Jan. 21, 1964 D. L. DYKINGA 3,118,443

HEAD HALTER

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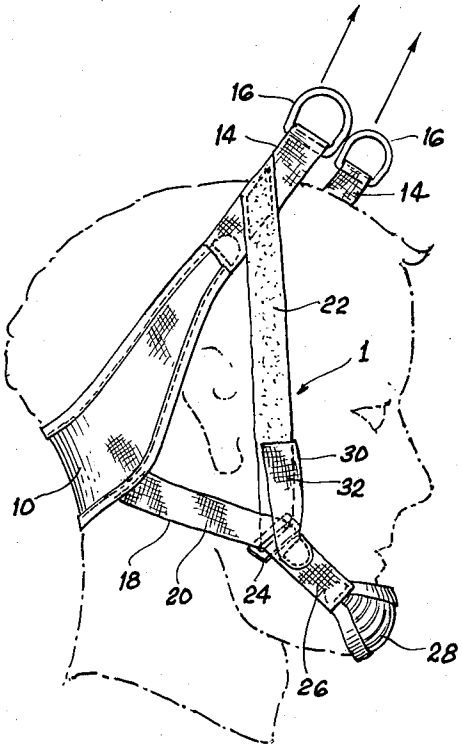


FIG. 1

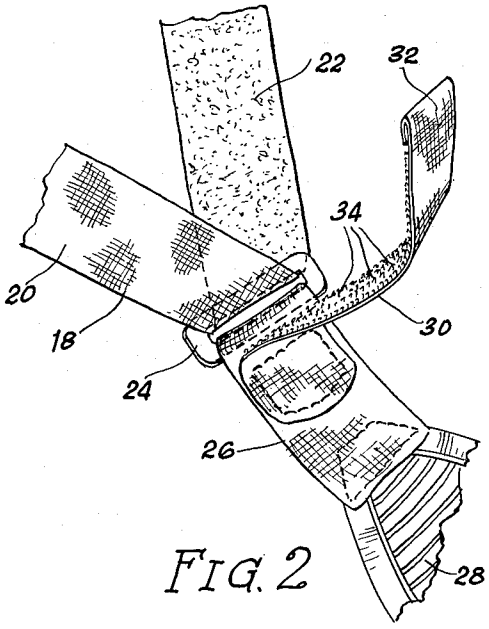


FIG. 2

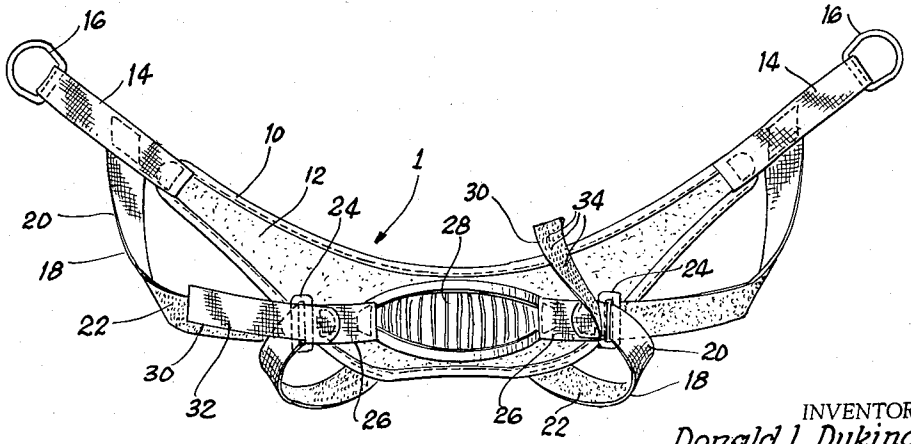


FIG. 3

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HEAD HALTER

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This invention relates to orthopedic traction devices and particularly to improved head halters especially useful for applying cervical traction.

The principal object of this invention is to provide a simpler, more easily manipulated, and more effective head halter than has been previously available for applying traction to a patient.

Another primary object of this invention is to provide a head halter which is easier for both trained and untrained personnel, as well as for a patient himself, to fit, to reproduce predetermined fits, to adjust and to use.

A further object of this invention is to provide a head halter which more readily remains in place during intermittent traction than do known head halters of its type.

Yet another object of this invention is to provide a head halter which is adjustable to a very wide range of head sizes and shapes and which fits all of those heads perfectly in any desired position of adjustment.

Still another object contemplated by this invention is the provision in a head halter having a chin strap of an arrangement of parts which distributes pressure exerted by the chin strap evenly over the jaws and the cheek bones thereby producing a more comfortable fit than has been previously possible thereby preventing discomfort, almost unbearable at times, generally attendant heavy traction.

Further an object of this invention is the provision in a head halter of simple means whereby either anterior or posterior tilt may be obtained with the same head halter.

Still another object of this invention is to provide novel locking and fastening means in a head halter for locking certain of the parts in place and for assisting in maintaining a predetermined relationship between those and other parts.

