

[54] **CERVICAL COLLAR**
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[51] Int. Cl. **A61h 1/02**
[58] Field of Search. **128/75, 90, DIG. 23, 128/87, 83, 84, 89**

[56] **References Cited**

UNITED STATES PATENTS			
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Orthopaedic Appliances Atlas, page 240, Figure 296, 1952.
Primary Examiner—Richard A. Gaudet
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Attorney—Arthur H. Seidel et al.

[57] **ABSTRACT**
Orthopedic device of the cervical collar type formed in two halves. Each half is preformed from a soft flexible closed cell polymeric material and adjustably coupled to the other half. Each half has a rigid support member fixedly secured thereto. One of said members is a chin support and the other is a posterior member which is adapted to extend along the spine from the back to the basal portion of the skull.

10 Claims, 4 Drawing Figures

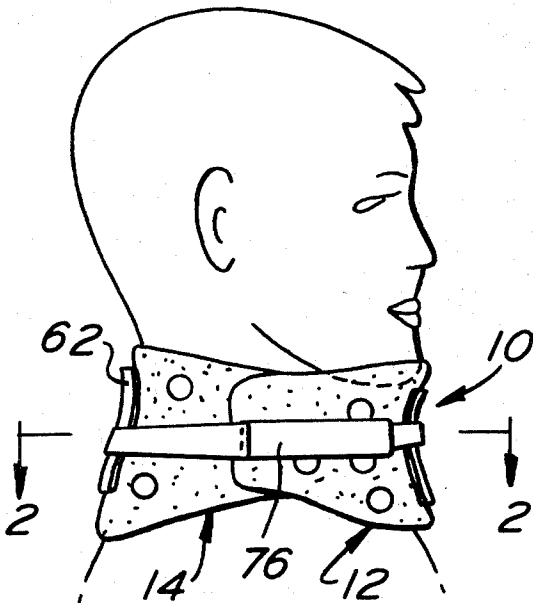


FIG. 1

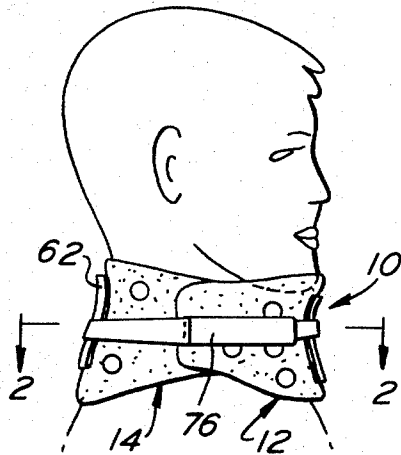


FIG. 4

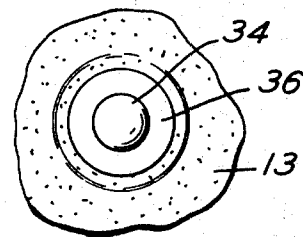


FIG. 2

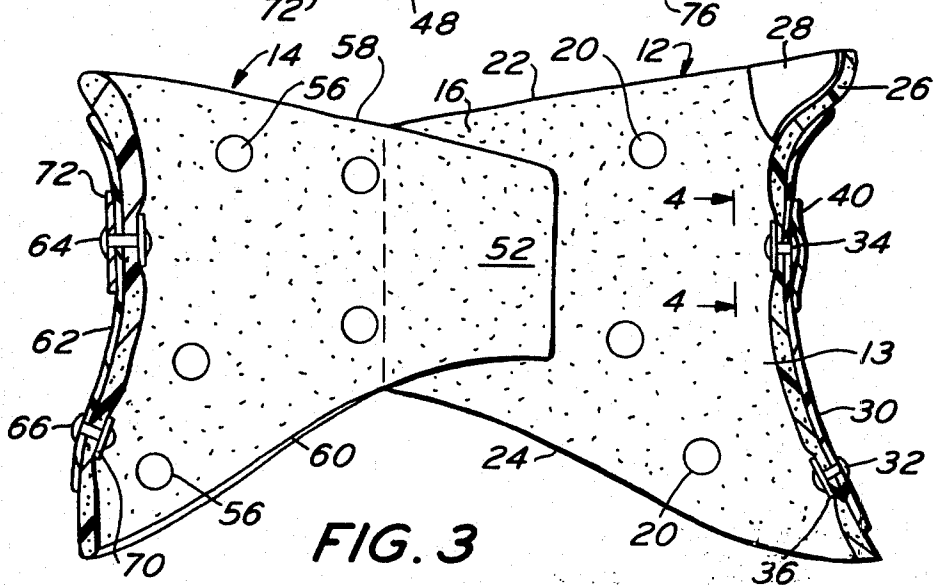
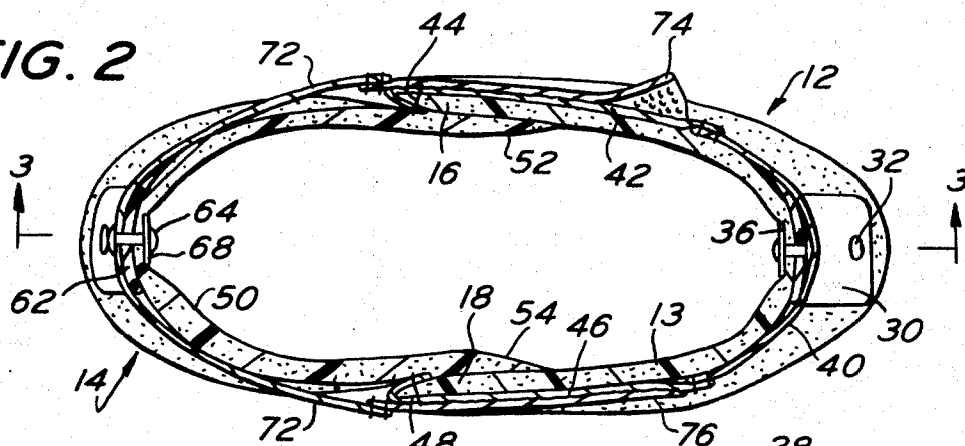


FIG. 3

CERVICAL COLLAR

This invention is directed to a cervical collar which is structurally interrelated in a manner having certain advantages. Heretofore, cervical collars have been constructed in a wide variety of manners including rigid collars as per U. S. Pat. No. 3,530,853; flexible collars, and inflatable collars as per U. S. Pat. No. 3,070,090. The cervical collar of the present invention is extremely light in weight, easier and quicker to install, and is constructed in a manner so that it may be an off-the-shelf item as opposed to a custom-made or custom-adjusted item.

