UNITED STATES PATENT AND TRADEMARK OFFICE

Utility Patent Application (Provisional)

TITLE: NOVEL MEANS OF INTEGRATED BUOYANCY CONTROL IN COMMERCIAL AND RECREATIONAL DIVE EXPOSURE SUIT APPARATUS

INVENTOR: George E. Davis IV

FIELD OF INVENTION

[0001] The aforementioned invention relates to dive buoyancy management apparatus which is fully integratable into an exposure suit allowing for higher levels of subsea performance due to its superior aquadynamic and ergonomic properties. The device functions as a weighted fabric belt capable of being either integrated into specialized exposure suits or worn on top of/under currently available garments.

BACKGROUND

[0002] Recreational and commercial dive activities have been on the rise with the advent of further ocean-related exploration and utilization. These sub-sea activities require specialized equipment such as exposure suits and buoyancy control and or management devices. These devices are often large, poorly streamlined, and expensive due to their current nature.

SUMMARY OF INVENTION

[0003] This invention aims to be a superior option in diver buoyancy management. This is achieved through a simply manufactured lead woven band with adjustable and expansionary segments made from silicone. The belt is to be worn within or under a garment allowing for further streamlining and superior movement possibilities for the wearer.

DESCRIPTION OF INCLUDED FIGURES

[0004] Some properties of the current invention are provided below for exemplary and illustrative purposes and do not limit the precise specifications of the invention but rather serve as a reference for general attributes.

[0005] FIG. 1 - Figure 1 depicts a top-down isometric of a single belt unit with labels describing major elements: expansion units, lead segments, and adjustment latch.

[0006] FIG. 2 - Figure 2 depicts a close-up view of the lead-laden belt segment showing also the intricacies of the “plain” weave used in its manufacture. The relation between the nylon threads and lead strands within the segment are illustrated within the figure.

[0007] FIG. 3 - Figure 3 depicts a possible cross-sectional view of the invention installed within a 3mm exposure garment.

[0008] FIG. 4 - Figure 4 depicts a close-up isometric expansion section of the invention. Showing the silicone connectors reaching to the sides of the “plain” woven lead belt section.

COMPREHENSIVE SUMMARY OF THE INVENTION

[0009] This device consists of one main component, a coupling of lead wires strung together with nylon interlacing holding them together. This band can be manufactured using a standard industrial band weaver, where the lead wire is the longer feed-through strand and the nylon thread is the pass-through strand. The belts are to be made of approximately 1-pound or 0.5-kilogram increments. To achieve this each band will consist of 16 meters of 0.5 mm diameter lead wire and 0.2mm nylon thread.

[0010] The band will also consist of three expansion segments, one under each arm and one in the front. These expansion units can be seen in Fig 4. Their construction is a nylon fabric stitched to both the lead band and also to a set of silicone strands effectively connecting them. The makeup of the silicone bands is yet to be determined as various options can be offered for differing levels of movement.

[0011] The final component is a back-mounted adjustable strap. Its location can be identified in Fig 1. This component consists of a standard and 3rd party assembly and is subject to change. It will however fulfill the following criteria: low profile, lightweight, and durable.

[0012] The overall invention once assembled in totality will consist of the lead band connecting three stretching points and connected to itself by a fabric or velcro latch. Once assembled the device can be used in one of three ways: secured around the outside waist of an exposure suit, clasped directly to the wearer under the garment, or within a specialized suit. To be used the operator will have to select the belt with the proper weight or combine several to achieve the required weight for their activity.

