

[54] WRIST BRACE

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- [51] Int. Cl. A63b 71/14
- [58] Field of Search 273/54 B, 189 A;
2/161 A; 128/89 R, 165

[56] References Cited
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OTHER PUBLICATIONS

- Richards Advertisement, Journal of Bone & Joint Sur-
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- Mr. Spare-Time Bowler's Wristlet, Bowling Magazine,
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- Primary Examiner—Anton O. Oechsle
Attorney—Ford W. Harris, Jr. et al.

[57] ABSTRACT

A wrist brace having a unitary support member with a rigid forwardly extending section and a bendable later-
ally extending section for partially wrapping around
the thumb-side of the forearm. A strap member con-
nected to the forwardly extending section is designed
to encircle the hand immediately behind the knuckles
and in front of the thumb, and two more strap mem-
bers connected to the forwardly and laterally extend-
ing sections are designed to encircle for the forearm
immediately behind the wrist joint.

3 Claims, 7 Drawing Figures

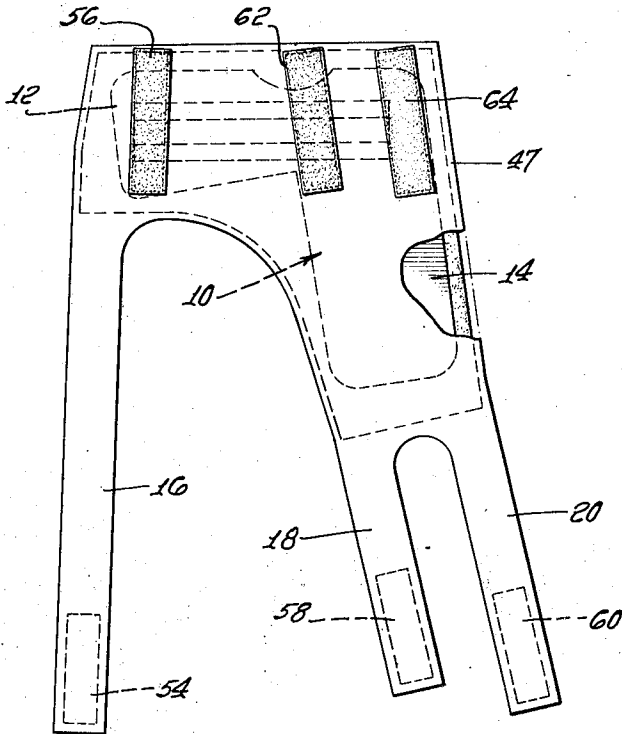


FIG. 1.

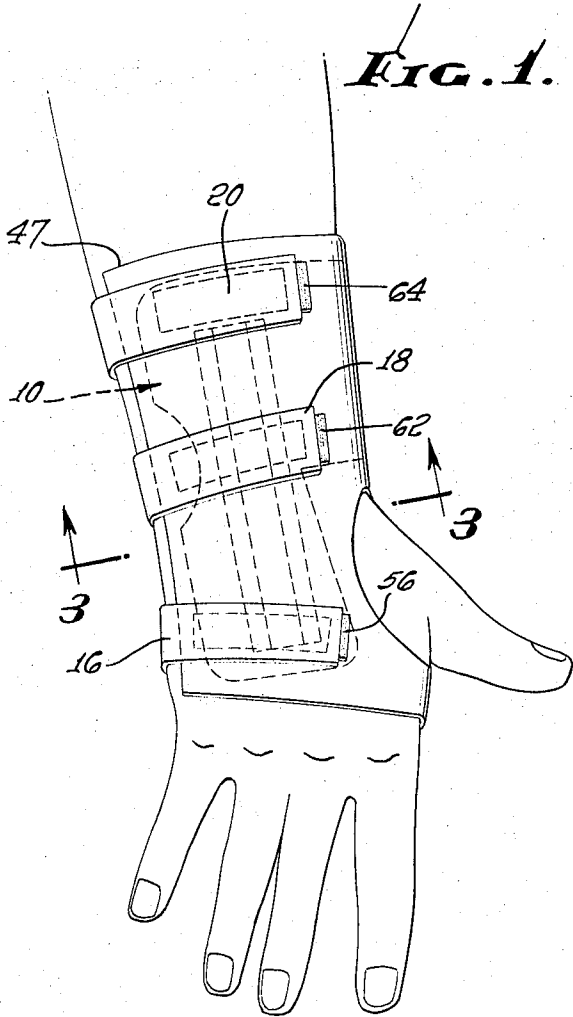


FIG. 2.

