US Patent & Trademark Office
Patent Public Search | Text View

United States Patent Application Publication	20250261895
Kind Code	A1
Publication Date	August 21, 2025
Inventor(s)	Lopes; Kevin

LEAD CABLE ORGANIZER AND HOLDER

Abstract

The disclosed device is a clamp intended to organize wire/leads of an ECG device, or any machinery having a plurality of loosely hanging wires or connectors, each of which is intended to fulfill and individualized purpose. The disclosed clamp device is intended to clamp onto all cables at the same time and have the ability to freely slide along the length of the cables as required. Thus, if the machine is idle, with leads handing downward, the clamp device will preferably be located near the distal ends of the leads, which is the best location to ensure that the cables do not get entangled. Once the leads are required for a procedure and are then raised to be placed on a patient's body, the clamp slides away under the force of gravity to the lowest point along the cable.

Inventors: **Lopes; Kevin (East Rutherford, NJ)**

Applicant: **Lopes; Kevin** (East Rutherford, NJ)

Family ID: **1000008615263**

Appl. No.: **19/198307**

Filed: **May 05, 2025**

Publication Classification

Int. Cl.: **A61B5/30** (20210101); **A61B5/282** (20210101); **A61B5/308** (20210101)

U.S. Cl.:

CPC **A61B5/303** (20210101); **A61B5/282** (20210101); **A61B5/308** (20210101);

Background/Summary

FIELD OF INVENTION

[0001] The present invention is related to a clamp designed to prevent entanglements and scrambling of wires and cables.

BACKGROUND OF THE INVENTION

[0002] An electrocardiogram (ECG or EKG) monitor is a medical device used to measure and record the electrical activity of the heart over a period of time. It serves as a critical diagnostic tool in the detection and monitoring of various cardiac conditions. The ECG monitor works by detecting electrical impulses generated by the depolarization and repolarization of cardiac muscle cells during each heartbeat. These impulses are captured by electrodes, also known as leads, placed on the skin and are translated into a graphical representation on a screen or printed on paper.

[0003] The existence of multiple leads in an ECG system is essential for providing a comprehensive view of the heart's electrical activity. A standard 12-lead ECG, for example, uses 10 electrodes to generate 12 distinct perspectives of the heart. Each lead represents a specific axis or plane of electrical activity, allowing for a detailed analysis of the heart's function from different anatomical orientations.

[0004] The leads used in an electrocardiogram (ECG) monitoring system are approximately 60 to 100 centimeters (24 to 40 inches) long—to allow for convenient placement of electrodes on the patient's body without excessive tension or restriction of movement. In clinical or emergency settings, some systems may have even longer leads to accommodate different scenarios, such as allowing healthcare providers to monitor patients from a safe distance or in crowded environments.

[0005] The downside of having lengthy leads or cables is an ongoing challenge to keep them from becoming entangled or damaged when not in use. Additionally, entangled leads will delay the deployment of ECG cables on a patient's body and lead to errors in placing the leads at proper locations. Proper placement of the ECG leads is critical for accurate interpretation of the heart's electrical activity. Each lead corresponds to a specific anatomical location and axis of electrical measurement. If the leads are jumbled by incorrect placement of the electrodes on the patient's body it can lead to failure to detect proper pathology, misdiagnosis, and generally to distortions in the signal. For this reason, a device or clamp that assists with maintaining separation between leads and prevents their entanglement, and which does not interfere with the operations of the leads would be highly desirable.

[0006] While the above describes an EKG machine, similar considerations would apply to any equipment that collects health information using cables or leads. Scrambled or entangled cables wastes valuable time and often results in incorrect results. Therefore, a device that maintains leads or cables in a joined but organized fashion would be highly desirable.

SUMMARY OF THE INVENTION

[0007] The disclosed device is a clamp intended to organize wire/leads of an ECG device, or any machinery having a plurality of loosely hanging wires or connectors, each of which is intended to fulfill an individualized purpose. The disclosed clamp device is intended to clamp onto all cables at the same time and have the ability to freely slide along the length of the cables as required. Thus, if the machine is idle, with leads handing downward, the clamp device should preferably engage the distal ends of the leads, which is the best location to ensure that the cables do not get entangled. Once the leads are required for a procedure and are then raised to be placed on a patient's body, the clamp slides away under the force of gravity to the lowest point along the cable.

