

Sept. 1, 1970

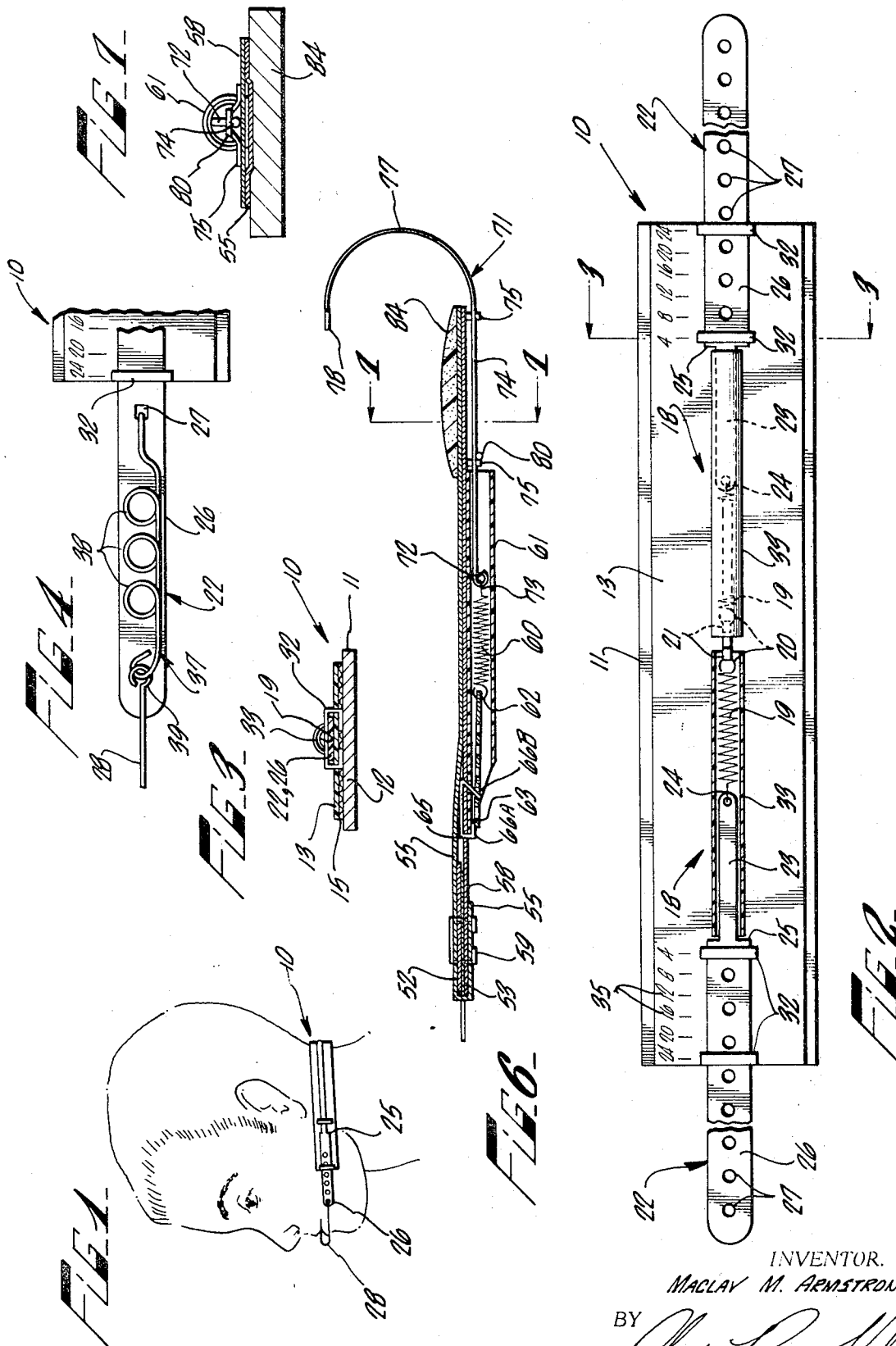
M. M. ARMSTRONG

3,526,035

ORTHODONTIC HEADGEAR

Original Filed Dec. 23, 1968

2 Sheets-Sheet 1



INVENTOR.