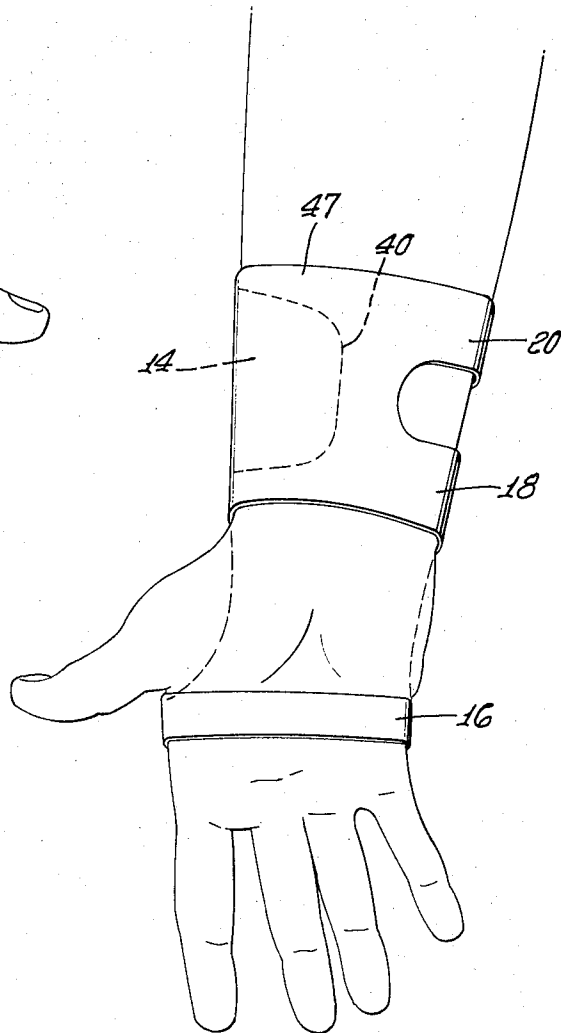
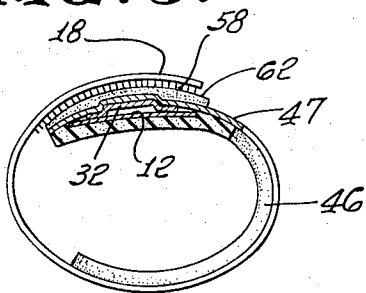


FIG. 3.



