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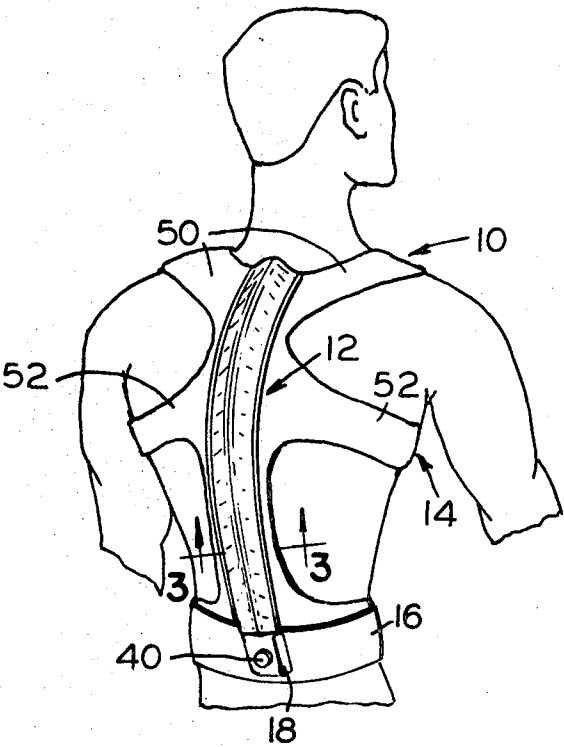
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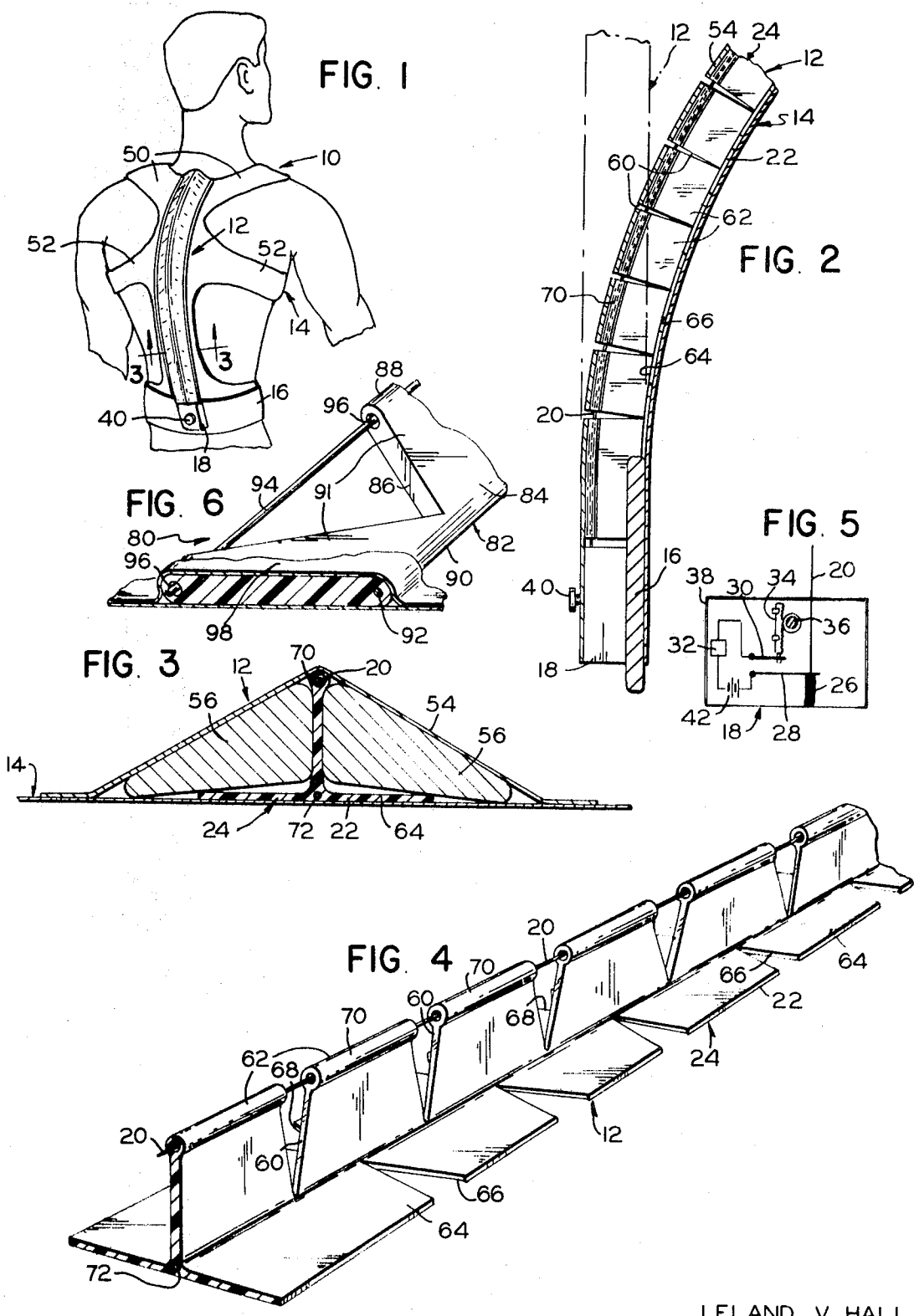
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[54] **POOR POSTURE DETECTORS**
10 Claims, 6 Drawing Figs.
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ABSTRACT: Flexible columns hinged at one side thereof have actuating cables at the opposite sides thereof which actuate warning indicators when the columns are flexed to extents in which the wearers have poor postures.





