An adjustable cervical collar for encircling the neck of a wearer and characterized by the ability to be readily adjusted in height by the wearer while the collar is positioned about the neck. The collar includes a pair of elongate, semi-rigid, flexible bands held in overlapping relationship, and means for permitting the wearer to adjust the height thereof including a pair of apertures in the outer band, and a pair of elongate flexible fasteners carried by the inner band, with each fastener extending outwardly through one of the apertures. The apertures and fasteners are relatively positioned with respect to each other such that a pull exerted on the fastener results in the overlap of the bands being reduced to thereby increase the height of the collar. A pair of cooperating securing members are carried by the outer face of the outer band for securing each of the fasteners thereto in a predetermined position.
ADJUSTABLE CERVICAL COLLAR

BACKGROUND OF THE INVENTION

This invention relates to an adjustable cervical collar for encircling the neck and immobilizing the wearer's head while supporting the neck and head. The cervical collar is characterized by having means for allowing the wearer to adjust the height of the collar while the collar encircles the neck of the wearer.

The use of cervical collars is widely prescribed by physicians in treating trauma of the muscles and ligaments of the neck, and of the cervical and upper thoracic vertebrae and associated spinal nerves. The collar, by shifting support of the head from the neck and vertebrae to the lower chin and upper sternum, allows the affected body parts to maintain a substantially neutral and relaxed position and thus heal faster and more completely.

It is often necessary to vary the height of cervical collars repeatedly during a course of treatment on a single patient, in order, for example, to increase or decrease the degree of permissible head and neck movement. To eliminate the necessity of repeatedly exchanging one collar for another having a different height, several different designs for cervical collars having means for adjusting the height thereof have been proposed. However, several persistent disadvantages exist in known adjustable cervical collars of this type.

For example, U.S. Pat. No. 3,027,894, issued Apr. 3, 1962, discloses a cervical collar formed of upper and lower overlapping bands. The bands are slidable relative to each other by means of four separate, pivotally mounted sliding metal clamps which are each individually held in a desired position by tightening a screw. A major disadvantage of this approach is the necessity of using a screwdriver to individually tighten each of four separate screws. This procedure renders it difficult for the wearer alone to adjust the height since it is difficult to maintain the proper separation while tightening the screws. Thus normally the collar must be put on and then taken off several times to insure the correct adjustment of each of the four clamps. Other disadvantages are that the cervical collar described above is structurally complicated and therefore relatively expensive, and it is quite heavy due to the large number of metal parts on the collar.

U.S. Pat. No. 3,135,256, issued June 2, 1964, discloses a cervical collar formed of upper and lower overlapping bands adjustable by means of cooperating Velcro elements secured to the outside of the lower band and the inside of the upper, overlapping band. Thus the lower band is trapped beneath the upper band when the collar is in place around the neck, and the collar must be removed in order to peel the lower band away from engagement with the upper band and make the necessary adjustment.

SUMMARY OF INVENTION

Accordingly, it is the object of this invention to provide an adjustable cervical collar with means for allowing the wearer of the cervical collar to adjust the height thereof while the collar encircles the neck of the wearer.

It is a further object of the present invention to provide a cervical collar which is adapted to permit the wearer to selectively increase or decrease the effective height of the collar while the same is positioned about the wearer's neck.

It is still another object of the present invention to provide a cervical collar which is simple in construction, and relatively inexpensive to manufacture.

These and other objects and advantages of the present invention are achieved in the embodiment illustrated herein by the provision of a cervical collar which comprises a pair of substantially parallel, elongate, semi-rigid, flexible bands which are held in overlapping relationship, and means for releasely securing the collar in encircling relation about the wearer's neck. Means are provided for permitting the wearer to adjust the height of the collar comprising an edge surface positioned on the inner band, and an elongate flexible fastener carried by the outer band. The fastener has one end secured to the inner band, and it extends vertically and is looped about the edge surface such that the other end of the fastener overlies the outer face of the outer band. The edge surface thereby serves as a bearing surface whereby a pull exerted upon the fastener results in the overlap of the bands being reduced to thereby increase the height of the collar. A securing member is carried by the outer face of the outer band for releasably securing the fastener thereto in a predetermined position to thereby maintain the desired height of the collar.