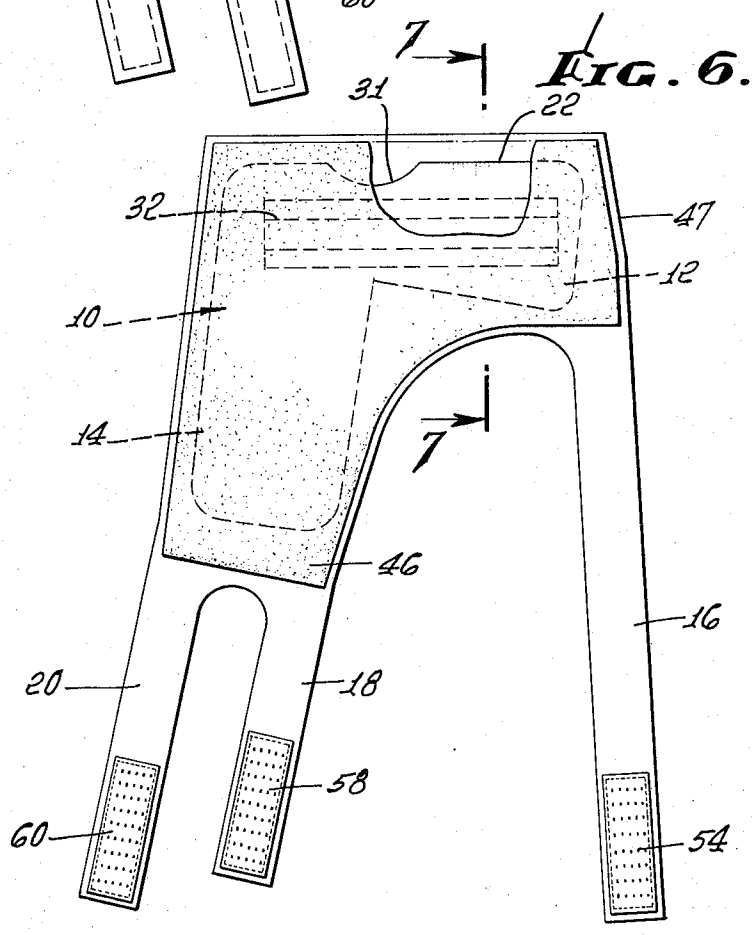
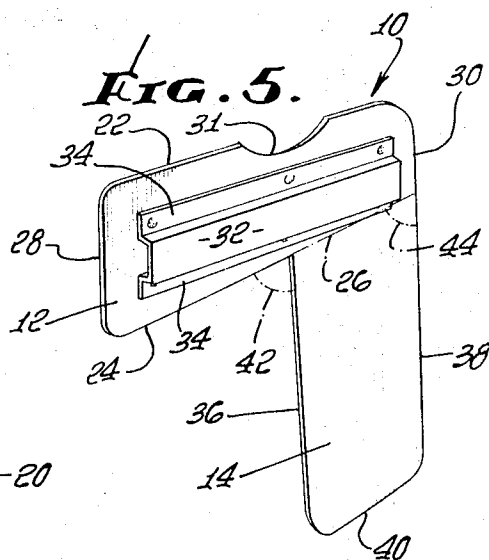
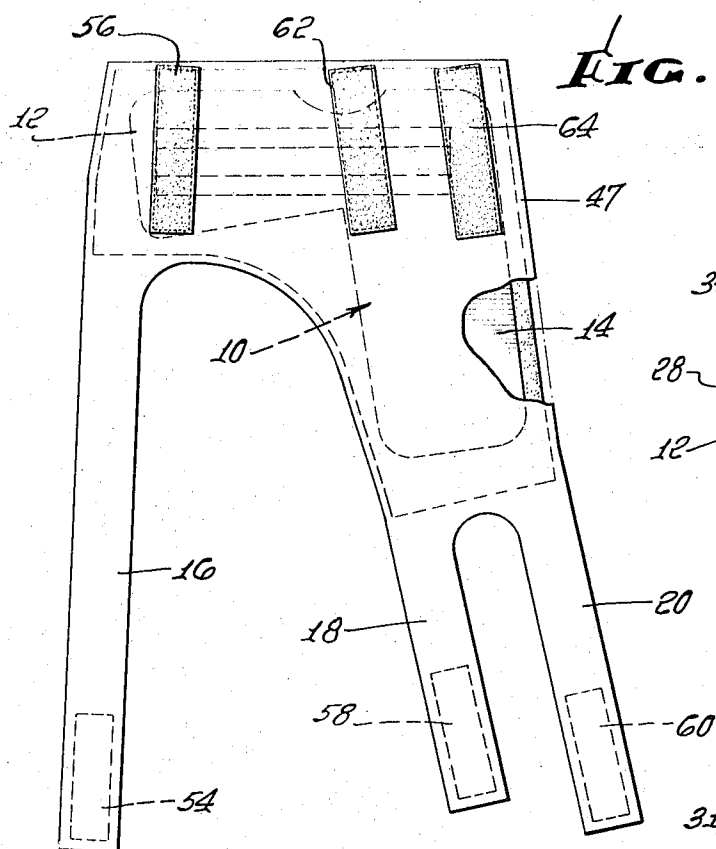
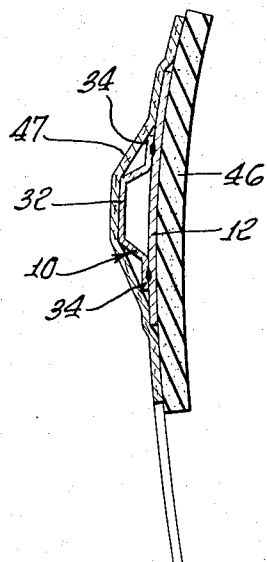


FIG. 7.



WRIST BRACE

This invention relates generally to wrist braces, and more particularly to wrist braces used in athletic activities such as bowling to restrict the movement of the wrist joint in a predetermined manner.

Various prior art wrist braces have been designed for use in bowling and other sports. However, such prior art braces have failed to combine the optimum combination of firm support and freedom of action. Some of them provide prohibitive rigid wrist support in every direction and include cumbersome support members and stops which cover too much of the hand, wrist and forearms, thereby interfering with the manipulative activities of the hand. Others provide insufficient support because of a poorly designed support member and/or inadequate fasteners for holding the support in proper operative position on the arm. Typical prior art braces having various of the foregoing deficiencies are shown in the following United States patents: Barry U.S. Pat. No. 2,924,458; Anderson U.S. Pat. No. 3,117,786; Blough U.S. Pat. No. 3,269,728; and Thomas U.S. Pat. No. 3,512,776.