MACLAY M. ARMSTRONG

BY

Christie, Parker & Hale
ATTORNEYS

Sept. 1, 1970

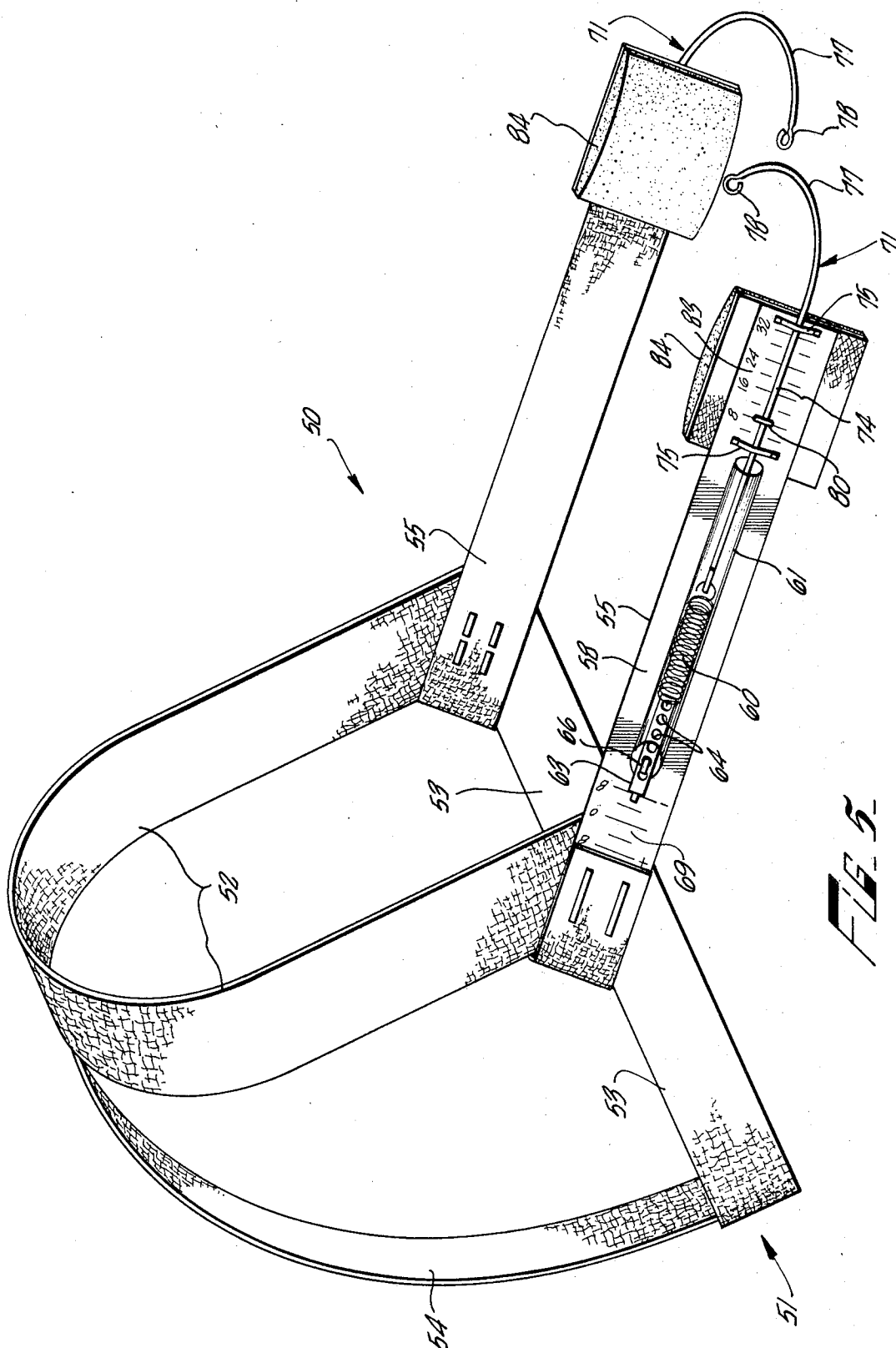
M. M. ARMSTRONG

3,526,035

ORTHODONTIC HEADGEAR

Original Filed Dec. 23, 1968

2 Sheets-Sheet 2



1

3,526,035

ORTHODONTIC HEADGEAR

Maclay M. Armstrong, 2312 NW. 199th,
Seattle, Wash. 98177

Continuation of application Ser. No. 786,329, Dec. 23,
1968. This application Aug. 12, 1969, Ser. No. 857,532

Int. Cl. A61c 7/00

U.S. Cl. 32-14

26 Claims

ABSTRACT OF THE DISCLOSURE

An orthodontic extraoral headgear using wire coil springs to apply corrective forces to a patient's teeth or jaws. A force scale is positioned adjacent each spring to provide a direct-reading indication of spring restoring force for any given spring elongation. Means are provided to prevent both longitudinal and rotational distortion of the springs.

