformity of application from start of treatment to completion. The forces required for the alignment may be from polymeric material used to fabricate the orthodontic appliances, the shape memory alloy, and/or micro-implants to accomplish optimal tooth movement.

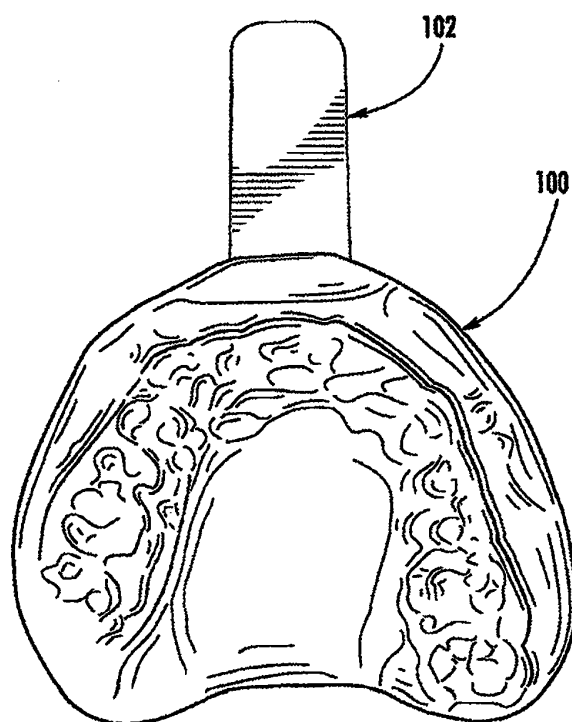


FIG. 1

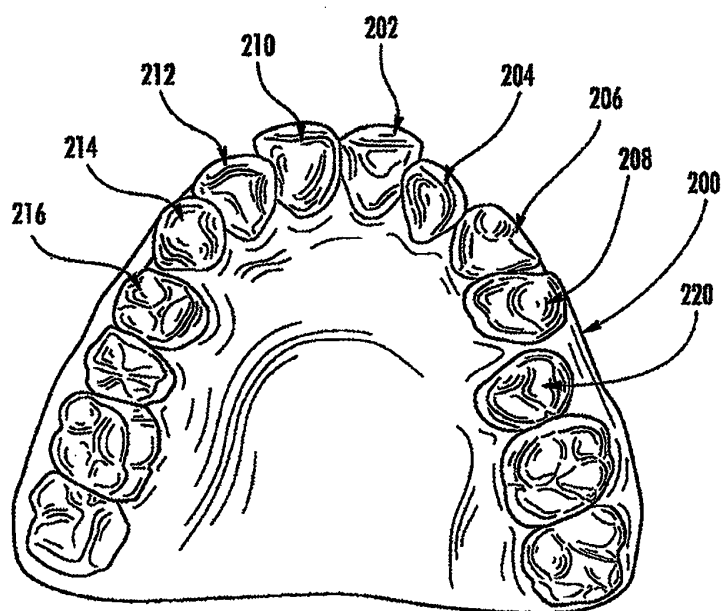


FIG. 2

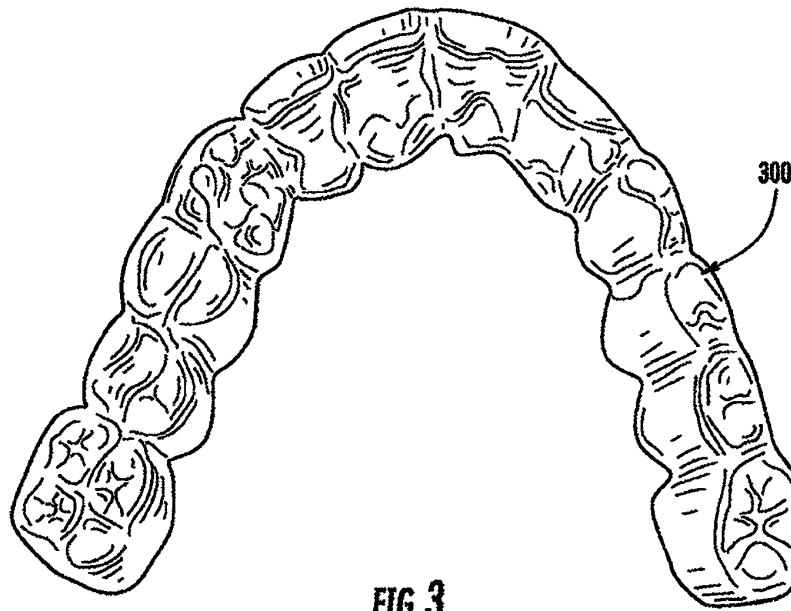
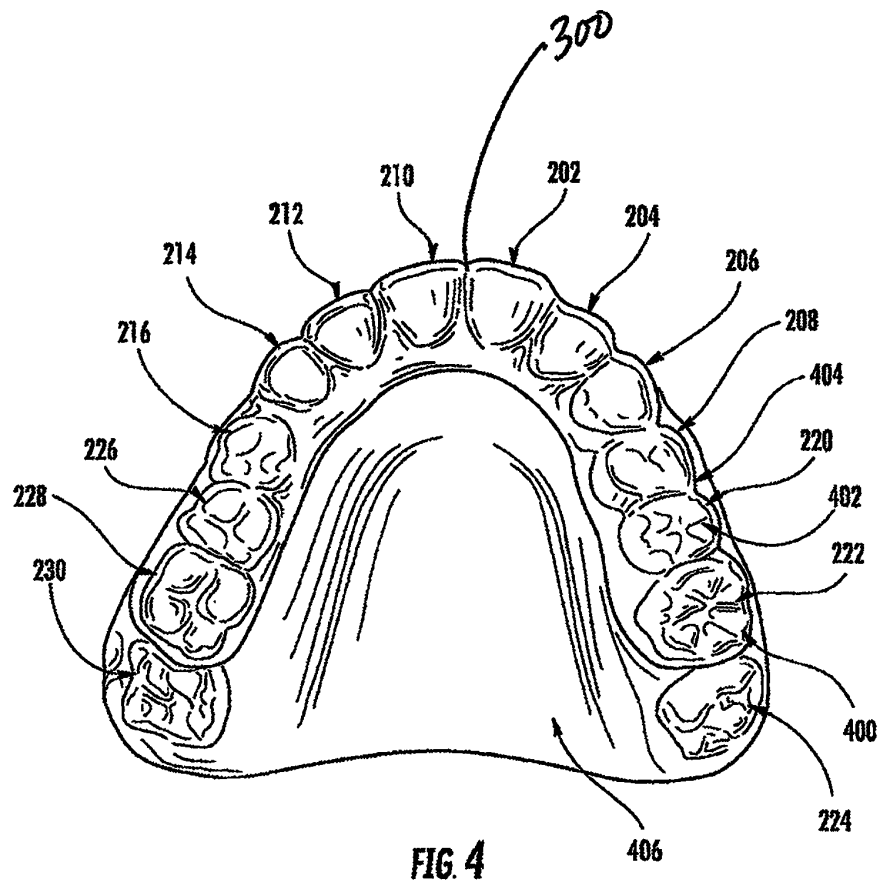


FIG 3



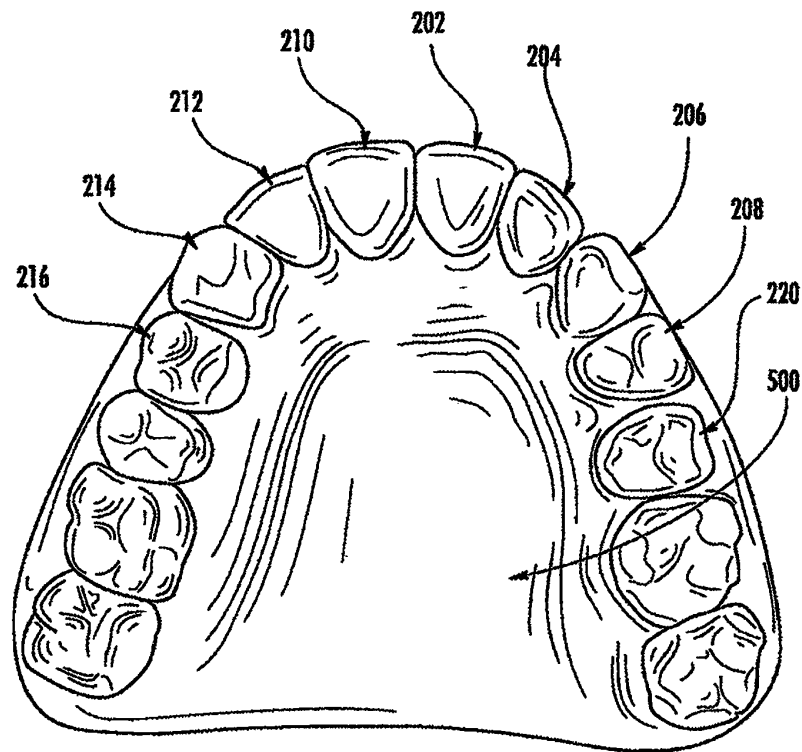


FIG. 5

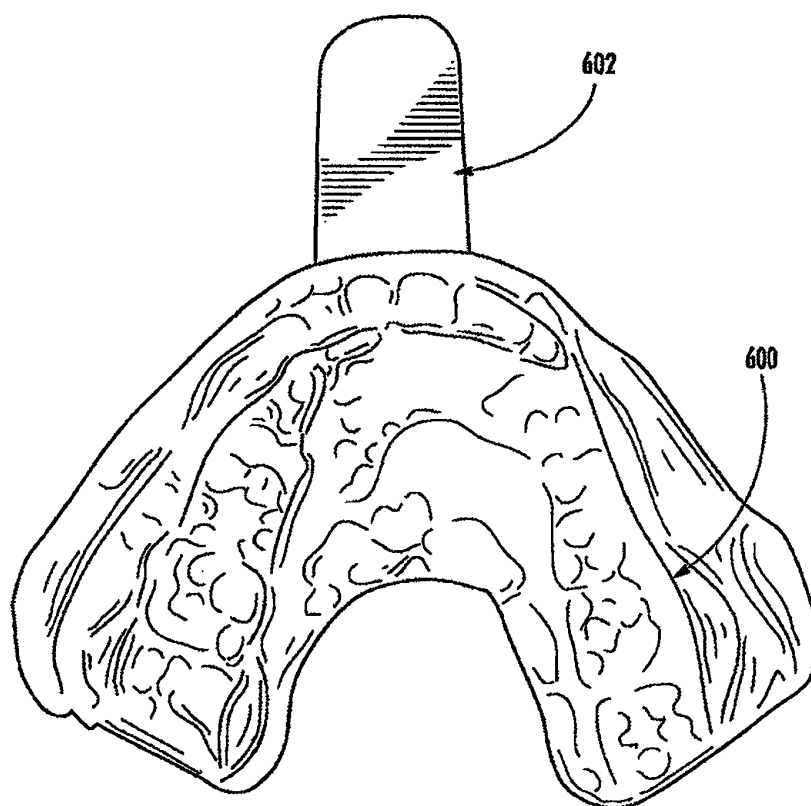


FIG. 6

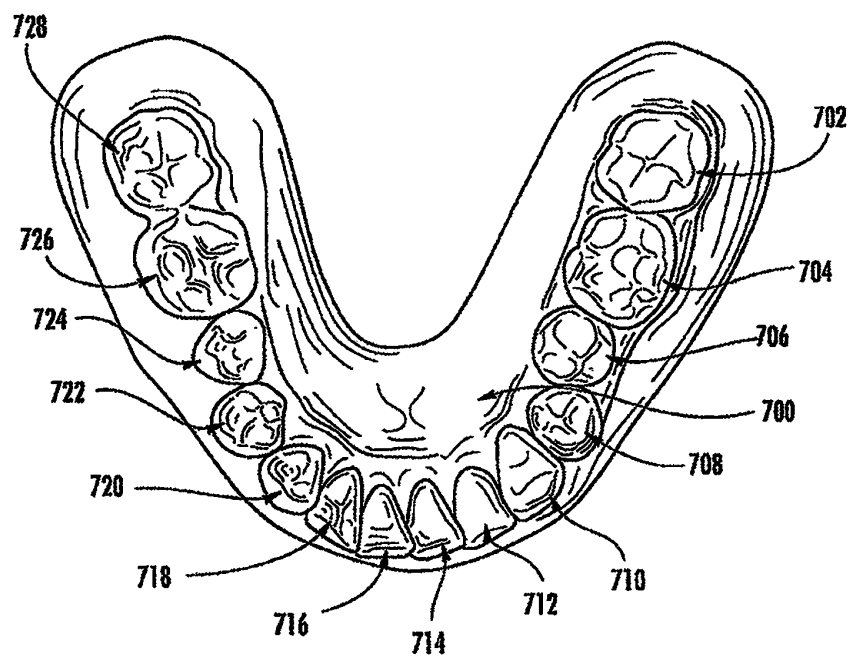


FIG. 7

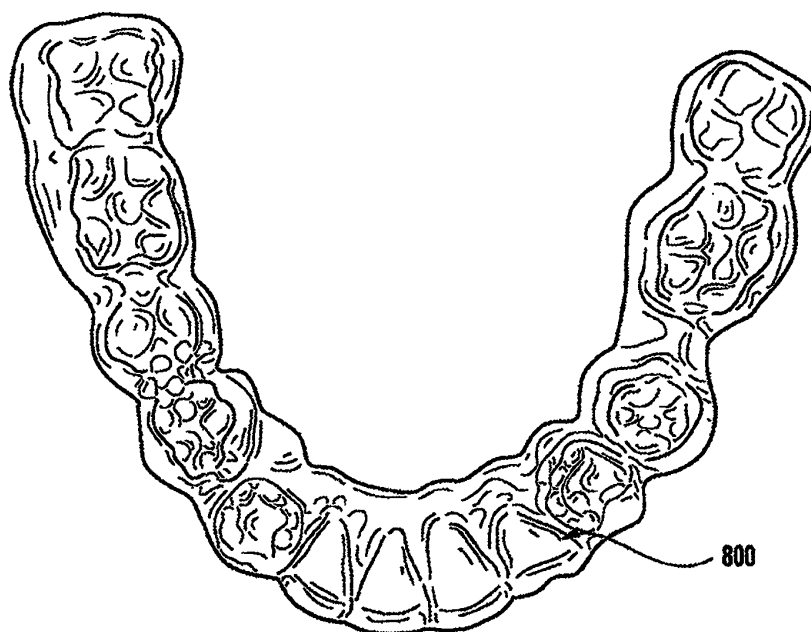


FIG. 8

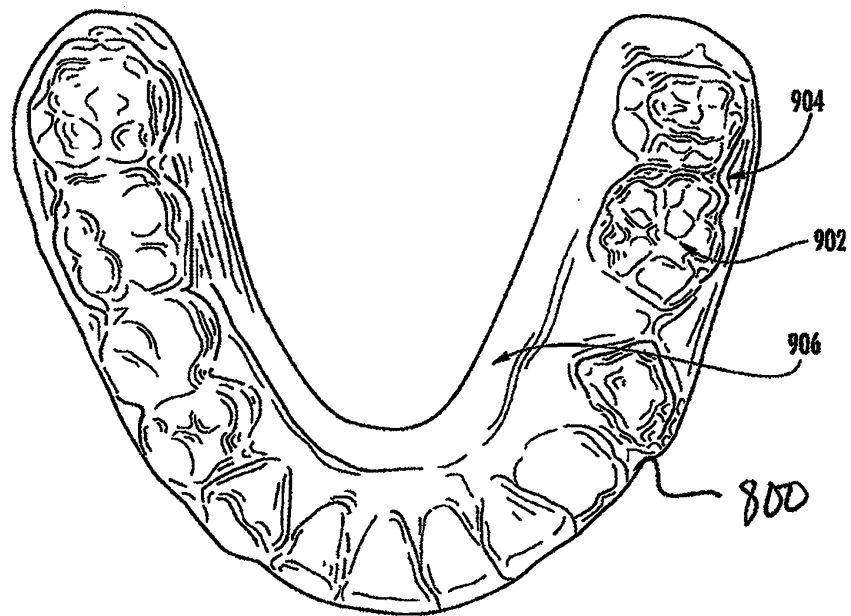
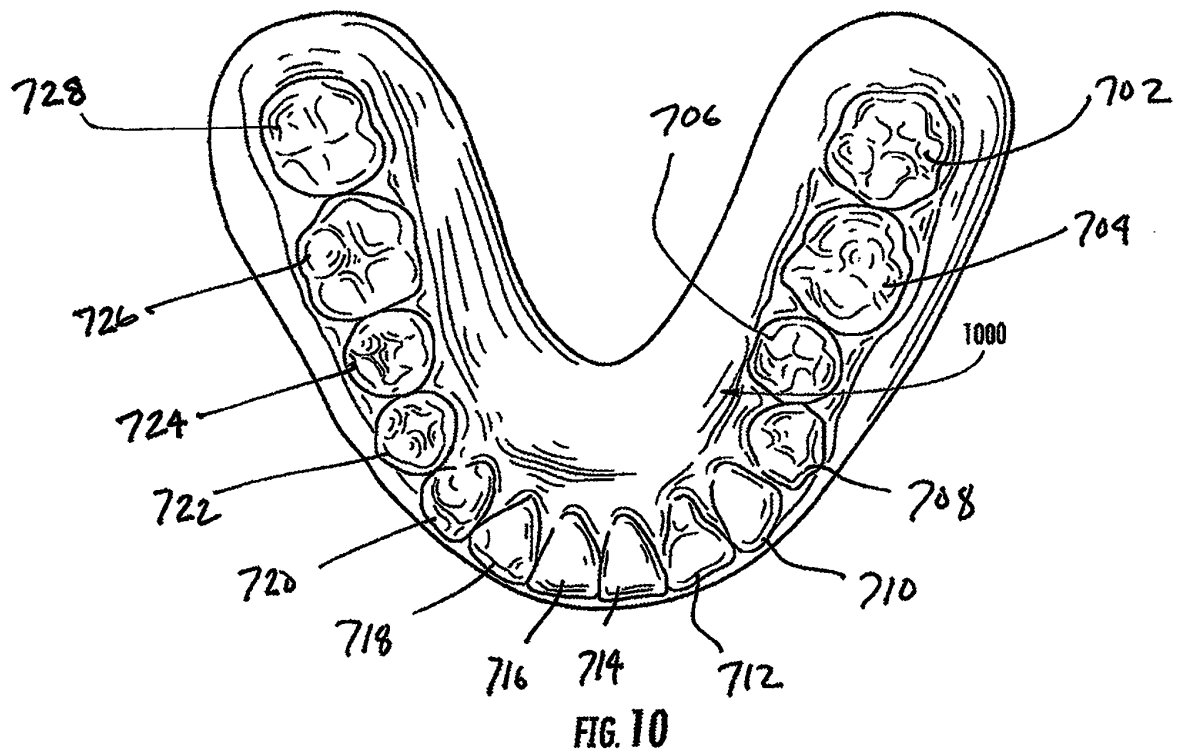


FIG. 9



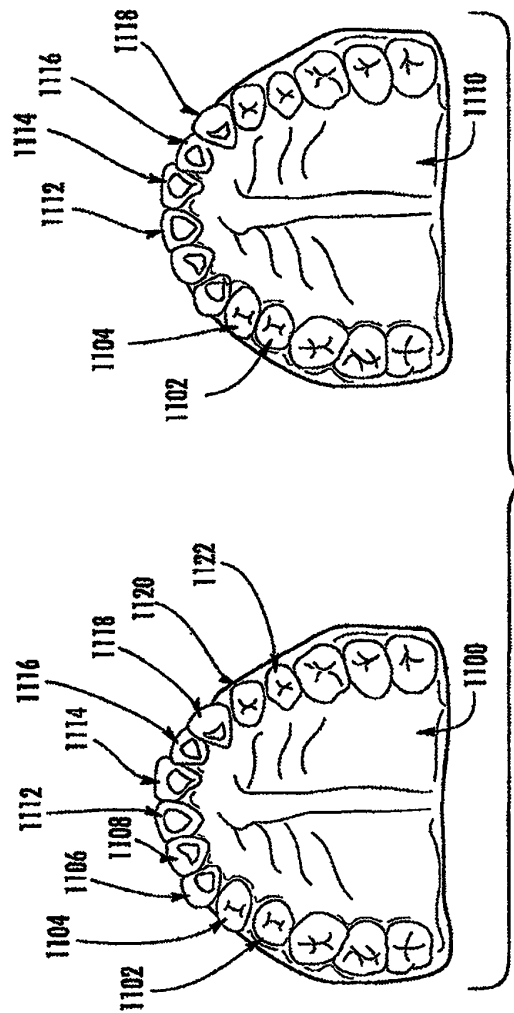


FIG. 11

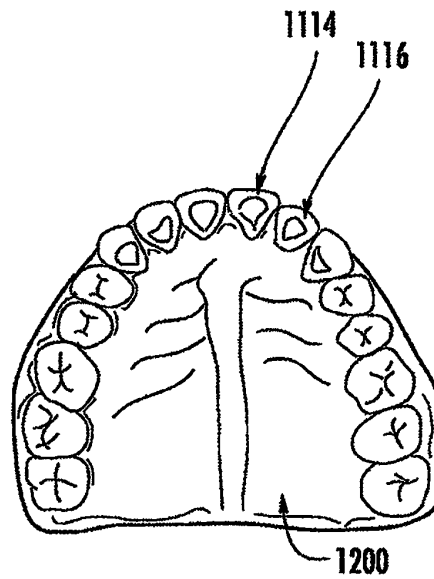
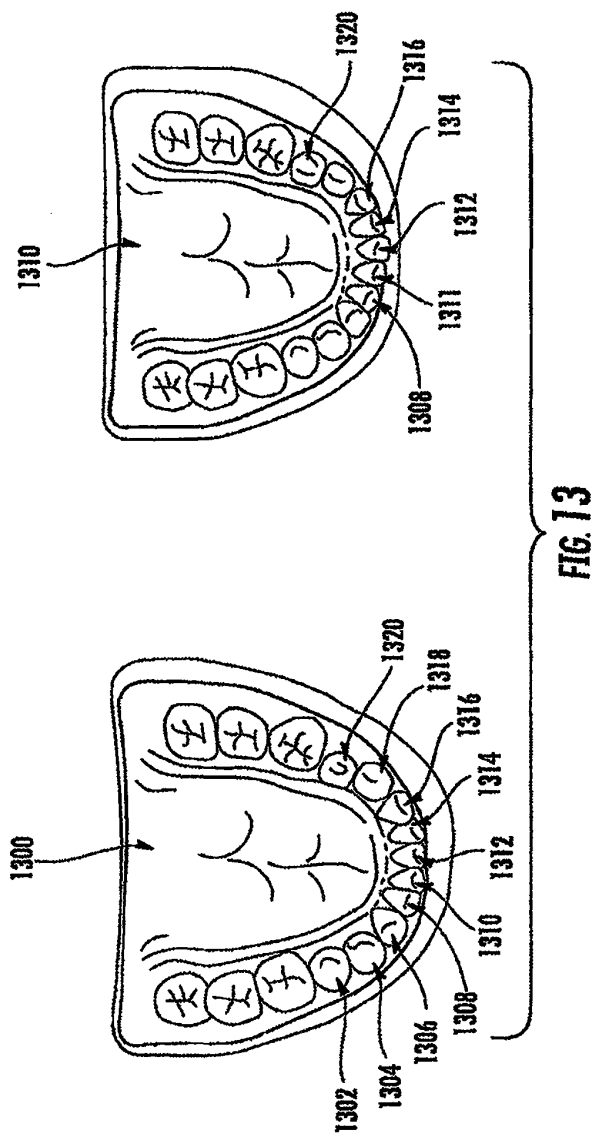


