

Sept. 25, 1962

L. J. DI PALMA ETAL

3,055,358

CERVICAL COLLAR

Filed Aug. 5, 1959

Fig. 1

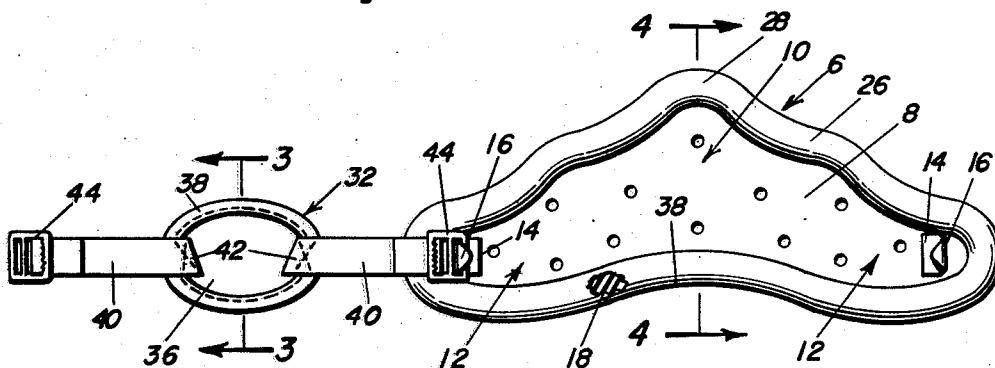


Fig. 2

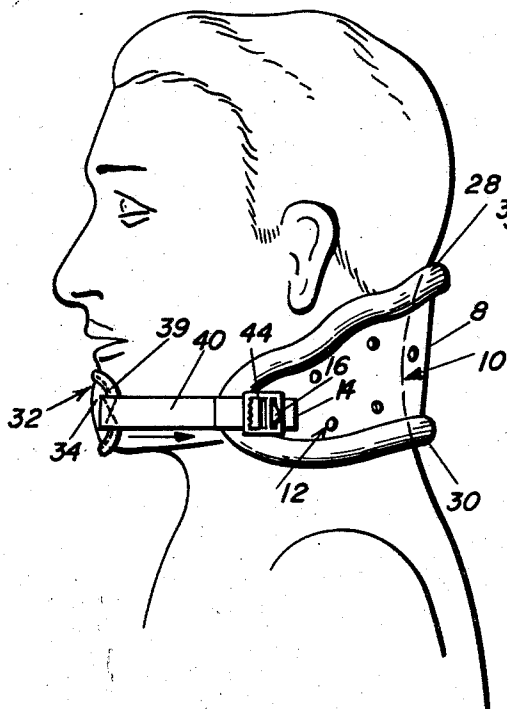


Fig. 3

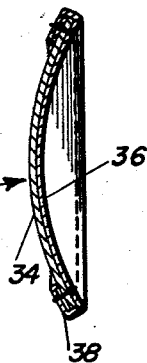
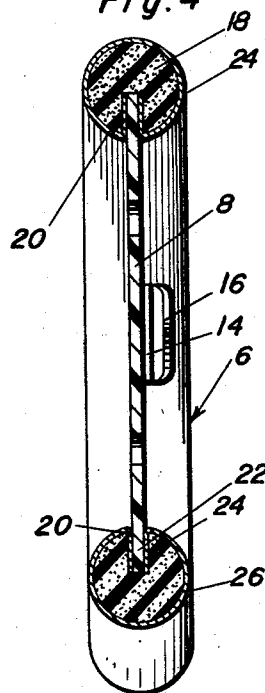


Fig. 4



Leon J. DiPalma
Laurine M. DiPalma
INVENTORS.

BY *Chance A. O'Brien*
and *Harvey B. Jacobson*
Attorneys

1

3,055,358

CERVICAL COLLAR

Leon J. Di Palma, North Long Beach, Calif. (2422 Torrance Blvd., Torrance, Calif.), and Laurine M. Di Palma, 5907 California Ave., North Long Beach, Calif.
Filed Aug. 5, 1959, Ser. No. 831,797
4 Claims. (Cl. 128—75)

This invention relates to an improved cervical collar which is unique in that its construction and principle of operation is such that it effectually and properly restricts head and neck motions and cervical extension, but more important, flattens the normal lordotic cervical curvature and efficaciously uses the wearer's chin as a reliable point of pressure. The significance of the concept may be measured in relation to the ability of the collar to more satisfactorily prevent or relieve posterior neck muscle spasms.

