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(54) Title: HEMOSTASIS BAND FOR APPLYING A CONSTANT PRESSURE TO A CANNULATION SITE

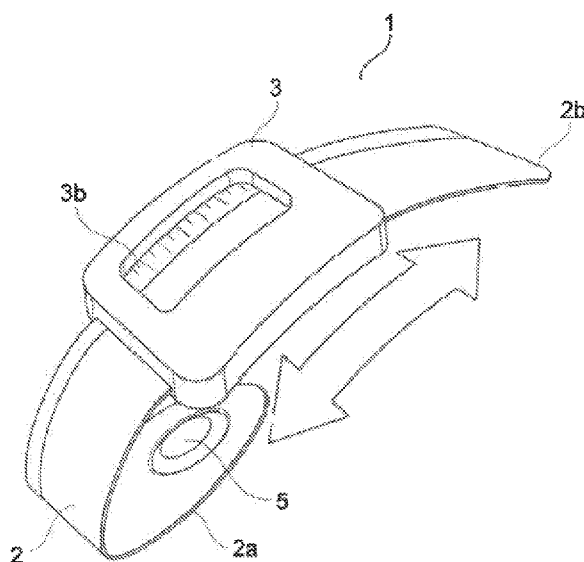


Fig. 2

(57) Abstract: A hemostasis band (1), comprising a band (2), preferably made from an elastic material, a pressure focusing element (3) that is configured to focus pressure generated by the band (2) to hold a cannula in place at a cannulation point, and at least one marking (4) on the band (2) and/or the focusing element (3) to define at least one relative position of a first end (2a) of the band (2) to a second end (2b) of the band (2) or to define at least one relative position of the first end (2a) or the second end (2b) of the band (2) to the pressure focusing element (3).

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HEMOSTASIS BAND FOR APPLYING A CONSTANT PRESSURE TO A CANNULATION SITE

TECHNICAL FIELD

The present invention relates to a hemostasis band for applying a defined constant pressure to a cannulation site to quench blood flow after cannulation.

BACKGROUND

Especially for weak or elderly patients, it often proves impossible to manually press a hemostasis swab to a cannulation site until blood flow stops.

Thus, in many cases, medical personnel has to manually press the hemostasis swab to the cannulation site of such patients. Because it can easily take up to 10 minutes before blood flow stops, a lot of time is taken just by medical personnel holding swabs to patients arms.

To alleviate this problem, conventionally hemostasis bands are used to affix the swab to a patients arm. Such conventional hemostasis bands, however, do not reproducibly apply a defined pressure to the patients arm. Thus, in many cases the hemostasis bands apply too much pressure to the cannulation site causing patient discomfort or risks to patient safety. Especially in patients in that an arterio-venous fistula or an arterio-venous shunt / graft has been laid, too much pressure may cause these structures to be damaged.

Alternatively, if too little pressure is applied, the cannula may not be securely held in place or the pressure is insufficient for efficient hemostasis.

SUMMARY

It is the object of the present invention to alleviate or even completely resolve the technical problems of the prior art. In particular, it is an object of the present invention to provide a hemostasis band for reproducibly applying a constant pressure to a cannulation site.

This object is achieved by a hemostasis band comprising the features of claim 1.

Further advantageous embodiments of the invention are the subject-matter of the dependent claims.

A hemostasis band according to the present invention comprises:

- a band, preferably made from an elastic material,
- a pressure focusing element that is configured to focus pressure generated by the band to support hemostasis after cannulation, and
- at least one marking on the band and / or the focusing element to define at least one relative position of a first end of the band to a second end of the band or to define at least one relative position of the first end or the second end of the band to the pressure focusing element.

In other words, in an embodiment of the invention, the hemostasis band comprises at least one marking that defines a relative position of a first end of the band to a second end in that the first and second ends of the band can be reversibly affixed to each other.

Depending on the relative position in that the first and second ends of the band are affixed to each other, the band can be arranged in a tighter or looser fit, for example around a patient's arm, because the diameter of the loop formed by band can be set as required.

The marking ensures that the relative position of the first and second ends of the band to each other is reproducible. This ensures that the pressure applied to the patient's body when the band is affixed to a patient's arm is reproducible, constant and defined as well.