In the illustrated embodiment, the elongate fastener has Velcro elements secured to one side thereof, and the securing member comprises a patch of Velcro elements releasably cooperating with the Velcro elements on the elongate fastener.

BRIEF DESCRIPTION OF THE DRAWINGS

Some of the objects of this invention have been set forth above, other objects and advantages will appear as the description of the invention proceeds, when taken in conjunction with the following drawings in which:

FIG. 1 is an elevational view of the outwardly facing, front side of a cervical collar according to this invention with the fastener elements disengaged;

FIG. 2 is an exploded perspective view of the collar in FIG. 1, showing the manner in which the collar bands are slidable connected;

FIG. 3 is a front elevational view of the cervical collar according to this invention in place around the neck of the wearer and showing the manner in which the height of the collar is increased;

FIG. 4 is a side elevational view of the cervical collar according to this invention in place around the neck of the wearer and showing the increased height of the collar obtained by manipulating the collar in the manner shown in FIG. 3;

FIG. 5 is a fragmentary sectioned perspective view of the collar taken substantially along the line 5--5 of FIG. 3 and showing the means for adjusting the collar in its secured position, and with the detached position of the elongate fastener shown in dotted lines; and

FIG. 6 is a fragmentary sectioned perspective view of the collar taken substantially along the line 6--6 of FIG. 3 and through the means slidable interconnecting the bands.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, an adjustable cervical
collar according to the present invention is shown in FIG. 1 and generally indicated at 10. The cervical collar 10 comprises an upper elongate band 11 having upper and lower longitudinally extending edges 11a, 11b, respectively, and a lower elongate band 12 overlapping the upper band 11 substantially parallel therewith and having upper and lower longitudinally extending edges 12a, 12b, respectively. The upper band 11 and lower band 12 are each formed of a thin, lightweight, semi-rigid plastic material, such as polyethylene, and are substantially sinusoidal in shape to conform to the configuration of the chin, neck, shoulders and upper chest of the wearer. It will be understood that, while the preferred embodiment of this invention comprehends the lower elongate band 12 overlapping the upper band 11, the objects of the invention can be likewise accomplished with a structure wherein the upper band 11 overlaps the lower band 12.

The upper and lower bands 11, 12, respectively, are slidably interconnected for vertical movement relative to each other by means comprising three spaced-apart, transverse, elongate slots 11c, 11d, 11e through the medial and opposing end portions, of upper band 11, in communicating alignment with three spaced-apart, transverse, elongate slots 12c, 12d, 12e through medial and opposing end portions of the overlapping lower band 12. The interconnecting means further includes three studs having an enlarged head on one end thereof, collectively referred to by reference numeral 13, each of the studs 13 being extended through one of the communicatively aligned pairs of slots 11c, 12c; 11d, 12d; and 11e, 12e, respectively. Two washers 14 and 15 are carried in spaced-apart relation by each of the studs 13 with the upper band 11 and lower band 12 interposed therebetween. The end of the stud 13 remote from the enlarged end is then crimped or otherwise flattened to maintain the assembled relationship.

In order to releasably secure the cervical collar 10 in an encircling relation around the neck of the wearer, means are provided which include an elongate, integrally formed tongue 18 on one end of the lower band 12. A patch of conventional fibrous Velcro fastener material 19, formed of a loose non-woven felt-like substance, is secured, as for example by stitching, to the tongue 18 opposite the opposing end of the lower band 12. A patch of conventional hook-type Velcro material 20, comprising numerous rows of small plastic hooks, which cooperates with the fibrous material 19 on the tongue 18 to releasably secure the collar around the neck of the wearer in the desired position, as is shown in FIG. 4. The cooperating Velcro patches 19, 20, respectively, cover a substantial area on opposing ends of the lower band 12, thus permitting the tightness of the collar around the neck to be varied as desired.