The collar of the present invention is comprised of two mating halves. The halves are generally the same except for the shape of the rigid support member attached thereto. Each half is made from a soft flexible non-supporting type of material, such as a closed cell polyethylene. The material from which the bodies are made is extremely light and is pre-molded to a generally U-shape while being formed so as to be compatible with the neck portion of a person. The collar halves made in this manner are resistant to hot water and detergents, have low flammability, and are non-toxic.

The halves are preferably coupled together by an adjustable means such as Velcro straps. A rigid chin support member is attached at the bight of one half while a posterior bar of rigid material is attached to the bight of the other half. The adjacent ends of the halves are tapered and overlap one another. An operative embodiment of the present invention has a total weight of only about four ounces. Hence, the collar of the present invention combines maximum comfort, maximum adjustability, with minimum weight while at the same time being an off-the-shelf item for immediate application to a patient.

It is an object of the present invention to provide a novel orthopedic device of the cervical collar type.

It is another object of the present invention to provide a cervical collar which combines maximum adjustability with minimum weight and may be an off-the-shelf item for rapid application to a patient.

It is another object of the present invention to provide a cervical collar comprised of mating halves of light-weight close cell polymeric material adjustably coupled together with each half having a rigid body support member.

Other objects will appear hereinafter.

For the purpose of illustrating the invention, there is shown in the drawings a form which is presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

FIG. 1 is an elevation view of a person wearing a collar in accordance with the present invention.

FIG. 2 is a sectional view of the collar taken along the line 2—2 in FIG. 1.

FIG. 3 is a sectional view taken along the line 3—3 in FIG. 2.