This application is a continuation of Ser. No. 786,329 filed Dec. 23, 1968 and is now abandoned.

BACKGROUND OF THE INVENTION

Orthodontics is a specialized branch of dentistry dealing with treatment of malpositioned teeth and correction of improper relationships between the upper and lower dental arches. Orthodontic treatment is effected by application of mechanical force to selected teeth, or to an entire jaw when a malocclusion involving a full dental arch is to be corrected. Many different types of intraoral appliances are available for mounting directly on the patient's teeth, and resilient wires or elastic bands are typically used to provide corrective forces urging malpositioned teeth into correct alignment.

An orthodontic headgear is an extraoral appliance which includes a strap or series of straps configured to fit around the back of the patient's head or neck. A headgear is typically used when it is necessary to apply a traction or posterior force to teeth. Headgears which are presently in common use employ elastic bands or straps (of rubber, latex, or similar elastomers) which are elongated and coupled to the teeth (usually through a wire face bow) to deliver the desired traction force.

When an upwardly directed traction force is desired, the headgear usually includes a series of straps forming a partial cap fitting over the top and back of the patient's head to provide an occipital anchorage. When the upwardly directed or "high pull" traction force is unnecessary, a more comfortable neck strap is used to provide a cervical anchorage. The term headgear as used in this application refers to a strap or series of straps configured for either occipital or cervical mounting.

Known types of orthodontic headgears present several problems to the orthodontist. A major difficulty is that the rubber, latex or plastic elastic bands normally used to provide a traction force have a short life and are elastically unstable. The restoring force delivered by a rubber elastic band for any given elongation drops off quite rapidly with time, and the patient must be instructed to replace the bands frequently during use of the headgear. Elastic straps used in neck straps also require frequent replacement by the orthodontist, and have a markedly unstable elasticity and restoring force while in use.

A key factor in effective orthodontic treatment is the ability to apply a known, relatively constant corrective force in a desired direction. This goal is difficult to achieve with conventional headgears using elastic bands because the orthodontist must rely on complete patient cooperation with respect to frequent replacement of the bands.

2

Many children are careless in following instructions on band replacement, and the orthodontist thereby partially loses control of his treatment program. Even if the patient is fully cooperative, the relatively rapid decrease in restoring force of elastic bands with time is another factor which prevents delivery of the desired relatively constant corrective force.

Another problem presented by conventional headgears is the difficulty involved in measuring the exact traction force delivered to the teeth for any given elongation of the elastics. Force gages are normally used for this measurement, but they are relatively difficult and time-consuming to manipulate if an accurate measure of restoring force is to be obtained. Even when an accurate measurement is achieved, the orthodontist's confidence in his treatment program is not greatly strengthened because he knows that the elastic-band restoring force will decrease in an only partially predictable way within hours of making the measurement.

The orthodontic headgear of this invention overcomes these problems, and permits application of a stable selectable force, the magnitude of which can be determined at a glance. Wire coil springs are used in place of the traditional rubber elastic bands, and the restoring force of the springs is very stable and predictable over long periods of use. Preferably, two springs are provided on each headgear to deliver equal bilateral corrective forces, and the springs are housed in individual plastic tubes for protection against distortion, and to prevent entanglement with the user's hair. A force scale is provided adjacent each spring, and the orthodontist can determine at a glance the restoring force exerted by the springs.

A coupling member is used to connect each spring to an intraoral appliance such as a face bow, or an auxiliary extraoral appliance such as a chin cap. An anti-rotation means such as a laterally extending bar is mounted on the coupling member to prevent rotation of the coupling member which would result in winding or unwinding of the spring and consequent rotational distortion. Children tend to toy with and mishandle this type of appliance, and it is important to provide the rotation stop to maintain structural integrity and reproducible force characteristics of the spring. Stops are also provided to prevent overelongation and consequent distortion of the spring.

A significant feature of the invention is that the orthodontist can quickly and precisely adjust the amount of force to be applied by the springs. In the past, it has been necessary to change or vary the number of elastic bands, or to vary the length of adjustable elastic straps to adjust the corrective force applied to the patient's teeth. Each such adjustment is followed by a time-consuming measurement by a separate force gage. This is a slow, trial and error process which requires considerable time to achieve a desired setting. My headgear, on the other hand, permits quick and easy selection of a desired traction force, and the selected force will be accurately maintained as the wire coil springs are not subject to the aging and creep problems exhibited by elastic bands.