FIG. 12



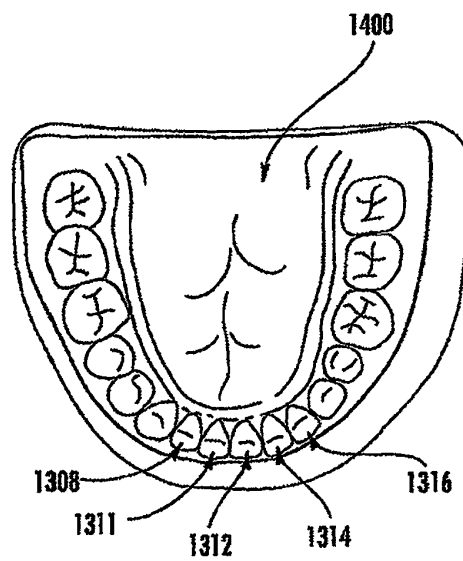


FIG. 14

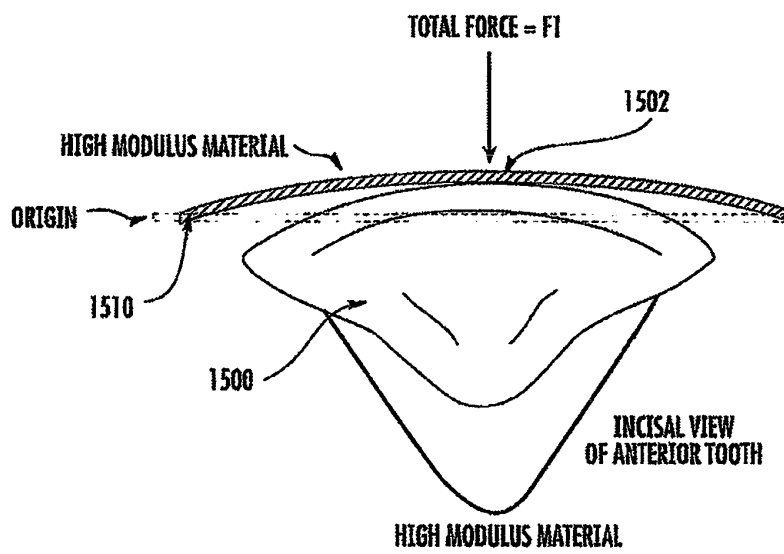


FIG. 15

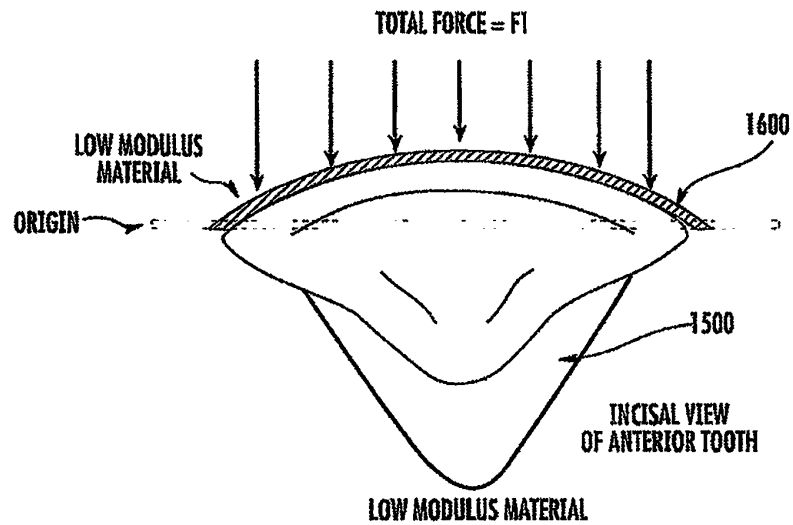
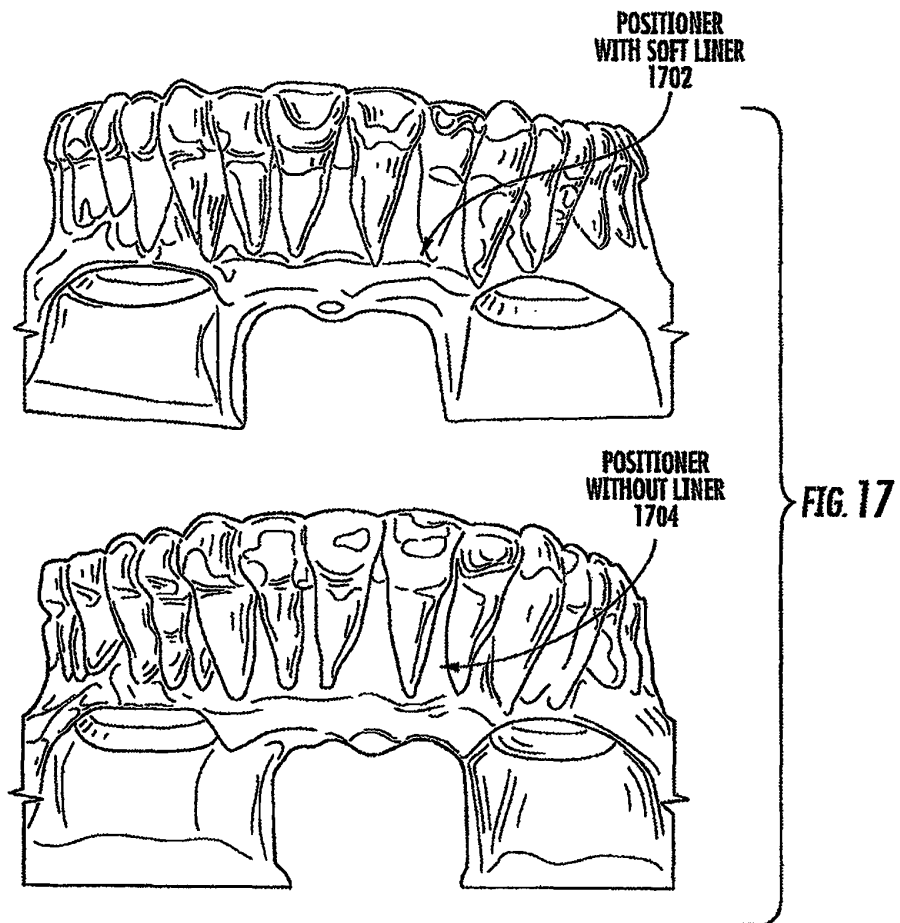
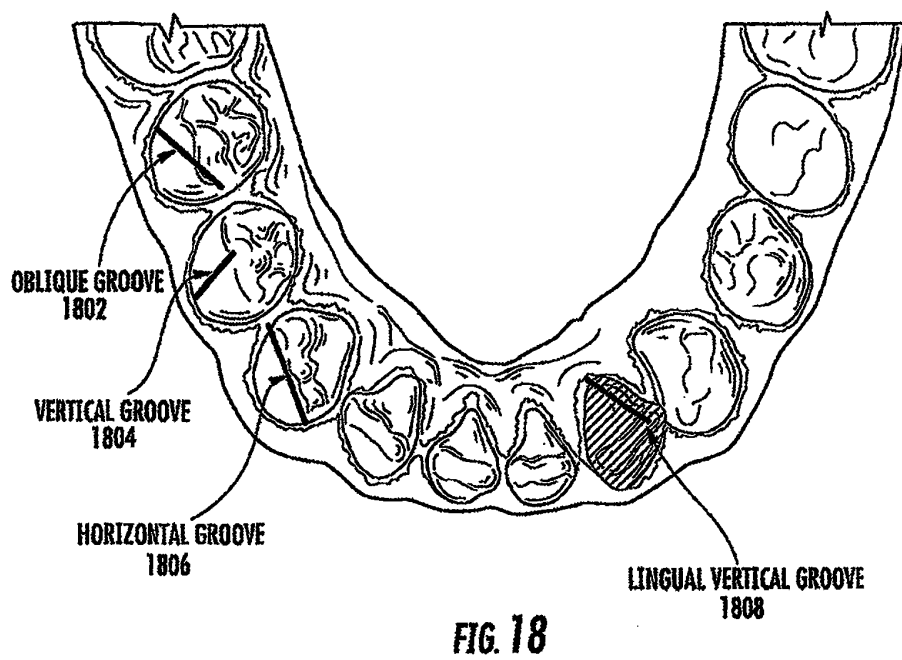
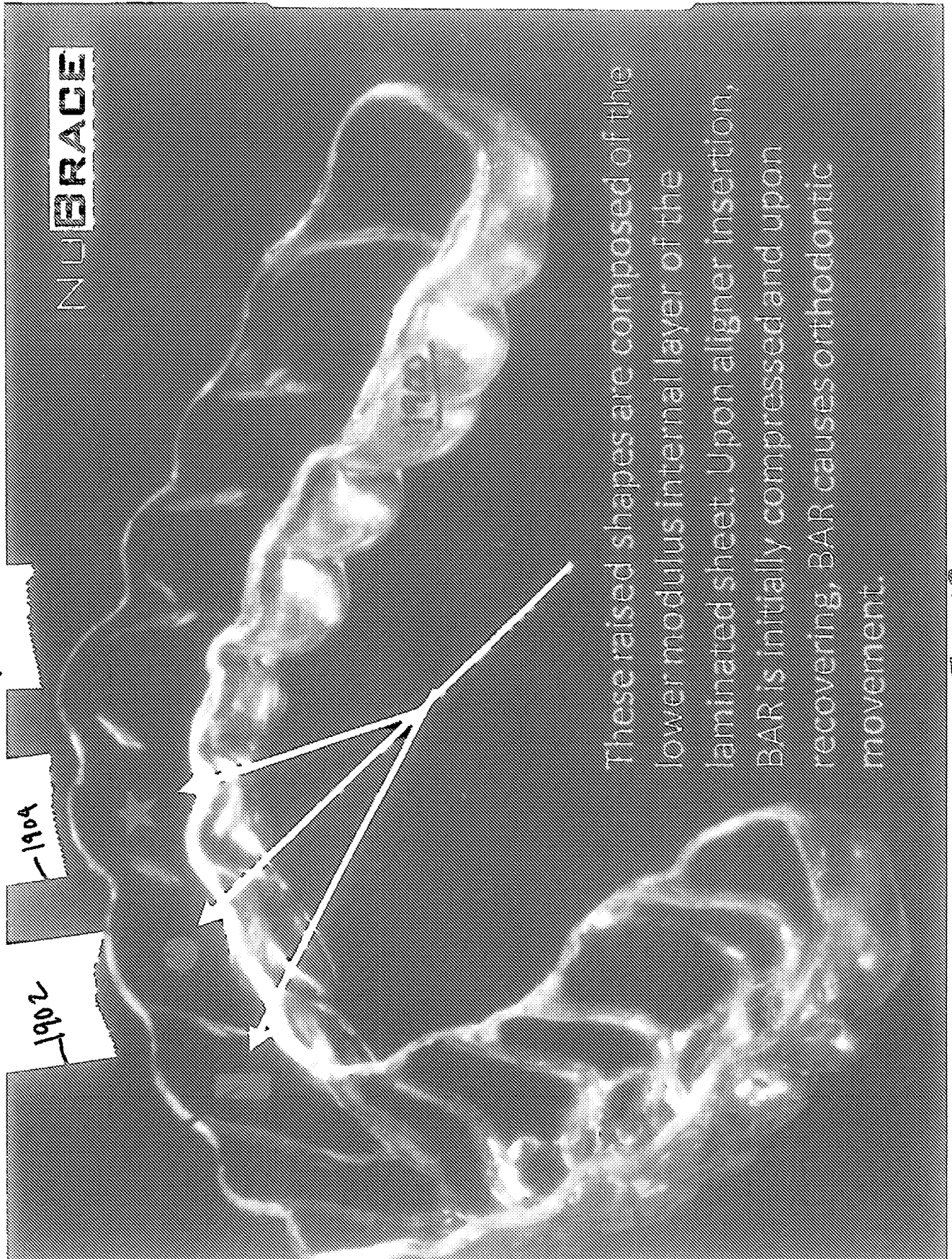
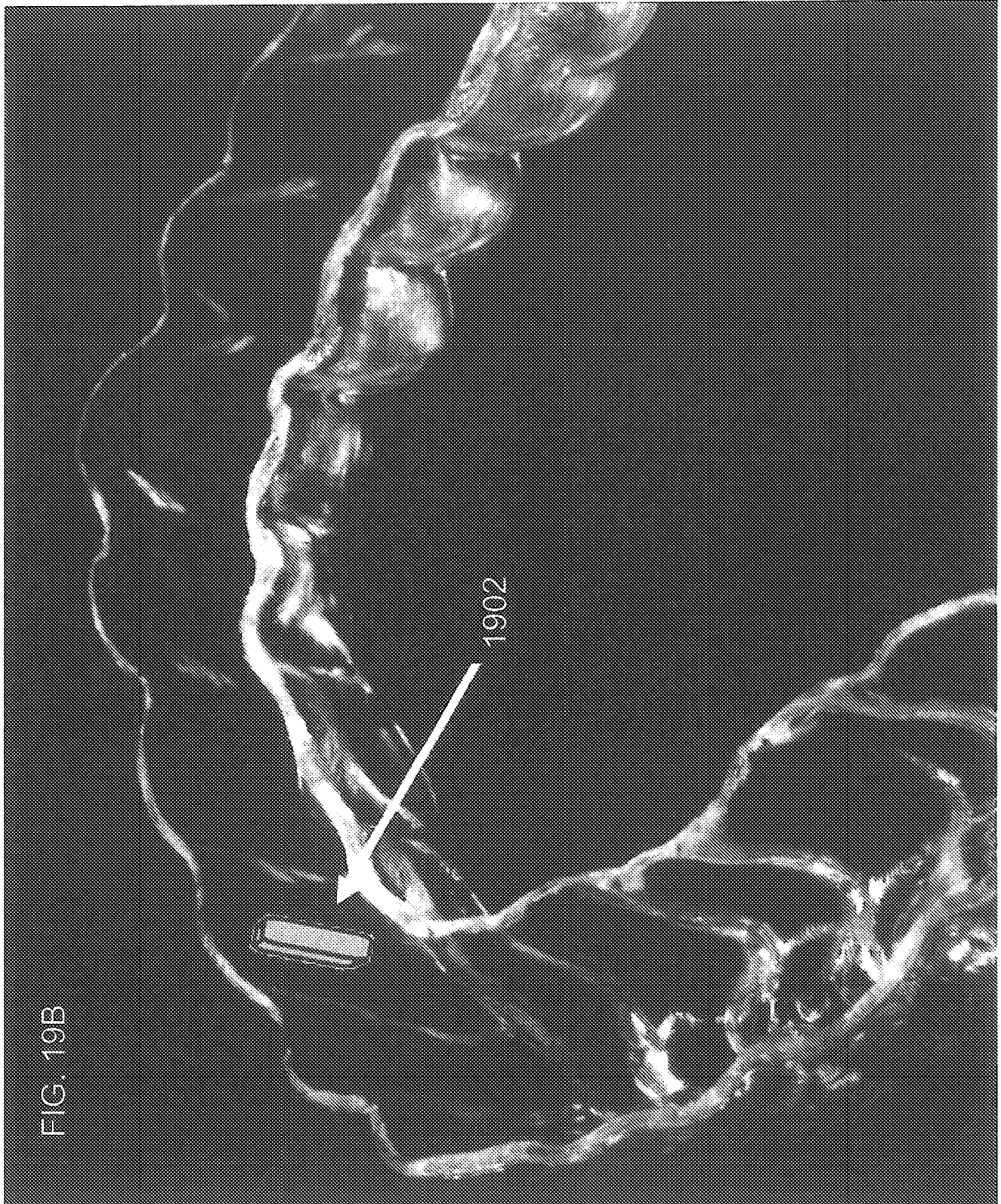