Other objects and advantages of this invention will become apparent from the following description and drawings of which:

FIG. 1 is a side elevational view of a preferred embodiment of this invention;

FIG. 2 is an enlarged perspective view of the fastening means of FIG. 1 showing its environment and construction; and

FIG. 3 is a perspective view of the entire head halter of FIG. 1.

The head halter 1 illustrated in FIGS. 1 to 3 of this application is specially designed for use in applying cervical traction to patients and may be fitted to a patient's head both by trained and relatively unskilled personnel as well as by the patient himself.

The head halter includes a back piece 10 having a butterfly shape, that shape being best seen in FIG. 3. It may be of any suitable material but preferably includes a soft interior facing 12 of a fabric such as flannel. The exterior surface of back piece 10 as seen in FIG. 1, should be dimensionally stable and relatively nonstretchable.

Sewed or otherwise suitably attached to each of the ends of back piece 10 are side straps 14. Side straps 14 may be a woven nylon fabric. At the free ends of side straps 14 metal D rings 16, through which traction may be applied to the head halter and thence to the patient's head in a manner to be described, are attached.

Two pile straps 18 are sewed or otherwise suitably attached to the base of back piece 10 near its center. Those straps include a dimensionally stable woven nylon fabric backing 20, on one side of which there is provided a large plurality of tiny upstanding loops of very fine thread or other filamentary material, that side being indicated as pile side 22. Pile straps 18 are stitched at their other ends to side straps 14 as is shown in FIGS. 1 and 3.

As is apparent from the drawings and particularly from FIG. 2, pile straps 18 pass through adjusting rings 24. Those rings are attached to chin piece straps 26 which may be of the same material as that from which side straps 14 are made. At their other ends, chin piece straps 26 are connected suitably to chin piece 28. Chin piece 28 is made of a contoured material which molds itself to almost any chin. Suitable materials include, among others, fiber reinforced plastic or rubberized materials.

Hook strips 30 are attached to and oriented generally parallel with chin piece straps 26. Hook strips 30 include a fabric backing 32 made of a material such as that from which the backing of pile straps 18 are made. A plurality of tiny hook elements 34 extend outwardly from one side of the backing. One method of producing a hook strip suitable for use in accordance with this invention is described in U.S. Patent No. 2,717,437 issued September 13, 1955. The elements which have been described as pile straps 18 and hook strips 30 when brought into contact in a manner to be described serve as a fastener.

To apply the head halter of this invention to a patient, the chin piece 28 is pulled forward and the halter is placed over the patient's head, the chin piece placed under the patient's chin, and the butterfly shaped back piece 10 placed across the occipital region of the patient's head. The butterfly shape is particularly adapted to fit the contours of the occipital region. With those elements in place, the D rings 16 are grasped and an upward force is exerted upon them until the chin piece 28 and the back piece 10 are aligned properly to exert traction at the prescribed angle of tilt. The D rings are then hooked onto a conventional spreader bar, such as that shown in U.S. Patent No. 2,665,685 issued January 12, 1954. It is from such a spreader bar that traction is applied to the patient.

To lock chin piece 28 in place and to maintain the parts of the head halter of this invention in their proper orientation, hook strips 30 are pressed against pile side 22, the vertical portion of pile straps 18 as shown in FIG. 1. So that the largest number of head sizes and shapes may be accommodated by a single head halter of this invention the pile straps 18 should preferably be about 12 inches in length and be attached at a distance of about 4 inches from each other to the base of back piece 10. The tiny hooks 34 of hook strip 30 are preferably made of a plastic material which is relatively stiff but somewhat flexible. The pile side 22 of pile straps 18 generally includes loops of a plastic filamentary material having a relatively high tensile strength. When the hooks of hook strip 30 are pressed against the pile 22 of pile straps 18 a large number of hooks 34 engage the loops of the pile side 22 causing an interlocking to occur between pile straps 18 and hook strips 30. This interlocking action serves to fasten pile straps 18 to hook strip 30, thereby causing the two elements to act as a fastener.

So strongly do the hooks **34** and loops of pile side **22** interlock that substantial force is required to separate them. The relative strengths of the hooks and the loops are so proportioned that when a force sufficient to pull pile straps **18** and hook strips **30** apart is exerted, the hooks and loops disengage without pulling the hooks from the backing and without tearing the loops of pile side **22**. Therefore the fastening function which the loops and hooks perform can be renewed indefinitely.

The locking action provided by this contact fastener has a number of purposes and advantages. One of those is to prevent upward movement (as would be the case in FIG. 1) of connecting pile straps **18** through the adjusting rings **24** when heavy traction is applied upwardly through **D** ring **16**. Another purpose is to assist in retaining the parts of the head halter in their proper orientation with respect to each other especially during intermittent traction. Perhaps the greatest advantage of the use of such locking and fastening means is their great simplicity. Especially is this important where straps and buckles have been the rule for years in the head halter art. To obtain the easy and rapid reproducibility of position and the extreme simplicity which such fastening means provides is a boon particularly in the home where untrained, ofttimes very weak and sickly people, must put themselves into and take themselves out of traction.