Alternatively or additionally, one end of the band or both ends of the band can be reversibly affixed to the pressure focusing element to affix the band e.g. to a patient's arm with a define loose or tight fit.

In this embodiment, instead of affixing the two ends to each other, for example, one end of the band can be fixedly arranged at the pressure focusing

element and the other end of the band can be reversibly affixed to the pressure focusing element in at least one defined relative position of the end of the band to the pressure focusing element.

The pressure focusing element provides the necessary structural stability to focus the pressure generated by the band onto a desired spot, e.g. a cannulation site.

The band can run through an opening in the pressure focusing element to secure the pressure focusing element to a patient's arm, if the band is arranged in a loop around the patient's arm. The pressure generated by the band then presses the pressure focusing element against the patient's body.

According to an embodiment of the invention, the band of the hemostasis band is manufactured from a flexible and / or elastic material to ensure a comfortable fit of the band around a patient's arm.

Preferably, the pressure focusing element is manufactured of a material that is more rigid /stiff than the material of the band to ensure the necessary structural stability required to focus the pressure generated by the band onto a structure underlying the pressure focusing element. During use of the hemostasis band, the pressure focusing element is preferably arranged directly on a cannulation site.

Preferably, the marking indicating the at least one relative position takes the form of a scaling and / or a color code.

For example, the scaling can comprise several markings, e.g. lines, numbers, letters or dots or any other marking, arranged next to each other along the longitudinal direction of the band. The pressure generated by the band once it is arranged around a patient's arm depends upon in which relative position indicated by which marking the two ends of the band are affixed to each other or the at least one end is affixed to the pressure focusing element.

Alternatively or additionally, the marking can be color coded. For example,

a relative position indicated by a red marking may cause a tight fit of the hemostasis band around a patient's arm and thus a high pressure being applied to the patient's body, a yellow marking may cause a medium fit of the hemostasis band around a patient's arm and thus a medium pressure being applied to the patient's body and a green marking may cause a loose fit of the hemostasis band around a patient's arm and thus a low pressure being applied to the patient's body.

The nature and color of the markings are not limited to the examples outlined above, but can comprise any kind of marking, for example symbols (stars, smileys, etc.), letters (e.g. A,B,C for different increments of pressure to be applied), numbers or even names of certain patients.

The latter embodiment in which names of different patients are marked on the band can prove useful in an embodiment of the invention in that the hemostasis band is configured as a reusable item. In this case, for example, the wristband may be used first with a first patient (patient X). The defined relative position that leads to an optimal pressure for hemostasis in patient X may be marked on the hemostasis band by an "X". After disinfection, the same hemostasis band may be reused with a different patient, e.g. patient Y. Due to individual differences between patients, patient Y may require a different setting of the hemostasis band or relative position than patient X. Thus, the defined relative position that leads to an optimal pressure for hemostasis in patient Y may be marked on the hemostasis band by an "X". This way, if the hemostasis band is reused, the optimal setting for each patient can easily and reproducibly be achieved.

The markings can also correspond to different groups of patients, e.g. defined by age, gender etc. For example, children generally have thinner arms than adults, so on the hemostasis band a marking may be provided to ensure a (tighter) fit that is optimized for children and a (looser) fit that is optimized for adults.

Preferably, the markings are arranged in such a way that they are easily visible when the hemostasis band is arranged around a patient's arm. This allows medical personnel to easily grasp with a single glance the pressure being applied by the band to the cannulation site.

In other words, in an embodiment of the invention, a plurality of markings are present on the band, each defining a relative position of the first end of the band to the second end of the band, wherein in each relative position the band generates a different, defined pressure.

Alternatively or additionally, a plurality of markings are present on the focusing element, each defining a relative position of the first end of the band or the second end of the band to the focusing element, wherein in each relative position the band generates a different, defined pressure.

A hemostasis band according to the present invention can be a disposable or a multi-use product.

Preferably, the hemostasis band or at least the band thereof is made of a flexible and / or elastic material, preferably of silicone. The pressure focusing element is preferably made of polymer, metal or other suitable material.

It has proved advantageous in practice if the hemostasis band further comprises an attachment element at the first and / or the second end by which the first end and the second end of the band can be reversibly attached to each other or by which the first end and/ or the second end of the band can be reversibly attached to the focusing element.