FIG. 16









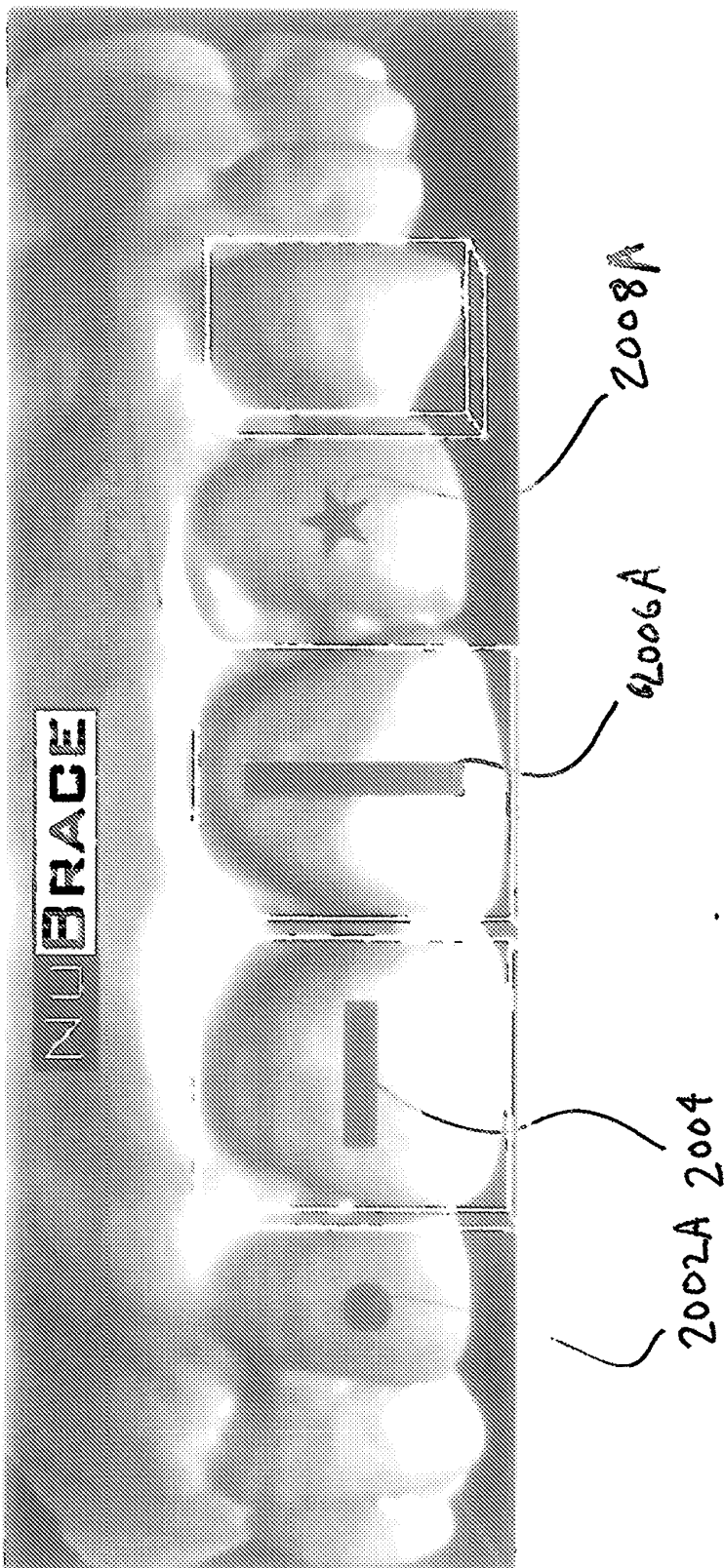


FIG. 20A

2006B
2002B
2008B

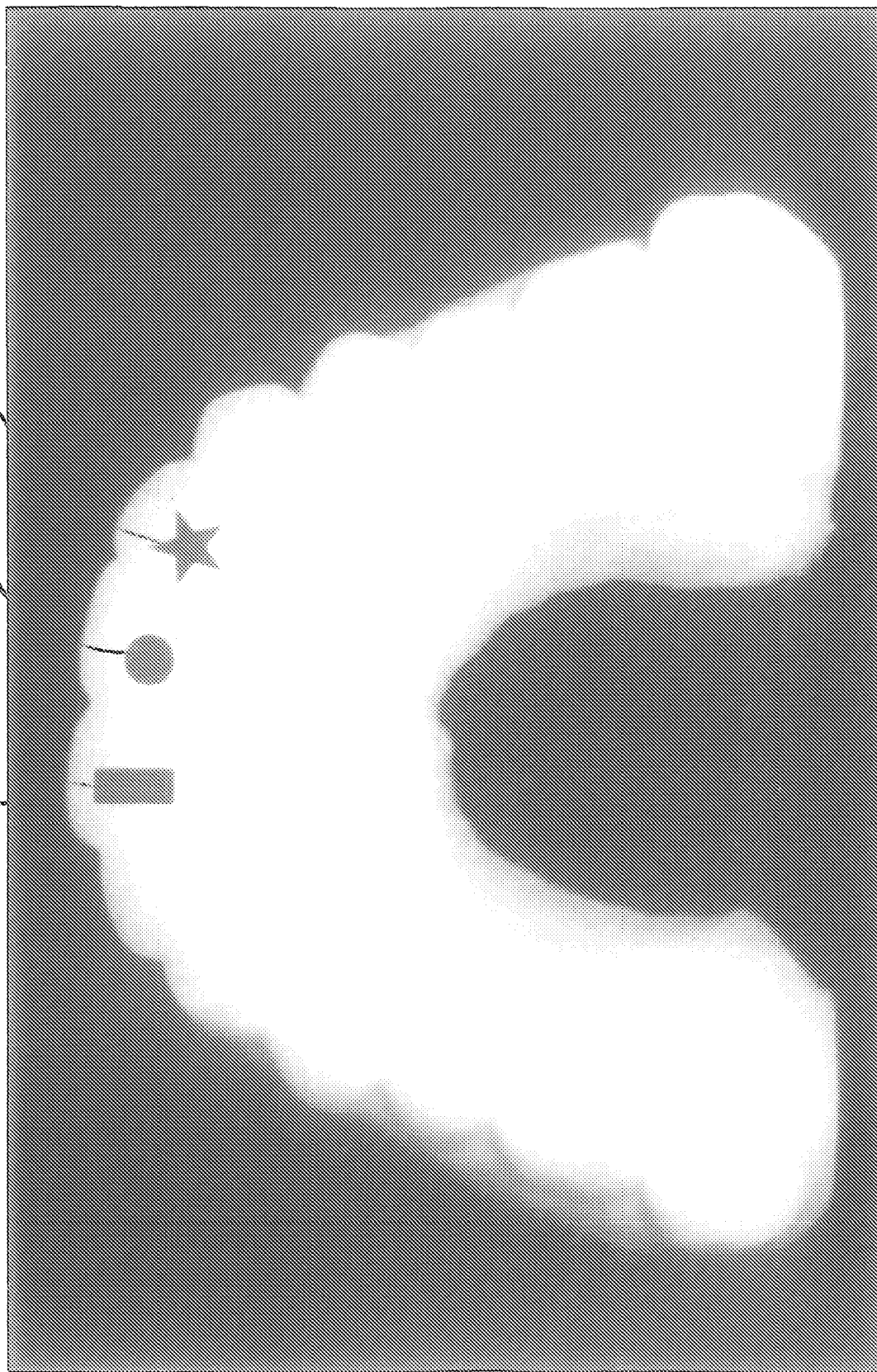


FIG. 20B

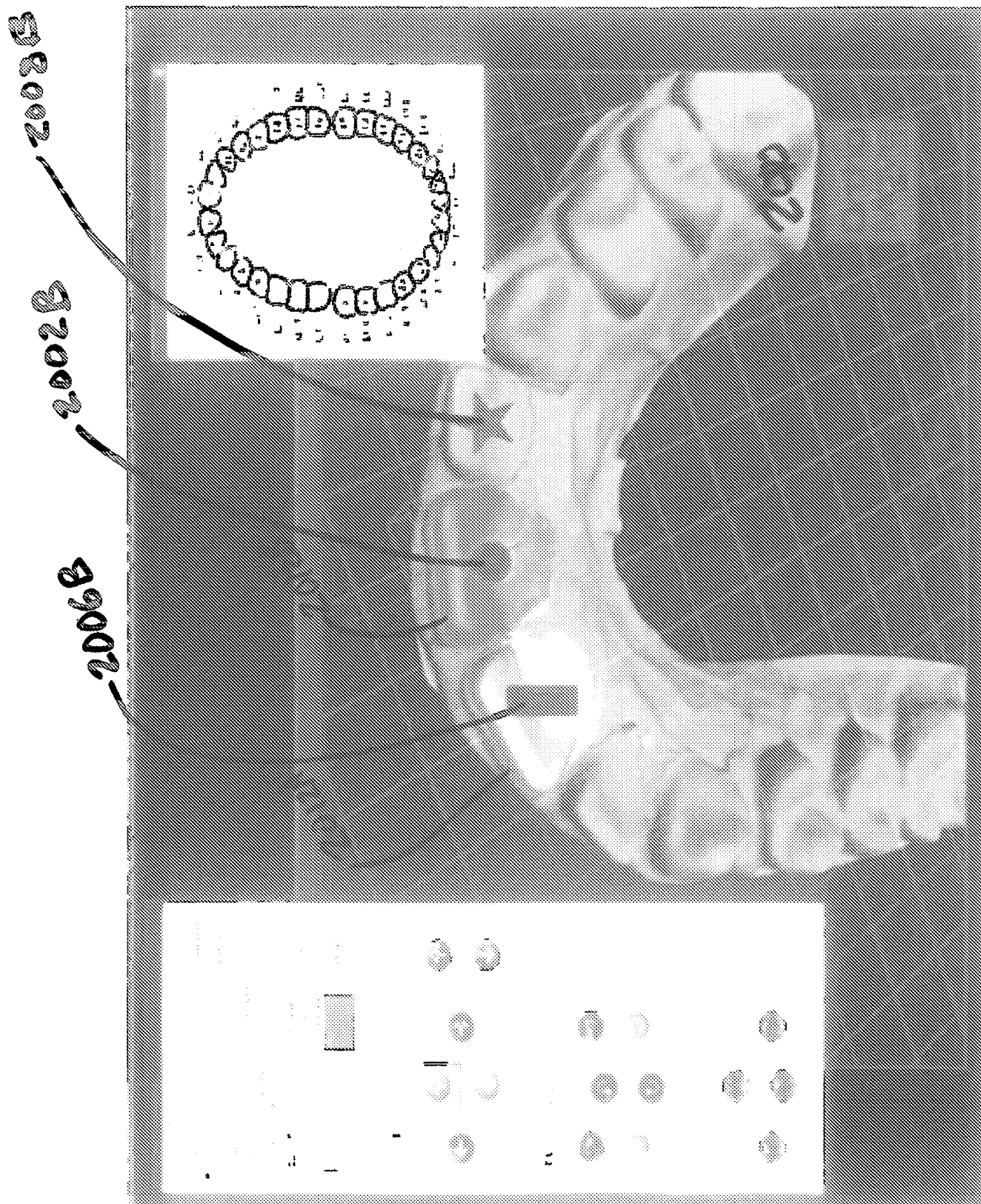
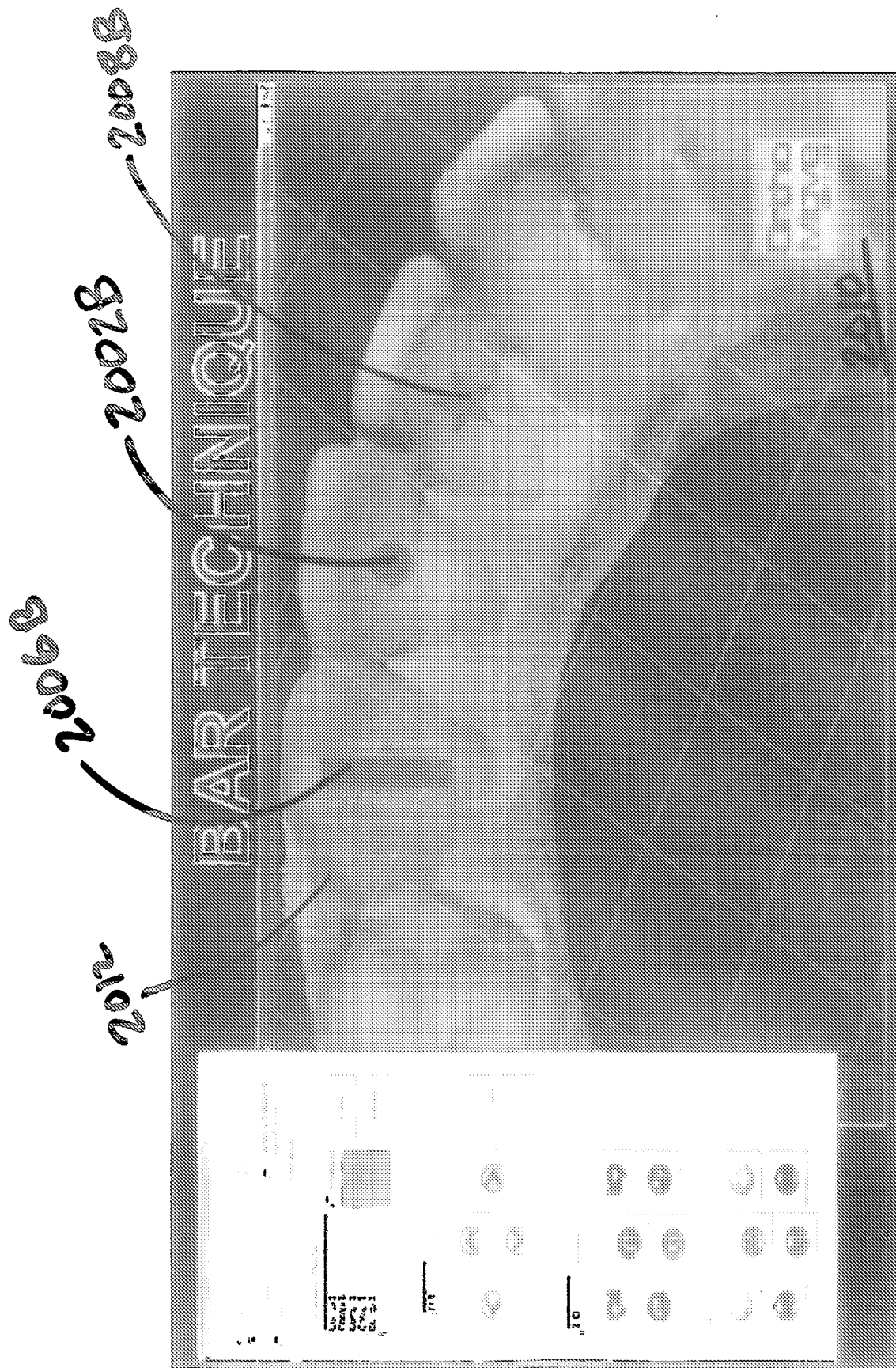


FIG 21A



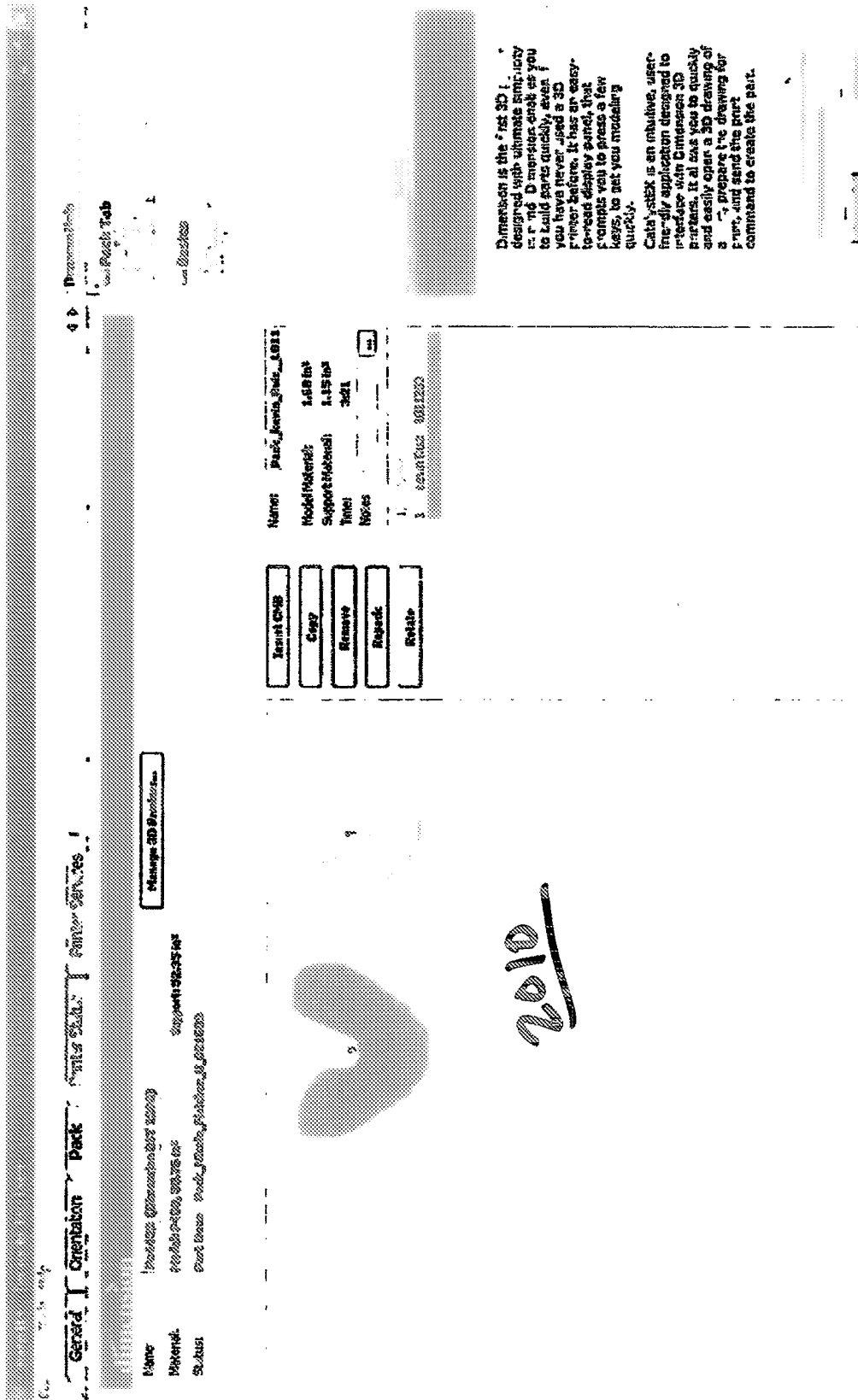
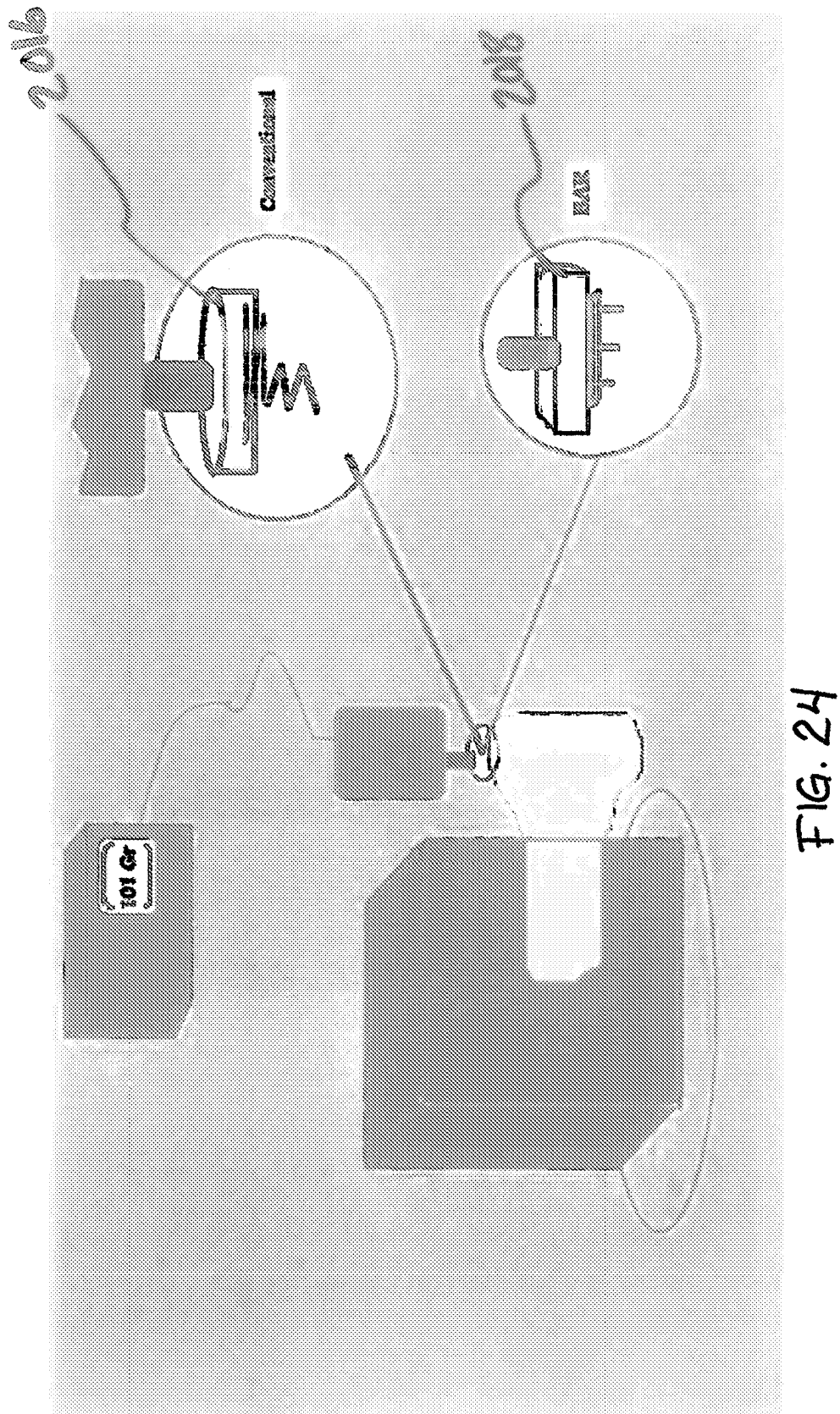
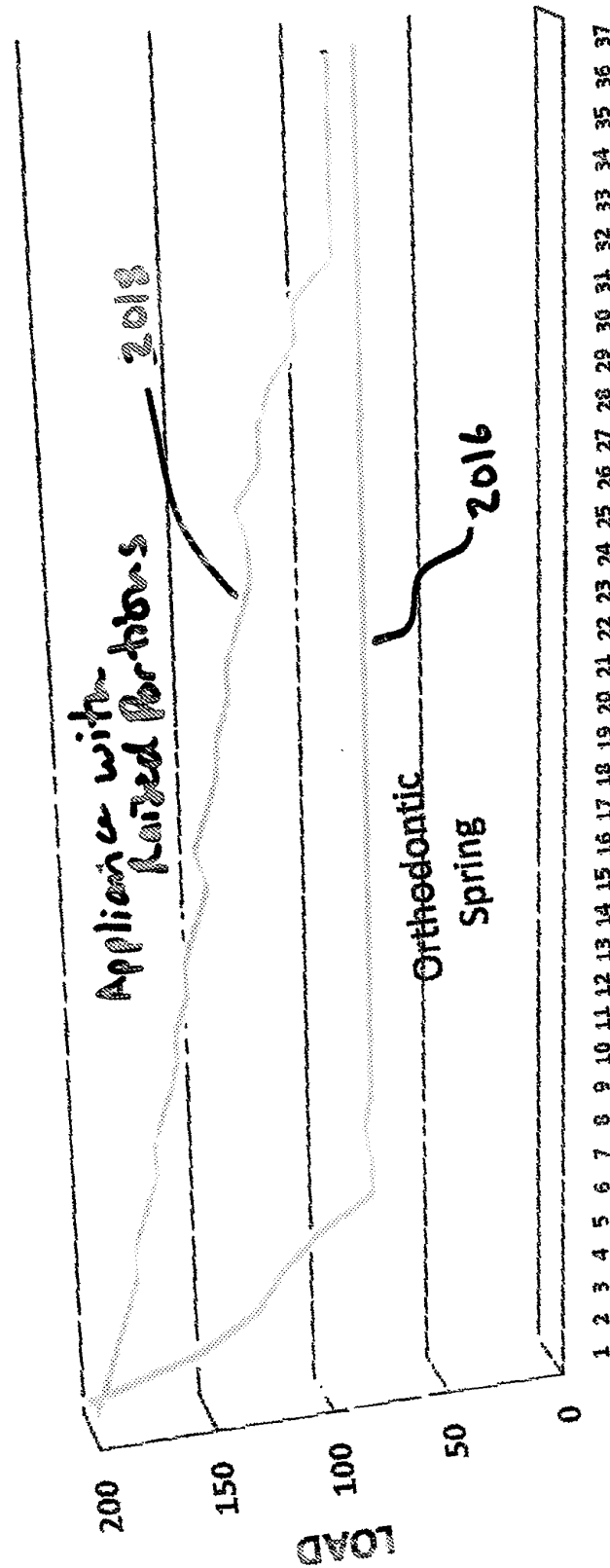


