April 18, 1967 J. M. RUBIN 3,314,151

ORTHODONTIC FACE BOW AND METHOD OF MAKING SAME

Filed March 26, 1964

Fig. 1.

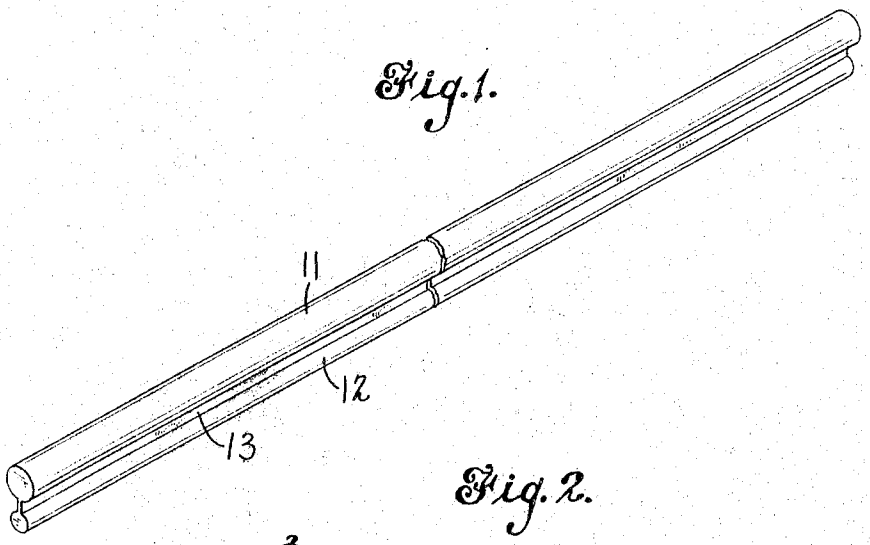


Fig. 2.

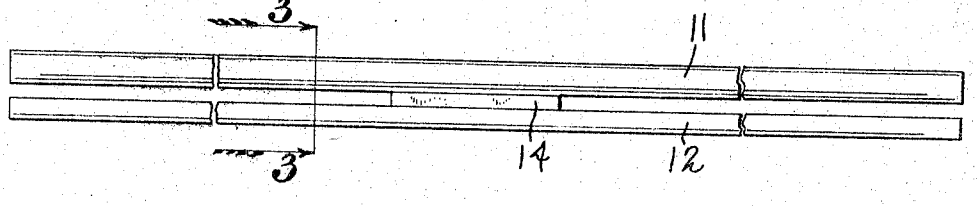


Fig. 4.

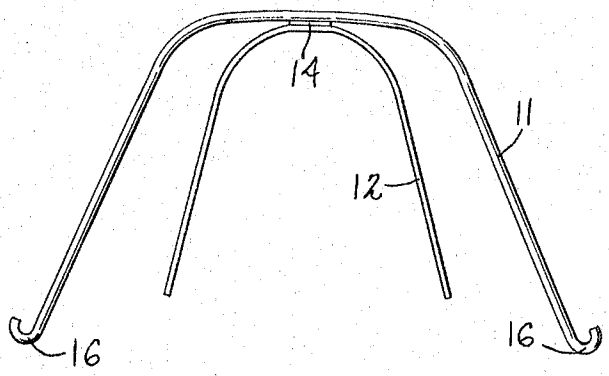
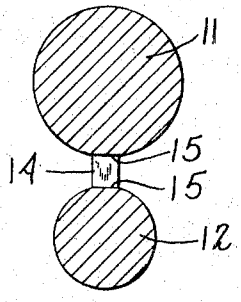


Fig. 3.



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ORTHODONTIC FACE BOW AND METHOD OF MAKING SAME

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This invention relates generally to an orthodontic face bow and is more specifically directed to a face bow of unitary construction.

Face bows are in general use in orthodontics for the distal movement of teeth. In contradistinction to the usual type of orthodontic appliance, which is placed wholly within the patient's mouth, face bows are carried externally and have portions thereof extending into the patient's mouth. For this reason, face bows are generally worn when the patient is at home and when the patient is sleeping.

