Feb. 21, 1956 M. J. BENJAMIN 2,735,424

CERVICAL BRACE

Filed March 31, 1953

Fig. 1.

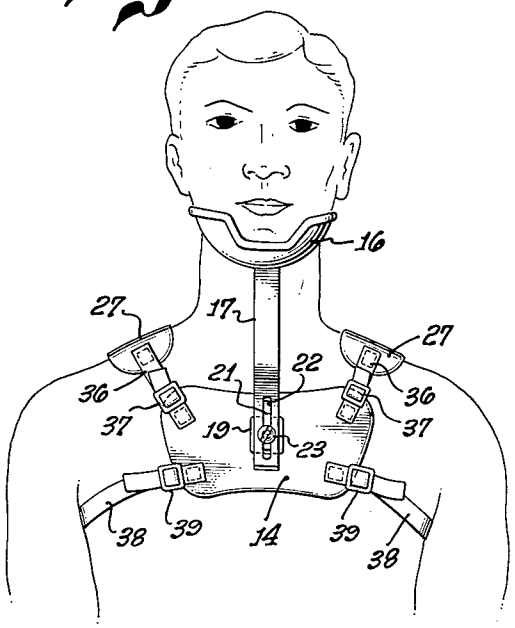


Fig. 2.

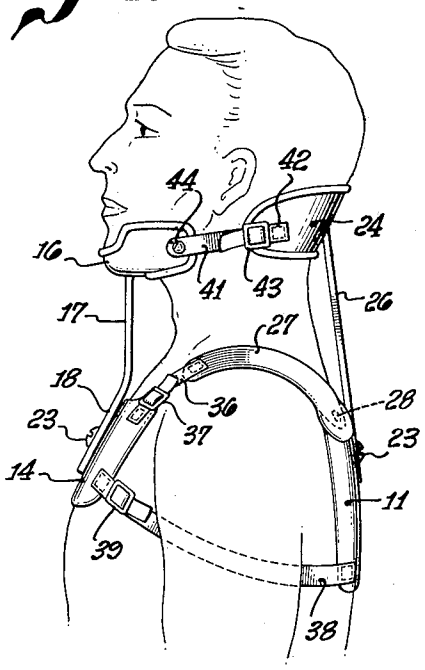


Fig. 6.

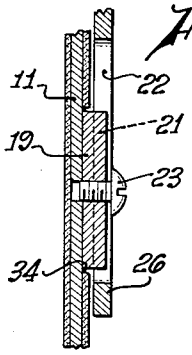


Fig. 3.

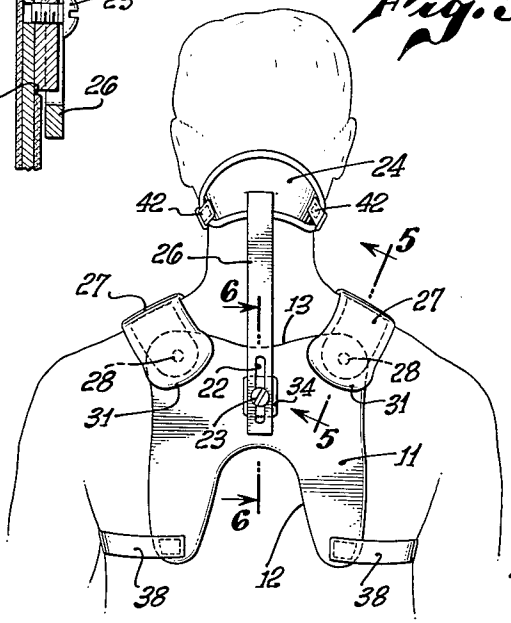


Fig. 4.

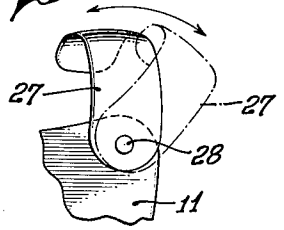
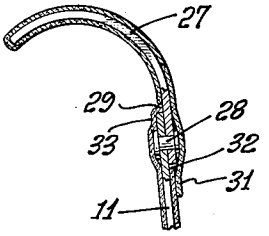


Fig. 5.



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2,735,424

CERVICAL BRACE

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1 Claim. (Cl. 128—87)

This invention relates to cervical brace apparatus.

