CLAIMS:

1. An orthodontic appliance system comprising:

at least one first docking component configured to be attached to the lingual or palatal side of at least one respective support tooth;

at least one target magnet, the at least one target magnet comprising at least one of a magnet or paramagnet, the at least one target magnet being configured to be attached to at least one of a lingual, palatal, distal or mesial surface of at least one respective target tooth, at least one point on a bony palate and/or at least one point on a buccal bone;

a rigid support arch having respective at least one second docking component corresponding to, and for securement to, the at least one first docking component, the rigid support arch being configured to support at least one therapeutic magnet at at least one respective therapeutic position adjacent a respective one of the at least one target magnet;

wherein the at least one of the rigid support arch, at least one of the at least one target magnet or at least one of the at least one therapeutic magnet includes at least one stop configured to prevent or limit an aspect of movement of a tooth.

2. The orthodontic appliance system of claim 1 wherein the rigid support arch comprises at least one of an orthodontic wire; or

a metal band; or

a thermoplastic appliance; or

a resin based appliance; or

a rigid thermoplastic or resin.

3. The orthodontic appliance system of claim 1 wherein at least one of the at least one target or at least one of the at least one therapeutic magnet has a non-planar shape; or

wherein the non-planar shape comprises an L-shape; or

wherein the L-shape comprises an obtuse angle between legs of the L-shape; or

wherein the non-planar shape comprises one of a C-shape and a U-shape in cross section from an occlusal view; or

wherein at least one target of the at least one target comprises an extended target that is larger in at least one dimension than a corresponding dimension of an exposed portion the at least one associated target tooth; or

wherein the at least one stop comprises a first stop and a second stop, the first stop being configured to make an initial contact during a therapeutic movement of a tooth, thereby limiting a first aspect of the therapeutic movement the tooth, while the second stop has not yet made a contact, thereby allowing a second aspect of therapeutic movement of the tooth; or

wherein the rigid support arch includes at least one extension configured to extend into a space left by an extracted or missing tooth and the at least one therapeutic magnet includes at least one therapeutic magnet mounted on the at least one extension and the at least one target magnet includes at least one target magnet mounted on at least one mesial or distal surface of at least one target tooth adjacent the space left by the extracted or missing tooth; or

wherein the at least one extension that is configured to occupy the space left by an extracted or missing tooth comprises a tooth shaped pontic; or

wherein the rigid support arch supports at least one non-magnetic guide plane configured to provide a supplemental contact-based guidance to urge a tooth in a desired direction; or

wherein the rigid support arch wherein at least one of the at least one target magnet and at least one of the at least one therapeutic magnet are configured to have opposite poles facing each other while at least one of the at least one target magnet and the at least one therapeutic magnet include at least one stop configured to prevent movement of the target tooth toward the therapeutic magnet; or

wherein the L-Shaped magnet is configured to urge the target tooth occlusally, lingually and/or laterally.

4. The orthodontic appliance system of claim 1 wherein at least one of the at least one target magnet and the at least one therapeutic magnet supports at least a first stop and a second stop, the first stop being configured to contact the other of the at least one target magnet and the at least one therapeutic magnet during a therapeutic time period before the second stop contacts the other of the at least one target magnet and the at least one therapeutic magnet, thereby providing a pivot point for achieving a desired movement of an associated target tooth; or

wherein the at least one target magnet and the at least one therapeutic magnet comprise complementary triangular shapes whereby respective hypotenuses of the triangular shapes can be configured to face each other; or

wherein the at least on target magnet comprises a first target magnet and a second target magnet configured to be attached to a lingual or palatal side of a same respective target tooth and wherein the rigid support arch is configured to support a first therapeutic magnet and a second therapeutic magnet adjacent the same respective target tooth, wherein the first target magnet and the first therapeutic magnet are configured to produce an attractive force therebetween and the second target magnet and the second therapeutic magnet are configured to produce a repulsive force therebetween; or

wherein at least one of the at least one therapeutic magnet is configured to include a substantially horizontal lever arm longer than the width of an associated target tooth; or

wherein the substantially horizontal lever arm supports a magnetic attachment at a distal end thereof.