FIG. 4 is an elevation view taken along the line 4—4 in FIG. 3.

Referring to the drawing in detail, wherein like numerals indicate like elements, there is shown in FIG. 1 a cervical collar in accordance with the present invention designated generally as 10. The collar 10 includes a first half for the front of a person's neck designated generally as 12, and a second half for the rear of a person's neck designated generally as 14.

The front half 12 is comprised of a U-shaped body 13 having end portions 16 and 18 extending from a bight portion. The body is preferably made from a soft, flexible, closed cell polymeric plastic material such as polyethylene or polyurethane. The material of body 13 must be capable of being formed in a die or mold so as to assume the horseshoe shape shown in FIG. 2. Body 13 is provided with air holes 20 extending there-through.

The end portions 16 and 18 are tapered at their terminal ends as shown more clearly in FIG. 2, and are defined by converging top and bottom edges 22 and 24, as shown more clearly in FIG. 3. Thus, the body 13 tapers away from the bight portion so that the vertical dimensions of the end portions 16 and 18 are only about one-half the vertical height of the bight portion when viewed in elevation or section as shown in FIG. 3.

The upper end of the bight portion of the body 13 is shaped to provide a chin cavity 26. A covering 28 from a material such as moleskin, which is adhesively or otherwise secured on the inner surface of body 13 in the chin cavity 26.

The front half 12 is provided with a reinforcing rigid support member 30 on the outer surface of the bight portion. Member 30 is made from a rigid polymeric plastic material such as rigid polystyrene. Other materials may be used for the member 30 including aluminum, leather, etc. Member 30 has a curved upper end opposite the chin cavity 26 and extends for substantially the entire length of the bight portion on body 13.

Member 30 is fixedly secured to the bight portion of the body 13 by means of rivets 32 and 34. In order to prevent contact with the rivet heads and to prevent the rivet heads from being pulled through the foam body 13, washers 36 and 38 are provided on the rivets 32 and 34 respectively. The washers are substantially larger in diameter than the rivet heads as will be apparent from FIG. 4.

An adjustable strap means is provided for coupling the halves 12 and 14 together in a manner so that the free ends of the halves are disposed in overlapping relationship. The strap means is of a readily disconnectable type so that the collar 10 may be applied or removed rapidly. A portion of the adjustable strap means is fixedly connected to each of the halves 12 and 14.

The portion of the adjustable strap means on the body 13 includes a strap 40 which overlies the rivet 34, as shown more clearly in FIGS. 2 and 3. One end of the strap 40 is stitched to one end of a Velcro member 42. The other end of the Velcro member 42 extends around the terminal end of portion 16 and is secured thereto in any convenient manner such as by stitching 44 which extends through the end portion 16.

The other end of the strap 40 is secured to one end of Velcro member 46. The other end of Velcro member 46 extends around the terminal end of end portion 18 and is secured thereto in any convenient manner such as by stitching 48. Stitching 48 extends through the end portion 18. Thus, the portion of the adjustable strap means on the front half 12 is fixedly secured in place and is immobile and forms a permanent part of the front half 12.

The rear half 14 is in the form of a U-shaped body 50 made from the same material as the material used for body 13. The shape of body 50 is substantially identical with the shape of body 13 as will be apparent from a comparison of FIGS. 2 and 3. The end portions 52 and

54 on body 50 are tapered as shown in FIG. 2 and have converging upper and lower edges 58 and 60, as shown in FIG. 3.

Body 50 is provided with air holes 56 which extend therethrough in the same manner as holes 20. A rigid support member 62, made from the same material as member 30, is fixedly secured to the bight portion of body 50 on the outer surface thereof, as shown in FIG. 3. Member 62 is secured to the bight portion of body 50 by rivets 64 and 66 and washers 68 and 70, respectively.

The portion of the adjustable strap means for coupling the halves 12 and 14 together includes a portion secured to the body 50. The last-mentioned portion includes a strap 72 which may be made from the same material as strap 40, such as a strip of vinyl plastic. A central portion of the strap 72 is secured to the bight portion of the body 50 by the rivet 64. This is the only portion of strap 64 which is secured to the body 50.