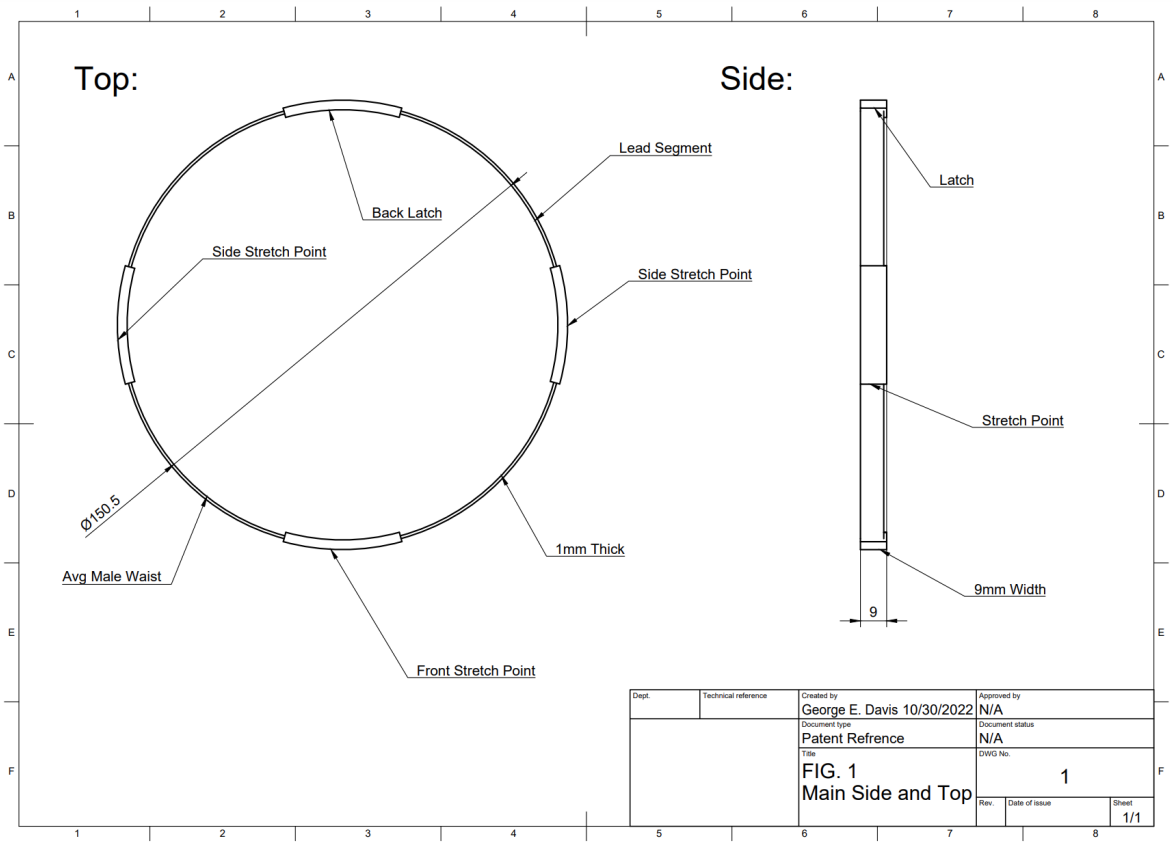
ClAIMS

What is Claimed:

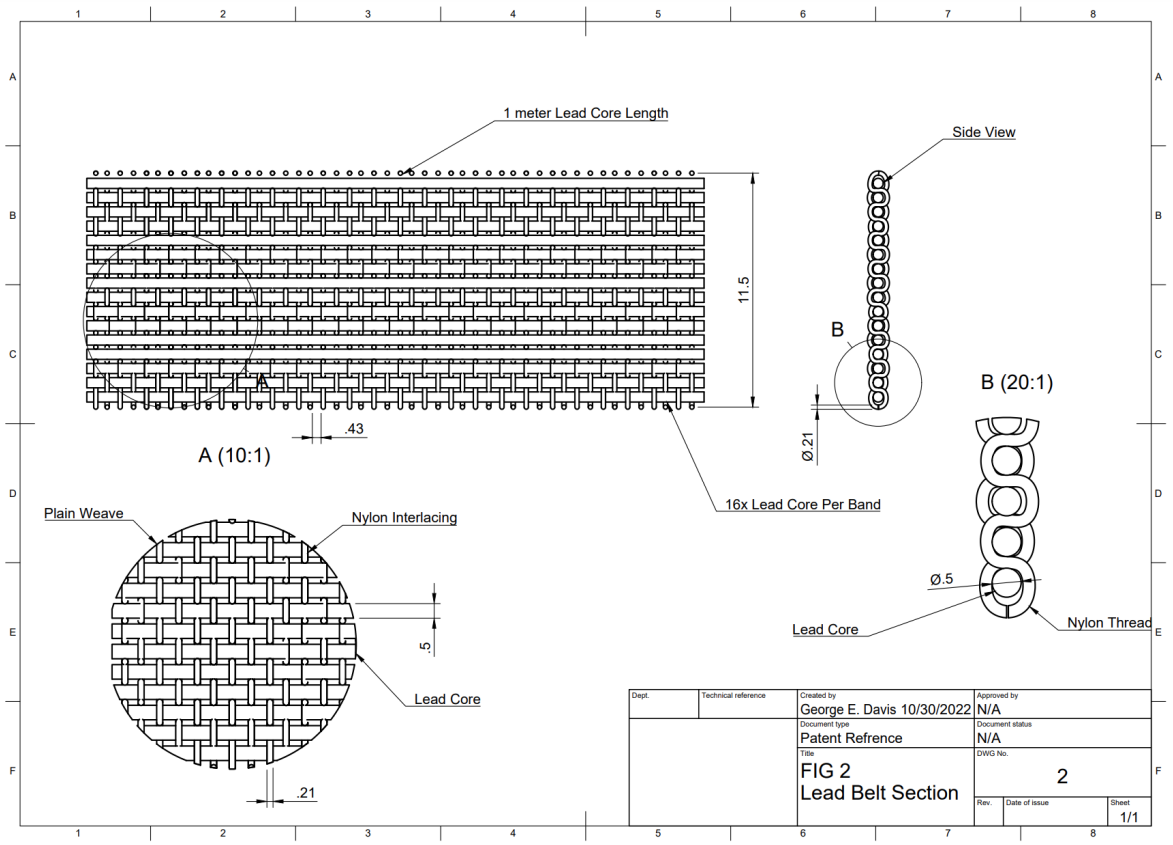
1. A weight belt that is in itself a weight and can be worn within or under an exposure suit due to its dense and flexible properties.
2. A woven thread and lead wire material to be used to add integrated weight to exposure suits.
3. An integrated weight belt with several stretch points allowing for improved movement.