To enable the collar 10 to conform more closely to the anatomy of the wearer, and to provide additional comfort, elongate cushion pads 22 and 23 are stitched to the upper edge of the upper band 11 and lower edge of lower band 12, respectively. The cushion pads 22 and 23 comprise a tubular core of dense foam rubber, enclosed in an outer covering of soft, pliable covering material such as vinyl as is shown in FIGS. 5 and 6. A plurality of perforations 24 are provided in the upper band 11 and lower band 12 to permit the flow of ventilating air through the collar, thus making the collar more comfortable for the wearer.

Means for allowing the height of the collar to be adjusted by the wearer while encircling the wearer's neck by varying the amount of overlap of the lower band 12 relative to the upper band 11 are provided and comprise a pair of elongate flexible fasteners 28 and 29. In the illustrated embodiment, each fastener comprises a strip of relatively narrow fabric, and has a conventional, fibrous Velcro material, as described above, secured to one side thereof. Fastener 28 is secured at one end thereof to the upper band 11 intermediate transverse slots 11c and 11d therein, and extends vertically therefrom in the manner more fully described below. Fastener 29 is secured at one end thereof to the upper band 11 intermediate transverse slots 11d and 11e, and likewise extends vertically therefrom as described below.

Extending through the lower band 12 in transverse alignment with the fasteners 28, 29 are longitudinally extending apertures, in the form of slots 34 and 35, respectively. Each of the slots 34 and 35 receive therein one of the elongate fasteners 28, 29, respectively, as is shown in FIG. 1, and define lower edge surfaces 34a, 35a for the purposes described below. As will be observed in FIG. 2, slots 34, 35 are positioned adjacent the upper edge 12a of the lower band 12, whereas the fasteners 28, 29 are secured to the upper band 11 adjacent the lower edge 11b thereof. Secured to the lower band 12 directly beneath the slots 34, 35 are hook-like Velcro securing patches 38 and 39, respectively, as described above, for securing the elongate fasteners 28, 29 in a desired position.

As best seen in FIGS. 3-5, the fasteners 28, 29 extend upwardly from the point of attachment to the band 11, and through the associated slots 34, 35 such that the remote free end of each fastener overlies the outer face of the band 12. Thus in order to increase the height of the collar, the wearer grasps the fastener 28 between the thumb and forefinger of one hand, and the fastener 29 between the thumb and forefinger of the other hand, and pulls the same outwardly through the slots 34, 35. Thus the surfaces 34a and 35a serve as a bearing surface whereby the outward pull results in the overlap of the bands being reduced to thereby increase the height of the collar. When the fasteners 28, 29 have been pulled outward sufficiently to increase the height of the collar 10 to its desired level, the fasteners 28, 29, having the fibrous Velcro material thereon, are pulled downward and pressed firmly into engagement with the hook-like Velcro patches 38, 39, respectively. This engagement maintains the collar at its desired height against downward pressure against the upper band 11 by the chin.

As best seen in FIG. 3, the slot 34 and associated fastener 28 are longitudinally spaced a predetermined distance from the medial portion of the collar represented by the line 6-6, and the other slot 35 and associated fastener 29 are longitudinally spaced a corresponding distance in the opposite direction from the medial portion. This arrangement facilitates the gripping of the fasteners by the wearer as described above.

To decrease the height of the collar, the elongate fasteners 28, 29 are pulled upwardly out of engagement with the hook-like Velcro patches 38, 39. With the fasteners 28, 29 thus disengaged, the chin may be used to push downwardly upon the upper edge of the upper band 11, thus lowering the upper band 11 relative to the lower band 12, or the bands 11 and 12 may be
moved together in any manner by the hands of the wearer or otherwise to increase the extent of overlap therebetween.

By using the chin to adjust the height of the collar 10, the proper adjustment of the collar may be determined directly by observing the effect of lowering or raising the height thereof upon the position of the head and neck, rather than by making continuous, incremental adjustments while the collar is removed from encircling relation around the neck and then replacing the collar around the neck to determine the effect of the adjustment on the position of the head and neck.