Stated otherwise, the collar is recommended and has been found to be suitable and practical in preventing added trauma or irreversible changes due to prolonged muscle spasm in cervical disorders such as arthritis, myocitis, fibrositis, rheumatic conditions, tension states, cervical-type headaches, cervical root syndromes, and the ever increasing whip lash injury.

Presently marketed cervical collars are designed and made chiefly, if not exclusively, for the prevention of cervical extension. They do not, however, attempt to cope with and prevent undesirable forward protrusion of the wearer's head. A typical, if not standard, collar completely encircles the neck and is wide (or high) at the front with its upper edge portion underlying the chin with the chin projecting and overhanging it. The opposite left and right sides are tapered or gradually narrowed and merge into the appreciably narrowed back portion where the ends overlap and are suitably fastened together. The bottom of the collar is contoured to rest firmly on the surfaces at the juncture of the neck and body. In carrying out the present invention, the collar is a three-quarter (or approximately so) length one and the median or central portion is wide (or high) and the forward free end flap-like or wing portions are gradually narrowed to embrace the sides of the neck with the high central portion at the back of the neck as will be hereinafter fully set forth.

Clinical studies show that hyperextension of the cervical spine increases muscular spasm, nerve root irritation and other disabling symptoms. They also indicate that a decrease in the cervical lordosis or "flattening of the neck" results in the symptomatic relief of the above named disorders.

The exclusively novel feature in the collar herein revealed is that by using three points of pressure, namely the chin and two posterior points, the head is retracted, thereby decreasing the cervical lordotic curve. This "flattening of the neck" is the position of choice in the previously named types of disorders because it decreases posterior neck muscle spasm, opens the intervertebral foramina for nerve root clearance and relieves root pressure in intervertebral disc protrusions or ruptures. It follows that my improved collar offers the wearer 24-hour-a-day treatment while in the protective custody of the collar.

Other objects, features and advantages of the invention will become readily apparent from the accompanying drawing and the specification and subjoined claims.

In the drawing, wherein like numerals are employed to designate like components or parts throughout the views:

FIG. 1 is a plan view (or if preferred a rear elevation) of a cervical collar constructed in accordance with the principles of the instant invention.

FIG. 2 is a side elevation on a scale sufficient, it is be-

2

lieved, to illustrate the correct mode of using the improved cervical collar.

FIGS. 3 and 4 are enlarged detail sections taken on the lines 3—3 and 4—4, respectively, of FIG. 1, looking in the direction of the indicating arrows.

Briefly summarized, this invention comprehends an innovation in cervical collars which not only restricts and restrains head and neck movements and cervical extension; it also flattens the normal lordotic cervical curvature. It is characterized by a neck embracing collar, not the usual type which completely encircles the neck but rather a shorter collar approximately a three-quarter length collar. It embodies a chin seating and suspending means (similar to a stirrup or cup) and utilizes left and right hand adjustable manually regulatable means connecting left and right forward end portions of the collar to the chin seating means which, obviously, functions to minimize forward protrusion of the head and definitely results in relief of posterior muscle spasms.

The collar per se is denoted, as an entity, by the numeral 6 and is of composite construction. It embodies, broadly, a suitable plastic plate or diaphragm marginally bordered by a welt-like bead providing the desired cushioning properties. The diaphragm is denoted at 8 and may be perforated and preferably is a sheet of polyethylene semi-pliable commercial plastics. It is characterized by a relatively wide or high median or central portion 10 and gradually narrowing wing-like end portions 12. Secured adjacent the tips or terminals of the "wings" are attaching clips or fixtures provided with suitably located detaching hooks, as at 14 and 16 respectively. As before mentioned the plastic sheet material is marginally bound with a welt-like pad or bead which as shown in FIG. 4 comprises a length of foam rubber or the like 18 which is preferably circular in cross-section. As shown in FIG. 4 the inner periphery of this bead has an endless groove 20 providing a channel for reception and retention of the edge portions 22 of the sheet or diaphragm 8. The enveloping material may be a suitable fabric but from experience leatherette has been employed. An edge of the leatherette material is keyed in the channel or groove as at 24. Then the material is wrapped around the beads in the manner shown at 26. The convex high pressure point is denoted in FIG. 1 at 28 and this occupies the centralized position seen in FIG. 2. The pressure point therebelow is concave and is denoted at 30. Speaking generally the collar, when flat, would be approximately triangulate in shape marginal contour of the diaphragm and also encircling the bead conforms to the anatomy so that the flaps or wing-like extension project forward and embrace the left and right sides of the neck and perhaps the adjacent jaw portions.