The face bow usually consists of an inner arch wire and an outer arch wire joined together at the longitudinal centers of the arches. The inner arch wire engages the patient's teeth by means of buccal tubes or other known attachments and the wire forming the inner arch extends outwardly from the patient's mouth between his lips. Outside of the mouth the inner and outer arch wires are joined and the outer arch wire extends around the patient's face parallel to the cheeks. The outer arch wire is usually anchored to the patient's head by means of a suitable harness. A variety of extra oral head caps and cervical traction straps are in common use as harnesses for occipital anchorage. Since the face bow is firmly secured relative to the patient's head by the harness, all pressures and torques are applied to the particular teeth to which the inner arch wire is connected, to thereby urge these teeth in the desired direction.

It is readily understood in orthodontics that, while face bows are awkward and unsightly, their characteristics of operation are highly desirable. In the usual arch wire appliance, brackets or buccal tubes are attached to the teeth of both the upper and lower jaws and arch wires are secured in the brackets or tubes. If distal movement of the upper molars is desired, elastics are stretched from the anterior portion of the upper arch wire to the molars of the lower jaw, by means of hooks of attachments, using the lower jaw for anchorage. However, it will be readily seen that reaction forces are also applied to the lower jaw and, thus, undesired movement of the lower molar teeth or jaw may result. By the utilization of face bows, this is avoided, as the inner arch wire is only connected to the teeth which are to be distally driven, and the reaction forces are taken up by the harness about the head.

Face bows are most advantageously used to distally drive molars, which are multi-root teeth and usually require greater forces than the single-root teeth.

As stated above, known constructions of orthodontic face bows usually include an inner arch wire and an outer arch wire brazed or soldered together with or without a connector for joining the wires. Unfortunately, the heat from soldering or brazing tends to soften the wire, thereby reducing its resiliency. It will be readily appreciated that the resiliency of the wire is an important factor in the application of the straightening forces. Furthermore, experience has demonstrated that the wires tend to break in the area of the soldered or brazed connection, thus necessitating replacement or refabrication of the face bow.

Accordingly, it is an object of this invention to provide an orthodontic face bow having improved mechanical properties.

Another object of the invention is to provide an improved orthodontic face bow which does not require soldering or brazing for the joinder of the inner and outer arch wires.

Still another object of the invention is to provide an improved orthodontic face bow of one-piece construction.

A still further object of the invention is to provide an orthodontic face bow requiring no external means for connecting the inner and outer arch wires.

Still other objects and advantages of the invention will in part be obvious and will in part be apparent from the specification.

Generally speaking, in accordance with the invention, an orthodontic face bow is constructed by forming a single piece of metal into longitudinal portions defining a pair of wires and a connecting web of material. All but the longitudinal central portion of the web is subsequently removed to delineate the pair of wires spaced from one another and interconnected by the short segment of remaining web.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the invention, reference is had to the following description taken in connection with the accompanying drawing, in which:

FIG. 1 is a perspective, broken away, view of a strip of material representing the initial stage of fabrication of a novel orthodontic face bow;

FIG. 2 is a side elevational, broken away, view of the material of FIG. 1 from which a portion of the web has been removed;

FIG. 3 is an end elevational view, shown on an enlarged scale, of the element shown in FIG. 2; and

FIG. 4 is an elevational view of an orthodontic face bow formed in accordance with the invention.

Referring now to the dawings, a strip of material will first be formed into the configuration shown in FIG. 1. While any suitable material may be used, stainless steel is most commonly used in orthodontic appliances because of its strength and resiliency and because of its resistance to corrosion. 17–7 stainless steel has been found to give good results in face bow construction. The strip would be formed to delineate an outer arch wire **11** and an inner arch wire **12** with a web **13** extending therebetween. By way of example, the diameter of outer arch wire **11** would be .060" as compared with a diameter of .045" for the inner arch wire. The width of the web separating the arch wires would be .010" or greater. Many methods could be used to form the unitary strip depicted in FIG. 1. Such methods would include profile rolling, extruding, milling, forging, and the like. Any method capable of forming the material into the configuration shown, would be suitable.