SUMMARY OF THE INVENTION

Briefly stated, the invention contemplates an orthodontic headgear for mounting on a patient's head to apply calibrated traction force in orthodontic treatment. The headgear includes a strap member configured to fit on the occipital or cervical regions of the back of the head. A resilient means is mounted on the strap member, and is adapted to produce a predictable and repeatable restoring force upon elongation. A coupling member is attached to and extends from the resilient means to be movable with respect to the strap member as the resilient means is elongated. The coupling member is adapted for attachment

3

to an orthodontic appliance such as a face bow or wire hook. A marking means is carried by a strap member or the coupling member, and defines a force scale which co-operates with an index means on the other member to indicate the amount of restoring force exerted by the resilient means for a given elongation.

Preferably, the resilient means comprises a pair of coil springs disposed on opposite sides of the strap member to extend along the sides of the patient's face toward the mouth. Each spring has an anchored end secured to the strap member, and a free end which is movable with respect to the strap when the spring is elongated. The coupling members are secured to the free ends of the springs. Preferably, a guide means is associated with each coupling member for aligning and guiding the coupling member on the strap, and for preventing rotation and overelongation of the spring. In one form, an adjustable biasing means connects the anchored end of each spring to the strap member, and is adapted for varying the initial elongation of the spring. A second marking means is associated with the biasing means, and defines a biasing force scale indicating correction factors to be applied to the main-force-scale reading.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a patient wearing a cervical-neckband headgear according to the invention;

FIG. 2 is a plan view of the neckband;

FIG. 3 is a view on line 3—3 of FIG. 2;

FIG. 4 is a plan view of a portion of the headgear showing an optional severable link for adjusting spring force;

FIG. 5 is a perspective view of a headgear according to the invention in the form of a high-pull occipital head strap;

FIG. 6 is a top cross-sectional view of a portion of the headgear shown in FIG. 5; and

FIG. 7 is a view on line 7—7 of FIG. 6.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1—3, an orthodontic headgear 10 in accordance with the invention is shown in the form of a neckband adapted for mounting around the back of a patient's neck as shown in FIG. 1. The headgear includes a generally rectangular strap member 11 having an inner cushioned pad 12 covered with a smooth material such as woven nylon or satin which will be comfortable against the patient's skin. A spring-carrying strip 13 of a flexible material such as nylon plastic is fastened to the outer surface of pad 12.

The strip and pad may be permanently secured together by glue, staples, or any other conventional means, but preferably these components are releasably secured together by a fastening means such as a fabric fastener 15 (as sold under the trademark "Velcro"). Hooks, snaps, or other forms of conventional fasteners can also be used to secure the spring-carrying strip releasably to the cushioned pad.

A pair of spring assemblies 18 are mounted on strip 13 and extend from opposite ends of strap member 11. Each spring assembly includes a coil spring 19 which is preferably formed of stainless-steel wire. An anchored end 20 of each spring is secured in place by a staple 21 which passes through spring-carrying strip 13 as best seen in FIG. 2. Each spring assembly further includes a coupling member 22 preferably formed of a strip of plastic material such as nylon.

Each coupling member has a narrow end 23 which is connected to a free end 24 of a respective spring 19. The narrow end of the coupling member terminates at a shoulder 25, and a wider portion 26 of the member extends longitudinally beyond the end of strap member 11. A plurality of longitudinally spaced holes 27 are formed through the wider portion of the coupling member, and an orthodontic appliance such as a face bow 28 (see FIG. 1) is hooked through a selected one of the holes.

4

A guide means such as a pair of longitudinally spaced staples 32 is associated with each spring assembly to guide and control the motion of coupling member 22 as the spring is elongated. A tubular shield 33 is disposed around each spring 19, and is preferably formed of a flexible, smooth plastic material such as sold under the trademark "Teflon" which presents low frictional drag to the spring during elongation. The shield prevents manipulation or distortion of the spring by the patient, and also keeps the patient's hair from becoming entangled between the spring coils.

A force scale 35 is printed or stamped on spring-carrying strip 13 between each set of staples 32. The force scale is normally graduated in ounces, and indicates the restoring force exerted by spring 19 for any given elongation. This restoring force acts on the patient's teeth through the coupling member and face bow, and urges the patient's teeth toward a desired correct alignment.