FIG. 22



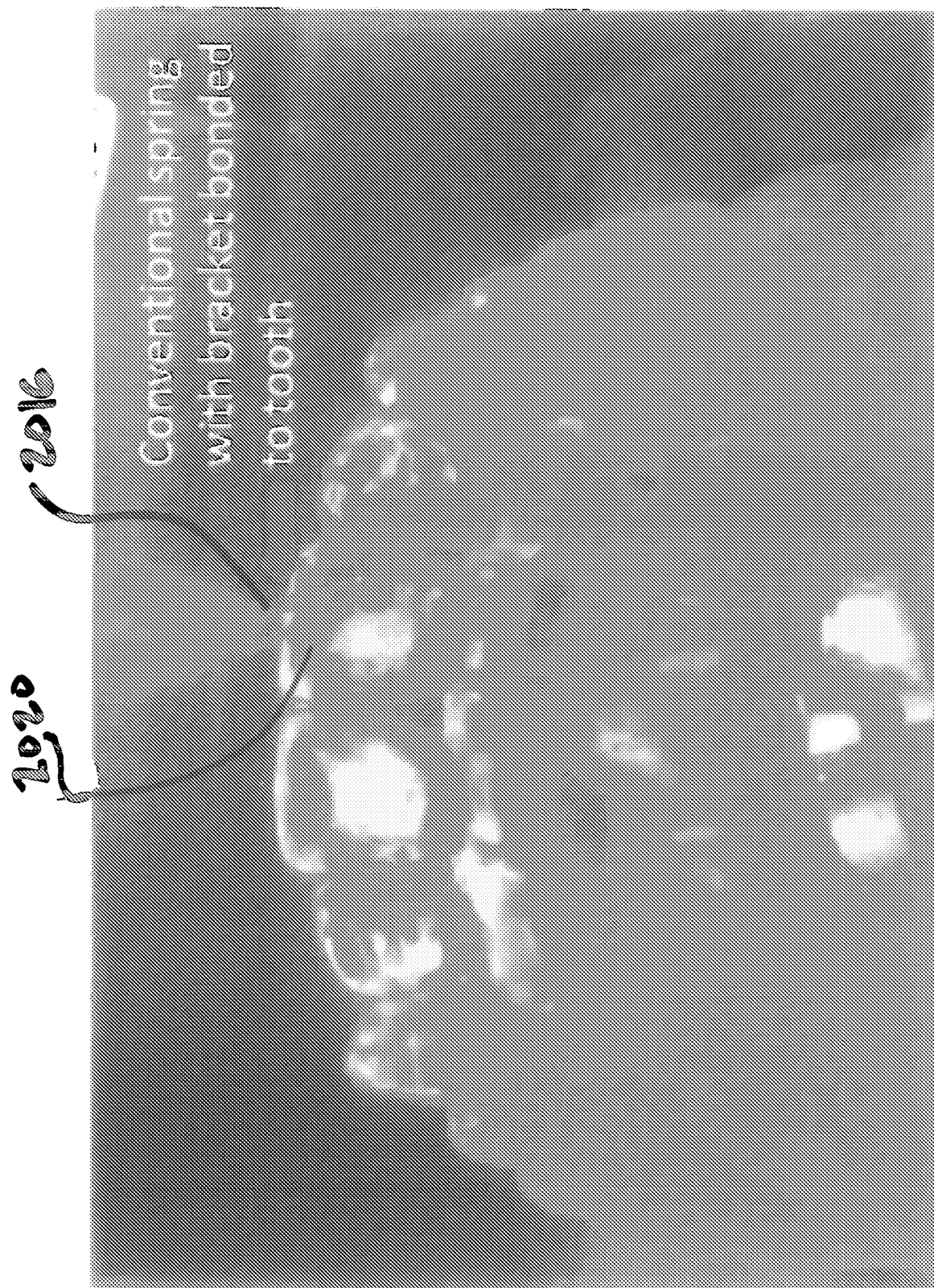
FIG. 23





Time at 5 min intervals

FIG. 25



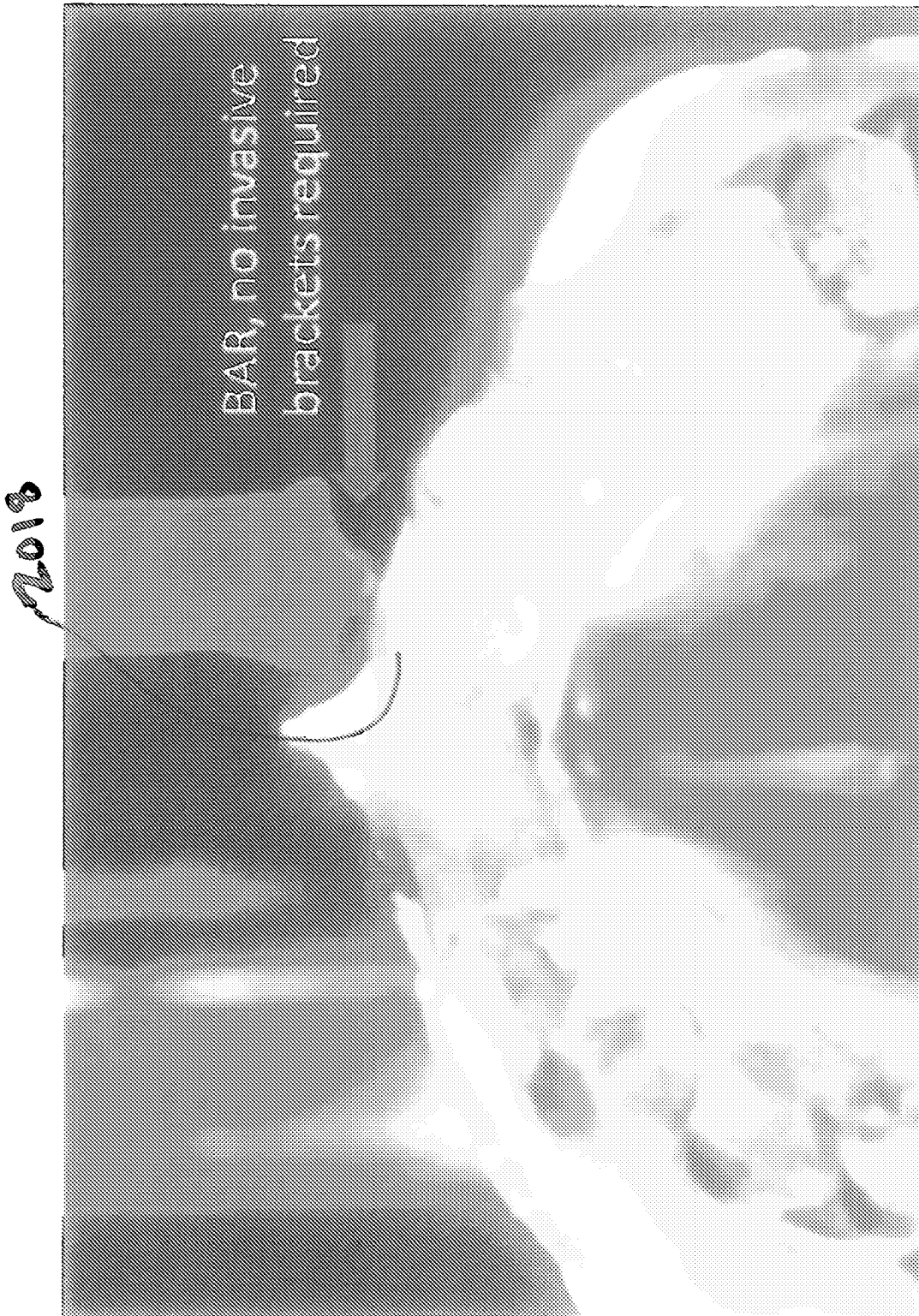


FIG. 27

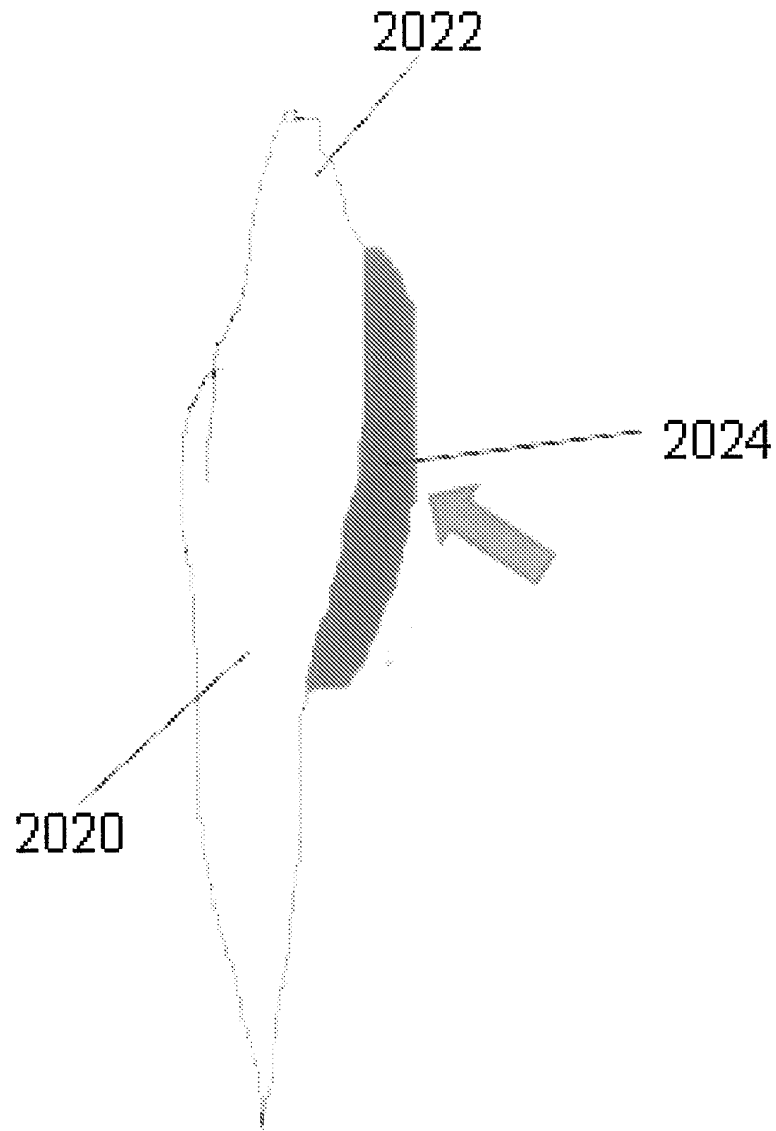


FIG. 28A

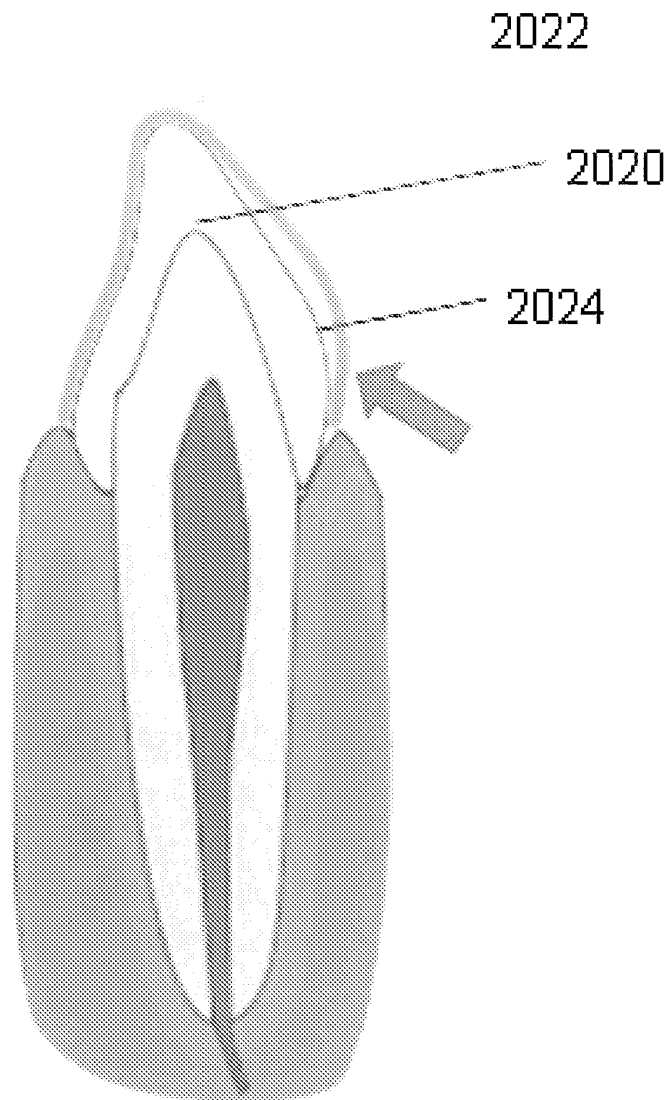
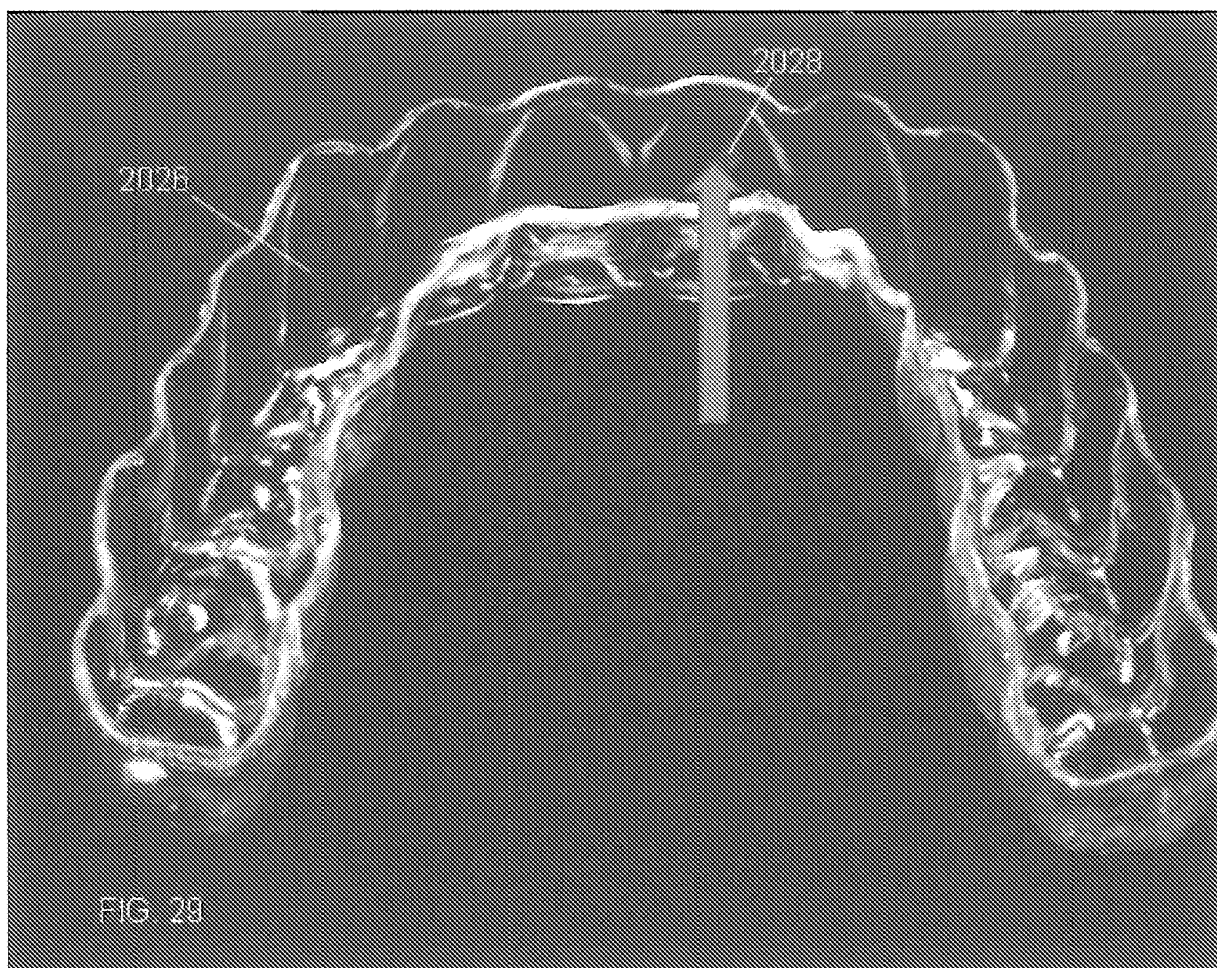


FIG. 28B



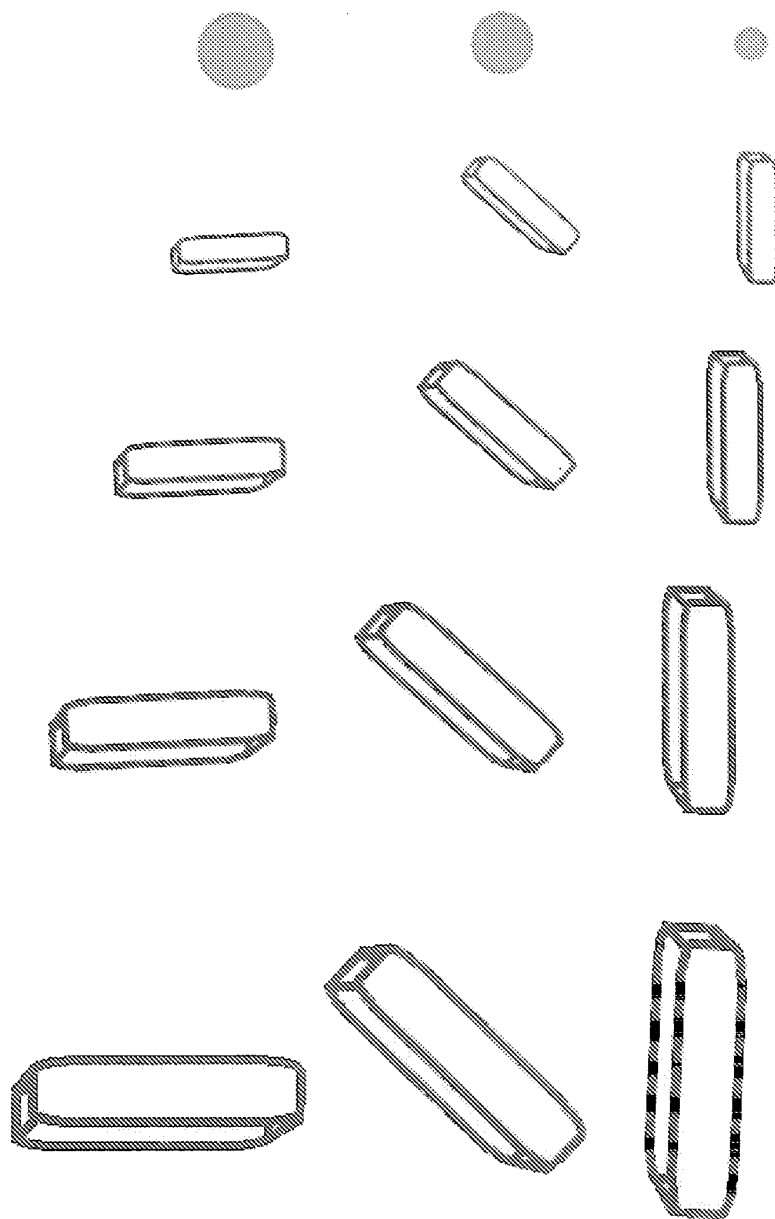
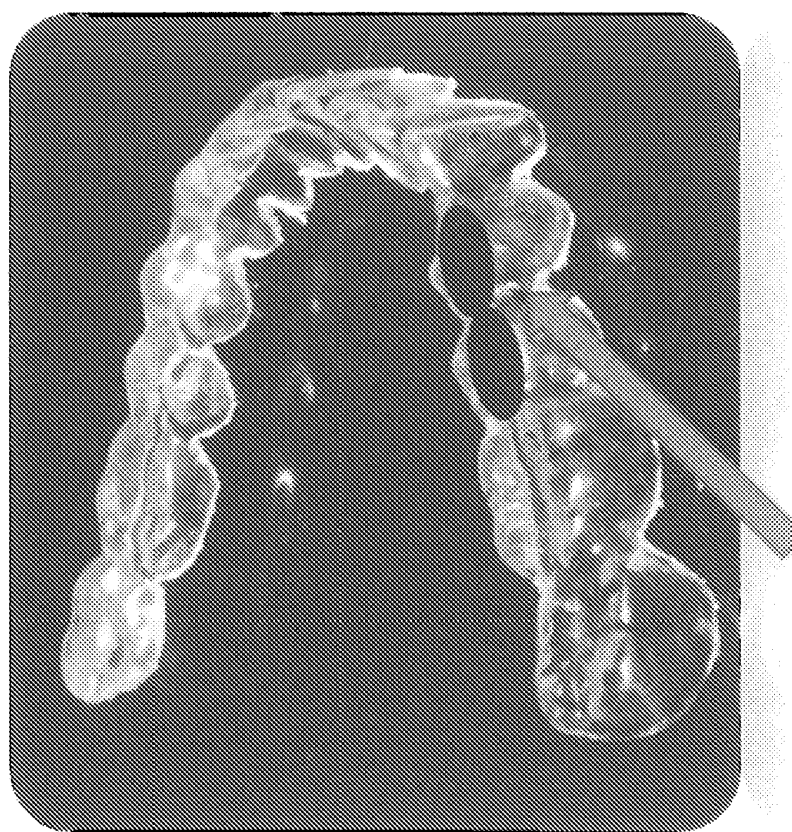


FIG. 30



2030

FIG. 31

2032

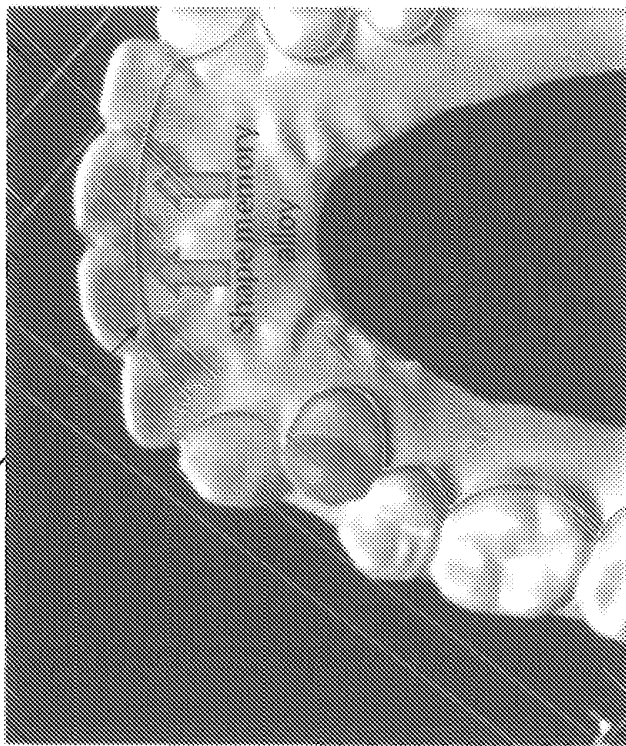


FIG. 32

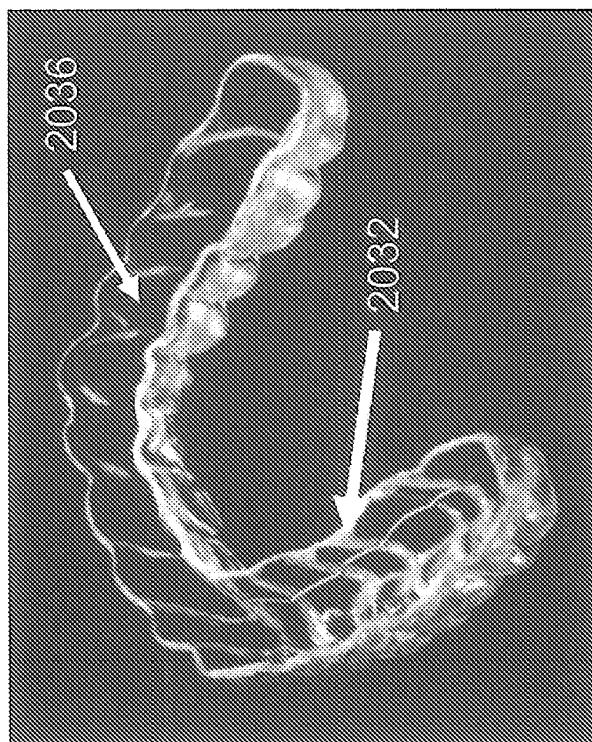


FIG. 33

BW Ref. 007087.00018

**PATENT APPLICATION
DECLARATION and POWER OF ATTORNEY**

As the below named inventor, I hereby declare that:

My/Our residence, post office address and citizenship is/are as stated below next to my/our name(s);

I believe I am the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled ORTHODONTIC REPOSITIONING APPLIANCE, the specification of which is filed herewith unless the following box is checked:

☐ was filed on _____ as U.S. Application Serial Number _____ or PCT International Application Serial No. _____ and which application was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I hereby acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

Prior Foreign Application(s)

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent or inventor's or plant breeder's rights certificate(s) or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed:

Country	Application No.	Date of Filing (day month year)	Date of Issue (day month year)	Priority Claimed Under 35 U.S.C. §119

Power of Attorney

And I hereby appoint, both jointly and severally, as my/our attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the U.S. Patent and Trademark Office connected herewith the practitioners associated with:

Customer Number: 22907

Please direct all correspondence and telephone communications to the address and telephone number associated with the Customer Number stated above.

BW Ref. 007087.00018

I hereby declare that all statements made herein of my/our own knowledge is/are true and that all statements made on information and belief is/are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signature  Date 6-11-10
Full Name of Inventor Thomas
Family Name First Given Name Second Given Name
Residence (city, state or country) Beverly Hills, CA Citizenship U.S.
Post Office Address 416 N. Bedford Drive, Suite 102, Beverly Hills, CA 90210

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		Orthodontic Repositioning Appliance		
First Named Inventor/Applicant Name:		Thomas Kalili		
Filer:		Bradley John VanPelt/Maria Lagunas		
Attorney Docket Number:		007087.00018		
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	82	82
Utility Search Fee	2111	1	270	270
Utility Examination Fee	2311	1	110	110
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				462

Electronic Acknowledgement Receipt	
EFS ID:	7803946
Application Number:	12814725
International Application Number:	
Confirmation Number:	9978
Title of Invention:	Orthodontic Repositioning Appliance
First Named Inventor/Applicant Name:	Thomas Kalili
Customer Number:	22907
Filer:	Bradley John VanPelt/Maria Lagunas
Filer Authorized By:	Bradley John VanPelt
Attorney Docket Number:	007087.00018
Receipt Date:	14-JUN-2010
Filing Date:	
Time Stamp:	14:24:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$462
RAM confirmation Number	640
Deposit Account	190733
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)					
Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)					
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	ADS18.pdf	977680	no	4
			84818f2af98e96058dfd952e8964aa3de6007a7d		
Warnings:					
Information:					
2		Application18.pdf	186125	yes	26
			879e42823fbf314c6f48b2947d85a81945905810		
	Multipart Description/PDF files in .zip description				
	Document Description	Start	End		
	Specification	1	22		
	Claims	23	25		
	Abstract	26	26		
Warnings:					
Information:					
3	Drawings-other than black and white line drawings	Figures18.pdf	3007010	no	37
			3f480baa65d5cf2160d946735b8a72e460c795b8		
Warnings:					
Information:					
4	Oath or Declaration filed	Declaration18.pdf	59851	no	2
			3ccc5345ca9edd06eb779de29049bca4931847a9		
Warnings:					
Information:					
5	Fee Worksheet (PTO-875)	fee-info.pdf	32719	no	2
			7088e801f48db9b6648504431a57b00c39233513		
Warnings:					
Information:					
Total Files Size (in bytes):			4263385		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

SCORE Placeholder Sheet for IFW Content

Application Number: 12814725

Document Date: 6/14/2010

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions developed by SIRA.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface using the Supplemental Content tab.
- Other USPTO employees can bookmark the current SCORE URL (<http://es/ScoreAccessWeb/>).
- External customers may access SCORE content via the Public and Private PAIR interfaces using the Supplemental Content tab.

DATE 06/14/10

Approved for use through 7/31/2006. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 12/814,725	
APPLICATION AS FILED – PART I						
(Column 1)		(Column 2)		SMALL ENTITY		OR
OTHER THAN SMALL ENTITY						
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	RATE (\$)	FEE (\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	82	N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	270	N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	110	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20	minus 20 =	x\$26		x\$52	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3	minus 3 =	x\$110		x\$220	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$270 (\$135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR					
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			195		390	
			TOTAL	462	TOTAL	
* If the difference in column 1 is less than zero, enter "0" in column 2.						
APPLICATION AS AMENDED – PART II						
(Column 1)		(Column 2)		(Column 3)		
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		SMALL ENTITY	
	Total (37 CFR 1.16(i))	Minus **	=		RATE (\$)	ADDI-TIONAL FEE (\$)
	Independent (37 CFR 1.16(h))	Minus ***	=		X =	
	Application Size Fee (37 CFR 1.16(s))			X =		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			N/A		
			TOTAL		TOTAL	
			ADD'T FEE		ADD'T FEE	
(Column 1)		(Column 2)		(Column 3)		
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		SMALL ENTITY	
	Total (37 CFR 1.16(i))	Minus **	=		RATE (\$)	ADDI-TIONAL FEE (\$)
	Independent (37 CFR 1.16(h))	Minus ***	=		X =	
	Application Size Fee (37 CFR 1.16(s))			X =		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			N/A		
			TOTAL		TOTAL	
			ADD'T FEE		ADD'T FEE	
<p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p>						

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
12/814,725	06/14/2010		462	007087.00018	20	3

CONFIRMATION NO. 9978

FILING RECEIPT



OC000000042903680

22907
BANNER & WITCOFF, LTD.
1100 13th STREET, N.W.
SUITE 1200
WASHINGTON, DC 20005-4051

Date Mailed: 08/06/2010

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Thomas Kalili, Beverly Hills, CA;

Power of Attorney: The patent practitioners associated with Customer Number 22907

Domestic Priority data as claimed by applicant

This application is a CIP of 11/549,506 10/13/2006
which claims benefit of 60/822,991 08/21/2006

Foreign Applications

If Required, Foreign Filing License Granted: 08/03/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/814,725**

Projected Publication Date: To Be Determined - pending completion of Corrected Papers

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Orthodontic Repositioning Appliance

Preliminary Class**PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/814,725	06/14/2010	Thomas Kalili	007087.00018

CONFIRMATION NO. 9978

FORMALITIES LETTER



22907
BANNER & WITCOFF, LTD.
1100 13th STREET, N.W.
SUITE 1200
WASHINGTON, DC 20005-4051

Date Mailed: 08/06/2010

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Filing Date Granted

An application number and filing date have been accorded to this application. The application is informal since it does not comply with the regulations for the reason(s) indicated below. Applicant is given TWO MONTHS from the date of this Notice within which to correct the informalities indicated below. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
 - The drawings must be reasonably free from erasures and must be free from alterations, overwriting, interlineations, folds, and copy marks. See Figure(s) 22.
 - The drawings have a line quality that is too light to be reproduced (weight of all lines and letters must be heavy enough to permit adequate reproduction) or text that is illegible (reference characters, sheet numbers, and view numbers must be plain and legible) see 37 CFR 1.84(l) and (p)(1)); See Figure(s) 25, 28A & 28B.
 - Numbers, letters, and reference characters on the drawings must measure at least 0.32 cm (1/8 inch) in height. See Figure(s) 22.
 - The drawings submitted to the Office are not electronically reproducible because portions of figures 22-24 are missing and/or blurry.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
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For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/mkibret/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Attorney Docket No. 007087.00018)

In re U.S. Patent Application of Kalili	)	
	)	Examiner: Unassigned
Application No. 12/814,725	)	
	)	Art Unit: Unassigned
Filed: June 14, 2010	)	
	)	Confirmation No. 9978
For: ORTHODONTIC REPOSITIONING	)	
APPLIANCE	)	

RESPONSE TO NOTICE TO FILE
CORRECTED APPLICATION PAPERS

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Notice to File Corrected Application Papers mailed August 6, 2010, Applicant respectfully submits 19 sheets of replacement drawings containing Figures 19-33. Please substitute the enclosed drawings for those presently on file. No new matter is added by the submission of these drawings.