Cervical injuries are often of such nature that the patient may be allowed to walk around, provided his head and neck are held quite rigid. To achieve such ambulation it is customary to provide the patient with a cervical brace, which supports his head and immobilizes it. Because of the widely different anatomies encountered in treatment of cervical injuries, it has been quite customary to custom fabricate the cervical brace for each individual patient, taking the measurement and contour of the brace from a plaster mold made of the cervical and thoracic portion of the patient's body. This procedure is not only expensive but also often requires the patient to wait for a considerable time before his brace is ready.

As an alternative, attempts have been made to manufacture standard cervical braces and adjust them to varying anatomies. This has for the most part required the elimination of the relatively rigid metal shoulder plates, which, in the custom braces are formed integrally with the back plate. However, when such shoulder plates are eliminated and replaced by separate pads secured by straps, it has been found that the lost rigidity derogates appreciably from the required immobilizing action of the brace; and the patient is not as adequately protected by the brace as he should be.

It is an important object of this invention to provide a brace which may be produced in standard form for many patients while still retaining the advantages of relatively rigid metal shoulder plates.

It is often possible for a patient wearing a cervical brace to loosen the chin straps which secure his chin plate in place so that he may shave, wash his face, and place a fresh gauze pad under his chin. This operation, however, is rendered somewhat difficult by the present practice of placing the buckle which adjusts the chin strap, at the forward end of the strap. This is required so that the patient can more readily get to the buckle for detaching it and moving the chin plate aside. However, the operation requires the unbuckling and rebuckling of the chin straps, which is difficult for some patients, and also leaves the bulky buckle sticking out at the forepart of the wearer's head.

It is a further important object of this invention to provide a simplified chin strap securement which the wearer may readily loosen and resecure without requiring him to go through the motions of adjusting the buckle each time. In this connection it is a further object of the invention to place the adjusting buckle at a less obstrusive position on the brace.

It is another object of this invention to provide a cervical brace apparatus which is of rigid construction, and may also be adjusted to suit the anatomy of different wearers.

It is another object of this invention to preclude the necessity for individual or custom fabricating of cervical braces for each individual wearer.

It is another object of this invention to provide a cervical brace which may be produced in quantity in standard form, and still provide adequate immobilizing for the wearer.

It is another object of this invention to provide simplified means whereby a wearer may more easily remove or disengage a portion of the cervical brace which he is wearing.

In accordance with these and other objects which will become apparent hereinafter, a preferred embodiment of the invention will now be described with reference to the accompanying drawing wherein:

Fig. 1 is a front view of a patient wearing the cervical brace of the instant invention.

Fig. 2 is a side view of the patient wearing the brace.

Fig. 3 is a back view of the patient wearing the brace.

Fig. 4 is a fragmentary detail showing an important feature of the present invention.

Fig. 5 is a fragmentary cross-section taken on line 5—5 of Fig. 3.

Fig. 6 is a fragmentary cross-section taken on line 6—6 of Fig. 3.

In the drawing, the cervical brace is shown comprised of a back plate 11 which rests against the upper portion of the wearer's back. The back plate 11 is roughly of square configuration, although the corners are rounded and the bottom edge has a deep relief 12 to permit shaping of the plate both horizontally and vertically to match body contour. The upper edge is also molded, as shown at 13, to adapt itself to the wearer's anatomy.

A front or chest plate 14 is also provided, which bears against the wearer's chest just below the neck. The plate 14 is roughly trapezoidal in shape and is also molded to fit the wearer's anatomy.

A cup-shaped chin plate 16 is provided on which the wearer's chin is adapted to rest. Depending from the bottom of the chin plate 16 and secured thereto by a suitable weldment, is a front brace 17, which bends outwardly at its bottom end as shown at 18, and is adjustably secured to the center of the chest plate 14. The adjustable securement of the brace 17 to the plate 14 is effected through a small strengthening plate 19 secured to the plate 14 and having an elongate, vertical boss 21. The boss 21 rides within an elongate slot 22 formed longitudinally in the brace 17. A screw 23 is threaded into the plates 19 and 14; and the head of the screw bears against the brace 17 at each side of the slot 22 to secure the brace 17 to the plate 14, while permitting vertical adjustment.

An occipital plate 24, generally arcuate in shape, rests against the back of the wearer's head immediately above the neck. Depending from the plate 24 and secured thereto, as by welding, is a rear brace 26, which is adjustably secured to the back plate 11 in a manner similar to that by which the front brace 17 is secured to the chest plate 14.