Shoulder 25 on the coupling member provides an index or marker against which the scale is read. That is, if shoulder 25 is directly below the figure "12" in the scale, the spring has been elongated to a point which provides a restoring force of twelve ounces. The scale can also be mounted or printed on the coupling member to be aligned with a suitable index marker or lubber line on strip 13 or the underlying cushioned pad.

As best seen in FIG. 3, coupling member 22 is non-circular and preferably rectangular in cross section, and is confined by staples 32 against complete rotation. Any twisting forces imposed by the patient on the coupling member are thereby isolated from the coil spring, and rotational distortion of the spring through twisting or untwisting is prevented. Longitudinal overelongation of the spring is prevented by staple 32 which is adjacent tubular shield 33. This staple abuts the coils at the free end of the spring when the spring is fully elongated within the tubular shield, and thereby prevents an overelongation which would cause a permanent longitudinal distortion or set.

In use, headgear 10 is positioned as shown in FIG. 1 with strap member 11 extending around the back of the patient's neck. The extraoral ends of face bow 28 are hooked through holes 27 selected to produce the desired amount of restoring force from the springs. This force is read by the orthodontist directly on force scale 35, and there is no need to employ auxiliary force-measuring instruments. The extraoral arms of face bow 28 may be bent slightly if desired to position each of the arm ends in selected holes 27 which provide precisely the desired amount of restoring force. Any excess length of strip 22 can be snipped off and discarded.

Alternatively, an auxiliary coupling appliance 37 of adjustable length may be used to connect face bow 28 to coupling member 22. Appliance 37 is made of dead-soft stainless-steel wire formed into a plurality of longitudinally spaced loops 38. One end of appliance 37 is hooked through a selected hole 27 in the coupling member, and the other end of the appliance is fastened over a hook 39 at the extraoral end of face bow 28. If a greater force is required, one or more loops 38 are either moved together or snipped off by the orthodontist to shorten the auxiliary coupling appliance and the appliance is re-engaged with hook 39 of the face bow. The auxiliary coupling appliance is thus a severable linkage which is adjusted in length by re-forming or snipping off loops 38 until a desired elongation of each spring 19 is achieved.

Headgear 10 tends to be self-centering on the patient's neck so equal restoring forces are applied by each spring to the face bow. As tooth movement begins in response to the applied corrective force, the elongation of springs 19 will gradually decrease. The resulting decreased restoring force is immediately apparent to the orthodontist by simply glancing at the position of shoulder 25 with respect to force scale 35. Any desired adjustments in

restoring force are quickly achieved simply by coupling face bow 28 to another hole 27 in the coupling member, or by reforming or removing a loop 38 in auxiliary coupling appliance 37.

The wire coil springs used in headgear 10 provide an accurately predictable and repeatable restoring force for any given elongation over long periods of time. Cushioned pad 12, however, may require replacement after some months of use if it becomes badly soiled, creased or torn. When such replacement is necessary, the cushioned pad is removed by separating fastener 15, and a new cushioned pad is installed on the fastener which is carried by spring-carrying strip 13. A major part of the headgear is thus useful during the full term of orthodontic treatment, and only the cushioned pad need be replaced if wear or soiling occurs.

Another form of an orthodontic headgear 50 in accordance with the invention is shown in FIGS. 5-7. This form of headgear is useful in applications where the corrective force is to be directed upwardly as well as rearwardly with respect to the patient's teeth. Such "high pull" headgears have been in use for many years, but these known units have not incorporated resilient elongatable units providing a stable and predictable restoring force, nor have they provided a force scale for immediate indication of the magnitude of restoring force.

Headgear 50 includes a strap member 51 having a looped upper strip 52 and a looped lower strip 53 configured to fit respectively around the top and back of the patient's head. The upper and lower strips are joined at their midpoints by a vertically extending strip 54. A forwardly extending strip 55 is secured to the junction of upper and lower strips 52 and 53 on each side of the strap member. The several strips are secured together by stapling, heat sealing, or any other convenient conventional means, and are formed of a flexible webbing such as belting material or a similar woven stock.

A spring-carrying strip 58 of a material such as nylon plastic overlays strip 55 and is secured by a staple 59 or other conventional fastening means to the junction of strips 52, 53 and 55 on each side of the headgear. A wire coil spring 60 surrounded by a tubular shield 61 is disposed centrally on each spring-carrying strip. An anchored end 62 of spring 60 is coupled to one end of an elongated adjusting tab 63 having a plurality of holes 64 along its length. A fastening means such as a staple 65 extends through strip 58, and has an outwardly extending end 66 which passes through the rear end of tubular shield 61 to hold the shield in place. End 66 of the staple also passes through a selected hole 64 in adjusting tab 63 to secure the anchored end of the spring to strip 58. A second end 67 of the staple extends over the rear end of tubular shield 61 to hold the shield in place against strip 58.