Respectfully submitted,

Date: October 6, 2010

By: Bradley J. Van Pelt
Bradley J. Van Pelt
Registration No. 59,773
BANNER & WITCOFF, LTD.
10 South Wacker Drive
Suite 3000
Chicago, Illinois 60606
Telephone: 312-463-5000
Facsimile: 312-463-5001

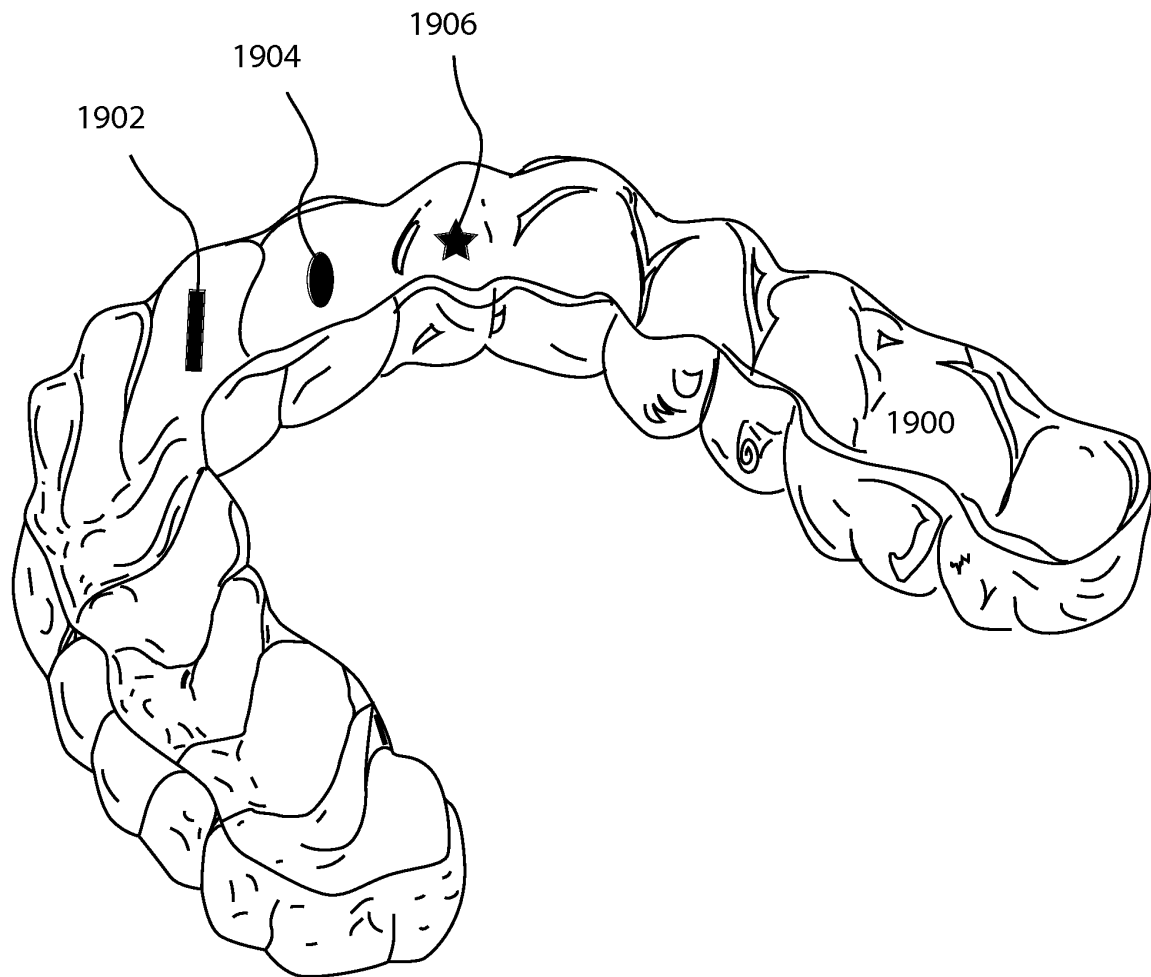


FIG. 19A

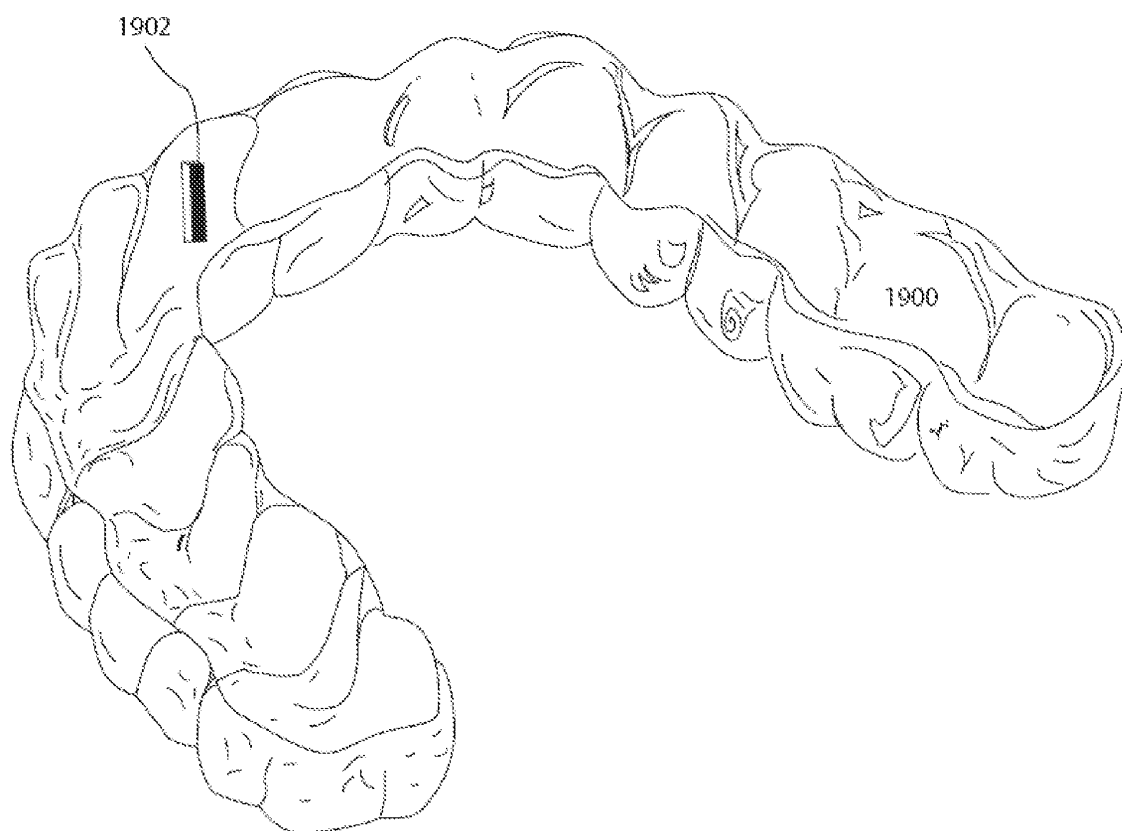


FIG. 19B

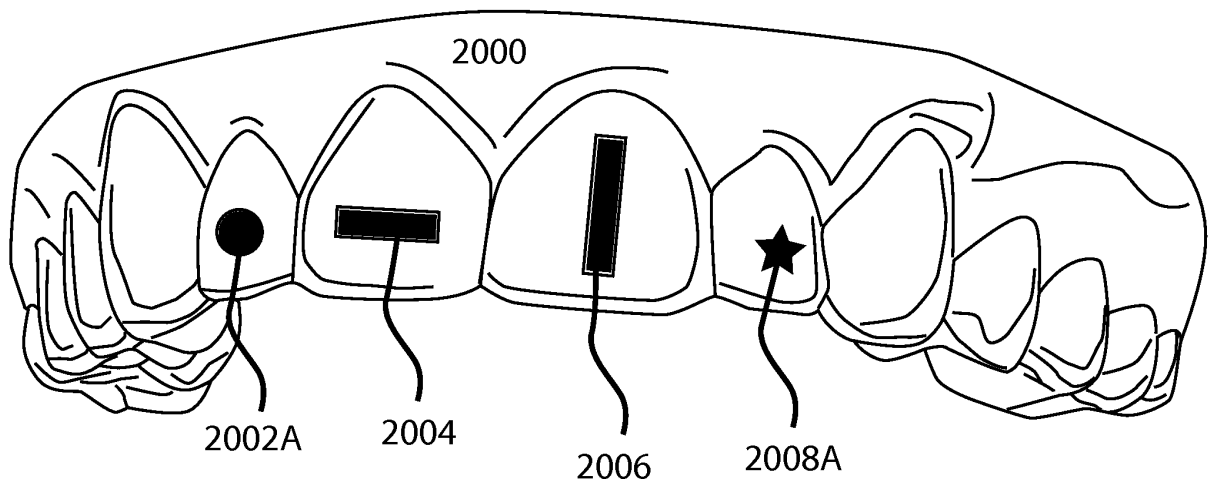


FIG. 20A

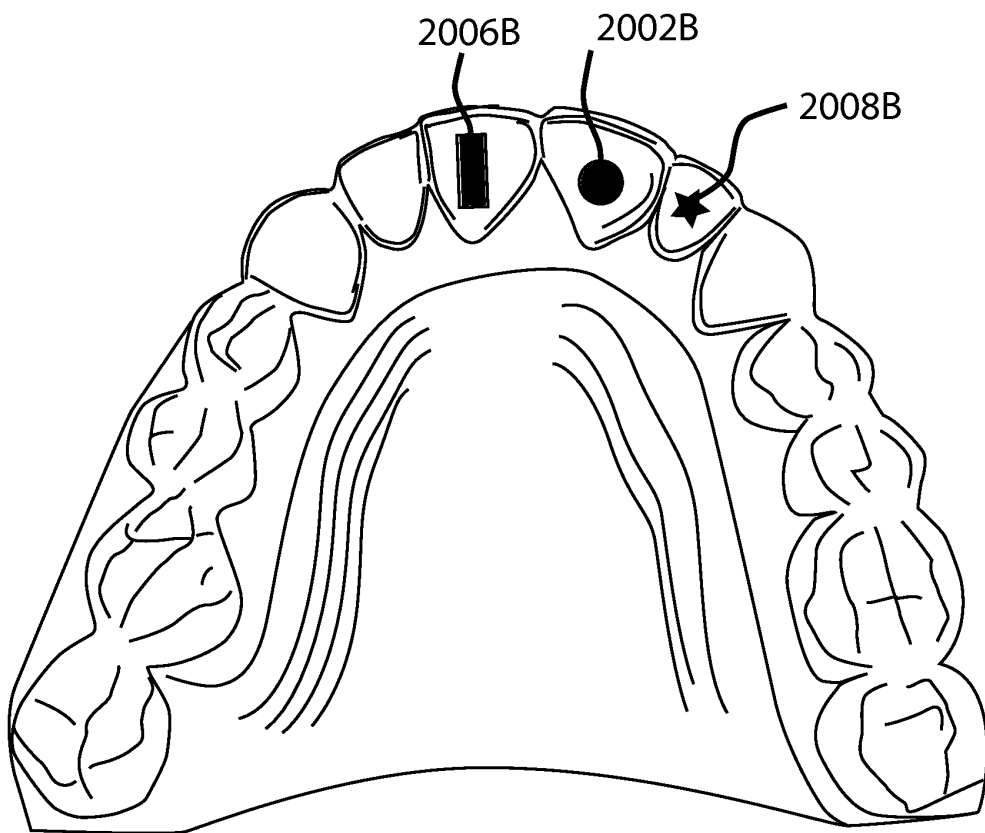


FIG. 20B

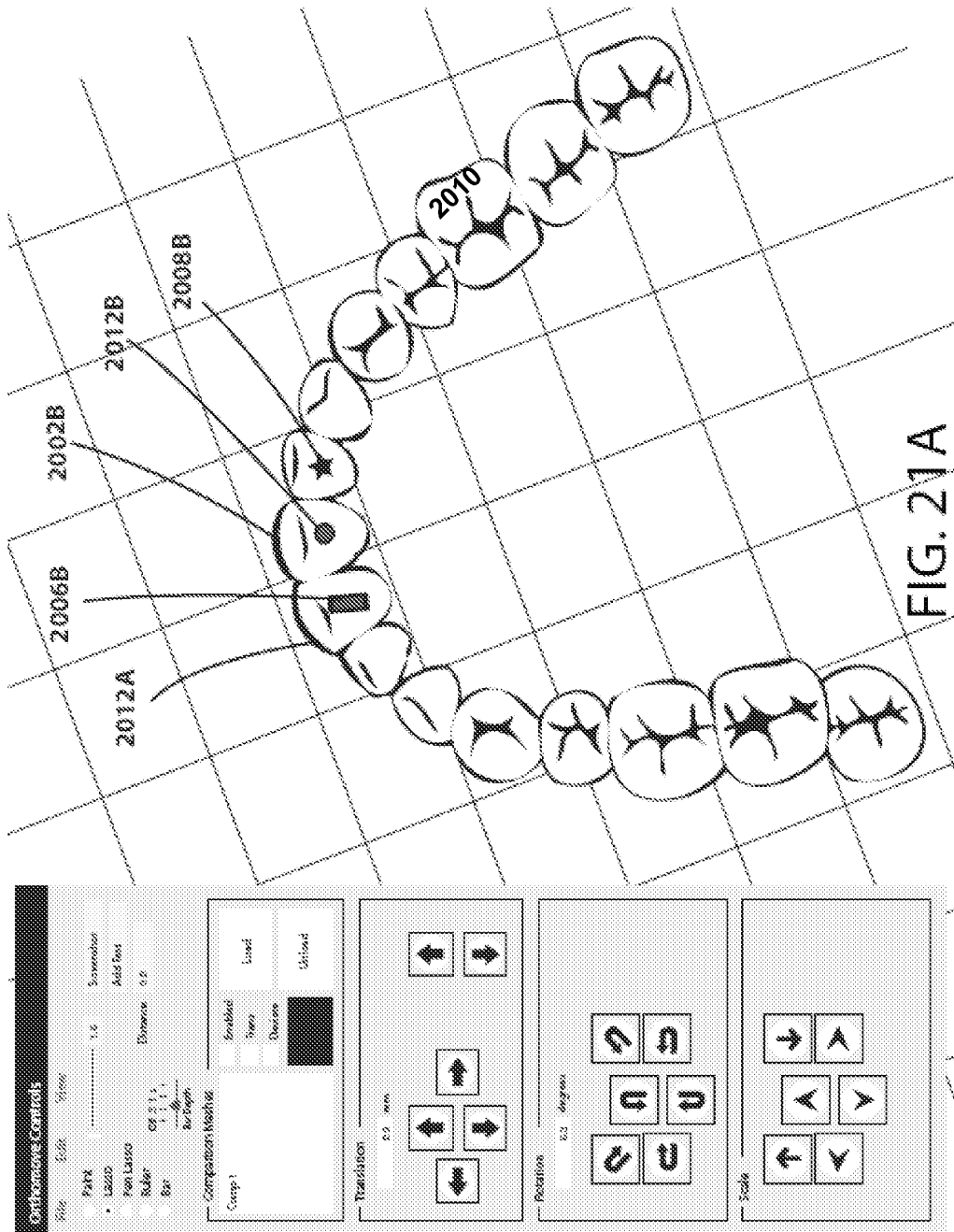


FIG. 21A

FIG. 21B

File

View

Tools

Help

General

Orientation

Pack

Printer Status

Printer Services

dimension

Name

P04452 (Dimension 8511200)

Manage 3D Printers...

Material

Model: P400, 30.76 in

Support 52.35 in

Status

Part Done - Pack_Niccol_Fletcher_U_021609

Preview

Insert CM8

Copy

Remove

Repack

Rotate

Clear Pack

Save AS

Pack Details

Name

Pack_Kevin_Ruiz_L011

Model Material

1.68 in

Support Material

1.15in

Time

3:21

Notes

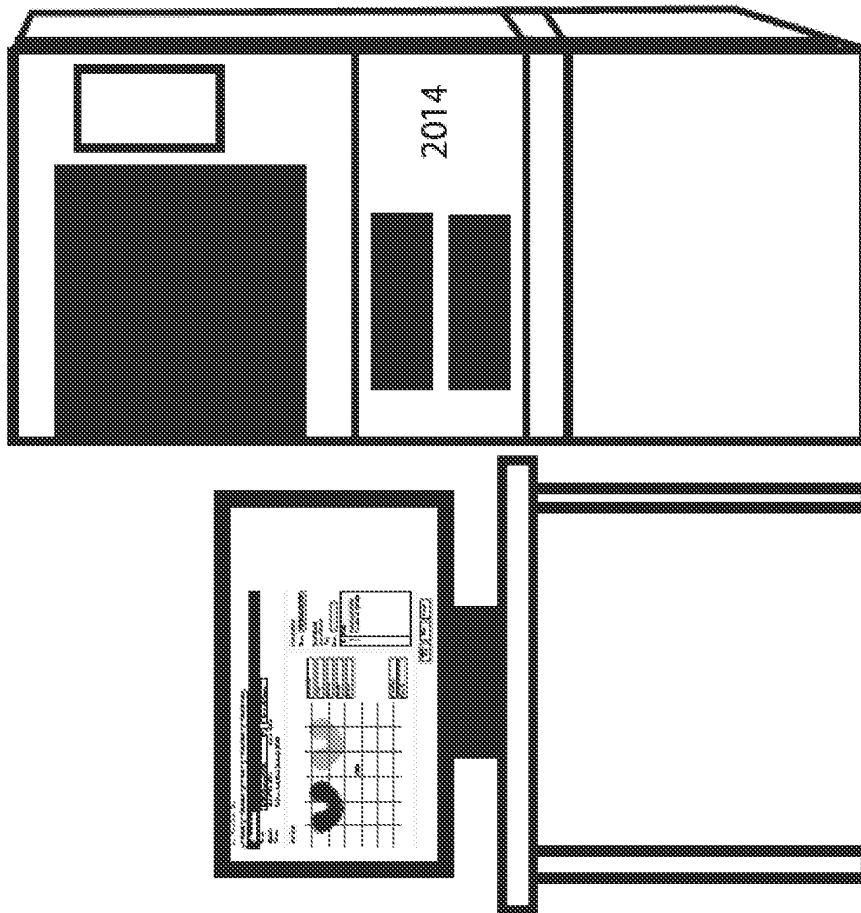
ID	NAME
1.	Kevin Ruiz_L0011209
2.	Kevin Ruiz Jr_L0011209

Add to Pack

Print

Cancel

FIG. 22



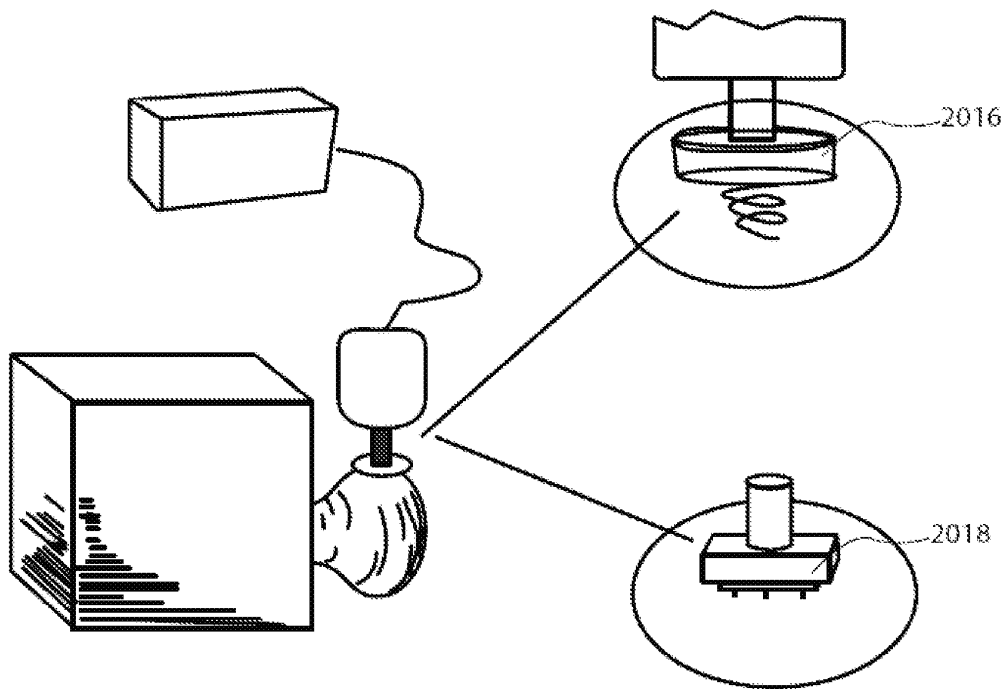
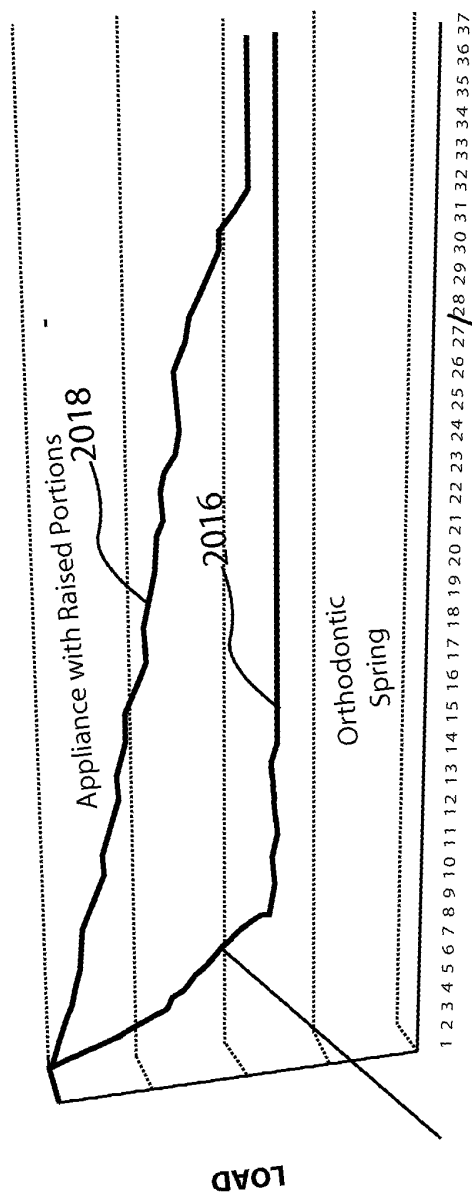