The chin pressure point is attained through the medium of the aforementioned chin cup 32. This is of composite construction and is preferably, though not necessarily, made up of an outer ply of canvas 34 and an inner ply or lining 36 of moleskin or equivalent material, the marginal edges being double and stitched or otherwise constructed as at 38 to provide the desired cup-like shape and also to promote strength and durability. The harnessing straps of suitable inelastic material or at the left and right sides and are denoted by the numeral 40. The forward ends are stitched at 42 to diametrically opposite portions of the generally ovate chin cup as shown in FIG. 1. The straps are provided with suitable buckles 44 which are adjustable and which are releasably connected with the retaining hooks 16 in an obvious manner. (See FIG. 2).

It is contemplated that these collars will be turned out in several sizes, small, medium and large. The materials may of course be varied (felt, leather, leatherette, suit-

3

able grades of commercial plastics, moleskin and so on) as long as the shape and principles of pressure of the collar are not changed. Experimentation has shown that the construction revealed is practical in respect to manufacturing procedures and economies, comfort and purpose. The sheet 8, being suitably perforated, provides the desired passage and circulation of air and affords the user's neck ample ventilation.

It should be understood that the chin cup 32 is not actually a "rest" for the chin, such as a rigid support from below would be. The cup is actually a restraining and thrust element where pressure is applied to retract the head posteriorly. It is further evident that the significant purpose of the chin cup is to apply pressure to the anterior surface of the chin through the medium of the adjustable side straps in order to retract the head and flatten the cervical spine. As to the purpose of the inelastic adjustable side straps, it is the collective purpose of these straps to regulate the amount of flattening of the neck by pulling backward on the chin cup.

Minor changes in shape, size, materials, and rearrangement of components may be resorted to in actual practice without departing from the spirit of the invention or the scope of the invention as claimed.

What is claimed as new is as follows:

1. A cervical collar which not only restricts head and neck motion and cervical extension but flattens the normal lordotic cervical curvature consisting exclusively of a neck embracing head retracting collar, a flexible chin pad ovate and conformable in shape to and designed to apply pressure to the anterior surface of the chin, and left and right manually regulatable traction adjusting means for connecting the left and right forward end portions of said collar to said chin pad in a manner to minimize forward protrusion of the head, resulting in relief of posterior muscle spasms, said means embodying inelastic straps secured at forward ends to diametrically opposite marginal end portions of said pad, said collar being applicable to the back and left and right sides only of the neck, said collar having a comparatively wide median portion of a width ranging vertically from the base of the wearer's skull and nape of the neck to the neck to the upper vertebral part of his spinal column, and also having gradually and forwardly narrowing left and right wing-like end portions providing an overall adaptation relying upon and utilizing three points of coordinating pressure; namely, the chin and two posterior points and with the significant result that the wearer's head is

4

efficaciously retracted, thereby decreasing the cervical lordotic curve.

2. A cervical collar which not only restricts head and neck motion and cervical extension but flattens the normal lordotic cervical curvature consisting exclusively of a neck embracing, supporting and head retracting collar, a flexible chin pad designed to apply and impose pressure restricted to the anterior surface only of the chin, and left and right manually regulatable adjusting means connecting left and right forward end portions of said collar to said pad in a manner to minimize forward protrusion of the head, resulting in relief of posterior muscle spasms, said adjustable connecting means comprising a pair of duplicate inelastic rearward pull exerting straps, the forward ends of said straps being positively secured to diametrically opposite left and right marginal end portions of said chin pad, and the rearward ends of said straps being adjustably and detachably connected to the respective cooperating end portions of said neck embracing collar.

3. The structure defined in claim 2, and wherein said pad consists of a flexible outer ply of canvas and an inner ply of soft moleskin secured to the rearward surface of and covering the canvas and providing a liner for said pad.

4. A cervical collar which achieves its purposes and the overall result desired by using three points of pressure; namely, the anterior surface of the chin and two posterior points, consisting of a flexible but substantially inelastic chin pad which conforms in shape to and imposes restraining pressure against the anterior surface only of the chin, a neck-embracing head-retracting collar having a wide central portion and gradually narrowing flap-like free end portions, and a pair of duplicate inelastic straps, the forward ends of said straps being positively secured to diametrically opposite left and right marginal edge portions of said chin pad, the rearward ends of said straps being adjustably and detachably connected to the respective cooperating end portions of said neck-embracing collar, said straps serving to regulate the amount of flattening of the neck by pulling backward on the chin pad.

References Cited in the file of this patent

UNITED STATES PATENTS

2,735,424	Benjamin	Feb. 21, 1956
2,736,314	Hale	Feb. 28, 1956
2,801,630	Moore	Aug. 6, 1957