A biasing force scale 69 is stamped or printed on strip 58 adjacent the rear end of adjusting tab 63. In the form shown in FIG. 5, the biasing force scale has graduations equal to four ounces of restoring force, and the scale has a total range of plus-or-minus eight ounces around a central zero marking. The rear end of adjusting tab 63 is viewed against the graduation of the biasing force scale to determine bias force as explained below.

A wire coupling member 71 is associated with each coil spring 60 in headgear 50. Coupling member 71 has a hook 72 at a rear end thereof to engage a looped free end 73 of spring 60. A straight portion 74 of the coupling member extends forwardly from hook 72 and passes through a guide means formed by a pair of longitudinally spaced staples 75 secured to strip 58.

Staples 75 are bowed outwardly from the outer surface of strip 58 as best seen in FIG. 7 to permit free longitudinal movement of coupling member 71 and to confine the coupling member against lateral motion. An inwardly curved portion 77 of the wire coupling member extends forwardly from straight portion 74 toward the patient's mouth, and portion 77 terminates in an eye 78 or other conventional fastener. Eye 78 is connected to either an

intraoral orthodontic appliance (not shown) such as a hook mounted on a tooth band, or to a face bow member (not shown) extending from the patient's mouth.

An antirotation wire bar 80 is soldered or welded to coupling member 71 between staples 75, and extends laterally across the coupling member. Bar 80 prevents complete rotation of the wire coupling member by abutting strip 58 after the coupling member is rotated approximately 45 degrees in either direction. Twisting or untwisting of the spring due to careless handling by the patient is thereby prevented, and the spring is still free to rotate within a limited range during engagement of eye 78 with the intraoral appliance being used.

Bar 80 cannot pass through either of staples 75, and therefore also provides a stop against forces tending to distort the spring by overelongation. That is, forwardmost staple 75 is positioned such that it will abut and restrain further forward motion of bar 80 before spring 60 is elongated to an extent causing permanent distortion.

A force scale 83 is stamped or printed on spring-carrying strip 58 between staples 75. Wire bar 80 serves as a pointer or index on the scale, and the amount of restoring force exerted by spring 60 for any given elongation is determined by reading the position of the wire bar against the force scale. A cheek pad 84 is secured to the underside of the forward end of each strip 55, and is covered with a smooth fabric which will be comfortable against the patient's cheek.

In use, headgear 50 is mounted on the patient's head, and eyes 78 are coupled to an intraoral appliance (not shown). Curved portions 77 of the wire coupling members are bent until springs 60 are elongated to provide a desired restoring force as indicated on the force scale. Alternatively and preferably, the amount of restoring force can be adjusted without bending the coupling members by adjusting the position of tab 63 on end 66 of staple 65.

For example, if an initial positioning of the headgear on the patient produces a restoring force (acting on the intraoral appliance) which is eight ounces higher than desired, the adjusting tab is positioned as shown in FIG. 5 to be in alignment with "8" marking on the biasing force scale. This forward translation of the adjusting tab reduces the elongation of the spring to an extent necessary to produce an eight-ounce reduction in restoring force.

Whenever the rear end of tab 63 is offset from the zero position on the biasing force scale, the two scales are read together, and the indicated biasing force is added to or subtracted from the reading force scale 83 to measure the total restoring force being exerted on the patient's teeth. Tab 63 can also be used in the course of orthodontic treatment to maintain in a constant restoring force as the teeth shift in position in response to the corrective force.

The springs used in either of the orthodontic headgears described above may be wound with initial tension if desired to provide an initial restoring force of say four to eight ounces upon a very slight elongation of the spring. Use of initial tension is desirable in many cases as it provides high restoring forces with only relatively small elongation of the spring. Alternatively, the springs can be configured to be slightly elongated when the overelongation stop is against the rear staple, such that an initial restoring force must be overcome before the coupling member can be moved forwardly.