For example, the attachment element can take the form of a button, stud, hook or rip configured to be inserted into a corresponding opening, hole, loop or groove. The attachment element can also be a magnet. The attachment element is not limited to any of the structures mentioned above, but can take any suitable form.

It is also possible to provide a plurality of attachment elements, that, for example can be arranged along the longitudinal direction of the band.

It has proved advantageous in practice if the pressure focusing element comprises a swab to be applied to the cannulation site. For example, swab can be inserted into a recess of the pressure focusing element or the swab can be present on an outer surface of the pressure focusing element, so that the swab is sandwiched between the pressure focusing element and a patient's skin when the hemostasis band is attached around a patient's arm.

To improve the transfer of pressure generated by the band onto the swab and / or the patient's body, the pressure focusing element can comprise at least one protrusion or hump to focus pressure onto to the cannulation site.

The protrusion or hump is preferably arranged at the side of the pressure focusing element that is facing the patient's body when the hemostasis band is arranged around a patient's arm.

Furthermore, it has proved advantageous in practice if the at least one marking on the band and / or the focusing element also serves as an attachment element for reversibly attaching the first end of the band to the second end of the band in the relative position defined by the marking or to attach the first end or the second end of the band to the pressure focusing element in the relative position defined by the marking.

For example, different studs on one end of the band that can be used to attach the end to corresponding holes on the other end of the band can be color coded. In such a case, for example, a red stud to be inserted into a red hole can indicate a relative position in that the hemostasis band applies high pressure on the patient's arm and a green stud to be inserted into a green hole can indicate a relative position in that the hemostasis band applies low pressure on the patient's arm. In this case, the marking for example has the form of a color- coded stud or more generally speaking attachment element.

More generally speaking, the scaling and or the color code can be implemented by using a plurality of attachment elements. The markings in this case not only serve to indicate a defined position but also have the

dual-purpose of securing the band in place in this defined position.

Another aspect of the invention relates to a method of use of a hemostasis band, preferably a hemostasis band according to the present invention, comprising the step:

- Reversibly affixing the hemostasis band to a patient by reversibly affixing a first end of the band to a second end of the band in a relative position of the first end of the band to the second end indicated by a marking on the band; or by reversibly affixing the first end or the second end of the band to the pressure focusing element in a relative position indicated by a marking on the band or the focusing element.

By using the markings to define fixed positions of the band, this method allows for reproducibly applying a defined pressure to the patient's body. Different relative positions cause different amounts of pressure being applied to the patient's body.

Preferably, the marking takes the form of a scaling and / or a color code. Multiple markings may be provided on the hemostasis band as outlined above.

Further features, advantages and effects of the present invention become apparent from the following detailed description of embodiments of the invention shown in the Figures. The same or similar elements are indicated by the reference signs in the figures.

The attachment element can work by force-fit and / or form-fit.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1a shows a schematic view of an embodiment of the invention in that a first end of the band is affixed to a second end of the band in a defined relative position indicated by a marking.

Fig. 1b shows a schematic view of an embodiment of the invention in that a first end of the band is affixed to the pressure focusing element in a defined relative position indicated by a marking.

Fig. 2 shows a hemostasis band 1 according to the present invention.

DETAILED DESCRIPTION

As shown in Fig. 1a, a hemostasis band 1 according to the present invention comprises a band 2, preferably made from an elastic material, a pressure focusing element 3 that is configured to focus pressure generated by the band 2 to hold a constant pressure at a cannulation point, and at least one marking 4 on the band 2 to define at least one relative position of a first end 2a of the band 2 to a second end 2b of the band 2.

In the hemostasis band 1 as shown in Fig. 1 the first end 2a of the band 2 and the second end 2b of the band 2 are reversibly affixed to each other in the relative position indicated by the marking 4 (the marking closest to the end 2a) by means of the attachment element 5. The attachment element can have the shape of a stud that is configured to be inserted into a corresponding hole (not shown) in the band. For example, each marking can have a corresponding hole.

In the embodiment of Fig. 1a, three markings 4 are present on first end 2a of the band 2 that are spaced apart from each other in the longitudinal direction of the band 2.