[0008] The disclosed device is shown having a first portion and a second portion. The first and second portions are configured to be detachable in a symmetric and parallel orientation with each other. Each of the first and second portions further having a top side and a bottom side, as well as points identified as a first end and a second end. The first and second portions having a plurality semicylindrical grooves running across the width of the first and second portions, otherwise referred to, from top side to the bottom side of the first and second portions. Each semicylindrical

groove is created with a counterpart semicylindrical groove on the opposing first or second portion, such that when the first and second portions are coupled together, the semicylindrical grooves combine to form a complete channel.
[0009] It is preferred that the first and second portions have a combination of male and female connectors that snap or dovetail together wherein said first portion and said second portion further comprising connectors configured to couple said first portion and said second together.
[0010] In another embodiment, channels can be grouped into at least one group of adjacent channels.
[0011] In yet another embodiment, the clamp device features at least one grip area. The grip area can be on either or both of the first or second ends of the first and second portions that are coupled together, or between two groups of adjacent channels.
[0012] In another embodiment, the inner edge of the channels on the bottom side of the first and second portions are tapered. The tapering is designed to act as a socket around the lead connectors or electrodes. The tapered edge is engaged when the clamp device is at the very end of the lead wires, typically while the leads are hanging off of an idle machine, an at-rest position.
[0013] It is preferred that each of the channels forms a loose ring around the cable such that the clamp device can easily slide along the cable either by a force of a hand displacing it to a desired location along the cable, or by force of gravity. Therefore, when the leads are hanging down, the holder or the clamp will naturally slide to the end of the leads and thus keep the very end of the cables separated. This will in turn, keep the rest of the wires separated as well. Once the wires are lifted to be placed on a patient, the clamp will naturally slide out of the way to the then lowest point along the length of the cables.
[0014] It is one objective of the present invention to create a clamp that is able to keep loose cables of an electrical device, such as an ECG machine, in a combined arrangement that avoids entanglement.
[0015] It is still another objective of the disclosed invention to provide a removable clamp that functions as an organizer for cables that does not interfere with regular operations of an electrical instrument, such as an EKG machine.
[0016] It is still another objective of the disclosed invention to provide a wire holder that easily snaps on and off of the existing cables, and which freely travels along the length of cables.

Description

BRIEF DESCRIPTION OF DRAWINGS
[0017] FIG. **1** is a perspective top and side view of the disclosed clamp device.
[0018] FIG. **2** is a perspective bottom and side view of the disclosed clamp device.
[0019] FIGS. **3** and **4** represent individual halves of the parallel first and second portions of the disclosed clamp device.
[0020] FIG. **5** demonstrates the clamp device that is deployed when leads of an EKG apparatus are idle and at rest.
[0021] FIG. **6** demonstrates a user operating the clamp device by grasping one of the grip areas to move the clamp device up and down.
[0022] FIG. **7** demonstrates the two parallel portions of the disclosed embodiment of the clamp device.
[0023] FIG. **8** demonstrates the clamp device in a position when the leads are being used, and the clamp has shifted out of the way on its own under the force of gravity.
DETAILED DESCRIPTION OF THE INVENTION
[0024] Embodiments of the present invention will now be described with reference to the drawings. Such embodiments are provided by way of explanation of the present invention, which is not

intended to be limited thereto. In fact, those of ordinary skill in the art may appreciate upon reading the present specification and viewing the present drawings that various modifications and variations can be made thereto.

[0025] Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, the figures illustrate a clamp device **10** comprising of the first portion **12** and the second portion **14**. It should be noted that the first and second portions **12** and **14** are interchangeable and what is designated as the first portion **12** can be the second portion **14**. It is preferable that first and second portions **12** and **14** can be detached and then re-attached to enclose or release a plurality of cables. It is preferable that the first and second portions **12** and **14** are configured to be parallel and symmetric to each other. Both the first and second portions **12** and **14** have the top side **20** and a bottom side **22**, the first end **30** and the second end **32**. The first and second portions **12** and **14** contain a plurality semicylindrical grooves **17***a* and **17***b* are situated across the first and second portions **12** and **14**, running between the top side **20** and the bottom side **22**. The grooves **17***a* and **17***b* may run straight across the first and second portions **12** and **14** as shown or at some diagonal line. Each semicylindrical groove **17***a* is preferably a mirror image of each semi-cylindrical groove **17***b* so as to form a complete channel **16**. While Channels in FIG. **1** are shown to be of the same diameter **21**, in some channels **16** may be of larger or smaller diameters depending on application.