FIG. 24



Time at 5 min intervals

FIG. 25

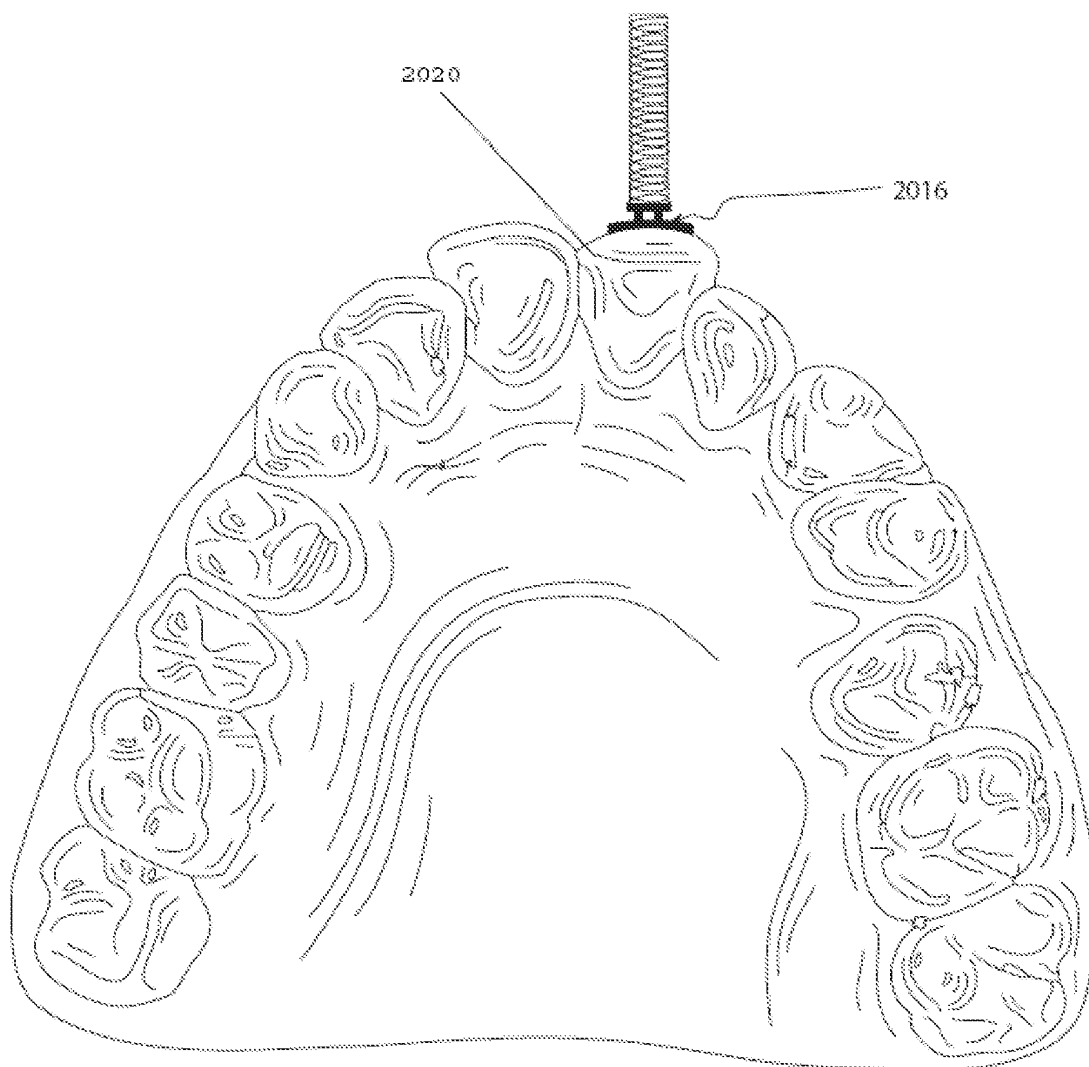


FIG. 26

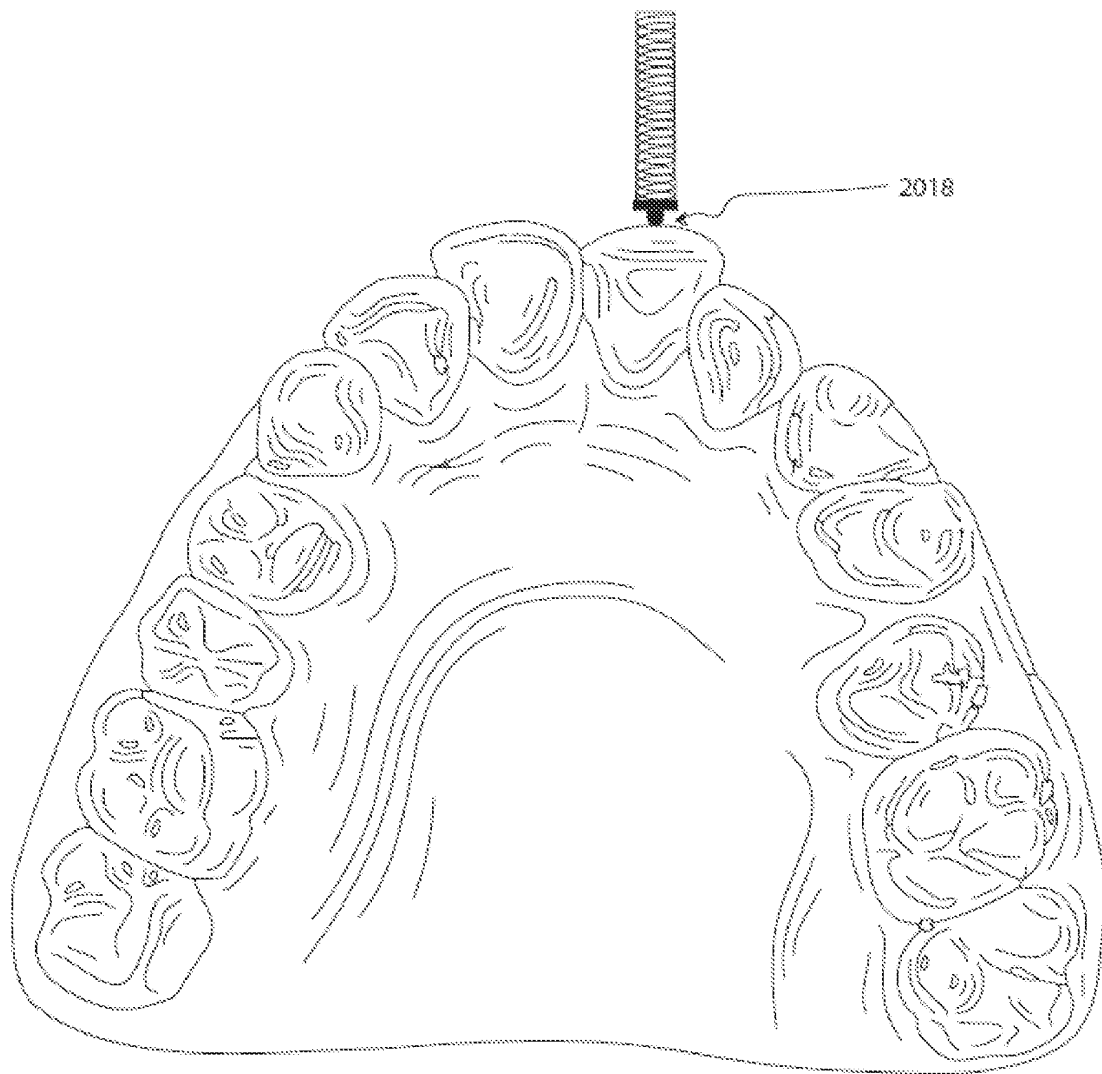


FIG. 27

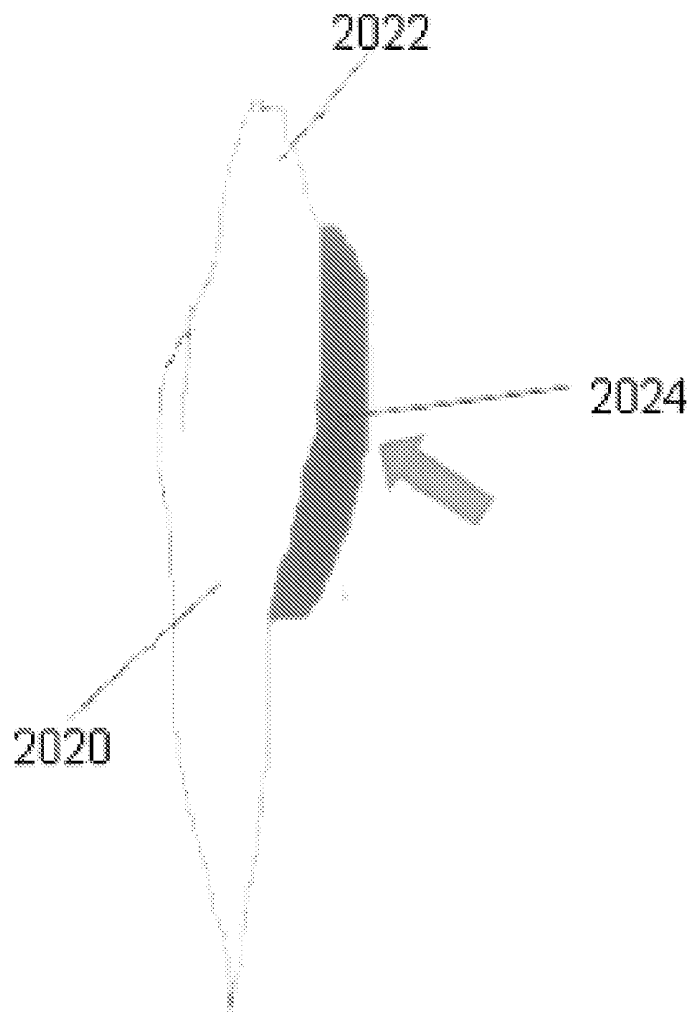


FIG. 28A

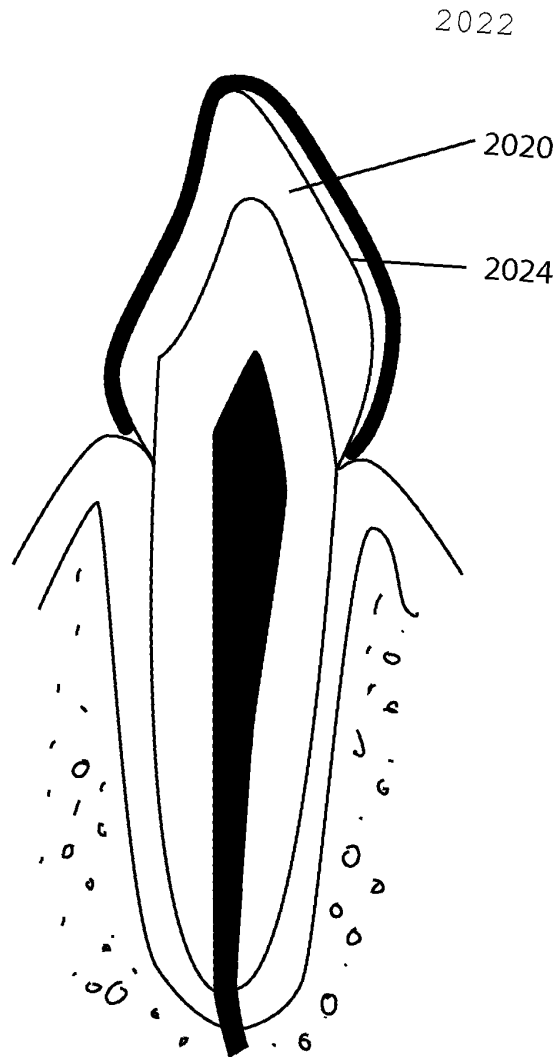


FIG. 28B

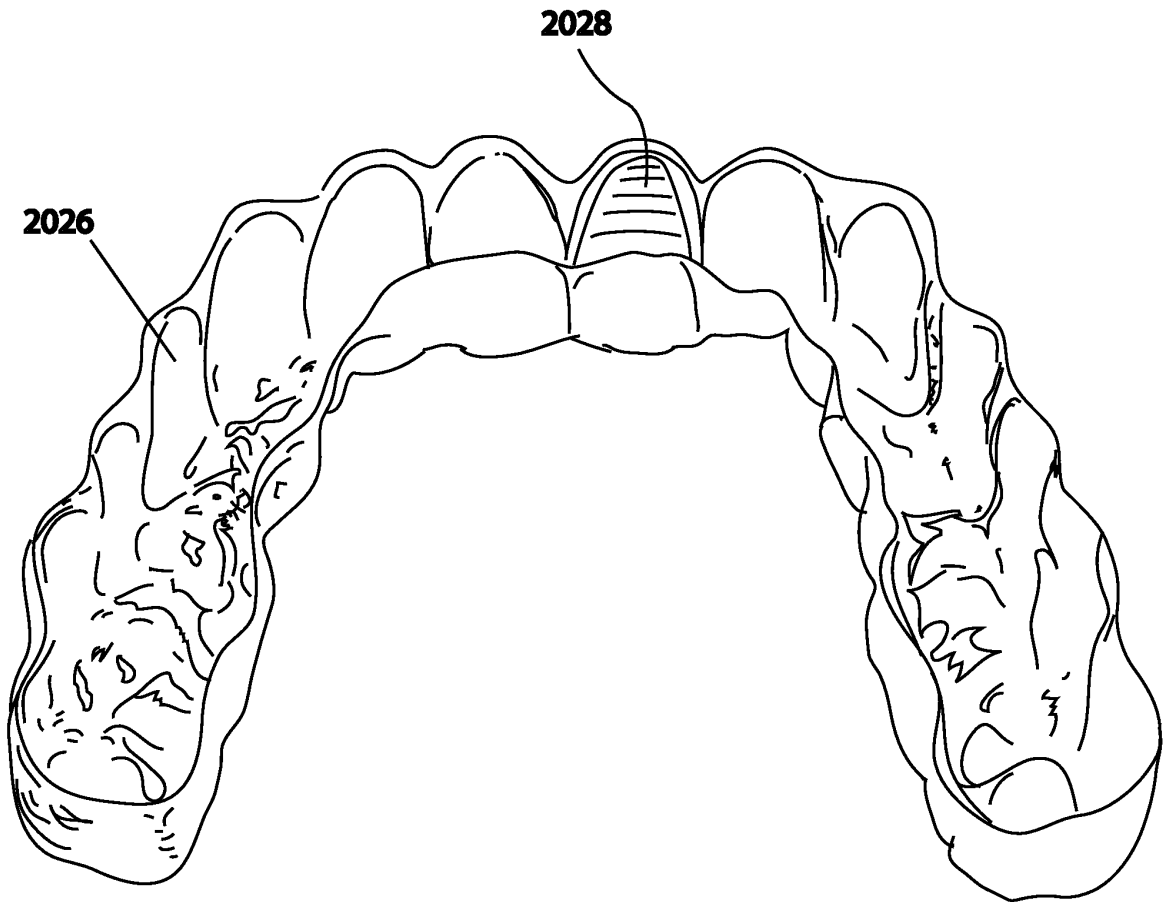


FIG 29

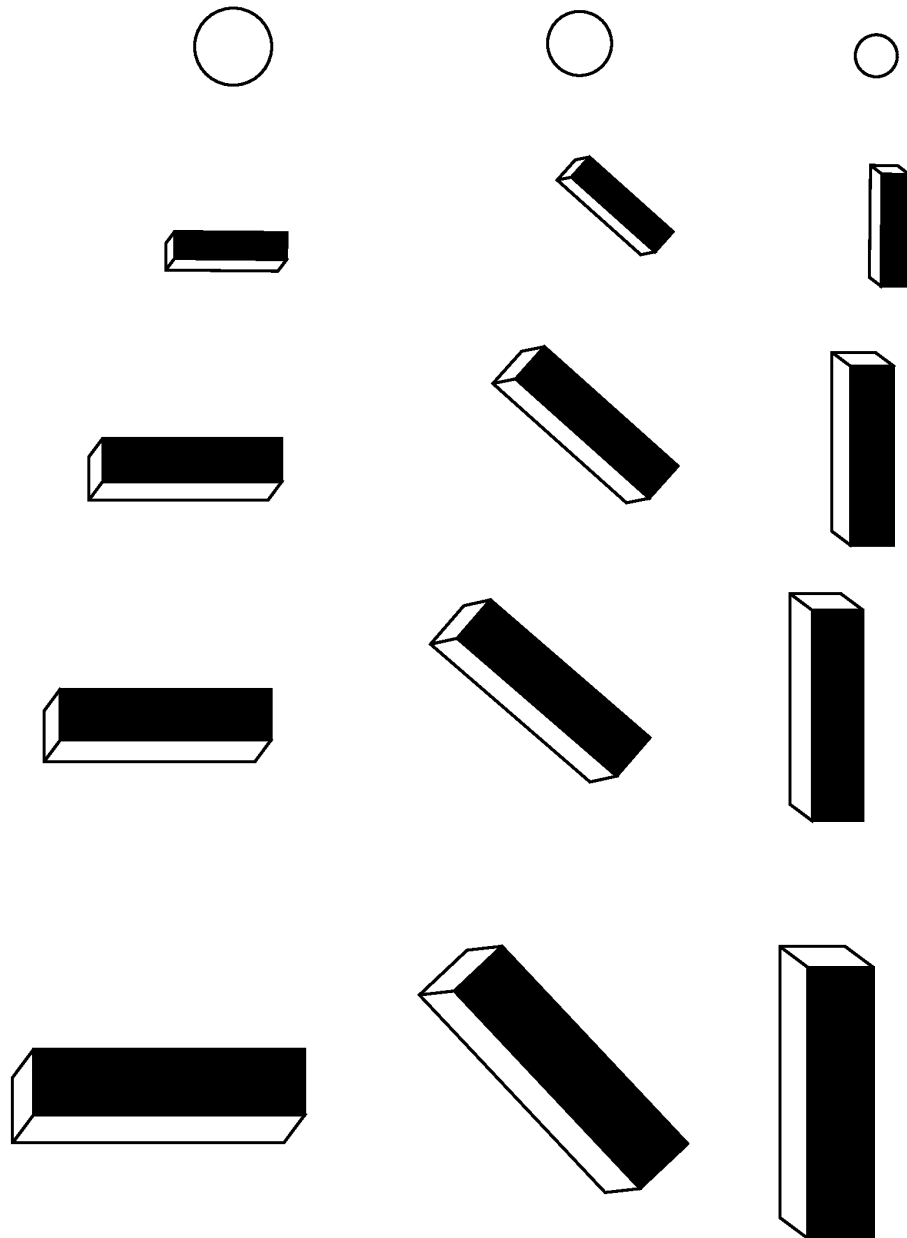


FIG. 30

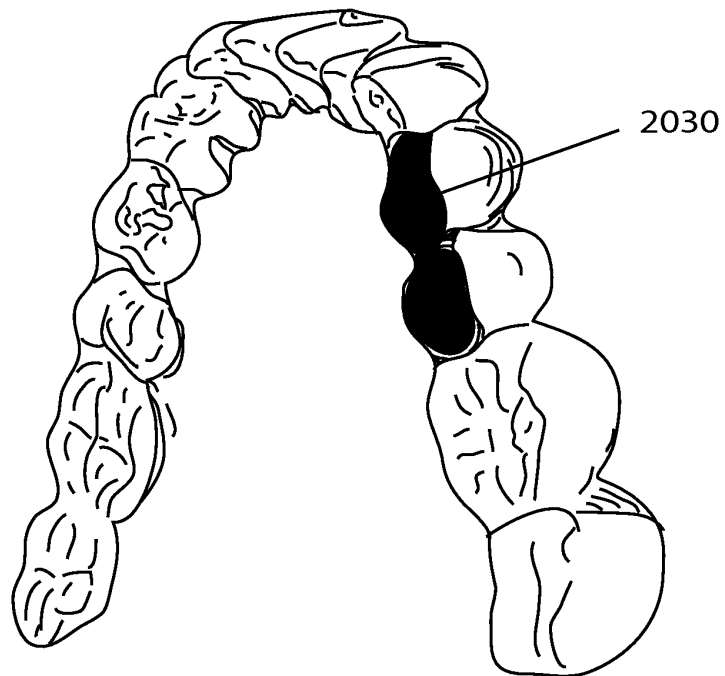


FIG. 31

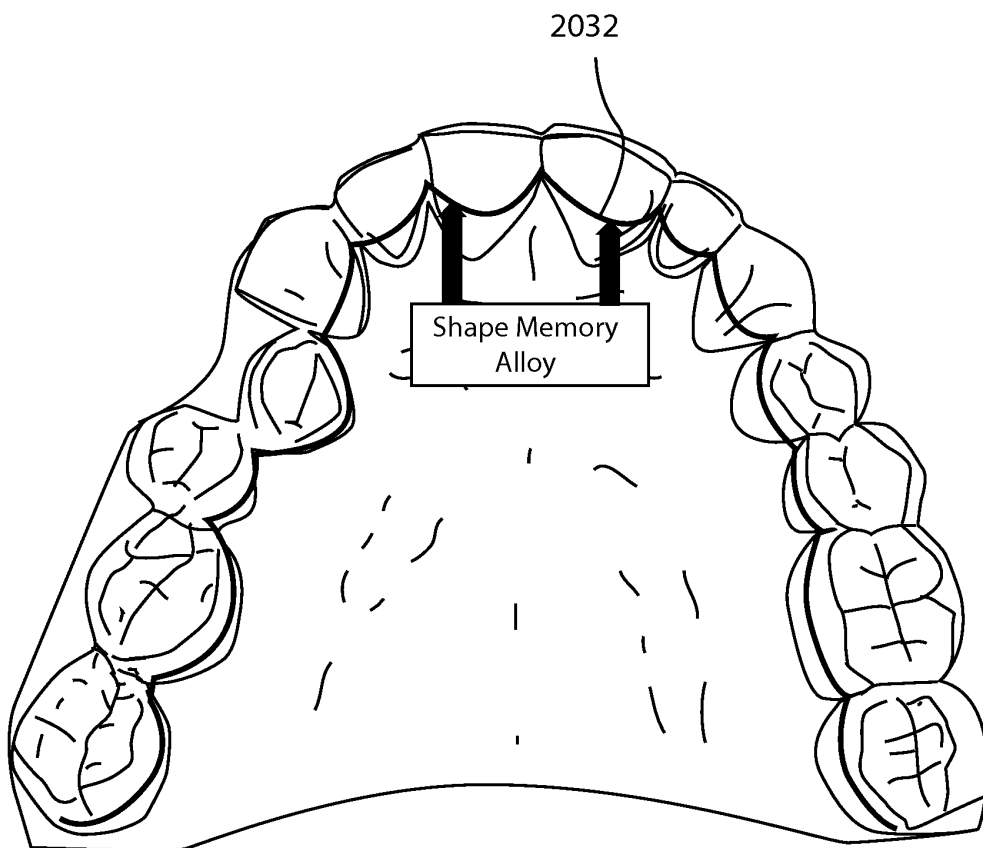


FIG. 32

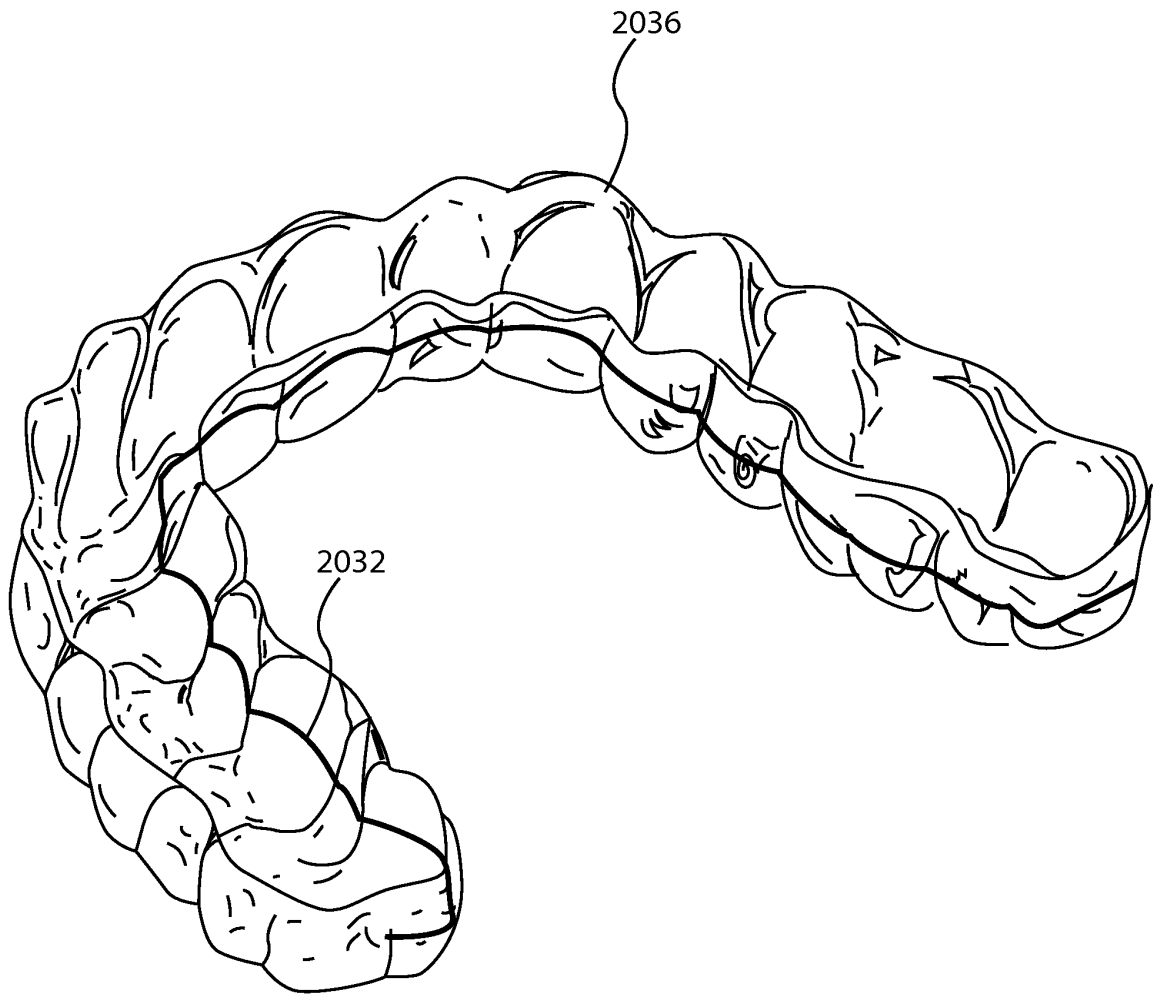


FIG. 33

Electronic Acknowledgement Receipt	
EFS ID:	8568307
Application Number:	12814725
International Application Number:	
Confirmation Number:	9978
Title of Invention:	Orthodontic Repositioning Appliance
First Named Inventor/Applicant Name:	Thomas Kalili
Customer Number:	22907
Filer:	Bradley John VanPelt/Maria Lagunas
Filer Authorized By:	Bradley John VanPelt
Attorney Docket Number:	007087.00018
Receipt Date:	06-OCT-2010
Filing Date:	14-JUN-2010
Time Stamp:	14:52:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	Response18.pdf	73647 fcafec1ab80bb9a06ffe721e82aab01d25a81fc	no	1

Warnings:

Information:

2	Drawings-only black and white line drawings	FIGS18.pdf	4275104 b2f85e838b7f7a0a3fb6b3032e6912b490f1d292	no	19
Warnings:					
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/814,725	06/14/2010		462	007087.00018	20	3

CONFIRMATION NO. 9978

UPDATED FILING RECEIPT



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22907
BANNER & WITCOFF, LTD.
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SUITE 1200
WASHINGTON, DC 20005-4051

Date Mailed: 10/15/2010

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Applicant(s)

Thomas Kalili, Beverly Hills, CA;

Power of Attorney: The patent practitioners associated with Customer Number 22907

Domestic Priority data as claimed by applicant

This application is a CIP of 11/549,506 10/13/2006
which claims benefit of 60/822,991 08/21/2006

Foreign Applications

If Required, Foreign Filing License Granted: 08/03/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/814,725**

Projected Publication Date: 01/27/2011

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

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Orthodontic Repositioning Appliance

Preliminary Class**PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

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Approved for use through 07/31/2012. OMB 0651-0031

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	Filing Date		2010-06-14
	First Named Inventor	Kalili	
	Art Unit	3776	
	Examiner Name	TBD	
	Attorney Docket Number	007087.00018	

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	4	5624257		1997-04-29	Farrell		
	5	2789351		1957-04-23	Gordon		
	6	6761560		2004-07-13	Miller		
	7	7025950		2006-04-11	Majeti		
	8	6554611		2003-04-29	Chishti		

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	9	6398548		2002-06-04	Muhammad	
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	4	20030198912		2003-10-23	Mah	
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	Filing Date		2010-06-14	
	First Named Inventor	Kalili		
	Art Unit	3776		
	Examiner Name	TBD		
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	2	Ormco Corporation v. Align Technology, Inc. No. 05-1426, 2006 WL 2493245, *6 (Fed. Cir. Aug. 30, 2006)	☐
	3	International Preliminary Report on Patentability for PCT/US06/061014 mailed March 5, 2009, 4 pages	☐
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	Filing Date		2010-06-14
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	Examiner Name	TBD	
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☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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Chicago, IL 60606-7407
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007087.00005
NO DUE DATE

Date of mailing (day/month/year) 05 March 2009 (05.03.2009)		
Applicant's or agent's file reference 007087.00005		IMPORTANT NOTICE
International application No. PCT/US2006/061014	International filing date (day/month/year) 17 November 2006 (17.11.2006)	
Priority date (day/month/year) 21 August 2006 (21.08.2006)		
Applicant KALILI, Thomas		

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

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(Chapter I of the Patent Cooperation Treaty)

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International application No. PCT/US2006/061014	International filing date (<i>day/month/year</i>) 17 November 2006 (17.11.2006)	Priority date (<i>day/month/year</i>) 21 August 2006 (21.08.2006)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant KALILI, Thomas		

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3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%;"> <tr> <td style="width: 10%; text-align: center;">☒</td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;">☒</td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	☒	Box No. I	Basis of the report	☐	Box No. II	Priority	☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	☐	Box No. IV	Lack of unity of invention	☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	☐	Box No. VI	Certain documents cited	☐	Box No. VII	Certain defects in the international application	☐	Box No. VIII	Certain observations on the international application
☒	Box No. I	Basis of the report																							
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☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability																							
☐	Box No. IV	Lack of unity of invention																							
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement																							
☐	Box No. VI	Certain documents cited																							
☐	Box No. VII	Certain defects in the international application																							
☐	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

<p style="text-align: center;">The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No. +41 22 338 82 70</p>	<p>Date of issuance of this report 24 February 2009 (24.02.2009)</p> <p>Authorized officer Ellen Moyse</p> <p>e-mail: pt02.pct@wipo.int</p>
--	--

Form PCT/IB/373 (January 2004)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US 06/61014

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed.
☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☐ on paper
☐ in electronic form

c. time of filing/furnishing

- ☐ contained in the international application as filed
☐ filed together with the international application in electronic form
☐ furnished subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US 06/61014

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Claims 14-19 lack an inventive step under PCT Article 33(3) as being obvious over US 2006/0121408 A1 to Hedge et al. (hereinafter 'Hedge') in view of Chishti.

