Abstract Title: A wetsuit with interchangeable pads

A hiking system for sailors comprises a wetsuit with pockets mounted on the inside of the wetsuit on the back of the leg, behind the wearers' thigh, the pockets hold one or more interchangeable pads which vary in thickness and flexibility. The system allows the wearer to use the pads suitable for their requirements e.g. the weather. The pads may be made from fibreglass battens (12, Fig 2) attached to neoprene or EVA foam (11, Fig 2), allowing the pad to be still in the vertical direction yet flexible in the horizontal direction, and mould around the leg of the user. The pads may also be made from EVA foam. The pads may be detachably secured inside the pocket via Velcro (RTM) 20 and when more than one pad is inserted into a pocket, the pads may be secured to each other by Velcro (RTM) (fig 4). The pockets may be made from a durable and abrasive resistant material to reduce wear. Preferably the pockets cover the seat area of the wet suit, and have drain holes (22, Fig 7) to avoid the collection of water in the pockets. The pads may be housed in waterproof material or coated with a waterproof solution.
"Watersport Hiking Support System."

The invention is described in the following statement:-
WATERSPORT HIKING SUPPORT SYSTEM

FIELD OF THE INVENTION

The invention generally relates to the field of sportswear products. More specifically, the invention relates to combining a novel hiking support system with sports clothing, such as a wetsuit, to help reduce muscle fatigue in situations such as hiking from the gunnels of a sailing vessel.

BACKGROUND OF THE INVENTION

Hiking support systems have been applied to wetsuits for dinghy sailing for some time, for hiking from a sailing dinghy like that shown in figure 1. These wetsuits are typically a set of fibreglass battens sewn directly into the wetsuit behind the thigh. These systems are fixed with no provision for adjusting the type of support required depending on sailing conditions or personal preference.

Such systems are restrictive in that the thickness of the battens (for example) cannot be easily changed given variable wind conditions. In addition, the pocket will typically wear out relatively quickly due to the method of housing the battens, and the battens will cut and pinch through the fabric of the wetsuit, and sometimes the leg.

SUMMARY OF THE INVENTION

In accordance with a first aspect of the present invention, there is provided an interchangeable pairs of pads, made of composite material, housed in a pocket behind each thigh. The removable pad is designed to produce a seamless surface, that won’t pinch the fabric of the pocket or the user, and that will be both stiff in the vertical direction and yet flexible in the horizontal direction. The pads can be varied in all dimensions, including flexibility and in depth depending on the user’s requirements and weather conditions. Pads of different types can also be joined together (using Velcro for example) and used in various combinations together in the same pocket, for different conditions or user requirements. Ideally, and as shown in the accompanying drawings, the application of the Velcro must be in the centre of the pad such that they can combine and maintain flexibility around the leg. The pads can be easily removed entirely if a sailor wants to train without hiking support, for example, or sail in light winds where the extra weight of the pads is unnecessary and extra flexibility for the sailor is an advantage.
A second aspect of the present invention is that the pad pocket is made of material that reduces wear.

In one embodiment the pockets are on the inside of the suit, and designed such that the stitching of this pocket does not irritate the user. That generally means the inner pocket is made considerably wider and longer than the composite pad inserts and these composite pad inserts are optionally fixed into position within the pocket using Velcro. The Velcro is generally applied to the central region of the pocket so that the composite pad inserts can flex easier around the leg. Using the internal pocket system it is also possible for the user to position the pads to be a more custom fit. The introduction of a second layer of foam, such as EVA, to the composite batten pad, can be fixed to the composite pad by a layer of Velcro also applied in the centre of the pad such that the system maintains good flexibility around the leg. This second layer of foam material can be a bigger size than the composite batten pad and mould to the shape of the leg while the suit is in use to provide a more comfortable and custom fit. There are many varieties of foam material to choose from, and this adds to the flexibility of the system depending on the conditions the suit is being used for. A durable soft foam material will mould nicely to the leg shape and help smooth out the edges of the composite batten pad for example. Thicker or thinner materials can be optionally used. The materials used for the inner pocket design are chosen to provide for durability and abrasive resistance, such that the user is protected from the pad inserts, and that the suit does not wear out prematurely.

In another embodiment the suit can be of other various forms, such as long “farmer” john styles with or without arms, or shorts or long pants without a top, or in a three quarter cut with shoulder straps.

BRIEF DESCRIPTION OF THE DRAWINGS

Notwithstanding any other forms which may fall within the scope of the present invention, preferred forms of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Fig. 1 illustrates a sailor in hiking position from a small sailing dinghy.

Fig. 2 illustrates an example position of batten inserts inside the batten pad.

Fig. 3 illustrates cross-section of extension and batten pad construction.

Fig. 4 illustrates method for Velcro attachment of extension pad with batten pad.

Fig. 5 illustrates attachment of extension pad with batten pad.
Fig 6. Illustrates Front View of Long John style suit with internal pocket system.

Fig 7. Illustrates internal pocket panels.

Fig 8. Illustrates Rear View of Long John style suit with internal pocket system.

Fig 9. Illustrates section view of internal pocket system.

Fig 10. Illustrates exploded section view of internal pocket system.