ABSTRACT

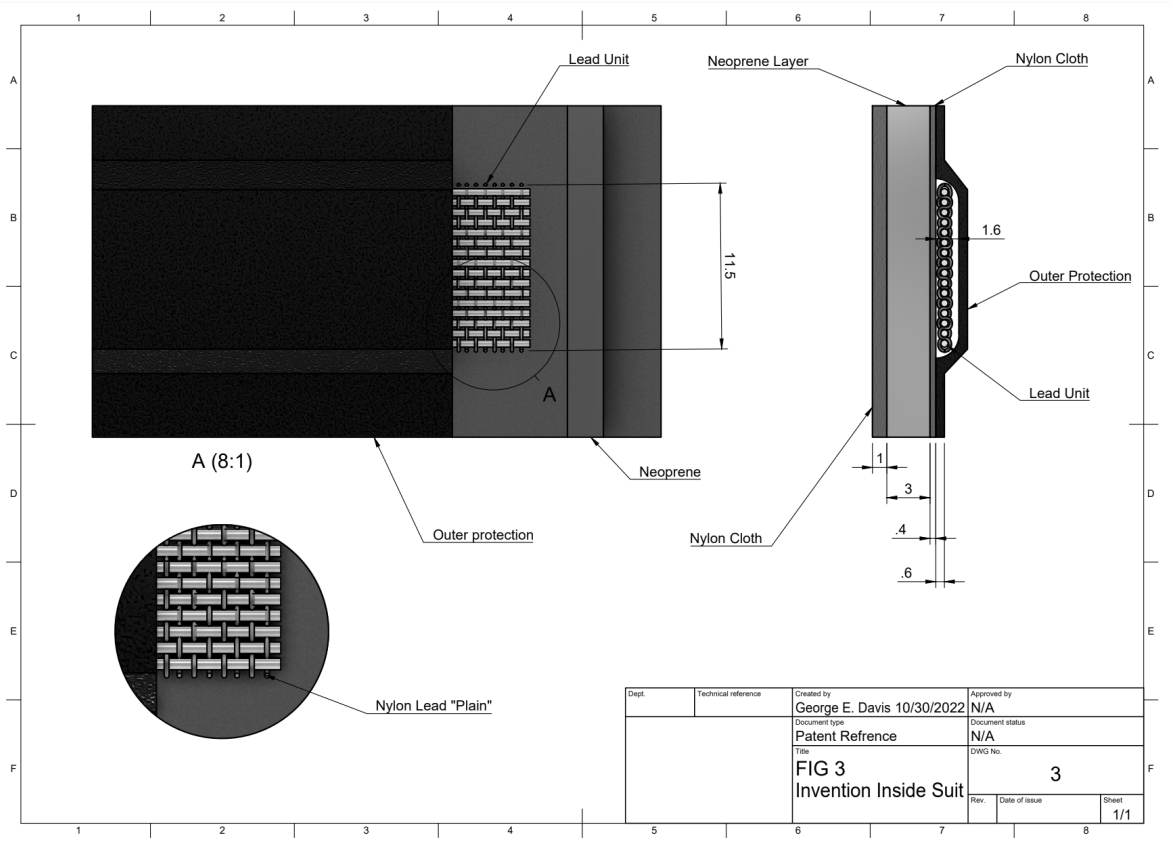
[0013] The present device comprises of a lead-laced band with several stretching points as well as an adjustable latch. It is to be worn under or within a diving exposure suit so as to control the diver's buoyancy. The device can be manufactured so as to provide different weights, sizes, and elasticity to meet a variety of technical and recreational dive activities.