The pressure focusing element 3 in Fig. 1a comprises a protrusion / hump 3a to apply pressure in a highly targeted and localized fashion to the site (e.g. a cannulation site) underlying the protrusion / hump 3a when the hemostasis band 1 is in use.

As shown in Fig. 1b, a hemostasis band 1 according to the present invention comprises a band 2, preferably made from an elastic material, a pressure focusing element 3 that is configured to focus pressure generated by the band 2 to hold a cannula in place at a cannulation point, and at least one marking 4 to define at least one relative position of the first end 2a of the band to the pressure focusing element.

In this embodiment, the second end 2b of the band 2 is fixedly attached at the pressure focusing element 3. Four markings 4 are present on the first end 2a of the band 2 and the band 2 is reversibly attached to pressure focusing element 3 by means of the attachment element 5. The markings can have different colors.

Fig. 2 shows a hemostasis band 1 according to the present invention. In this embodiment, the band 2 projects through the pressure focusing element 3. The pressure focusing element 3 comprises an opening 3b through that the band 2 projecting through the pressure focusing element 3 is visible to a user.

The band 2 is made of an elastic material such as silicone. The band 2 can be pulled in the direction of the arrow shown in Fig. 2 to stretch the band 2. The pressure focusing element 3 is made of a relatively stiff polymer.

The attachment element 5 in this embodiment has the form of a button that can be used to attach the end 2a to the end 2b of the band by an interaction with a corresponding attachment element (not shown), e.g. a press button, present on the end 2b.

CLAIMS

1. Hemostasis band, comprising
 - a band, preferably made from an elastic material,
 - a pressure focusing element that is configured to focus pressure generated by the band to support hemostasis after cannulation, and
 - at least one marking on the band and / or the focusing element to define at least one relative position of a first end of the band to a second end of the band or to define at least one relative position of the first end or the second end of the band to the pressure focusing element.
2. Hemostasis band according to claim 1, wherein the marking takes the form of a scaling and / or a color code.
3. Hemostasis band according to one of the preceding claims, wherein a plurality of markings are present on the band, each defining a relative position of the first end of the band to the second end of the band, wherein in each relative position the band generates a different, defined pressure.
4. Hemostasis band according to one of the preceding claims, wherein a plurality of markings are present on the focusing element, each defining a relative position of the first end of the band or the second end of the band to the focusing element, wherein in each relative position the band generates a different, defined pressure.
5. Hemostasis band according to one of the preceding claims, wherein the hemostasis band further comprises an attachment element at the first and / or the second end by which the first end and the second end of the band can be reversibly attached to each other or by which the first end and/ or the second

end of the band can be reversibly attached to the focusing element.

6. Hemostasis band according to one of the preceding claims, wherein the pressure focusing element comprises a swab to be applied to the cannulation site.

7. Hemostasis band according to one of the preceding claims, wherein the pressure focusing element comprises a protrusion or hump to be focus pressure onto to the cannulation site.

8. Hemostasis band according to one of the preceding claims, wherein the at least one marking on the band and / or the focusing element also serves as an attachment element for reversibly attaching the first end of the band to the second end of the band in the relative position defined by the marking or to attach the first end or the second end of the band to the pressure focusing element in the relative position defined by the marking.

9. Hemostasis band according to one of the preceding claims, wherein the attachment element has the form of a button, stud, hook or rip configured to be inserted into a corresponding opening, hole, loop or groove.

10. Use of a hemostasis band, preferably a hemostasis band according to one of the preceding claims, comprising the step:

reversibly affixing the hemostasis band to a patient by reversibly affixing a first end of the band to a second end of the band in a relative position indicated by a marking on the band or by reversibly affixing the first end or the second end of the band to the pressure focusing element in a relative position indicated by a marking on the band or the focusing element.