As to claim 14, Hedge teaches a method of repositioning teeth from an initial tooth position to final tooth position, the method comprising: taking an impression of the teeth to be repositioned (para [0019]); creating a model from the impression (para [0020]); modifying the model to incorporate the final tooth position (para [0068]); and creating a repositioning appliance from the model (para [0068]). Hedge does not teach an appliance including an inner layer configured to engage a portion of a patient's teeth; and outer layer attached to the inner layer, the outer layer having a higher elastic modulus than the inner layer. However Chishti teaches an orthodontic repositioning appliance (100) comprising an inner layer (132) configured to engage a portion of a patient's teeth; and an outer layer (134) attached to the inner layer, the outer layer having a higher elastic modulus than the inner layer (para [0058]) for the manipulation and re-application of the appliance to the patient's teeth. Therefore, it would have been obvious to one of ordinary skill in the art to provide an appliance as taught by Chishti in the method of Hedge so as to be able to manipulate and re-apply the appliance to a patient's teeth.

As to claim 15, Hedge teaches the method wherein the repositioning appliance is created using a 3-D scanner and printer (para [0020]).

As to claim 16, Hedge teaches the method further comprising repeating steps a) through d) at periodic intervals (para [0026], [0027]).

As to claim 17, Hedge/Chishti teaches essentially all of the limitations except for the periodic interval comprises six weeks. However, it would have been obvious to one of ordinary skill in the art that the interval time period varies from person to person since not all repositioning treatments will require the same amount of time to move a person's teeth to the desired position.

As to claim 18, Chishti teaches a method wherein the outer layer comprises a polycarbonate (para [0057]).

As to claim 19, Chishti teaches a method wherein the inner layer comprises a thermoplastic polyurethane resin (para [0069], [0070], [0074]).

Claims 1-20 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

Electronic Acknowledgement Receipt

EFS ID:	9175447
Application Number:	12814725
International Application Number:	
Confirmation Number:	9978
Title of Invention:	Orthodontic Repositioning Appliance
First Named Inventor/Applicant Name:	Thomas Kalili
Customer Number:	22907
Filer:	Bradley John VanPelt/Maria Lagunas
Filer Authorized By:	Bradley John VanPelt
Attorney Docket Number:	007087.00018
Receipt Date:	06-JAN-2011
Filing Date:	14-JUN-2010
Time Stamp:	13:11:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed (SB/08)	IDS18.pdf	938589 95f834c70d49f081850ea6a879c1e0640f154043	no	6

Warnings:

Information:

2	NPL Documents	Texin990R.pdf	357163	no	4
			2866b00547c5942caeb0c337d372b312f540a90c		
Warnings:					
Information:					
3	NPL Documents	OrmcovAlign.pdf	1406961	no	25
			986cea00e75e87d9b8eabbf7186cba03e50555d		
Warnings:					
Information:					
4	NPL Documents	IPR3-5-09.pdf	173884	no	4
			cf117daa4a946d670d8fd4f03e5fbc32e0eff0c		
Warnings:					
Information:					
5	NPL Documents	ISR10-5-07.pdf	334198	no	5
			e177c2b40ff43584dfa62ee7f65557e80c1e5aa5		
Warnings:					
Information:					
Total Files Size (in bytes):			3210795		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/814,725	06/14/2010	Thomas Kalili	007087.00018

CONFIRMATION NO. 9978

22907

BANNER & WITCOFF, LTD.

1100 13th STREET, N.W.

SUITE 1200

WASHINGTON, DC 20005-4051

PUBLICATION NOTICE



OC000000045703835

Title:Orthodontic Repositioning Appliance

Publication No.US-2011-0020761-A1

Publication Date:01/27/2011

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12814725	
	Filing Date		2010-06-14	
	First Named Inventor	Kalili		
	Art Unit	3776		
	Examiner Name	TBD		
	Attorney Docket Number	007087.00018		

U.S.PATENTS							Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	
	1	4983334		1991-01-08	Adell		

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Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	
	1	20010041320		2001-11-15	Phan		
	2	20050048433		2005-03-03	Hilliard		
	3	20050100853		2005-05-12	Tadros		
	4	20050003318		2005-01-06	Choi		

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² i	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12814725	
	Filing Date		2010-06-14	
	First Named Inventor	Kalili		
	Art Unit	3776		
	Examiner Name	TBD		
	Attorney Docket Number	007087.00018		

	1							☐
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NON-PATENT LITERATURE DOCUMENTS

Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	12814725
	Filing Date	2010-06-14
	First Named Inventor	Kalili
	Art Unit	3776
	Examiner Name	TBD
	Attorney Docket Number	007087.00018

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Bradley J. Van Pelt/	Date (YYYY-MM-DD)	2011-05-04
Name/Print	Bradley J. Van Pelt	Registration Number	59773

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	10016840
Application Number:	12814725
International Application Number:	
Confirmation Number:	9978
Title of Invention:	Orthodontic Repositioning Appliance
First Named Inventor/Applicant Name:	Thomas Kalili
Customer Number:	22907
Filer:	Bradley John VanPelt/Maria Lagunas
Filer Authorized By:	Bradley John VanPelt
Attorney Docket Number:	007087.00018
Receipt Date:	04-MAY-2011
Filing Date:	14-JUN-2010
Time Stamp:	11:56:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed (SB/08)	IDS18.pdf	614716 6e6416900ee33be3c9dab272e6e4217429 b7ca45	no	4

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/814,725	06/14/2010	Thomas Kalili	007087.00018	9978
22907 7590 01/25/2012 BANNER & WITCOFF, LTD. 1100 13th STREET, N.W. SUITE 1200 WASHINGTON, DC 20005-4051			EXAMINER PATEL, YOGESH P	
			ART UNIT 3776	PAPER NUMBER
			MAIL DATE 01/25/2012	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 12/814,725	Applicant(s) KALILI, THOMAS	
	Examiner YOGESH PATEL	Art Unit 3776	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 14 June 2010.

2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5) ☒ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.

7) ☐ Claim(s) ____ is/are rejected.

8) ☐ Claim(s) ____ is/are objected to.

9) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

Application Papers

10) ☐ The specification is objected to by the Examiner.

11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892) 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. 5) ☐ Notice of Informal Patent Application 6) ☐ Other: _____.
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Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-11 and 20, drawn to an orthodontic repositioning appliance, classified in class 433, subclass 6.
- II. Claims 12-19, drawn to a method for a method of repositioning misaligned teeth, classified in class 433, subclass 24.

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process such as by molding or 3D printing using computer where taking impression isn't required.

Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and/or examination burden if restriction were not required the search for each group requires different search queries.

Furthermore, execution of a comprehensive search of all method and system claims in the instant application would not only constitute an undue burden on the Examiner, but consideration of the findings of such a search for patentability determination would be unduly onerous. It is further noted that a comprehensive search

for the presently claimed subject matter is not solely limited to a search of the classes and subclasses in which they are classified. For instance, searching different classes/subclasses or electronic resources, or employing different search strategies or search queries constitute undue burden on the Examiner.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

A telephone call was made to attorney of record on 01/20/2012 to request an oral election to the above restriction requirement, but did not result in an election being made.

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double

patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Patel Yogesh whose telephone number is (571)270-3646. The examiner can normally be reached between 9 AM – 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, ***please contact the examiner's supervisor, SPE Todd Manahan, at (571) 272-4713.*** The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

If there are any inquiries that are not being addressed by first contacting the Examiner or the Supervisor, you may send an email inquiry to TC3700_Workgroup_D_Inquiries@uspto.gov.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 12/814,725
Art Unit: 3776

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/YOGESH PATEL/
Examiner, Art Unit 3776

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Art Unit: 3776

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Application/Control Number: 12/814,725
Art Unit: 3776

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<i>Index of Claims</i> 	Application/Control No. 12814725	Applicant(s)/Patent Under Reexamination KALILI, THOMAS
	Examiner YOGESH PATEL	Art Unit 3776

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant			☐ CPA			☐ T.D.			☐ R.1.47		
CLAIM		DATE									
Final	Original	01/20/2012									
	1	÷									
	2	÷									
	3	÷									
	4	÷									
	5	÷									
	6	÷									
	7	÷									
	8	÷									
	9	÷									
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	14	÷									
	15	÷									
	16	÷									
	17	÷									
	18	÷									
	19	÷									
	20	÷									

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Attorney Docket No. 007087.00018)

In re U.S. Patent Application of Kalili	)	
	)	Examiner: Patel, Yogesh P
Application No. 12/814,725	)	
	)	Art Unit: 3776
Filed: June 14, 2010	)	
	)	Confirmation No. 9978
For: ORTHODONTIC REPOSITIONING	)	
APPLIANCE	)	

RESPONSE TO RESTRICTION REQUIREMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This paper is responsive to the Office Action dated January 25, 2012. The Office Action set a one-month shortened statutory period for response making this response due on or before February 25, 2012 and this Reply is submitted within that time limit. The Commissioner is hereby authorized to charge any additional fee or credit any overpayment to Deposit Account No. 19-0733.

Amendments to the Claims are reflected in the listing of claims, which begin on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Original) An orthodontic repositioning appliance comprising:
an inner layer configured to engage a portion of a patient's teeth;
an outer layer secured to the inner layer; and
wherein the inner layer comprises at least one raised portion which provides increased control and attachment over at least one of the patient's teeth and is configured to compress upon contact with the at least one of the patient's teeth and is configured to recover causing the at least one of the patient's teeth to move.
2. (Original) The orthodontic repositioning appliance of claim 1, wherein the inner layer and outer layer comprise elastic moduli in the range of 0.1 to 10.0 GPa.
3. (Original) The orthodontic repositioning appliance of claim 1, wherein the outer layer comprises a polycarbonate and the inner layer comprises a thermoplastic polyurethane resin.
4. (Original) The orthodontic repositioning appliance of claim 1, further comprising a shape memory alloy.
5. (Original) The orthodontic repositioning appliance of claim 1, wherein the repositioning appliance is configured to be attached to a micro-implant to allow for increased control and force for orthodontic tooth movement.
6. (Original) The orthodontic repositioning appliance of claim 5, wherein the micro-implant further includes an attachment for securing the repositioning appliance.
7. (Original) The orthodontic repositioning appliance of claim 6, wherein the attachment comprises a male-female connection, or a magnet attachment.

8. (Original) The orthodontic repositioning appliance of claim 1, wherein the inner and outer layer comprise one or more of: a bacterial resistant material, a teeth whitening material, an oral freshness material, and a varied color material.
9. (Original) The orthodontic repositioning appliance of claim 1, wherein the at least one raised portion is selected from the group consisting of: a star shape, a rectangular shape, a circle shape, and a bar shape.
10. (Original) The orthodontic repositioning appliance of claim 1, wherein the raised portion consists of one of the following: a lingual vertical bar, a horizontal bar, and a diagonal bar.
11. (Original) The orthodontic repositioning appliance of claim 1 wherein the outer layer has a higher elastic modulus than the inner layer and wherein the inner layer comprises a continuous layer having a lower elastic module than the outer layer.
12. (Withdrawn) A method of repositioning misaligned teeth comprising:
 - a) taking an impression of the patient's teeth and forming a model based on the impression of the patient's teeth;
 - b) adding at least one indentation to the model; and
 - c) creating a repositioning appliance from the model, wherein the repositioning appliance is formed with an inner layer having at least one raised surface corresponding in shape and size to the at least one indentation formed in the model.
13. (Withdrawn) The method of claim 12 wherein the indentation is selected from the group consisting of: a star shape, rectangular shape, circle shape, and a bar shape.
14. (Withdrawn) The method of claim 12 wherein step (b) further comprises adding at least one additional indentation to the model of a different shape or size than the at least one indentation and wherein step (c) further comprises forming the appliance with at least one additional raised surface corresponding in shape and size to the additional indentation on the model.

15. (Withdrawn) The method of claim 12 wherein the repositioning appliance is formed by one or more of: 3D scanning, milling, printing, and vacuum suck down.
16. (Withdrawn) The method of claim 12 wherein step (b) further comprises adding material in the area opposing the indentation in the model and wherein step (c) further comprises forming a space in the appliance corresponding in shape and size to the added material in the model.
17. (Withdrawn) The method of claim 14, further comprising repeating steps a) through c) at periodic intervals using at least one different indentation on at least the same or an additional model so as to form at least one different raised surface on an at least one additional appliance.
18. (Withdrawn) The method of claim 16, wherein the periodic interval comprises six weeks.
19. (Withdrawn) The method of claim 14, wherein the outer layer comprises a polycarbonate and wherein the inner layer comprises a thermoplastic polyurethane resin.
20. (Original) An orthodontic repositioning appliance comprising:
 - an inner layer configured to engage a portion of a patient's teeth;
 - an outer layer laminated to the inner layer; andwherein the inner layer comprises a plurality of raised portions which provide increased control and attachment over at the portion of patient's teeth and wherein the raised portions are configured to compress upon contact with one or more of the patient's teeth and recover causing one or more of the patient's teeth to move to a desired position.

REMARKS

In the Office Action mailed January 25, 2012, claims 1-20 were deemed subject to a restriction requirement. More specifically, election is required between:

Invention I: Claims 1-11 and 20, drawn to an orthodontic repositioning appliance, classified in class 433, subclass 6.

Invention II: Claims 12-19, drawn to a method for a method of repositioning misaligned teeth, classified in class 433, subclass 24.

By this response, the Applicants provisionally elect Invention I corresponding to claims 1-11 and 20 without traverse. The Applicants' withdrawal of claims 12-19 is without prejudice to the Applicants' right to claim the subject matter of claims 12-19 in a continuation or divisional application.

Respectfully submitted,

Date: February 24, 2012

By: Bradley J. Van Pelt
Bradley J. Van Pelt
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Electronic Acknowledgement Receipt

EFS ID:	12152987
Application Number:	12814725
International Application Number:	
Confirmation Number:	9978
Title of Invention:	Orthodontic Repositioning Appliance
First Named Inventor/Applicant Name:	Thomas Kalili
Customer Number:	22907
Filer:	Bradley John VanPelt/Maria Lagunas
Filer Authorized By:	Bradley John VanPelt
Attorney Docket Number:	007087.00018
Receipt Date:	24-FEB-2012
Filing Date:	14-JUN-2010
Time Stamp:	13:45:35
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Response18.pdf	91798	yes	5
			1bef384a55f57498b8f49fd39d21430dc90d ef27		

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Response to Election / Restriction Filed	1	1
	Applicant summary of interview with examiner	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	5
Warnings:			
Information:			
Total Files Size (in bytes):		91798	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>			

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 12/814,725		Filing Date 06/14/2010		☐ To be Mailed		
APPLICATION AS FILED – PART I											
(Column 1)			(Column 2)			SMALL ENTITY ☒ OR		OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR		RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A				N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A				N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A				N/A				
TOTAL CLAIMS (37 CFR 1.16(j))	minus 20 =	*	X \$ =				X \$ =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =				X \$ =				
☐ APPLICATION SIZE FEE (37 CFR 1.16(s)) If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).											
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))											
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL				TOTAL				
APPLICATION AS AMENDED – PART II											
(Column 1)			(Column 2)			(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY	
AMENDMENT	02/24/2012	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)		RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X \$30 =	0	OR	X \$ =		
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	X \$125 =	0	OR	X \$ =		
	☐ Application Size Fee (37 CFR 1.16(s))							OR			
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR			
						TOTAL ADD'L FEE		0	OR	TOTAL ADD'L FEE	
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)		RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =		OR	X \$ =		
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =		OR	X \$ =		
	☐ Application Size Fee (37 CFR 1.16(s))							OR			
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR			
						TOTAL ADD'L FEE			OR	TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.											

Legal Instrument Examiner:
/CURTIS NELLOMS JR/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/814,725	06/14/2010	Thomas Kalili	007087.00018	9978

22907 7590 03/14/2012
BANNER & WITCOFF, LTD.
1100 13th STREET, N.W.
SUITE 1200
WASHINGTON, DC 20005-4051

EXAMINER	
PATEL, YOGESH P	

ART UNIT	PAPER NUMBER
3776	

MAIL DATE	DELIVERY MODE
03/14/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/814,725	KALILI, THOMAS	
	Examiner	Art Unit	
	YOGESH PATEL	3776	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 24 February 2012.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5) ☒ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) 12-19 is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.

7) ☒ Claim(s) 1-11 and 20 is/are rejected.

8) ☐ Claim(s) ____ is/are objected to.

9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

10) ☐ The specification is objected to by the Examiner.

11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. ____.
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)	5) ☐ Notice of Informal Patent Application
Paper No(s)/Mail Date <u>05/04/2011, 01/06/2011</u> .	6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of claims 1-11 and 20 in the reply filed on 02/24/2012 is acknowledged. Claims 12-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Drawings

The informal drawings are not of sufficient quality to permit examination. Accordingly, replacement drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to this Office action. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action.

The drawings (figures 19-33) are objected to because they include black and white photographs. 37 CFR 1.84. (b)(1) states:

Black and white. Photographs, including photocopies of photographs, are not ordinarily permitted in utility and design patent applications. The Office will accept photographs in utility and design patent applications, however, if photographs are the only practicable medium for illustrating the claimed invention. For example, photographs or photomicrographs of: electrophoresis gels, blots (*e.g.*, immunological, western, Southern, and northern), auto- radiographs, cell cultures (stained and unstained), histological tissue cross sections (stained and unstained), animals, plants, in vivo imaging, thin layer chromatography plates, crystalline structures, and, in a design patent application, ornamental effects, are acceptable. If the subject matter of the application admits of illustration by a drawing, the examiner may require a drawing in place of the photograph. The photographs must be of sufficient quality so that all details in the photographs are reproducible in the printed patent.

In this case, photographs are not deemed to be the only practicable medium for illustrating the claimed invention. Furthermore, the photographs are not of sufficient quality so that all details are reproducible in the printed patent.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The

figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5-7, 9-11, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schultz (2006/0093983) in view of Hilliard (2005/0048433).

Schultz discloses dental appliance including an inner layer and outer layer secured to inner layer (fig. 1), the outer layer having higher elastic modulus than the inner layer ([0014], [0018]). The inner layer is configured to engage a portion of a patient's teeth. Schultz further discloses inner layer having force providing activators 10 ([0018-0019]), but fails to disclose the inner layer comprises at least one raised portion.

Hilliard teaches an orthodontic aligners having a protrusion 30a, 30b (figure 8a; bump [0040]) as to provide force on patient's tooth 10. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the

appliance of Schultz by providing the protrusion as taught by Hilliard in order to progressively move/align teeth in a desired position by using series of protrusions/tacks having progression of elasticity ([0042]). Regarding claims 5-7, the appliance is capable of being functioning as claimed. Regarding claim 9, the raised portion is circular (figure 4C). Regarding claim 10, the raised portion is in shape of vertical bar (e.g. in triangular shape). Regarding claim 11 the inner layer is thinner and outer layer is thicker, thus the outer layer having higher elastic modulus than inner layer as they are made from polymeric material.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schultz in view of Hilliard as applied to claim 1 above, and further in view of Kuo et al. (6,607,382).

Schultz/Hilliard discloses the invention substantially as claimed except for the inner and outer layer comprising a bacterial resistant material, teeth whitening material or freshness material as claimed; however, Kuo teaches dental repositioning appliance having releasing agents such as fluoride agents, antibiotics, bleaching materials or fresheners (col. 7, lines 7-28). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the appliance by providing Schultz/Hilliard the agents as taught by Kuo in order to maintain dental hygiene.

Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schultz in view of Hilliard as applied to claim 1 above, and further in view of Chishti et al. (2004/0209218).

Schultz/Hilliard discloses the invention substantially as claimed except for the inner and outer layer having elastic moduli in the range of 0.1 to 10 GPa and the appliance includes shape memory materials.

Chishti teaches a dental positioning appliance having modulus in the range of 0.1 GPa to 4GPa ([0032]) and the dental appliance including shape memory materials ([0014]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the appliance of Schultz/Hilliard by providing the elastic modulus as taught by Chishti in order to reposition the teeth based on repositioning needs of the patients ([0032]) and the memory materials to change state to reduce stiffness or shape of the shell such that the engagement forces between the teeth and other interfaces are reduced or eliminated ([0014]).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schultz in view of Hilliard as applied to claim 1 above, and further in view of Tadros et al. (2005/0100853).

Schultz/Hilliard discloses the invention substantially as claimed except for the usage of polycarbonate and polyurethane materials to form the appliance; however, Tadros teaches dental appliance is made from known materials including polycarbonate and polyurethane. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the appliance of Schultz/Hilliard by using known materials to form the appliance as taught by Tadros since the selection of a known material based on its suitability for its intended use supported a prima facie

obviousness determination in *Sinclair & Carroll co. v. International Corp.*, 325 U.S. 327, 65.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Patel Yogesh whose telephone number is (571)270-3646. The examiner can normally be reached between 9 AM – 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, ***please contact the examiner's supervisor, SPE Todd Manahan, at (571) 272-4713.*** The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

If there are any inquiries that are not being addressed by first contacting the Examiner or the Supervisor, you may send an email inquiry to TC3700_Workgroup_D_Inquiries@uspto.gov.