Contributing in great measure to the wide range of adjustability of the head halter of this invention is the free travel of pile straps **18** through adjusting rings **24**. Thus, as seen in FIG. 1, one portion of pile strap **18** assumes a generally horizontal disposition and the other portion of pile strap **18** on the other side of adjusting ring **24** is generally vertically oriented. The horizontal portion in use may not always be in tension. That depends particularly upon the patient's head size and the angle of pull used. However when the head halter is in use and is locked in position with the hook strip the vertical portion is always in tension. As is also apparent from FIG. 1, as it passes through adjusting ring **24**, pile strap **18** turns upon itself so that the pile side **22** in the immediate vicinity of the adjusting ring **24** on the two portions of pile strap **18** faces itself.

To remove the head halter from the fitted position shown in FIG. 1, hook strips **30** are pulled downwardly and away from pile straps **18** until they assume generally the position shown in FIG. 2. Then **D** rings **16** are unhooked from the spreader bar, chin piece **28** is pulled forward, the adjusting rings thereby traversing part of pile straps **18**, and the head halter is lifted up and over the patient's head.

With the head halter of this invention anterior and posterior tilt of the head may be obtained by increasing or decreasing the angle of pull of traction upon the halter through the **D** rings. Particularly does the provision of separate head and chin pieces permit such adjustment.

Patients using this halter have experienced complete comfort even under heavy traction. Its ease of application and its adaptability to fit a large range of head sizes and shapes has made it especially suitable for widespread institutional and home use. Its simple design enables patients themselves to put themselves into and remove themselves from traction easily and with a minimum of effort and danger of injury. It also enables patients more easily to reproduce and obtain a prescribed force and angle of pull, particularly because of the very minimum adjustment necessary and because of the vastly simpler locking means used. That is extremely important because with more complex conventional head halters the danger of maladjustment and consequent injury to the patient is a very important factor.

While I have illustrated only one embodiment of my invention I do not intend to be limited thereby except insofar as may be required by the following claims.

I claim:

1. A head halter through which traction may be applied to a patient's head comprising an elongated back piece assembly adapted to span a portion of the rear of the patient's head including means through which traction may be exerted against the head halter, a first strap having one end connected near one end of the back piece assembly and having its other end connected near the central portion of the back piece assembly, a second strap having one end connected near the other end of the back piece assembly and having its other end connected near the central portion of the back piece assembly, a chin piece assembly, adjusting means connecting said chin piece assembly and said straps which permit said straps to be freely adjustably movable with respect to said connecting means and means for locking said straps in predetermined positions with respect to said chin piece assembly.

2. The head halter of claim 1 wherein said means for locking are releasable fastening means attached to said straps and to said chin piece assembly, said fastening means including a large plurality of small hooks, whereby said back piece assembly and said chin piece assembly may be fastened in predetermined positions with respect to each other.

3. The head halter of claim 1 in which said back piece assembly includes an elongated butterfly shaped portion.

4. A head halter through which traction may be applied to a person's head comprising an elongated back piece assembly adapted to span the occipital region of a person's head, rings attached to the ends of the back piece assembly by means of which traction may be applied to the head halter, a first strap having one end connected near one end of the back piece assembly and having its other end connected near the central portion of the back piece assembly, a second strap having one end connected near the other end of the back piece assembly and having its other end connected near the central portion of the back piece assembly, a ring engaging each of said straps, a chin piece assembly connected to said rings, fastening means for locking said straps in predetermined positions with respect to said chin piece assembly including a large plurality of small hooks, the portions of each of said straps adjacent opposite sides of each ring being turned against each other and being disposed at generally right angles to each other.

5. A head halter through which traction may be applied to a patient's head comprising an elongated back piece assembly adapted to span a portion of the rear of the patient's head including means through which traction may be exerted against the head halter, a first strap having one end connected near one end of the back piece assembly and having its other end connected near the central portion of the back piece assembly, a second strap having one end connected near the other end of the back piece assembly and having its other end connected near the central portion of the back piece assembly, a chin piece assembly, and means connecting said chin piece assembly and said straps which permit said straps to be freely movable with respect to said connecting means, said connecting means dividing the straps into two portions disposed at generally right angles to each other and means for locking said straps in predetermined positions with respect to said chin piece assembly.

6. A head halter through which traction may be applied to a patient's head comprising an elongated back piece assembly adapted to span a portion of the rear of the patient's head including means through which traction may be exerted against the head halter, a first strap having one end connected near one end of the back piece assembly and having its other end connected near the central portion of the back piece assembly, a second strap having one end connected near the other end of the back piece assembly and having its other end connected near the

central portion of the back piece assembly, a chin piece assembly, means connecting said chin piece assembly and said straps which permit said straps to be freely movable with respect to said connecting means, said connecting means including rings through which said straps pass, said straps after passing through said rings changing direction by about 90° and means for locking said straps in predetermined positions with respect to said chin piece assembly.

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