5. The orthodontic appliance system of claim 1 wherein the rigid support arch includes at least one occlusal extension configured to apply intruding forces to at least one tooth; or

wherein the rigid support arch includes at least one sagittal stabilization stop configured to contact a rear surface of a respective at least one attachment magnet and limit forward movement of the rigid support arch; or

wherein the at least one first and the at least one second docking components comprise respective at least one attachment and at least one mounting magnet; or

wherein the at least one first docking component comprises at least one set of conjoined attachment magnets; or

wherein at least one of the at least one mounting magnet includes a horizontal extension configured to extend from the at least one mounting magnet to an area adjacent a second face of a respective attachment magnet; or

wherein the horizontal extension includes at least one stop on the horizontal extension configured to prevent vertical movement of an associated support tooth due to attractive magnetic force between the at least one mounting magnet including the horizontal extension and the attachment magnet; or

wherein at least one of the at least one therapeutic magnet includes a horizontal extension configured to extend from the at least one therapeutic magnet to an area adjacent to and approximating a second face of a respective target magnet; or

wherein the horizontal extension includes a first stop and a second stop on a surface of the horizonal extension approximating the second face of the target magnet, wherein the first stop is configured to be positioned at a point that is closer to the top surface of the target magnet that the second stop, thereby limiting vertical movement of the corresponding side of the target magnet relative to a side of the target magnet corresponding to a location of the second stop.

6. The orthodontic appliance system of claim 1 wherein the rigid support arch comprises at least one of orthodontic rod, orthodontic wire, injection molded plastic, cast plastic and 3D printed material including ferromagnetic material.

7. The orthodontic appliance system of claim 1 comprising a transpalatal arch connecting one or more attachment magnets from either side of the rigid support arch.

8. The orthodontic appliance system of claim 1 wherein the rigid support arch is configured to follow the contour of a palate of a patient; or

wherein at least one of the at least one target is configured to be mounted on an implant configured to be implanted in the bony palate; or

wherein the rigid support arch comprises occlusal extensions configured to cover and transmit therapeutic force between the at least one target magnet and at least one therapeutic magnet to at least one target tooth; or

wherein at least one of the at least one target magnet is configured to be mounted on an implant configured to be implanted in the buccal bone; or

wherein the rigid support arch is configured to support a horizontal extension, the horizontal extension being configured to contact an occlusal surface between teeth; or

wherein the rigid support arch is configured to support a distal extension, the distal extension being configured to contact an occlusal surface of one of the at least one respective support tooth and further extend as a buccal extension to embrace a buccal surface of the one of the at least one respective support tooth and support a stabilizing magnet at a position adjacent to at least one stabilizing implant magnet mounted on a stabilizing implant implanted in the buccal bone; or

wherein at least one therapeutic magnet is L-shaped and one leg of the L-shaped magnet comprises a horizontal extension of the at least one therapeutic magnet the horizontal extension comprising a stop configured to initially be spaced from a mesial surface of one of the at least one target magnet and to be contacted by the mesial surface of the one of the at least one target magnet only after a therapeutic mesial movement of the target tooth associated with the one of the at least one target magnet; or

wherein at least one mounting magnet is L-shaped and one leg of the L-shaped magnet comprises a horizontal extension of the at least one therapeutic magnet the horizontal extension comprising a stop configured to initially contact a mesial surface of one of the at least one attachment magnet thereby preventing mesial movement of the support tooth associated with the one of the at least one attachment magnet; or

wherein the rigid support arch comprises a horizontal extension configured to reach through a space between teeth to support at least one stabilizing implant magnet at a stabilizing position corresponding to a stabilizing implant magnet configured to be mounted on an implant implanted in a buccal bone; or

wherein the horizontal extension is configured to abut a surface of a tooth, thereby providing further stabilization.

9. The orthodontic appliance system of claim 1 wherein at least one of the at least one attachment magnet includes a seat configured to receive a guide key extending from an associated mounting magnet; or

wherein at least one of the at least one mounting magnet includes a guide key configured to be received in a seat included in an associated attachment magnet; or

wherein the rigid support arch comprises at least one of a permanent magnet in the form of an arch shaped strip and an arch shaped strip including isolated magnetized regions; or

wherein at least one of the at least one therapeutic magnet comprises a therapeutic magnet extension configured to face a mesial side or a distal side of at least one of the at least one target magnet.

10. The orthodontic appliance system of claim 1 wherein at least one of the at least one mounting magnet is L-shaped due to inclusion of a horizontal mounting extension configured to provide a mesio-distal support force; or

wherein the horizontal mounting extension includes at least one stop for opposing mesio-distal movement of at least one associated support tooth; or

wherein the rigid support arch is configured to be located gingival to the crowns of teeth of an associated patient and wherein the at least one mounting magnet and the at least one therapeutic magnet are attached to the rigid support arch by vertical extensions from the rigid support arch; or

wherein the rigid support arch, at least one mounting magnet and the at least one therapeutic magnet are a single unitary manufacture.