Accordingly, it is a primary object of the present invention to provide a wrist brace which overcomes the aforementioned problems of prior art devices, and provides the necessary support for the wrist to keep it properly aligned, without unduly interfering with desirable wrist movement in certain directions and necessary manipulations of the thumb and fingers.

Another object of the invention is to provide a wrist brace which provides a support member having a rigid portion for positioning across the top of the wrist joint and a stiff bendable portion to partially wrap around and conform to the shape of the forearm. A related object is to provide a forward strap member adapted to encircle the hand immediately behind the knuckles and between the thumb and forefinger to hold the rigid portion of the support member against the back of the hand behind the knuckles, and to provide a rearward strap member adapted to encircle the forearm to hold the bendable portion against and partially wrapped around the thumb-side of the forearm.

Another object is to provide a wrist brace of the foregoing characteristics which is shaped and cushioned to fit snugly against the underlying hand, wrist, and forearm surfaces in a comfortable easily determined position without said position changing during manipulation of the thumb, fingers and wrist during athletic events such as bowling.

Further purposes, objects, features and advantages of the invention will be evident to those skilled in the art from the following description of a preferred embodiment of the invention.

In the drawings:

FIG. 1 is a top view of a presently preferred embodiment of the invention in operative position on the right arm of a user;

FIG. 2 is a bottom view of FIG. 1;

FIG. 3 is a sectional view taken along 3—3 in FIG. 1;

FIG. 4 is a top view of the brace of FIG. 1 in a flattened position;

FIG. 5 is a perspective view of a support member in a flattened position;

FIG. 6 is a bottom view of FIG. 4; and

FIG. 7 is a sectional view taken along line 7—7 of FIG. 6.

Generally speaking, the invention provides a removable wrist brace having a unitary support member 10 with a forwardly extending section 12 adapted to rest across the top of the wrist joint from the forearm to the back of the hand immediately behind the knuckles, and a laterally extending section 14 adapted to wrap around the thumb-side of the forearm immediately behind the wrist joint. The support member 10 is held in operative position at its forward end by a strap 16 which wraps around the palm of the hand immediately behind the knuckles and between the thumb and forefinger. The rearward end of the support member 10 is held in operative position behind the wrist joint by two more straps 18, 20 which wrap around the forearm. The custom-designed wrist brace is not interchangeable between the right and left arm, and provides restriction of movement of the wrist joint in a manner particularly useful in athletic events such as bowling, all as described in more detail hereinafter.

Referring to FIGS. 5 and 7, the support member 10 is shown in an upright flattened position and is preferably formed initially from a single sheet of bendable material such as sheet metal shaped like an L. In the preferred embodiment, the forwardly extending section 12 is defined by an outside edge 22, an inside edge 24 and its imaginary extension 26, a forward edge 28, and a rearward edge 30. The outer and inner edges 22, 24 slightly diverge in the forward direction, thereby making the forward edge 28 slightly longer than the rearward edge 30, with the forward and rearward edges substantially parallel. An indentation 31 positioned slightly rearwardly of a midpoint on the outside edge 22 is designed to receive the protruding portion of the wrist bone, thereby enabling quick positioning of the brace in proper operative location directly against and across the knuckle-side of the wrist joint. Such positioning leaves the remaining sides of the wrist joint, namely, the thumb-side, palm-side and little finger-side completely free of any overlying restraint.

A raised rib 32 with side flanges 34 is attached on one surface of the forwardly extending section 14 in approximate alignment with either the outside or inside edges 22, 24, the choice of surfaces being determined by whether the brace is designed for a right or left hand. The rib 32 is centered inside the periphery of the forwardly extending section 12 to make the forwardly extending section substantially rigid, and particularly to prevent longitudinal bowing thereof. Of course, it is to be emphasized that the rib combined with the underlying member defined by the four edges 22, 24, 28 and 30, or some other suitable rigid structure may be adapted for and considered as the forwardly extending section, without departing from the spirit of the invention herein.

