MUSCLE ANCHORAGE APPLIANCE

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This invention relates to a dental appliance for therapeu
tic treatment of misaligned teeth or malocclusion, and par
ticularly to an orthodontic device designed primarily to move upper molars in a distal direction and at the same
time reduce a protrusion.

Among the principal disadvantages of orthodontic de
gives is the production of adverse reactions in some of the teeth in
the patient by the anchorage device employed. These
devices often are designed to produce constant pressures
in the teeth are too intense for the purposes sought to be ac
tomitted, or for only a limited por
tion of the day and night. As a consequence, the total
period of treatment of the malocclusion is considerably
prolonged. Some of these prior art devices are relatively
complicated mechanically, require considerable time for
installation and for periodic adjustment, and are unhy
genic because they are not removable by the patient for
frequently frequent cleaning purposes. Furthermore
most of the prior devices do not adequately develop the
underdeveloped or hypotonic lip generally prevalent in
protrusion cases. As a result, final retention is not ac
complished. Mouth breathing is associated with a hy
potonic lip as the latter prevents a lip seal. Mouth bre
athing gives an "adnomial look" and patients who are mouth
breathers are more susceptible to upper respiratory in
fections and periodontal difficulties than non-mouth
breathers.

Accordingly, it is an important object of this invention
to provide a dental appliance for the treatment of mis
aligned teeth which will not produce adverse reactions in
other teeth of the patient.

Another object of this invention is to provide an ortho
dontic device wherein the pressure for tooth movement is
supplied by the patient's lip, which also is muscularly
developed thereby.

A further object of this invention is to provide a device
for the treatment of malocclusion, development of a hy
potonic lip, and prevention of mouth breathing which
continuously applies light, intermittent pressures to the
teeth to be moved, during both the waking and the sleep

Still another object of this invention is to provide a
dental appliance for the treatment of misaligned teeth
which is capable of speedy installation and periodic ad
justment.

It is a further object of this invention to provide an
orthodontic device which is removable by the patient, is
readily cleaned for hygienic purposes, and is again readily
installed by the patient.

Additional objects will become apparent from the fol
lowing description, which is given primarily for purposes
of illustration, and not limitation.

Stated in general terms, the objects of this invention
are attained by the provision of a dental appliance which
includes a pressure member such as a pressure pad or
shield, made of plastic material, such as polyethylene, and
adapted for insertion in a person's mouth, above or below
the front teeth. The pressure member is provided with a
wire, preferably embedded in the pressure member and
adapted for connection to the teeth on either side of an
upper or lower, dental arch, preferably the molars on
either side of a dental arch, such as by the use of auxiliary
buccal tubes and tooth bands. The installation of the wire
on the teeth on each side of a dental arch is adjusted so
that the pressure member is positioned slightly in front
of the alveolar tissue of the patient so that the patient can
apply pressure to the pressure member with his lips. Resil
ient means, such as pressure coils or springs are mounted
on the embedded wire or formed in the wire, on either
side of the pressure member to modify the pressure ap
plied to the pressure member by the patient's lip.

A more detailed description of specific embodiments of
the invention is given below with reference to the ac
companying drawings, wherein:

FIG. 1 is an isometric view showing the pressure mem
ber with a wire embedded therein;

FIG. 2 is a cross-sectional view of the pressure mem
ber of FIG. 1 taken along line 2--2;

FIG. 3 is a front elevational view showing the pres
sure member with embedded wire, pressure coils and

dimplable stops mounted on the embedded wire;

FIG. 4 is a similar view showing the device of FIG. 3
with the addition of mounted buccal tubes and molar
bands and the pressure coils opened for installation in
a patient's mouth;

FIG. 5 is a partial isometric view showing the ortho
dontic device installed upon an upper dental arch with
the buccal tubes anchored upon molars for distal driving
thereof;

FIG. 6 is a partial side elevational view of a patient's
head schematically showing the upper and lower dental
arches in a case of malocclusion and showing the ortho
dontic device operatively installed upon the upper dental
arch;

FIG. 7 is an isometric detail view of the orthodontic
device showing the lower side thereof in exploded, dis
assembled form and showing the upper side thereof in
assembled form;

FIG. 8 is a front elevational view showing an alterna
tive embodiment of the pressure member with embedded
wire and mounted buccal tubes and molar bands, wherein

the embedded wire is coiled to provide its own pressure
coils; and

FIG. 9 is a partial isometric view showing the ortho
dontic device of FIGS. 1 to 7 modified by the addition
of an accessory elastic band over the front teeth.

The pressure member, pad or shield 10 is shaped, con
toured or prefomed to fit inside the patient's lip and over
the alveolar tissue. The shape is, in general terms, a

flat peanut or flat, elongated kidney shape, as shown in
the drawings. Pressure member 10 is made of a plastic
material which can be contoured to shape by simple finger
pressure. Pressure member 10 should be relieved for the
frustum and should extend from the mesial of the cuspid
to the mesial of the cuspid. Polyethylene has been found
to be a very satisfactory plastic material, but many other
plastic or flexible materials can be used with equal or
greater satisfaction. Silicone rubber and acrylic resins
are examples of other suitable materials.