[0026] Each of the channels **16** is configured to admit at least one cable, preferably in a loose fit. The cylindrical channels **16** are preferably arranged adjacently to each other separated by a partition wall **19**. The sidewall **18** may consist of a plurality of outwardly curved sidewalls that match the concave curvature of the semi-cylindrical channels **17***a* and **17***b*. Alternatively, the outer wall may be substantially uniform with the curvature of the channels **16** being absorbed by the thickness of the first and second portions **12** and **14**. It should be noted further that the channels need not be curved, but may be cubic or parallelogrammical in appearance.

[0027] FIG. **2** demonstrates parts of the disclosed clamp device **10** that are not visible in FIG. **1**. Shown are a plurality of channels **16** that may be combined into at least one group **36** and another group **38**, with a grip area **34** separating between the groups **36** and **38**. Additional grip areas **30** and **32** may be disposed at distal ends **31**.

[0028] The rim **40** around each of the cylindrical channels **16** facing the top side **20** may be curved or angular. It is preferable that the rim **44** of each cylindrical channel **16** on the bottom side **22** is preferably tapered in the direction away from the inside of the cylindrical channel. The tapered rim **44** is intended to accommodate the end wire connector leads **54** (FIGS. **5** and **6**) at the end of cables **50** (FIGS. **5** and **6**).

[0029] The first portion **12** and second portion **14** are coupled together using connectors **60** and **60***a* as shown in FIGS. **3** and **4**. Connector **60** is shown as a male connector, which slides into the corresponding female connector **60***a* on the second portion **14** from the bottom side **22**. The connectors may be arranged with male connectors **60** extending from the first portion **12**, and with female connectors **60***a* existing as recessed gaps on the second portion **14**. Alternatively, male and female connectors may exist on both first and second portions. While male and female type connectors (**60** and **60***a*) may be a dovetail and lug connectors as shown, other possible connectors may be magnetic, snap-to, bayonet, or hook and loop, or any other connectors that may keep first and second portions **12** and **14** in a coupling and decoupling configuration.

[0030] FIGS. **4** and **5** demonstrate the utility of the disclosed clamp device **10**. Clamp device **10** is affixed over existing cables **50** of an electrical apparatus **52**. It is preferred that each of the channels **16** accommodates one cable **50**. The clamp device **10** may contain an exact number of channels **16** to match the number of cables **50**, or the number of channels **16** may be greater than the number of cables. Distal ends **31** and the midpoints **34** present grip surfaces that enable a user **70** to control where along the length of the cables **50** the clamp device **10** may be located. FIG. **4** demonstrates that while at rest, the cables **50** hang downward, and in the downward position present the greatest