Subsequently most of web **13** is cut away or removed to leave only a central web **14** interconnecting outer wire **11** and inner wire **12**. As will be readily appreciated, removal of the web sections can be easily accomplished by operations such as milling or sawing. After removal of the web section, an unbent face bow will emerge. The face bow appears as a pair of parallel, longitudinal wires, usually of different diameters, interconnected at the longitudinal center thereof by an integral web, as shown in FIG. 2.

On removal of the web sections, the substantially circular inner and outer arch wires will be provided with flats **15** as shown in FIG. 3. In cross section, the length of these flats will be equal to the thickness of web **14**. However, the occurrence of the flats does not in any way

affect the operation of the face bow. In fact, the wires in a face bow could have substantially any cross-sectional configuration although, in past practice, circular wire has generally been used. If desired, prior or subsequent to the removal of the outer web sections, the material may be tempered and/or stress-relieved to improve its mechanical properties.

The formed element is subsequently bent and shaped into an orthodontic face bow, sometimes known as an extra-oral labial bow, in accordance with the requirements of the particular patient. A typical face bow is shown in FIG. 4, wherein inner arch wire **12** has been bent for insertion into the patient's mouth and the ends of the inner arch wire have been trimmed as required. Outer arch wire **11** has also been bent to extend around the patient's face without making contact with the cheeks and the ends of the outer arch wire may be bent to form hooks **16** which will be utilized to attach the outer arch wire to a harness (not shown) worn by the patient. As harnesses form no part of the invention herein, no further description thereof is required. It will be readily understood by those skilled in the art, that the inner arch wire will engage the patient's teeth by means of buccal tubes or various well known attachments. For this reason, no further description of such attachments or accessories is deemed necessary.

It is contemplated that hooks, springs, loops and stops, all of which are known to those versed in the art, may be added to or integrally formed with the novel face bow, within the scope of this invention.

From the foregoing, it is quite apparent that an orthodontic face bow constructed as hereinabove described, will eliminate many of the problems presently encountered in the use of such devices in orthodontics. Failure of the soldered or brazed connection between the inner and outer arch wires will no longer be a problem. Also, the weakening of the wire itself and the loss of resilience due to the application of heat during soldering or brazing, will be completely eliminated. Additionally, the orthodontist will be saved considerable time as a face bow will be supplied as a fully-assembled, integral unit requiring only trimming and bending to adapt the face bow to the particular patient.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above construction without departing from the spirit and scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What is claimed is:

1. An orthodontic face bow comprising a first solid longitudinal wire, a second solid longitudinal wire spaced from said first longitudinal wire, and a solid web whose length is substantially less than the length of said wires, said web being integrally formed with said wires, the longitudinal axes of said wires being parallel one to another at least in the area of said web, said first wire adapted to be manipulated into a general U-shaped configuration with means at the ends thereof to engage a head band means, said second wire adapted to be manipulated into a substantially U-shaped configuration opening in the same general direction as said first wire.

2. An orthodontic face bow comprising a first solid wire of substantially circular cross-section, a second solid wire of substantially circular cross-section, and a solid web separating said wires, the length of said web being substantially less than the length of said wires, said web being integrally formed with said wires, the longitudinal axes of said wires being parallel one to another at least in the area of said web, said first wire adapted to be manipulated into a general U-shaped configuration with means at the ends thereof to engage a head band means, said second wire adapted to be manipulated into a substantially U-shaped configuration opening in the same general direction as said first wire.

3. The method of fabricating an orthdontic face bow comprising the steps of forming an elongated segment of material having the configuration of a pair of substantially circular parallel wires spaced one from the other by a web whose thickness is less than the diameter of either of said wires and removing a major portion of said web from both ends thereof to provide a central web portion interconnecting the resultant wire elements substantially centrally of the longitudinal axes thereof.

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