11. The orthodontic appliance system of claim 8 wherein the rigid support arch comprises an upper rigid support arch and the at least one mounting magnet comprises at least one upper mounting magnet, at least one of the at least one upper mounting magnet comprising a downward extension, the orthodontic appliance system further comprising:

a lower rigid support arch having at least one lower mounting magnet, at least one of the at least one lower mounting magnet comprising an upward extension;

wherein extensions of respective at least one pair of the downward extension of the at least one upper mounting magnet and the upward extension of the at least one lower mounting magnet are configured to magnetically attract one another when installed in an associated patient, thereby urging an upper dental arch and a lower dental arch of the associated patient toward one another in an antero-posterior direction; or

wherein at least one of the at least one attachment magnet and at least one mounting magnet comprise a stop; or

wherein the rigid support arch and at least one of the at least one therapeutic magnet and at least one mounting magnet comprise at least one set of interlocking portions; or

wherein the interlocking portions comprise at least one half-blind dovetail in the rigid support arch and a dovetail pin in the at least one of the at least one therapeutic magnet and at least one mounting magnet.

12. The orthodontic appliance system of claim 7 wherein at least one of the attachment magnets on either side of the rigid support arch and connected by the transpalatal arch is a wide attachment magnet configured to be attached to two or more support teeth.

13. The orthodontic appliance system of claim 9 wherein the at least one of the at least one attachment magnet includes at least one a spring clip configured to participate in retaining the guide key in the seat; or

wherein the at least one of the at least one attachment magnet includes a door that is configured to be securable under the at least one spring clip and over the seat, thereby being configured to participate in retaining the guide key in the seat; or

wherein the at least one spring clip comprises two spring clips configured to be installed on either side of the seat and wherein the guide key includes a stabilization member including a first arm and a second arm that extend out in two opposite directions perpendicular to a top surface of a distal end of the guide key, thereby forming a T-shape, the stabilization member being configured to rest on a top surface of the attachment magnet when the guide key is in the seat, and wherein the spring clips are configured to capture the first arm and the second arm of the stabilization member respectively.

14. The orthodontic appliance system of claim 1 wherein at least one of the at least one therapeutic magnet includes a slot or pocket configured to accept one or more additional magnets; or

comprises at least one additional magnet; or

wherein at least one of the at least one target magnet comprises the L-shape with an angle between a shorter leg and a longer leg of the L-shape wherein the shorter leg is configured to be bonded to and extend briefly lingually away from the crown of an associated target tooth of an associated patient and the longer leg is configured to extend, at an angle, away from the shorter leg, approximating a local contour of a bony palate of the associated patient until a distal end of the longer leg reaches a bit beyond a vertical location of a center of resistance in a root of the target tooth; and wherein

the rigid support arch is configured to support a therapeutic magnet corresponding to and for magnetic attraction to the target magnet at the distal end of the longer leg of the target magnet at a point centered on and horizontally

aligned in line with the center of resistance of the associated target tooth, whereby a force formed due the magnetic interaction between the therapeutic magnet and target magnet would act in a direction horizontally through the center of resistance; or

wherein the rigid support arch includes an extension configured to grasp a front edge of the crown of the associated target tooth; or

further comprising:

at least one of a first and/or second additional magnet and an L-shaped extension of the rigid support arch, wherein the first additional magnet is configured to be mounted on the distal end of the long leg of the target magnet, the second additional magnet being configured to be mounted on the short leg of the target magnet, the L-shaped extension of the rigid support arch having a longer leg extending from the rigid support arch generally parallel to the long leg of the target magnet and a short leg extending from a distal end of the long leg generally parallel to the short leg of the target magnet, the short leg of the extension of the rigid support arch supporting an auxiliary therapeutic magnet; or

wherein at least one of the at least one target comprises the L-shape with an angle between a shorter leg and a longer leg of the L-shape wherein the shorter leg is configured to be bonded to and extend briefly lingually away from the crown of an associated target tooth of an associated patient and wherein the longer leg is configured to extend, at an angle, away from the shorter leg and approximating a local contour of a bony palate of the associated patient until a distal end of the longer leg reaches beyond a vertical location of a center of resistance in a root of the target tooth; and wherein

the rigid support arch is configured to support a therapeutic magnet corresponding to and for magnetic attraction to the target magnet at the distal end of the longer leg of the target magnet centered on and aligned horizontally in line with a point beyond the center of resistance, closer to root end of the target tooth, whereby a force formed due the magnetic interaction between the therapeutic magnet and target magnet would act in a direction horizontally through the center of resistance; or

wherein the rigid support arch is configured to change the position of teeth and has extensions which hold labial veneers which are connected to each other thereby mimicking the final position of the teeth.

15. A method for performing an orthodontic procedure comprising using the orthodontic appliance system as set forth in any preceding claim.