DETAILED DESCRIPTION OF THE EMBODIMENTS

For figure 2, the dimensions of an example sized battened pad insert 18 is drawn. Ideally, the battens 12 are fibreglass and 45mm wide, with the sharp edges ground to fit within 3mm of the nylon laminated neoprene sheeting or EVA 11. The pad is designed to taper from top to bottom, have curved edges, and taper at the top to match ergonomics of hiking. Soft nylon laminated neoprene sheeting material, with plenty of flexibility and durability, is required so that the whole pad will mould around the leg comfortably. The battens are glued into place between two sheets of the nylon laminated neoprene material, or similar material. The whole pad is optionally covered in a waterproof material, such as a Teflon treatment for example. The cross section of the pad insert is shown in figure 3.

A second pad insert type is one that has no internal battens. It is designed to simply add extra height and padding. This “extension pad” 19 is designed to connect to the main batten pad with Velcro. The Velcro is at the centre of the pad so the two pads can still flex around the leg without increased stiffness. In one preferred embodiment, this extension pad can be made out of EVA and constructed with the dimensions as indicated in figure 3, 4 and 5.

In a preferred embodiment, there is provided a wetsuit with an internal pocket system as shown in figures 6, 7, 8, 9 and 10. Dimensions for pads can vary and be scaled for various sizes of suit, and personal preference for the sailor. The largest pads may have four internal battens and the smallest pads two or even one for very small suits.
In figures 6, 7, 8, 9 and 10 the following items 14 to 22 are described:

14. Neoprene panel of main suit, may be various materials depending on style, typically 2mm or 3mm nylon jersey, however can be other styles such as some of the more modern wetsuit materials such as thin neoprene with a microfleece inside.

15. Rear Panel with abrasive resistant neoprene with durable nylon laminated to outside, and regular wetsuit nylon to the inside.

16. Knee pad, can be various styles, in this case a durable nylon laminated foam patch sewn to the suit.

17. Inside pocket panel with abrasive resistant neoprene on the inside of the pocket; also made with a durable nylon laminated to neoprene on the inside of the pocket and a comfortable nylon laminated to the inside next to the skin.

18. Battened pad

19. EVA extension pad

20. Velcro centred in pocket that allows pad inserts to attach and stay in position.

21. Velcro seal of pocket

22. Drain hole inside suit.

EXAMPLES OF THE SYSTEM IN USE:

Example 1 Hiking Pants for Small Boat Dinghy Sailing

The system works well for sailors of dinghy classes, such as the Olympic Classes Laser, Finn and Europe.

Example 2 Hiking Pants for Sportboat Yachting

It is possible to design versions of the same for sportboat yachting. These systems may have hiking pads and suit in different dimensions and materials.

Example 3 Hiking Shorts for Yachting

A short version, with no straps, and a thinner padded insert design may be ideal for yachting purposes, where the hiking is less strenuous.

The forgoing describes preferred forms of the present invention. Modifications, obvious to those skilled in the art can be made thereto without departing from the scope of the invention.
The claims defining the inventions are as follows:

1. A hiking system where pads of various stiffness can be inserted in different combinations depending on sailing conditions into a durable pocket mounted on the inside thigh of a wetsuit.

2. A system as claimed in claim 1 wherein a pad insert designed using EVA sheeting or nylon laminated foam (or neoprene) or similar, glued together over fibreglass battens.

3. A system as claimed in claim 2 wherein the pad insert housed in waterproof material or treated with a waterproof substance such as Teflon.

4. A system as claimed in claim 2 or 3 where the pad is designed to taper down the leg and taper across the top of the leg for hiking ergonomics.

5. A system as claimed in claim 1 where two pad inserts can be inserted in one pocket together, clipped together in the centre with Velcro to maintain flexibility while used in combination.

6. A system as claimed in claim 5 where one of the pad inserts is made of EVA sheeting optionally housed in waterproof material, without battens, used to provide extra thickness to the hiking support or to mould to shape of leg.

7. A system as claimed in claim 1 where the design of the pocket for pad inserts is made of a durable material such as durable nylon laminated neoprene or similar, mounted on outside of suit with Velcro opening at top.

8. A system as claimed in claim 1 where the design of the pocket for pad inserts is made of a durable material such as durable nylon laminated neoprene or similar, and mounted in the inside panels of the suit.

9. A system as claimed in claim 8 where the internal pockets are large and cover the whole seat area of the suit, and high up the back so no seams to the pocket irritate the sailor while hiking.

10. A system as claimed in claim 8 where the internal pockets are mounted with Velcro only in the middle of the pocket to optimise flexibility of the internal batten pad around the leg when attached in a user specified position.
11. A system as claimed in claim 10 where the addition of an EVA or lightweight foam material is attached to the battered pad that will also mold to the shape of the leg for a snug custom fit to the user.

12. A system as claimed in claim 8 where the pocket has drain holes to avoid water accidentally collecting in the pocket.

13. A hiking system substantially as herein described with reference to the accompanying drawings.
Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

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Field of Search:
Search of GB, EP, WO & US patent documents classified in the following areas of the UKC:

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Worldwide search of patent documents classified in the following areas of the IPC

A41D; A63B; B63C

The following online and other databases have been used in the preparation of this search report

WPI, EPDOC