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POOR POSTURE DETECTORS

DESCRIPTION

This invention relates to poor posture detectors, and more particularly to spinal curvature detectors.

An object of the invention is to provide poor posture detectors.

Another object of the invention is to provide spinal curvature detectors.

A further object of the invention is to provide a poor posture detector attachable to the back of a wearer and having a warning indicator when the back of the wearer is bent to a poor posture.

Another object of the invention is to provide an elongated flexible column hinged at one side and having an actuator cable at the other side which is tensioned when the spinal column is curved too much and a warning indicator is actuated by the tensioning of the cable.

In the drawings:

FIG. 1 is a perspective view of a person wearing a poor posture detector forming one embodiment of the invention;

FIG. 2 is an enlarged, fragmentary vertical sectional view of the poor posture detector of FIG. 1;

FIG. 3 is an enlarged horizontal sectional view taken along line 3—3 of FIG. 1;

FIG. 4 is an enlarged, fragmentary perspective view of the poor posture detector of FIG. 1;

FIG. 5 is a schematic view of a warning circuit of the poor posture detector of FIG. 1; and

FIG. 6 is a fragmentary perspective view of a poor posture detector forming an alternate embodiment of the invention.

Referring now in detail to the drawings, there is shown in FIGS. 1 to 5 a poor posture detector 10 forming one embodiment of the invention and including a flexible column 12 carried by a vest 14 having a belt portion 16 carrying an indicator 18. The column 12 lies along the spine of the wearer, and has an actuator cable 20 parallel to and spaced from a hinged side 22 of a segmental core 24. When the wearer's back bends to a poor posture position, the cable is tensioned and, through a compression spring 26 (FIG. 5) permitting overtravel, moves a switch contactor 28 into engagement with an adjustable, fixed contact 30 to actuate a buzzer 32. This indicates to the wearer that he has moved to a poor posture. The contact 30 is carried by a rack 34 adjustable by a pinion 36 in a thin housing 38 attached to the belt portion 16 of the vest. A detented dial indicator knob 40 may be turned to turn the pinion to move the rack vertically to adjust the position of the contact 30 thereby adjusting the extent to which the column 12 can be moved before the buzzer 32 is actuated. A battery 42 in the housing supplies power to the buzzer when the switch comprising the contact 30 and the contactor 28 is closed.

The vest 14 (FIG. 1) includes shoulder straps 50, chest straps 52 and a covering sleeve 54. The straps hold the upper portion of the vest to the upper portion of the back of the wearer and the upper end of the core 24 is fixed by riveting or stitching to the upper portion of the vest. The lower end of the core 24 is fixed by riveting or stitches to the belt portion 16 of the vest. The core is enclosed in the very flexible sleeve 54. Soft, flexible filler strips 56 fill the spaces in the sleeve.

The core 24 is T-shaped in transverse cross section and preferably is composed of one of the well-known tough, flexible plastic materials and is formed by extruding and then cutting notches 60 in the stem portion of the T to form segments 62 to cause base portion 64 to be articulated. The base portion has notches 66 and 68 at opposite sides of the central portions of the segments 62 to articulate the core in a plane perpendicular to the other plane of articulation of the core. The segments 62 have beaded sleeve portions 70 through which the cable 20 slidably extends, the upper end of the cable being knotted to fix it to the upper segment 62. A flexible reinforcing strand 72 of wire, fiberglass or the like is embedded in the base portion 64.