Wire 11 is embedded in pressure member 10, and pref
erably extends linearly through the length of the pressure
member to extend thereon at either end in sections 12
and 13. Compensatory bends 15 and 16 are made in wire
ends sections 12 and 13, respectively, close to the corre
sponding ends of pressure member 10. The rigidity of
the wire maintains the plastic pad in contoured position
after it has been contoured by the fingers. As the pres
The appliance is hygienic because it can be removed by the patient, cleaned, and reinserted by the patient. As the pressure member is urged by the lip, back and forth against the labial tissue many times during the waking hours, the resulting light intermittent forces drive the molars distally in a bodily movement, and this same repetitive force acting over the roots of the anterior teeth reduces the protrusion progressively in a bodily manner.

In an alternative embodiment of the appliance of the invention shown in FIG. 8, the extending end sections 32 and 33 of embedded wire 34 are adapted to provide their own modifying or cushioning pressure without the use of auxiliary coils. This is accomplished by providing wire end section 32 with three loops or coils 36, 37 and 38 and similarly providing wire end section 33 with the loops 39, 40, 41, 42 and 43. Loops 38 and 41 are used for front elasticity. The appliance is installed in the patient’s mouth as described above in connection with the embodiment of FIGS. 1 to 7, with the aid of buccal tube-molar band assemblies 43–44 and 45–46. The desired one or two millimeter positioning of pressure member 42 in front of the labial tissue is produced by opening loops 36 and 39 and the proper amount to thus activate the appliance.

An accessory attachment 47 for the anterior teeth can be added to the dental appliance as shown in FIG. 9. The attachment 47 is an elastic band used to aid in correcting malocclusion or protrusion cases. Band 47 is mounted in hooks 48 and 49 connected to wire end sections 51 and 52, respectively. Double buccal tube 53 and 54 also can be used for such auxiliary, or additional auxiliary attachments. The hooks 48 serve various anchoring functions, such as, anchoring the cervical claw to a neck band or a class II elastic which is an elastic from the hook to the buccal tube. It will be seen that the dental appliance of this invention does not interfere in any manner with other mecanico-therapy used to supplement the therapy of the instant orthodontic device.

Obviously, many other modifications and variations of the present invention are possible in the light of the teachings given hereinabove. It is, therefore, to be understood that, within the scope of the appended claims, the invention can be practiced otherwise than as specifically described.

What is claimed is:

1. An orthodontic appliance which comprises a pressure member of plastic-like material and arch-shaped to conform to part of a patient’s mouth arch, said member being adapted for disposition in front of the alveolar tissue of the patient’s mouth, means to maintain the arch shape of said pressure member comprising a connector element attached to said pressure member and having end sections extending from either side of the pressure member, buccal located attachment means for slidably and loosely connecting the respective end sections of the connector element to a posterior tooth on either side of a patient’s dental arch, and coil spring means mounted on the respective end sections of the connector element on either side of the pressure member between the pressure member and said attachment means for receiving and transmitting pressure created by the patient’s lip engaging the pressure member.

2. An orthodontic appliance which comprises a pressure member of plastic-like material which can be contoured to fit in a patient’s mouth in front of the alveolar tissue, a wire element embedded in the pressure member of sufficient flexibility to maintain the flexible pressure member in any desired contoured shape and having an end section extending from opposite ends of the pressure member, posterior tooth buccal attachment means for slidably connecting the respective end sections of the wire element to a posterior tooth on either side of a patient’s dental arch, and coil spring means mounted on the respective wire end sections on either side of the pressure member for cushioning pressure applied to the pressure member by a patient’s lip and transference thereof to respective posterior teeth on either side of a patient’s dental arch to which the wire end sections are connected.

3. A dental appliance for treatment of protrusion cases which comprises a pressure member of plastic-like material adapted to fit in front of the alveolar tissue behind a patient’s lip, a wire element embedded in the pressure member to extend therethrough and including wire end sections extending from either side of the pressure member, buccal attachment means for a posterior tooth on either side of a patient’s dental arch, means for slidably and loosely engaging one of the wire end sections of the wire element on the attachment means on each side of the patient’s dental arch, coil spring means mounted on the respective wire end sections intermediate the buccal members and the pressure member and pressure applied to the pressure member by the patient’s lip and transference thereof to the tooth on either side of a patient’s dental arch.
4. A dental appliance according to claim 3, wherein the coil spring means are fixed in position on the wire end sections by crimpable stop means.

5. A dental appliance according to claim 3, wherein the coil spring means are adjustably held in position on the wire end sections by a barb on said sections.

6. A dental appliance according to claim 3, wherein said pressure member is made of polyethylene.

7. A dental appliance according to claim 3 including adjusting means supported on each of said wire end sections for adjusting the resiliency of the respective coil spring means.

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