The strap 72 has free end portions. One end portion of strap 72 is fixedly secured to a Velcro member 74. The other end portion of strap 72 is fixedly secured to a Velcro member 76. Member 74 is adapted to cooperate with member 42. Member 76 is adapted to cooperate with member 46. The mating Velcro members facilitate coupling the two halves together in a position encircling the neck of a person in a manner which is adjustable and rapid.

The body halves 12 and 14 may be made from sheets of closed cell foam polyethylene which is cross-linked to insure lightness. An operative embodiment of collar 10 has a total weight of four ounces. The sheets of polyethylene may be preheated in an oven for 3 to 5 minutes at a temperature of 140°-145°C. Then they may be placed in the mold and shaped under pressure and then permitted to air cool. Thereafter, the edges and end portions of the halves are rounded off or tapered by grinding. Hence, the manufacture of the collar 10 may be accomplished on a production line type basis with minimal equipment. The collars are preferably made in three sizes, namely small, medium, and large. Each size may have three variations in height of the bight portions of the body halves. In this manner, a complete line of off-the-shelf cervical collars may be produced and sold at prices which are substantially below the prices presently charged for cervical collars.

The bodies 13 and 50 are preferably made from closed cell foam polyethylene so as to have the following attributes: non-toxic, a low specific gravity of about 0.04, non-corrosive, will not burn but will melt.

Thus, the present invention enables cervical collars to be an off-the-shelf item rather than a custom-made item. Other advantages include the extreme light weight of the collar as well as the ability to choose and install a collar for a patient more rapidly than the custom procedure utilized heretofore. This is a direct benefit to the patient.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

We claim:

1. A cervical collar comprising first and second discrete body halves, one of said body halves being a front half and the other being a rear half, each half being U-

shaped and preformed from a soft flexible, lightweight closed cell foam polymeric plastic material, each half being provided with air holes extending therethrough, adjustable strap means having a portion coupled to each of said halves for releasably interconnecting the free ends of said halves in overlapping relation, a first rigid support member fixedly secured to and located only at the bight of the front half, a second differently shaped rigid support member fixedly secured to and located only at the bight of the rear half.

2. A cervical collar in accordance with claim 1 wherein said front half has a chin support cavity at its upper end, the first rigid support member having a curved portion juxtaposed to said cavity, said cavity and the first rigid support member being on opposite surfaces of said front half.

3. A collar in accordance with claim 1 wherein said rigid support members are secured to the respective body halves by rivets, with a large diameter washer between the body half and the head on one end of each rivet.

4. A collar in accordance with claim 1 wherein the free ends of said body halves converge away from the bight portion.

5. A collar in accordance with claim 4 wherein the end portions of the body halves are tapered.

6. A collar in accordance with claim 1 wherein the portion of the adjustable strap means on each body half overlies the respective rigid support member on each body half, and means fixedly securing each portion of the adjustable strap means to its respective body half.

7. A collar in accordance with claim 6 wherein the portion of the adjustable strap means on the front half is secured thereto at the ends of the U-shaped body, and the portion of the adjustable strap means on the rear half being secured thereto at the bight portion thereof.

8. A cervical collar comprising first and second discrete body halves, one of said body halves being a front half and the other being a rear half, each body half being U-shaped and formed from a soft, flexible, lightweight closed cell foam polymeric plastic material, each body half having air holes extending therethrough, a first rigid support member secured only to the bight of the front half, said front half having a chin cavity at its upper end juxtaposed to a curved portion on said rigid support member, a second differently shaped rigid support member secured only to the bight of the rear half, the upper end of said second support member being curved away from the front half, adjustable strap means having a portion coupled to each of said halves for releasably interconnecting the free ends of said halves in overlapping relation, each portion of said strap means being secured to its respective body half, and the free ends of each body half converging in a direction away from the bight portion thereof.

9. A collar in accordance with claim 8 wherein each portion of the adjustable strap means overlies its respective rigid support member.

10. A collar in accordance with claim 8 wherein the portion of the adjustable strap means on one body half being fixedly secured to the free ends of said one body half, and the portion of the adjustable strap means on the other body half being secured thereto only at the bight portion of its body half.

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