When the hinged side of this apparatus is strapped or otherwise fastened so that it fits the contour of the wearer's back, parallel to the spine, it is capable of measuring the amount or degree of change of postural curve of the spine because the opening of any segment will cause a pull on the operating cable, thus triggering the warning device. The apparatus may be constructed so the length of the operating cable may be adjusted from either end, one end of the cable will be stationary and the other will be attached to a mechanical warning device as illustrated, or to operate an electrical warning device such as a vibrator. The electrical warning device would not have to be attached directly to the operating apparatus except for the switch leg of the electrical circuit. This method of attachment may give more versatility as the warning device could be installed in a less conspicuous or more sensitive place, and could be embedded in the harness or arrangement used to hold the segmented apparatus in place.

A layer of plastic or other material used to form the extrusion may be provided to go over the top of the center riser attaching to the riser and extending down to an attached to the base at or near the outer edge. This construction will give the riser support and fill the void on each side of the riser section. In other words, the extrusion will resemble the shape of both harness and extrusion combined in FIG. 3.

EMBODIMENT OF FIG. 6

A poor posture detector 80 forming an alternate embodiment of the invention is similar to the detector 10 except that the detector 80 is designed to detect and apprise the wearer of side curvature only. The detector 80 includes a flexible column 82 which is a thin, flat extruded strip 84 having notches 86 from an edge 88 only to articulate the strip at edge 90 and form segments 91, a reinforcing strand 92 being embedded in the edge portion 90. An actuating cable 94 is slidable in aligned bores 96 in the segment 91 near the edge 88. The actuating cable 94 is spaced laterally a substantial distance from the articulated portion so that when the wearer bends to the right too far, the cable 94 is tensioned and actuates an indicator (not shown) like the indicator 18. The column 82 is enclosed in a sleeve 98 forming a part of a vest or harness like the vest 14. The column 82 is positioned as shown in FIG. 6 to detect poor posture to the right, and may be turned over with the notches to the right to detect poor posture to the left. The sleeves 54 and 98 may be part of the extrusions if desired.

The core 24 may be constructed without the notches 66 and 68, if desired, in which case the stem or web 60 is formed of a thickness much less than that of the base 64 and adapted to stretch extensively within its elastic limit while the base 64 articulates. The web 60 may taper from thicker at the base to thinner at its edge remote from the base. Each half of the base also may taper from thicker adjacent the web 60 to thinner at the outer edges of the base 64.

The poor posture detectors described above are compact, light in weight, durable and effective to warn of poor postures, and are quite comfortable to the wearers while being inconspicuous.

What is claimed is

1. In a poor posture detector, a flexible column articulated along one portion thereof and expansible along a second portion parallel to and spaced laterally from said one portion, an actuator strand carried by the second portion of the column, harness means adapted for mounting the column on the back of a wearer with said first portion adjacent the back, and indicator means operable by the actuator strand to provide a warning signal when the back of the wearer is bent to a predetermined extent.
2. The poor posture detector of claim 1 wherein the flexible column includes a plurality of segments articulated together along said one portion and spacing the strand laterally from said one portion.

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- 3. The poor posture detector of claim 2 wherein said one portion extends along the spine of the wearer and the segments space the strand outwardly from the spine.
- 4. The poor posture detector of claim 3 wherein the flexible column comprises an elongated member having a strip-like base portion adapted to lie flat against the back of the user and a web or riser portion in a plane perpendicular to the central portion of the base portion, the web portion being notched to form segments and carrying the strand.
- 5. The poor posture detector of claim 4 wherein the base portion has pairs of notches staggered relative to the notches in the web portion.
- 6. The poor posture detector of claim 1 wherein the indicator means includes means for varying the effective length of

- the strand to adjust the point of actuation.
- 7. The poor posture detector of claim 2 wherein the flexible column comprises a flat strip articulated along one edge portion and carrying the strand at the opposite edge portion, the strip being notched along said opposite edge portion.
- 8. The poor posture detector of claim 1 wherein the harness means includes strap means adapted to be secured to the wearer and sleeve means enclosing the column and carried by the strap means.
- 9. The poor posture detector of claim 1 wherein the harness means comprises a vest.
- 10. The poor posture detector of claim 9 wherein the harness means includes a belt portion carrying the indicator means.

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