risk of entanglement with each other. The clamp device **10** eliminates the entanglement risk by sliding down to the bottom of the cables **50**, coming to rest at the electrical connectors **54**. The tapered rim **44** allows the electrical connectors to fit to be substantially immobilized within the channels **16**, thereby further reducing the risk that the connectors themselves will become entangled with each other. It should be noted that as each cable **50** is lifted upward to be placed on a patient, the clamp device **10** will be configured to freely slide away to the then occurring lowest point along the cables **50** and thus remain clear of the area of active operation of the connectors **54**.
[0031] FIG. **7** demonstrates the combination of the first portion **12** and the second portion **14** of one embodiment of the clamp **10** using peg connectors **60** that snap into socket connectors **60***a*. Other connectors may be magnetic or utilize externally applied clamps. The semicircular grooves **17***b* and **17***a*, when combined form channels **16**. The semicircular grooves **17***a* and **17***b* may be substantially rectangular or parallelogrammical in shape.
[0032] While FIG. **6** demonstrates the operation of clamp **10** when the cables **50** are at rest, FIG. **8** demonstrates cables **50** in the position they would assume when in use. When in use, the leads **54** would be elevated to access points along the body of a patient where the lead must be fastened. The rest of the length of the cable **50** will be naturally slackened and hang down below the level of the lead **54**. Since the clamp **10** freely slides along the length of the cables **50** that pass through the plurality of channels **16**, the clamp will slip down to the lowest point **56** and thereby automatically avoid obstructing ordinary use of cables **50** while still maintaining its essential utility, which is keeping cables **50** together, in a particular order and not tangled.
[0033] Although this invention has been described with a certain degree of particularity, it is to be understood that the present disclosure has been made only by way of illustration and that numerous changes in the details of construction and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention. While various inventive aspects, concepts and features of the inventions may be described and illustrated herein as embodied in combination in the exemplary embodiments, these various aspects, concepts and features may be used in many alternative embodiments, either individually or in various combinations and sub-combinations thereof. Unless expressly excluded herein all such combinations and sub-combinations are intended to be within the scope of the present inventions. Still further, while various alternative embodiments as to the various aspects, concepts and features of the inventions—such as alternative materials, structures, configurations, methods, devices and components, alternatives as to form, fit and function, and so on—may be described herein, such descriptions are not intended to be a complete or exhaustive list of available alternative embodiments, whether presently known or later developed. Those skilled in the art may readily adopt one or more of the inventive aspects, concepts or features into additional embodiments and uses within the scope of the present inventions even if such embodiments are not expressly disclosed herein. Additionally, even though some features, concepts or aspects of the inventions may be described herein as being a preferred arrangement or method, such description is not intended to suggest that such feature is required or necessary unless expressly so stated. Still further, exemplary or representative values and ranges may be included to assist in understanding the present disclosure, however, such values and ranges are not to be construed in a limiting sense and are intended to be critical values or ranges only if so expressly stated. Parameters identified as “approximate” or “about” a specified value are intended to include both the specified value and values within 10% of the specified value, unless expressly stated otherwise. Further, it is to be understood that the drawings accompanying the present disclosure may, but need not, be to scale, and therefore may be understood as teaching various ratios and proportions evident in the drawings. Moreover, while various aspects, features and concepts may be expressly identified herein as being inventive or forming part of an invention, such identification is not intended to be exclusive, but rather there may be inventive aspects, concepts and features that are fully described herein without being expressly identified as such or as part of a specific invention, the inventions instead being set forth in the appended claims, as

currently written or as amended or added in the future. Descriptions of exemplary methods or processes are not limited to inclusion of all steps as being required in all cases, nor is the order that the steps are presented to be construed as required or necessary unless expressly so stated.

Claims

1. A clamp device comprising; a first portion and a second portion; said first and second portions being in a detachable and parallel orientation with each other; each said first and second portions having a top side and a bottom side, a first end and a second end; said first and second portions having a plurality semicylindrical grooves running from said top side to said bottom side; wherein each said semicylindrical groove of said plurality of semicylindrical grooves forming a complete cylindrical channel when said first portion and said second portion are coupled together forming a plurality of cylindrical channels; and wherein each channel said plurality of cylindrical channels configured to loosely accommodate one cable passing therethrough.
2. The clamp device of claim 1, wherein said first portion and said second portion further comprising connectors configured to couple said first portion and said second together.
3. The clamp device of claim 2, wherein said plurality of channels are organized into at least one group of said cylindrical channels.
4. The clamp device of claim 3, wherein said channels in said plurality of channels are cylindrical.
5. The clamp device of claim 1, further comprising at least one grip area.
6. The clamp device of claim 4, further comprising at least one grip area.
7. The clamp device of claim 5, wherein said at least one grip area is at said first end or said second end.
8. The clamp of claim 4, further comprising at least one grip area; wherein said at least one grip area is at said first end or said second end or between groups of said cylindrical channels.
9. The clamp device of claim 6, further comprising at least one grip area.
10. The clamp of claim 1, wherein a rim of said cylindrical channel on said bottom side of said first and second portions being tapered.
11. The clamp of claim 1, wherein said first and second portions coupled together are configured to slide to a distal end of said cables; and wherein said cables are lifted said clamp is configured to slide away from said distal end of said cables.