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/YOGESH PATEL/
Examiner, Art Unit 3776

Notice of References Cited	Application/Control No. 12/814,725	Applicant(s)/Patent Under Reexamination KALILI, THOMAS	
	Examiner YOGESH PATEL	Art Unit 3776	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,607,382	08-2003	Kuo et al.	433/6
*	B	US-2005/0100853	05-2005	Tadros et al.	433/006
*	C	US-2006/0093983	05-2006	Schultz, Charles J.	433/006
*	D	US-2004/0209218	10-2004	Chishti et al.	433/006
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
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<i>Index of Claims</i> 	Application/Control No. 12814725	Applicant(s)/Patent Under Reexamination KALILI, THOMAS
	Examiner YOGESH PATEL	Art Unit 3776

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA				☐ T.D.				☐ R.1.47			
CLAIM		DATE													
Final	Original	01/20/2012	03/05/2012												
	1	÷	✓												
	2	÷	✓												
	3	÷	✓												
	4	÷	✓												
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	16	÷	N												
	17	÷	N												
	18	÷	N												
	19	÷	N												
	20	÷	✓												

Search Notes 	Application/Control No. 12814725	Applicant(s)/Patent Under Reexamination KALILI, THOMAS
	Examiner YOGESH PATEL	Art Unit 3776

SEARCHED			
Class	Subclass	Date	Examiner
433	6,24,215, 80	3/5/2012	YP
128	859-861	3/5/2012	YP

SEARCH NOTES		
Search Notes	Date	Examiner
inventor name, foreign database	3/5/2012	YP

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

/YOGESH PATEL/ Examiner.Art Unit 3776	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12814725	
	Filing Date		2010-06-14	
	First Named Inventor	Kalili		
	Art Unit	3776		
	Examiner Name	TBD		
	Attorney Docket Number	007087.00018		

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	1	4983334		1991-01-08	Adell		

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	1	20010041320		2001-11-15	Phan		
	2	20050048433		2005-03-03	Hilliard		
	3	20050100853		2005-05-12	Tadros		
	4	20050003318		2005-01-06	Choi		

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	Filing Date		2010-06-14
	First Named Inventor	Kalili	
	Art Unit	3776	
	Examiner Name	TBD	
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SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
12/814,725	06/14/2010	433	3776	007087.00018		
RULE						
APPLICANTS Thomas Kalili, Beverly Hills, CA; ** CONTINUING DATA ***** This application is a CIP of 11/549,506 10/13/2006 ABN which claims benefit of 60/822,991 08/21/2006 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** ** SMALL ENTITY ** 08/03/2010						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☐ No Verified and Acknowledged <u>/YOGESH P PATEL/</u> Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY CA	SHEETS DRAWINGS 37	TOTAL CLAIMS 20	INDEPENDENT CLAIMS 3
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TITLE Orthodontic Repositioning Appliance						
FILING FEE RECEIVED 462	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	12814725
	Filing Date	2010-06-14
	First Named Inventor	Kalili
	Art Unit	3776
	Examiner Name	TBD
	Attorney Docket Number	007087.00018

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	4505672		1985-03-19	Kurz	
	2	4591341		1986-05-27	Andrews	
	3	4484895		1984-11-27	Smiley	
	4	5624257		1997-04-29	Farrell	
	5	2789351		1957-04-23	Gordon	
	6	6761560		2004-07-13	Miller	
	7	7025950		2006-04-11	Majeti	
	8	6554611		2003-04-29	Chishti	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12814725	
	Filing Date		2010-06-14	
	First Named Inventor	Kalili		
	Art Unit	3776		
	Examiner Name	TBD		
	Attorney Docket Number	007087.00018		

	9	6398548		2002-06-04	Muhammad	
	10	5975893		1999-11-02	Chishti	

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	1	20040170941		2004-09-02	Phan et al.	
	2	20060008760		2006-01-12	Phan et al.	
	3	20060093983		2006-05-04	Schultz	
	4	20030198912		2003-10-23	Mah	
	5	20040209218		2004-10-21	Chishti et al.	
	6	20060099545		2006-05-11	Lai et al.	
	7	20050186526		2005-08-25	Stewart	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12814725	
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	Art Unit	3776		
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	8	20060105179		2006-05-18	Hofman	
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	1	"TEXIN® 990R Thermoplastic Polyurethane," Product Information, Bayer Material Science LLC, Nov. 2002. pp. 1-4	☐	
	2	Ormco Corporation v. Align Technology, Inc. No. 05-1426, 2006 WL 2493245, *6 (Fed. Cir. Aug. 30, 2006)	☐	
	3	International Preliminary Report on Patentability for PCT/US06/061014 mailed March 5, 2009, 4 pages	☐	
	4	International Search Report for PCT/US06/61014 dated October 5, 2007	☐	

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	Filing Date	2010-06-14
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EAST Search History**EAST Search History (Prior Art)**

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S45	1296	433/215.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/01/07 16:51
S46	243	433/215.ccls. and appliance \$1	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/01/07 16:51
S47	11	"433".clas. and texin	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/01/08 09:17

S48	0	"433".clas. and (texin with "990")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/01/08 09:19
S49	9	(texin with "990")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/01/08 09:19
S50	1	11/549506	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/10/14 15:39
S51	1	S50 and laminat\$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/10/14 15:40
S52	0	433/6-7.ccls. and (dual near layer\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/10/14 16:16
S53	710	433/6-7.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/10/14 16:16
S54	0	S53 and (dual near layer \$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/10/14 16:16
S55	24	S53 and (inner near layer \$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/10/14 16:16
S56	1	11/549506	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 13:50
S57	1	S56 and bar	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 13:51
S58	1	433/6,24.ccls. and (bar with integrat\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 13:58

S59	33	433/6,24.ccls. and (appliance with integrat\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 13:59
S60	24	433/6,24.ccls. and (appliance with mesh\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 14:00
S61	859	433/6,24.ccls. and (appliance\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 14:02
S62	5	S61 and (integrat\$3 with layer\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 14:03
S63	127	S61 and bar	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 14:04
S64	1	S56 and micro-implant	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 14:23
S65	1	S61 and (shell with implant)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 14:29
S66	17	S61 and (appliance with implant)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 14:30
S67	0	S61 and (positioner with implant)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 14:36
S68	28	S61 and (position\$3 with implant)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 14:36
S69	2	("20040170941").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:09

S70	1	S69 and "92"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:09
S71	30	S61 and gpa	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:11
S72	0	S69 and gpa	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:14
S73	4	((("20060008760") or ("20040170941")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:25
S74	0	S73 and (shape adj memory)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:26
S75	0	S73 and (sma)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:26
S76	1	S56 and vertical	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:33
S77	2	("5,624,257").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:36
S78	2	("4505672").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:38
S79	10	("2643652" "4368040" "4591341").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:39
S80	2	("4591341").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:41

S81	2	("5267862").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:41
S82	92	("3407500" "3600608" "3660900" "3683502" "3860803" "3922786" "3950851" "4150485" "4253828" "4324546" "4324547" "4370129" "4500294" "4504225" "4505673" "4526540" "4591341" "4609349" "4664626" "4676747" "4755139" "4793803" "4798534" "4836778" "4837732" "4850865" "4856991" "4877398" "4880380" "4936862" "4941826" "4983334" "5011405" "5017133" "5022855" "5035613" "5055039" "5059118" "5100316" "5125832" "5139419" "5145364" "5186623" "5273429" "5338198" "5340309" "5342202" "5367478" "5368478" "5382164" "5395238" "5431562" "5447432" "5452219" "5454717" "5456600" "5474448" "5516812" "5528735" "5533895" "5536168" "5536169" "5542842" "5549476" "5587912" "5605459" "5607300" "5607305" "5645420" "5645421" "5683243" "5683244" "5692894" "5725376" "5725378" "5800174" "5866058" "5879158" "5880961" "5951291" "5957686" "5964587" "5971754" "5975893" "6044309" "6049743" "6080450" "6123544" "6183248" "6190165" "6217334" "6524101"). PN.	US-PGPUB; USPAT	OR	OFF	2010/05/11 15:42

S83	2	("20040170941").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:52
S84	0	S83 and "800"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:53
S85	1	S83 and "80"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/05/11 15:53
S86	1	11/549506	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/07/29 16:09
S87	1	S86 and bar	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/07/29 16:14
S88	1	11/549506	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 09:57
S89	1	S88 and micro	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 09:57
S90	1	S89 and bar	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 09:58
S91	2	("20020192617").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 10:10
S92	69	433/6,24.ccls. and (embed \$4 same forc\$3) and @Py<"2006"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 10:14
S93	6	"433"/\$.ccls. and (hader near2 bar)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 10:19

S94	0	S90 and straight	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 10:21
S95	2	("20060093983").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 11:08
S96	2	("20060008760").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 11:17
S97	4	S95 S96	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 11:32
S98	1	S97 and polycarbonat\$	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 11:32
S99	2	("20030198912").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 11:39
S100	1	S99 and (polycarbonate and thermoplastic)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 11:39
S101	1	S88 and vertical	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 11:50
S102	1	S101 and bar	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 11:50
S103	2	("20040170941").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/09/10 12:08
S104	1	"20060093983"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/02/11 11:08
S105	1	("5624527").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/02/11 11:12
S106	1	("5624257").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/02/11 11:13

S107	2	11/549506	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/22 15:19
S108	0	S107 and protrusion\$3	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/22 15:19
S109	2	S107 and bar	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/22 15:24
S110	11	("3311977" "4055895" "4370129" "4799884" "4983334" "5203695" "5746221" "5865619" "5947724" "6171107"). PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/22 15:30
S111	6	433/6,24.ccls. and (suction with cup\$3)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/22 15:37
S112	1	("20020192671").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 09:24
S113	1	("20020192617").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 09:25
S114	87	("4591341").URPN.	USPAT	OR	OFF	2011/03/23 09:33
S115	1	("6,702,575").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 09:41
S116	46	("1463968" "2257709" "2467432" "2479780" "3178820" "3407500" "3510946" "3574941" "3724075" "3950851" "3991471" "4055895" "4505672" "4591341" "4755139" "4793803" "5139419" "5242304" "5536168" "5683243" "5683244" "5692894" "5863198" "5879158" "5975893" "6183248" "6217325" "6293790" "6299440" "6309215" "6315553" "6318995" "6390812" "6398548" "6582227" "6702575" "6705863" "6830450" "6947038").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 09:46
S117	2	11/549506	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 10:05
S118	2	S117 and (shape adj memory)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 10:06

S119	1	("20060008760").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 10:14
S120	43	433/6,18,24.ccls. and (((inner internal) and (outer external)) with layer\$1)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 10:26
S121	25	S120 and (polycarbonate polyurethane)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 10:27
S122	4	S120 and (polycarbonate and polyurethane)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 10:27
S123	1	("20030198912").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 10:39
S124	1	("20060093983").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 10:43
S125	1	S124 and (inner with shell)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 10:44
S126	203	29/896.1,896.11.ccls. and @py<"2008"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 11:28
S127	17	S126 and (forc\$3 with (align\$3 position\$3 reposition\$3))	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/23 11:28
S128	128	433/6,18,24,215-225.ccls. and ((inner and outer) with layer\$1) and @Py<"2006"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 14:06
S129	315	433/6,18,24,215-225.ccls. and ((inner or outer) with layer\$1) and @Py<"2006"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 14:06
S130	190	S129 and (strength elastic modulus)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 14:07
S131	48	S130 and (polyurethane\$5 polycarbonate)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 14:07
S132	10	433/6,18,24,215-225.ccls. and ((dual) with layer\$1) and @Py<"2006"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:11
S133	581	433/6,18,24,215-225.ccls. and (layers) and @Py<"2006"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:12
S134	31	S133 and (elastic adj modulus)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:12
S135	1	("6454565").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:25

S136	10	("4150485" "4253828" "4370129" "4983334" "5022855" "5536168" "5607300" "5645420" "5951291" "5975893"). PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:33
S137	13	("6454565").URPN.	USPAT	OR	OFF	2011/03/24 15:34
S138	246	a61c003/00.ipc.	EPO; JPO	OR	OFF	2011/03/24 15:35
S139	6	S138 and (layer\$1)	EPO; JPO	OR	OFF	2011/03/24 15:35
S140	278	A61C003/00	EPO; JPO	OR	OFF	2011/03/24 15:36
S141	52	S140 and (align\$3 position \$3)	EPO; JPO	OR	OFF	2011/03/24 15:36
S142	388	433/24.ccls. and @Py<"2006"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:37
S143	96	S142 and layer\$1	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:37
S144	96	S143 not S141	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:37
S145	90	S143 not S131	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:38
S146	0	S142 and (poly\$1carbonate and polyurethane)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:42
S147	18	S142 and (poly \$1carbonate)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:42
S148	128	"433"/\$.ccls. and ((align\$3 position\$3) near3 (shell appliance\$1 device\$1) and layer\$1 and elastic) and @py<"2006"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:43
S149	47	S148 and modulus	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:43
S150	21	S149 and (poly \$1carbonate)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:43
S151	136	433/6,18,24,215-225.ccls. and ((thinner thick\$3) with layer\$1) and @Py<"2006"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:56
S152	20	433/6,18,24,215-225.ccls. and ((thinner thick\$3) with layer\$1 with (inner outer external internal)) and @Py<"2006"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 15:56

S153	1	("6183248").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 16:07
S154	187	29/896.1,896.11.ccls. and @py<"2006"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 16:12
S155	24	433/18-23.ccls. and ((inner outer) with layer\$1) and @PY<"2006"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 16:23
S156	52	S140 and ((align\$3 position \$3))	EPO; JPO	OR	OFF	2011/03/24 16:25
S157	1	S156 and layer\$1	EPO; JPO	OR	OFF	2011/03/24 16:25
S158	1	("4983334").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 16:32
S159	452	"264"/\$.ccls. and (dental with (appliance\$1 device\$1 shell))	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 16:33
S160	156	S159 and (layer\$1) and @Py<"2006"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 16:34
S161	3	S160 and positioner	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 16:37
S162	13	433/6,24.ccls. and (strength with yield)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 16:45
S163	1	("5328362").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 16:51
S164	388	433/24.ccls. and @Py<"2006"	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 17:04
S165	8	S164 and gpa	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 17:04
S166	18	S164 and (shape adj memory)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/03/24 17:07

EAST Search History (Interference)

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3/5/2012 1:16:33 PM**C:\Documents and Settings\ypatel\My Documents\EAST\Workspaces\11549506.wsp**

REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS

Application Number	12814725
Filing Date	June 14, 2010
First Named Inventor	Kalili
Art Unit	3776
Examiner Name	PATEL
Attorney Docket Number	007087.00018

**To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450**

Please withdraw me as attorney or agent for the above identified patent application, and

- ☐ all the practitioners of record;
- ☐ the practitioners (with registration numbers) of record listed on the attached paper(s); or
- ☒ the practitioners of record associated with Customer Number: 22908

NOTE: The immediately preceding box should only be marked when the practitioners were appointed using the listed Customer Number.

The reason(s) for this request are those described in 37 CFR :

- | | | | |
|---|--|--|---|
| ☐ 10.40(b)(1) | ☐ 10.40(b)(2) | ☐ 10.40(b)(3) | ☒ 10.40(b)(4) |
| ☐ 10.40(c)(1)(i) | ☐ 10.40(c)(1)(ii) | ☐ 10.40(c)(1)(iii) | ☐ 10.40(c)(1)(iv) |
| ☐ 10.40(c)(1)(v) | ☐ 10.40(c)(1)(vi) | ☐ 10.40(c)(2) | ☐ 10.40(c)(3) |
| ☐ 10.40(c)(4) | ☐ 10.40(c)(5) | ☐ 10.40(c)(6) Please explain below: | |

Certifications

Check each box below that is factually correct. WARNING: If a box is left unchecked, the request will likely not be approved.

- ☒ I/We have given reasonable notice to the client, prior to the expiration of the response period, that the practitioner(s) intend to withdraw from employment.
- ☒ I/We have delivered to the client or a duly authorized representative of the client all papers and property (including funds) to which the client is entitled.
- ☒ I/We have notified the client of any responses that may be due and the time frame within which the client must respond.

Please provide an explanation, if necessary:

[Page 1 of 2]

This collection of information is required by 37 CFR 1.36. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS

Complete the following section only when the correspondence address will change. Changes of address will only be accepted to an inventor or an assignee that has properly made itself of record pursuant to 37 CFR 3.71.

Change the correspondence address and direct all future correspondence to:

A. ☐ The address of the inventor or assignee associated with Customer Number: _____

OR

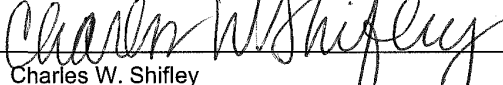
B. ☒ Inventor or
Assignee name Thomas Kalili

Address 4169 N. Bedford Drive, Suite 102

City Beverly Hills	State CA	Zip 90210	Country US
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Telephone	Email ceo@smile90210.com
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I am authorized to sign on behalf of myself and all withdrawing practitioners.

Signature			
Name	Charles W. Shifley	Registration No.	28042

Address Banner & Witcoff, Ltd. - 10 S. Wacker Drive, Suite 3000

City Chicago	State IL	Zip 60606	Country USA
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Date	April 11, 2012	Telephone No. 312.463.5000
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NOTE: Withdrawal is effective when approved rather than when received.

[Page 2 of 2]

This collection of information is required by 37 CFR 1.36. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	12519153
Application Number:	12814725
International Application Number:	
Confirmation Number:	9978
Title of Invention:	Orthodontic Repositioning Appliance
First Named Inventor/Applicant Name:	Thomas Kalili
Customer Number:	22907
Filer:	Charles W. Shifley/Tracy Webber
Filer Authorized By:	Charles W. Shifley
Attorney Docket Number:	007087.00018
Receipt Date:	11-APR-2012
Filing Date:	14-JUN-2010
Time Stamp:	17:09:07
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition to withdraw attorney or agent (SB83)	0708700018wd.PDF	53403 15248d696783c59a255a2a01a1b9e753598f5077	no	2

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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BANNER & WITCOFF, LTD.
1100 13th STREET, N.W.
SUITE 1200
WASHINGTON DC 20005-4051

MAILED

MAY 01 2012

OFFICE OF PETITIONS

In re Application of	:	
Thomas KALILI	:	
Application No. 12/814,725	:	DECISION ON PETITION
Filed: June 14, 2010	:	TO WITHDRAW
Attorney Docket No. 007087.00018	:	FROM RECORD
	:	

This is a decision on the Request to Withdraw as attorney or agent under 37 C.F.R. § 1.36(b) or 37 C.F.R. § 10.40 filed April 11, 2012.

The request is **NOT APPROVED**.

A review of the file record indicates that Customer Number 22908 does not have power of attorney in this patent application nor is there any statement or evidence of record of employment in or otherwise being engaged in the proceedings in this patent application. Accordingly, the request to withdraw under 37 C.F.R. § 1.36(b) is not applicable.

All future communications from the Office will continue to be directed to the below-listed address until otherwise properly notified by the applicant.

Telephone inquiries concerning this decision should be directed to the undersigned at 571-272-4231.

/Michelle R. Eason/
Michelle R. Eason
Paralegal Specialist
Office of Petitions

REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS

Application Number	12814725
Filing Date	June 14, 2010
First Named Inventor	Kalili
Art Unit	3776
Examiner Name	PATEL
Attorney Docket Number	007087.00018

**To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450**

Please withdraw me as attorney or agent for the above identified patent application, and

- ☐ all the practitioners of record;
- ☐ the practitioners (with registration numbers) of record listed on the attached paper(s); or
- ☒ the practitioners of record associated with Customer Number: 22907

NOTE: The immediately preceding box should only be marked when the practitioners were appointed using the listed Customer Number.

The reason(s) for this request are those described in 37 CFR :

- | | | | |
|---|--|--|---|
| ☐ 10.40(b)(1) | ☐ 10.40(b)(2) | ☐ 10.40(b)(3) | ☒ 10.40(b)(4) |
| ☐ 10.40(c)(1)(i) | ☐ 10.40(c)(1)(ii) | ☐ 10.40(c)(1)(iii) | ☐ 10.40(c)(1)(iv) |
| ☐ 10.40(c)(1)(v) | ☐ 10.40(c)(1)(vi) | ☐ 10.40(c)(2) | ☐ 10.40(c)(3) |
| ☐ 10.40(c)(4) | ☐ 10.40(c)(5) | ☐ 10.40(c)(6) Please explain below: | |

Certifications

Check each box below that is factually correct. WARNING: If a box is left unchecked, the request will likely not be approved.

- ☒ I/We have given reasonable notice to the client, prior to the expiration of the response period, that the practitioner(s) intend to withdraw from employment.
- ☒ I/We have delivered to the client or a duly authorized representative of the client all papers and property (including funds) to which the client is entitled.
- ☒ I/We have notified the client of any responses that may be due and the time frame within which the client must respond.

Please provide an explanation, if necessary:

[Page 1 of 2]

This collection of information is required by 37 CFR 1.36. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS

Complete the following section only when the correspondence address will change. Changes of address will only be accepted to an inventor or an assignee that has properly made itself of record pursuant to 37 CFR 3.71.

Change the correspondence address and direct all future correspondence to:

A. ☐ The address of the inventor or assignee associated with Customer Number: _____

OR

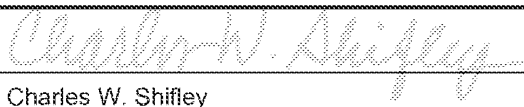
B. ☒ Inventor or Assignee name Thomas Kalili

Address 4169 N. Bedford Drive, Suite 102

City Beverly Hills State CA Zip 90210 Country US

Telephone Email ceo@smile90210.com

I am authorized to sign on behalf of myself and all withdrawing practitioners.

Signature 

Name Charles W. Shifley Registration No. 28042

Address Banner & Witcoff, Ltd. - 10 S. Wacker Drive, Suite 3000

City Chicago State IL Zip 60606 Country US

Date May 10, 2012 Telephone No. 312.463.5000

NOTE: Withdrawal is effective when approved rather than when received.

[Page 2 of 2]

This collection of information is required by 37 CFR 1.36. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	12745297
Application Number:	12814725
International Application Number:	
Confirmation Number:	9978
Title of Invention:	Orthodontic Repositioning Appliance
First Named Inventor/Applicant Name:	Thomas Kalili
Customer Number:	22907
Filer:	Charles W. Shifley/Tracy Webber
Filer Authorized By:	Charles W. Shifley
Attorney Docket Number:	007087.00018
Receipt Date:	10-MAY-2012
Filing Date:	14-JUN-2010
Time Stamp:	10:42:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition to withdraw attorney or agent (SB83)	0708700018withdrawal.pdf	259043 ed7e9d3a3ed8dbfedc3d271361fb834aa4a d5a4d	no	3

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/814,725	06/14/2010	Thomas Kalili	007087.00018

22907
BANNER & WITCOFF, LTD.
1100 13th STREET, N.W.
SUITE 1200
WASHINGTON, DC 20005-4051

CONFIRMATION NO. 9978
POWER OF ATTORNEY NOTICE



Date Mailed: 06/04/2012

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/10/2012.

- The withdrawal as attorney in this application has been accepted. Future correspondence will be mailed to the new address of record. 37 CFR 1.33.

/mreason/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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SUITE 1200
WASHINGTON DC 20005-4051

MAILED
JUN 04 2012
OFFICE OF PETITIONS

In re Application of	:	
Thomas KALILI	:	
Application No. 12/814,725	:	DECISION ON PETITION
Filed: June 14, 2010	:	TO WITHDRAW
Attorney Docket No. 007087.00018	:	FROM RECORD
	:	

This is a decision on the renewed Request to Withdraw as attorney or agent of record under 37 C.F.R. § 1.36(b), filed May 10, 2012.

The request is **APPROVED**.

A grantable request to withdraw as attorney/agent of record must be signed by every attorney/agent seeking to withdraw or contain a clear indication that one attorney is signing on behalf of another/others. The Office requires the practitioner(s) requesting withdrawal to certify that he, she, or they have: (1) given reasonable notice to the client, prior to the expiration of the response period, that the practitioner(s) intends to withdraw from employment; (2) delivered to the client or a duly authorized representative of the client all papers and property (including funds) to which the client is entitled; and (3) notified the client of any responses that may be due and the time frame within which the client must respond, pursuant 37 CFR 10.40(c).

The request was signed by Charles W. Shifley on behalf of all attorneys of record who are associated with customer No. 22907. All attorneys/agents associated have been withdrawn. Applicant is reminded that there is no attorney of record at this time.

All future correspondence will be directed to the first named inventor Joe Smith at the address indicated below.

There is an outstanding Office action mailed March 14, 2012 that requires a reply from the applicant.

Telephone inquiries concerning this decision should be directed to the undersigned at 571-272-4231.

/Michelle R. Eason/
Michelle R. Eason
Paralegal Specialist
Office of Petitions

cc: **THOMAS KALILI**
4169 N. BEDFORD DRIVE
SUITE 102
BEVERLY HILLS, CA 90210



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Bib Data Sheet

CONFIRMATION NO. 9978

SERIAL NUMBER 12/814,725	FILING OR 371(c) DATE 06/14/2010 RULE	CLASS 433	GROUP ART UNIT 3776	ATTORNEY DOCKET NO.
APPLICANTS Thomas Kalili, Beverly Hills, CA; ** CONTINUING DATA ***** This application is a CIP of 11/549,506 10/13/2006 ABN which claims benefit of 60/822,991 08/21/2006 ** FOREIGN APPLICATIONS ***** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** SMALL ENTITY ** ** 08/03/2010				
Foreign Priority claimed ☐ yes ☐ no 35 USC 119 (a-d) conditions ☐ yes ☐ no ☐ Met after met Allowance Verified and Acknowledged <u>Examiner's Signature</u> <u>Initials</u>		STATE OR COUNTRY CA	SHEETS DRAWING 37	TOTAL CLAIMS 20
			INDEPENDENT CLAIMS 3	
ADDRESS THOMAS KALILI 4169 N. BEDFORD DRIVE SUITE 102 BEVERLY HILLS, CA90210				
TITLE Orthodontic Repositioning Appliance				
FILING FEE RECEIVED 462	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit	



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/814,725	06/14/2010	Thomas Kalili		9978

7590 12/14/2012
THOMAS KALILI
4169 N. BEDFORD DRIVE
SUITE 102
BEVERLY HILLS, CA 90210

EXAMINER

PATEL, YOGESH P

ART UNIT	PAPER NUMBER
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3776

MAIL DATE	DELIVERY MODE
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12/14/2012

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of Abandonment	Application No.	Applicant(s)
	12/814,725	KALILI, THOMAS
	Examiner	Art Unit
	YOGESH PATEL	3776

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 14 March 2012.
 - (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply (including a total extension of time of _____ month(s)) which expired on _____.
 - (b) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection. (A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
 - (c) ☐ A reply was received on _____ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
 - (d) ☒ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
 - (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
 - (b) ☐ The submitted fee of \$_____ is insufficient. A balance of \$_____ is due.
The issue fee required by 37 CFR 1.18 is \$_____. The publication fee, if required by 37 CFR 1.18(d), is \$_____.
 - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
 - (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.
 - (b) ☐ No corrected drawings have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☐ The reason(s) below:

	/YOGESH PATEL/ Examiner, Art Unit 3776
--	---

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.