Dept.	Technical reference	Created by	Approved by
		George E. Davis 10/30/2022	N/A
		Document type: Patent Refrence	Document status: N/A
		Title: FIG. 1 Main Side and Top	DWG No.: 1
			Rev. / Date of issue / Sheet: 1/1



Dept.	Technical reference	Created by	Approved by
		George E. Davis 10/30/2022	N/A
		Document type: Patent Refrence	Document status: N/A
		Title: FIG 2 Lead Belt Section	DWG No.: 2
			Rev. / Date of issue / Sheet: 1/1


Lead Unit
Neoprene Layer
Nylon Cloth
11.5
A
A (8:1)
Neoprene
Outer protection
1.6
Outer Protection
Lead Unit
1
3
.4
.6
Nylon Cloth
Nylon Lead "Plain"
Dept.
Technical reference
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Patent Refrence
Document status
N/A
Title
FIG 3
Invention Inside Suit
DWG No.
3
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Date of issue
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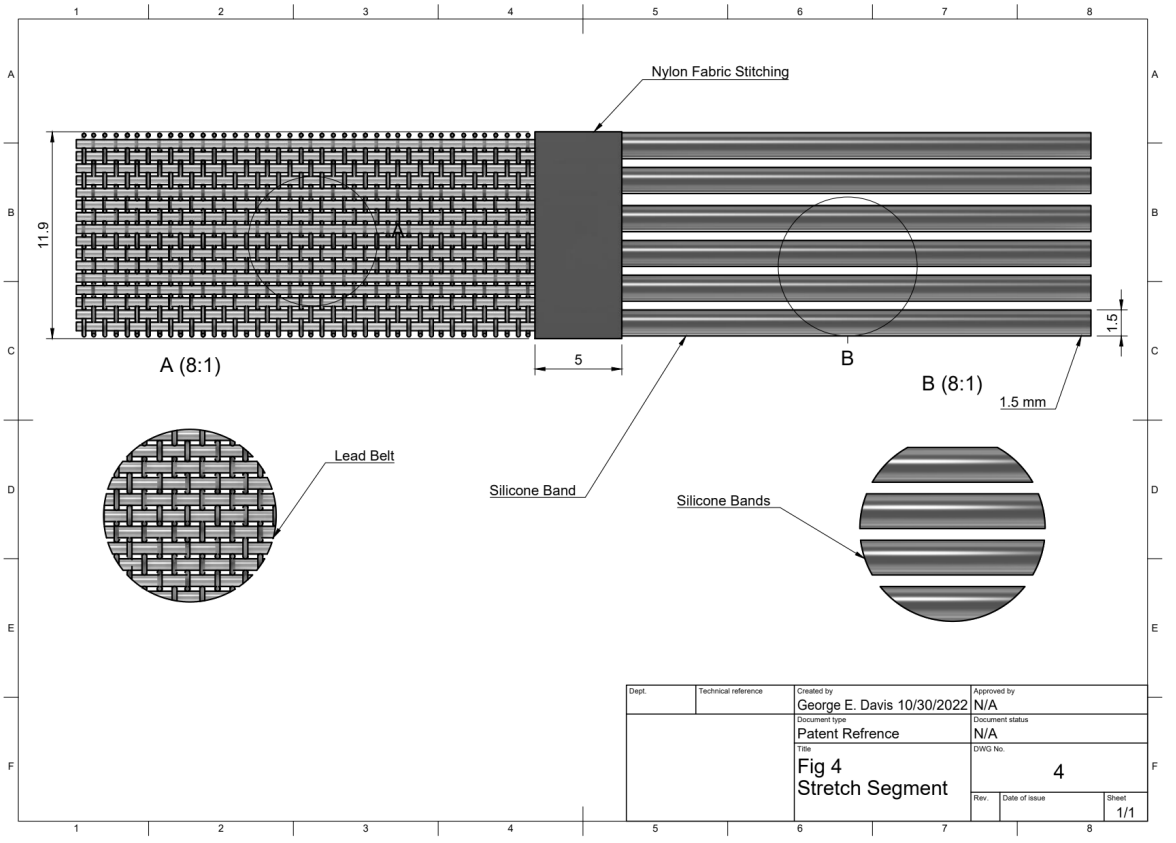
Nylon Fabric Stitching
11.9
A
A (8:1)
5
B
B (8:1)
1.5
1.5 mm
Lead Belt
Silicone Band
Silicone Bands
Dept.
Technical reference
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Approved by
N/A
Document type
Patent Refrence
Document status
N/A
Title
Fig 4
Stretch Segment
DWG No.
4
Rev.
Date of issue
Sheet
1/1