There has been described several forms of an orthodontic headgear in which wire coil springs are used in place of conventional elastic bands to provide a corrective orthodontic force. Such springs are characterized by long life and a substantially constant restoring force in contrast to the rapidly changing force characteristics of elastic bands. As used in the several forms of headgears, the springs are protected against overelongation or rotational distortion, and the use of tubular shields further protects the springs against entanglement with the patient's hair or

7

deformation through careless handling of the patient. The use of force scale on the headgear permits an immediate readout by the orthodontist of the amount of restoring force being applied, and the need for cumbersome and time-consuming force measurement with external gages is eliminated.

The orthodontist's control of the treatment program is also substantially improved as he need no longer rely on the patient to change elastic bands on a daily basis. The optimum force for desired tooth movement or orthopedic correction is easily and quickly selected by the orthodontist on a custom basis for each patient. Furthermore, a smaller number of headgears need be stocked by the orthodontist because the corrective force is readily adjusted and is not fixed at a single value or limited range of values. The graduated and calibrated force system herein disclosed has been described in terms of its use in specific low-pull and high-pull headgears, but the system is of course equally useful in mid-pull units or other styles of headgears.

What is claimed is:

1. An orthodontic headgear for mounting on a patient's head and/or neck to apply traction force in orthodontic treatment, comprising:

a strap member configured to fit on the back of the head and/or neck;

resilient means mounted on the strap member and adapted to produce a predictable and repeatable restoring force upon elongation;

a coupling member attached to and extending from the resilient means to be movable with respect to the strap member as the resilient means is elongated, and adapted for attachment to an orthodontic appliance;

marking means on one of the members and defining a force scale; and

index means on the other member and adjacent the marking means to indicate on the force scale the amount of restoring force exerted by the resilient means for a given elongation.

2. The headgear defined in claim 1 and further comprising guide means on the strap for aligning the strap and coupling member, and for preventing complete rotation of the coupling member.

3. An orthodontic headgear for mounting on a patient's head and/or neck to apply traction force in orthodontic treatment, comprising:

a strap member configured to fit on the head and/or neck;

a pair of coil springs disposed on the strap member, each spring having an anchored end to be secured to the strap member and a free end which is movable with respect to the strap when the spring is elongated;

a fastening means associated with each spring and connecting the anchored end to the strap;

a pair of coupling members connected respectively to the free ends of the springs to extend on opposite sides of the head, the coupling members being adapted for connection to an orthodontic appliance; and

marking means on the strap member and defining a force scale indicating a restoring force exerted by at least one of the springs undergoing elongation when the headgear is in place and connected to the intraoral appliance.

4. The headgear defined in claim 3 and further comprising guide means associated with each coupling member for aligning and guiding the coupling member on the strap, and for preventing rotation of the coupling member with respect to the strap whereby rotational distortion of the springs is prevented.

5. The headgear defined in claim 4 in which the guide means is arranged to limit elongation of the springs to a predetermined amount whereby overelongation and longitudinal distortion of the springs is prevented.

8

6. The headgear defined in claim 4 in which the coupling members have a non-circular cross section, and in which the guide means includes a clip secured to the strap and extending over the coupling member to prevent rotation thereof.

7. The headgear defined in claim 4 in which the guide means includes a pair of spaced-apart clips secured to the strap over the coupling member, and a bar secured to and extending laterally from the coupling member between the clips to prevent rotation of the coupling member and overelongation of the associated spring.

8. The headgear defined in claim 4 in which a tubular shield is disposed around each spring.

9. The headgear defined in claim 4 in which each coupling member includes a link of selectable length for adjusting the degree of elongation of the associated spring when the headgear is in use.

10. The headgear defined in claim 4 in which the strap member includes a removable portion which carries the springs and coupling members.

11. The headgear defined in claim 4 and further comprising adjustable biasing means connecting the anchored end of each spring to the strap member for varying spring tension.

12. The headgear defined in claim 11 and further comprising a second marking means associated with the biasing means and defining a biasing force scale.

13. The headgear defined in claim 12 and further comprising a tubular shield disposed around each spring.

14. An orthodontic headgear for mounting on a patient's head and/or neck to apply traction force in orthodontic treatment, comprising:

a support member configured to fit on a patient's head, and/or neck,

resilient means associated with the support member and adapted to produce a predictable and repeatable restoring force,

coupling means in force applying relationship with the resilient means and adapted to be movable with respect to the support member as the resilient means is activated to produce said restoring force, said coupling means adapted for attachment to an orthodontic appliance,

indicia means defining a force scale associated with said headgear,

indicator means operatively associated with said headgear,

said indicator means in adjacent relationship with said indicia means to indicate on said force scale the amount of restoring force exerted by the resilient means upon a given amount of movement of said coupling means,

whereby the treatment of the patient is controlled and accurate through the application of a known and stable force.