Thus, it may be seen that an adjustable cervical collar is described above for encircling the neck and immobilizing the wearer's head while supporting the neck and head, which is characterized by the ability to be readily adjusted in height by the wearer while the collar encircles the neck of the wearer.

In the drawings and specification there has been set forth a preferred embodiment of this invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the invention being defined by the claims.

That which is claimed is:

1. An adjustable cervical collar for encircling the neck of a wearer and substantially immobilizing the wearer's head while supporting the head and neck, and characterized by the ability to be readily adjusted in height by the wearer while the collar is positioned about the neck, said cervical collar comprising:
   a. a pair of substantially parallel, elongate, semi-rigid, flexible bands held in overlapping relationship with one of said bands overlapping the other of said bands when placed in position about a wearer's neck;
   b. means for releasably securing the cervical collar in encircling relation about the wearer's neck;
   c. means for readily permitting the wearer of the cervical collar to adjust the height thereof while the collar is positioned about the neck, comprising:
      a. an edge surface positioned on said one band,
      b. an elongate flexible fastener having one end thereof secured to said other band and extending vertically from said other band and looped about said edge surface such that the other end of said fastener overlies the outer face of said one band, said edge surface serving as a bearing surface whereby a pull exerted upon the fastener results in the overlap of the bands being reduced to thereby increase the height of the collar, and
      c. means carried by the outer face of said one band adjacent said edge surface for releasably securing said fastener thereto to permit the fastener to be maintained in a desired position.

2. An adjustable cervical collar for encircling the neck of a wearer and substantially immobilizing the wearer's head while supporting the head and neck, and characterized by the ability to be readily adjusted in height by the wearer while the collar is positioned about the neck, said cervical collar comprising:
   a. a pair of substantially parallel, elongate, semi-rigid, flexible bands, one of said bands overlapping the other of said bands when placed in position about a wearer's neck;
   b. means slidably interconnecting said bands for vertical movement of said bands relative to each other;
   c. means for releasably securing the cervical collar in encircling relation about the wearer's neck;
means for slidably interconnecting said bands for vertical movement of said bands relative to each other;
means for securing the cervical collar in encircling relation about the wearer's neck;
means for readily permitting the wearer of the cervical collar to adjust the height thereof while the collar is positioned about the neck, and comprising:
a. a pair of longitudinally spaced apart apertures extending through said one band and adjacent said upper side edge thereof;
b. a pair of longitudinally spaced apart, elongate flexible fasteners secured to said other band adjacent said lower side edge thereof, each of said fasteners being substantially aligned with one of said apertures and extending upwardly and through the aligned aperture such that the other end of each fastener overlies the outer face of said one band, said apertures serving as a bearing surface whereby a pull exerted on the fasteners results in the overlap of the bands being reduced to thereby increase the height of the collar; and
c. means carried by the outer face of said one band for releasably securing each of said fasteners thereto to permit the fasteners to be maintained in a desired position.
9. An adjustable cervical collar according to claim 8, wherein each of said pair of bands has a plurality of spaced-apart perforations therein for allowing a ventilating flow of air through said pair of bands.
10. An adjustable cervical collar according to claim 8, including an elongate strip of soft cushioning material secured to the lower longitudinally extending side edge of said one band and an elongate strip of soft cushioning material secured to the upper longitudinally extending side edge of said other band for permitting the cervical collar to conform more closely to the anatomy of the wearer's neck, lower chin, and shoulders, and making the cervical collar more comfortable while encircling the wearer's neck.
11. An adjustable cervical collar according to claim 8, wherein said pair of bands are longitudinally sinusoidal in shape for corresponding to the configuration of the head, neck and upper chest of the wearer when in encircling relation around the neck of the wearer.
12. An adjustable cervical collar according to claim 8, wherein one of said apertures and associated fastener are longitudinally spaced a predetermined distance from the medial portion of the collar, and the other of said apertures and associated fastener are longitudinally spaced a corresponding distance in the opposite direction from the medial portion of the collar.