The laterally extending section 14 is defined by opposing edges 36, 38, the latter being a direct continuation of rearward edge 30 of the adjoining forwardly extending section 12. An inside edge 40 and the extension 26 of the inside edge 24 delineate the other boundaries so that the laterally extending section 14 has greater width but lesser length than its longitudinal counterpart 12, although the length must be sufficient to allow the laterally extending section to partially wrap around the thumb-side of the forearm and at least a portion of the palm-side of the forearm. The laterally extending section 14 is integral with and adjoins the forwardly extending section 12 at a forward junction angle 42 of ap-

proximately ninety degrees to assure that edge 36 does not interfere with the wrist joint and the rearward base portion of the thumb and at a rearward junction angle 44 also of about ninety degrees. These relative alignments and dimensions have proved satisfactory, but are given only by way of example.

As best shown in FIGS. 4 and 6, the support member 10 is attached to an underlying cushion member 46 having a size sufficient to extend an appreciable distance beyond the periphery of the support member. A flexible skin 47 of leather, plastic or the like completely overlies the support member 10 and its cushion member 46, and includes the three strap members 16, 18, and 20. The first strap member 16 is substantially aligned with and adjacent to the forward edge 28 of the support member 10 and is designed to encircle the hand immediately behind the knuckles and across the palm between the thumb and forefinger. A suitable fastener for removably and adjustably holding the strap member 16 in tight operative position is provided on the bottom surface 54 of the loose end of the strap member 16 and a properly aligned portion 56 on the top surface of the skin 47. Similarly, the second and third strap member 18, 20 are each substantially aligned with and adjacent to edges 36, 38 respectively, of the support member 10 and are designed to encircle the forearm behind the wrist joint. As with the strap member 16, a suitable fastener such as Velcron is provided on the bottom surfaces 58, 60 of the loose ends of the strap members 18, 20, respectively, and on the correspondingly aligned portions 62, 64 on the top surface of the skin 47. The fastener portions 56, 64 are preferably positioned on the skin 47 adjacent but not extending beyond the edges 28, 30, respectively, to assure that strap members 16, 20 are in an optimum location for securing the support member 10 against the arm. Similarly the fastener portion 62 is preferably positioned to be aligned adjacent but not extending beyond edge 36 so that strap member 18 is properly positioned.

In view of the foregoing, and particularly by reference to FIGS. 1, 2 and 3, it will be appreciated by those skilled in the art that when the brace is in proper operative position on the arm, the knuckles and fingers are completely free for manipulative action, while the single-layered narrow strap 16 is the only structural element on the palm of the hand. Furthermore, considering an arm in an upright hand-shaking position, it will be apparent that the invention provides firm lateral restraint against the wrist joint while at the same time providing only partial restraint in the vertical direction whereby a person wearing the brace can still impart the necessary and desirable vertical lift as when throwing a bowling ball. In addition, desirable freedom of move-

ment is assured by having no portion of the support member at the junction between the thumb and index finger or against the thumb and index finger joints.

Although an exemplary embodiment of the invention has been disclosed herein for purposes of illustration, it will be understood that various changes, modifications, and substitutions may be incorporated in such embodiment without departing from the spirit of the invention as defined by the claims which follow.

We claim:

1. A wrist brace including:

a normally rigid flat unitary support member having a forwardly extending section for positioning across the wrist joint against only the knuckle-side of the hand and forearm and a lateral section extending from said forwardly extending section on the thumb-side only and bendable into a position behind the wrist joint wrapped around and against the forearm from the knuckle-side across the thumb-side to the palm-side, said support member terminating to leave the finger-side of the hand, wrist joint and forearm free of any overlying rigid restraint;

a reinforcing rib attached on top of said forwardly extending section and disposed across the wrist joint; a cushion member underlying said support member; and

flexible skin means overlying said support member for holding said forwardly extending section across the wrist joint against the back of the hand and for holding said lateral section wrapped around the thumb-side of the forearm.

2. The device of claim 1 wherein said support member includes a notch cut from the side of said forwardly extending section directly opposite said lateral section for receiving the protruding portion of the wrist bone, and wherein said flexible skin means includes a separate strap means for passing behind the wrist joint directly over said notch.

3. The device of claim 1 wherein said flexible skin means includes a first strap means aligned with the forward edge of said forwardly extending member for extending around the hand immediately behind the knuckles, a second strap means aligned with forward edge of said laterally extending member for extending only partially around the arm on the little-finger-side of the forearm immediately behind the wrist joint, a third strap means aligned with the rearward edge of said laterally extending member for extending only partially around the arm on the little-finger-side of the forearm, and attachment means on the knuckle-side of the hand and forearm for adjustably engaging said first, second, and third strap means.

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