In accordance with this invention a pair of shoulder plates 27 rest upon the shoulders of the wearer. The rear ends of the shoulder plates overlie the respective upper corners of the back plate 11, and are pivotally and frictionally secured thereto by pin connections, as shown in Fig. 5. In the particular embodiment shown, a pair of rivets 28 are used, which secure the plates 27 and 11 together pivotally, and also press them together tightly enough that they will stay in adjusted position by virtue of the friction between the plates. All of the plates 11, 14, 16, 24, and 27, as well as the braces 17 and 26 are preferably fabricated of light weight metal sheet such as aluminum.

The instant construction of the shoulder plates 27 provides virtually the same rigidity and immobilizing of the patient's head as is provided in those braces where the shoulder plates are integral with the back plate. At the same time the adjustability provided by the pivot 28 al-

lows a single model to be used on patients having widely varying shoulder anatomies.

All of the plates are preferably covered on both sides and around the edges by a softening material such as felt, covered with light horse hide and an outside trim of light sole leather. The covering over the shoulder plates **27** terminates, on the inner face of the plates **27**, just short of the edge of the back plate **11**, as shown at **29** in Fig. 5. The covering on the upper or outer face of the shoulder plates **27** continues over the rivet **28** and overlies the leather on the back plate **11**, as shown at **31** in Fig. 5. Conversely, the covering on the outer face of the back plate **11** terminates at the edge of the overlying shoulder plate **27**, as shown at **32** in Fig. 5; while the covering on the under face of the back plate **11** covers the rivet **28** and continues around the upper edge of the back plate **11** as shown at **33** in Fig. 5.

The covering on the outer face of the back plate **11** is cut away to allow protrusion of the strengthening plate **19** with its elongate boss **21**, as shown at **34** in Fig. 3. Similar construction is employed on the chest plate **14**.

The forward ends of the shoulder plates **27** are secured by shoulder straps **36** to the respective upper corners of the chest plate **14**. The effective length of the straps **36**, and hence the distance between the plates **27** and **14**, are adjusted by buckles **37**.

Chest straps **38** extend under each arm pit of the wearer and connect the bottom corners of the chest plate **14** with the respective bottom corners of the back plate **11**. The chest straps are also made adjustable in effective length by buckles **39**.

Head straps **41** are provided at each side of the wearer's head connecting the adjacent portions of the chin plate **16** and the occipital plate **24**. As shown in Fig. 2, the rear end of the strap **41** is permanently secured at **42** to the leather covering of the occipital plate **24**. The strap **41** is made adjustable in effective length by a buckle **43**.

In accordance with the instant invention, the forward end of the strap **41** is readily detachably secured to the chin plate **16** by a snap connection **44**. This snap connection may be readily unsnapped and resnapped into position by the wearer; and in so doing he does not alter the adjustment of the belt **41**, since the buckle **43** remains unaffected. The snap securement at **44** not only facilitates partial disassembly of the brace by the wearer, but also removes the bulky buckle portion of the strap to the rear of the wearer's head where it is not as obtrusive.

While the instant invention has been shown and described herein in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is therefore not to be limited to the details disclosed herein but is to be accorded the full scope of the claim.

What is claimed is:

Cervical brace apparatus comprising in combination a back plate of leather covered metal adapted to rest against the back of a person, a pair of arcuate leather covered shoulder plates pivotally and frictionally attached to said back plate at the respective upper corners of said back plate, said shoulder plates being adapted to rest upon the shoulders of the person, a leather covered chest plate adapted to rest against the chest of the person, a pair of shoulder straps adjustably connecting the respective forward ends of said shoulder plates to the upper corners of said chest plate, a pair of chest straps connecting the respective lower corners of said back plate with the corresponding lower corners of said chest plate and adapted to extend beneath the arm pits of a person, a chin plate adapted to rest beneath the chin of a person and having a brace extending substantially vertically downwardly therefrom, said brace being secured to said chest plate for vertical adjustment with respect thereto, and occipital plate adapted to be disposed against the occiput of the person, a rear brace secured to said occipital plate and extending downwardly therefrom, means adjustably securing said rear brace to said back plate for vertical adjustment with respect thereto, and a pair of chin straps connecting said chin plate with said occipital plate at the respective sides of the person's head.

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