11. Use according to claim 10, wherein the marking takes the form of a scaling and / or a color code.

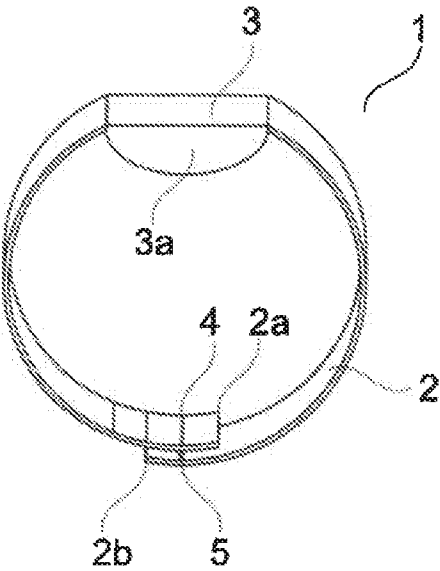


Fig. 1a

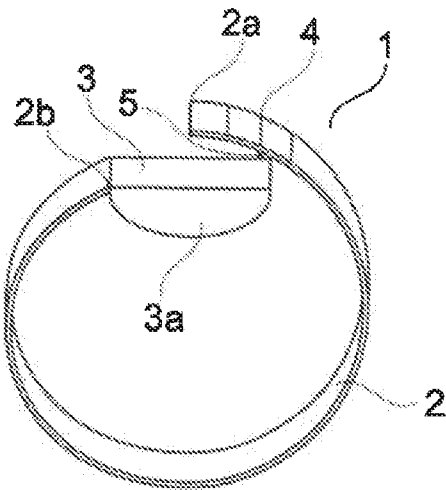


Fig. 1b

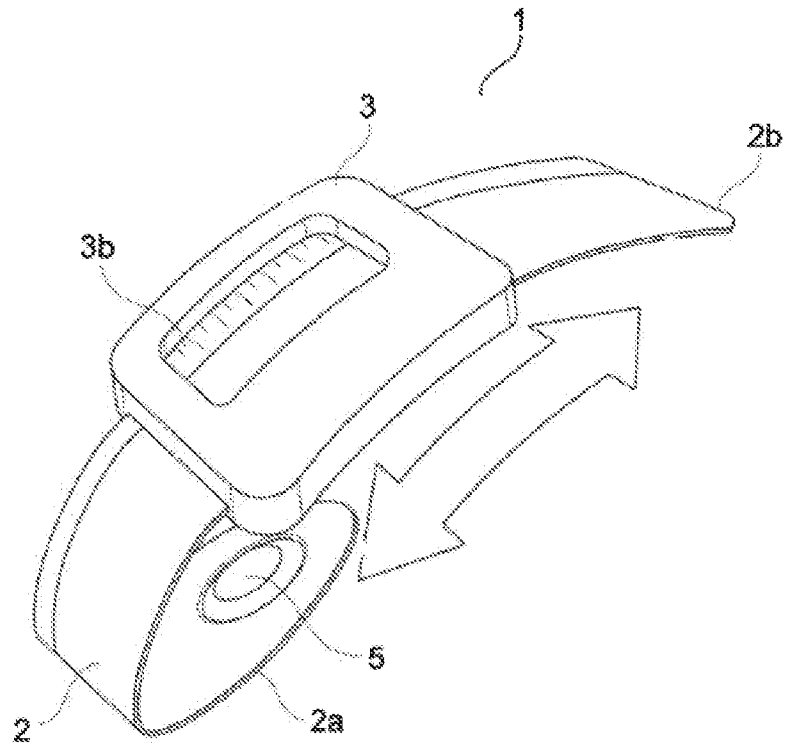


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/105665

A. CLASSIFICATION OF SUBJECT MATTER

A61B 17/135(2006.01)i; A61B 17/132(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61B 17

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS,CNTXT,VEN:band+, hemostasis, pressur+, mark+, elastic, A61B 17/1325(CPC)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	CN 106073854 A (JIANGSU YUNDI MEDICAL TECHNOLOGY DEV CO) 09 November 2016 (2016-11-09) description, paragraphs [0024]-[0038], figures 1, 2	1-11
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A	CN 205569013 U (LU WEN et al.) 14 September 2016 (2016-09-14) the whole document	1-11
A	WO 2014037960 A1 (POTDAR ANIL) 13 March 2014 (2014-03-13) the whole document	1-11
A	US 2019099188 A1 (MEDTRONIC VASCULAR INC) 04 April 2019 (2019-04-04) the whole document	1-11



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

06 April 2021

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Name and mailing address of the ISA/CN

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2020/105665

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
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