15. The headgear is defined in claim 14 and further comprising means to adjust the restoring force to be exerted by the resilient means for a predetermined movement of said coupling means, whereby the restoring force is selectable.

16. The headgear as defined in claim 14 and further comprising guide means for maintaining the position relationship between the coupling means and the resilient means.

17. The headgear as defined in claim 14 wherein said resilient means and said coupling means are located externally of said support member.

18. An orthodontic headgear adapted to be mounted on a patient's head and/or neck to apply a corrective force in orthodontic treatment comprising:

support means configured to engage the head and/or neck of a patient,

spring means associated with said support means and adapted to produce a predictable and repeatable restoring force,

coupling means in force applying relationship with said

spring means and adapted to be movable with respect to said support means and adapted to engage an orthodontic appliance,

indicia means associated with said headgear so as to be visible and defining a force scale,

indicator means associated with said headgear having at least a portion thereof visible,

said indicator means and said indicia means positioned on said headgear in relation to one another, said support means, said resilient means and said coupling means so as to indicate on said force scale the amount of restoring force exerted by the resilient means in response to movement of said coupling means,

whereby the treatment of the patient is controlled and accurate through the continued application of a known and stable force.

19. An orthodontic headgear as defined in claim 18 and further including guide means for aligning the resilient means and the coupling means.

20. An orthodontic headgear as defined in claim 18 and further comprising means to adjust the restoring force exerted by the resilient means in response to movement of said coupling means, whereby said restoring force is selectable.

21. An orthodontic headgear for applying corrective forces to a patient undergoing orthodontic treatment comprising:

support means adapted to fit a patient's head and/or neck,

resilient means having one end fixed against movement with respect to said support means, and adapted to produce a restoring force,

coupling means having an end portion thereof in force applying relationship with the other end of said resilient means, the other end portion of said coupling means adapted to engage an orthodontic appliance, and said coupling means adapted to be movable with respect to said support means,

indicia means positioned on said headgear and defining a force scale,

indicator means positioned on said headgear adjacent said indicia means so as to indicate on said force scale the amount of restoring force exerted by said resilient means in response to movement of said coupling means,

one of said indicia means and indicator means being in operative relationship with said spring means, whereby the treatment of the patient is controlled and accurate through the continued application of a known and stable force.

22. The orthodontic headgear as defined in claim 21 and further comprising guide means attached to said support means and adapted to maintain the position relationship between said resilient means and said coupling means.

23. The orthodontic headgear as defined in claim 21 wherein the resilient means and said coupling means positioned on said headgear externally of said support means.

24. An orthodontic headgear as defined in claim 21 and further comprising means to adjust the restoring

force exerted by the resilient means in response to a constant movement of said coupling means whereby said restoring force is selectable.

25. An orthodontic headgear adapted to be mounted on a patient's head and/or neck to apply a corrective force during orthodontic treatment comprising:

support means configured to engage the rear of a patient's head and/or neck,

spring means having one end fixed with relation to said support means and adapted to produce a predictable and repeatable restoring force,

coupling means having one end thereof in force applying relationship with said spring means and adapted for movement with respect to said support means, said other end of said coupling means adapted to engage an orthodontic appliance,

indicia means on said support means defining a force scale,

indicator means on said coupling member 4 adjacent said indicia means so as to indicate on the force scale the amount of restoring force exerted by the resilient means upon movement of said coupling means,

whereby the treatment of the patient is controlled and accurate due to the application of a known and stable force.

26. An orthodontic headgear for mounting on a patient's head and/or neck to apply a known and stable corrective force throughout an orthodontic treatment period, comprising:

support means configured to fit a patient's head and/or neck,

guide means connected to said support means,

spring means mounted within said guide means, said spring means adapted to produce a predictable and repeatable restoring force,

coupling members in force applying relationship with said spring means and adapted to be movable with respect to said support means and adapted to engage an orthodontic appliance,

indicia means on said headgear defining a force scale means,

indicator means operatively associated with said coupling members and in adjacent relationship to said indicia means and adapted to indicate on said force scale means the amount of restoring force exerted by the resilient means in response to a given amount of movement of said coupling members,

whereby the treatment of the patient is controlled and accurate throughout the application of a known and stable force.

References Cited

UNITED STATES PATENTS

2,874,468	2/1959	Woskin.
3,203,099	8/1969	Interlandi.

ROBERT PESHOCK, Primary Examiner