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(54) **SEAMLESS WEBBING LOOP OF ROCK CLIMBING QUICKDRAW, TEXTILE MACHINE AND TEXTILE METHOD**

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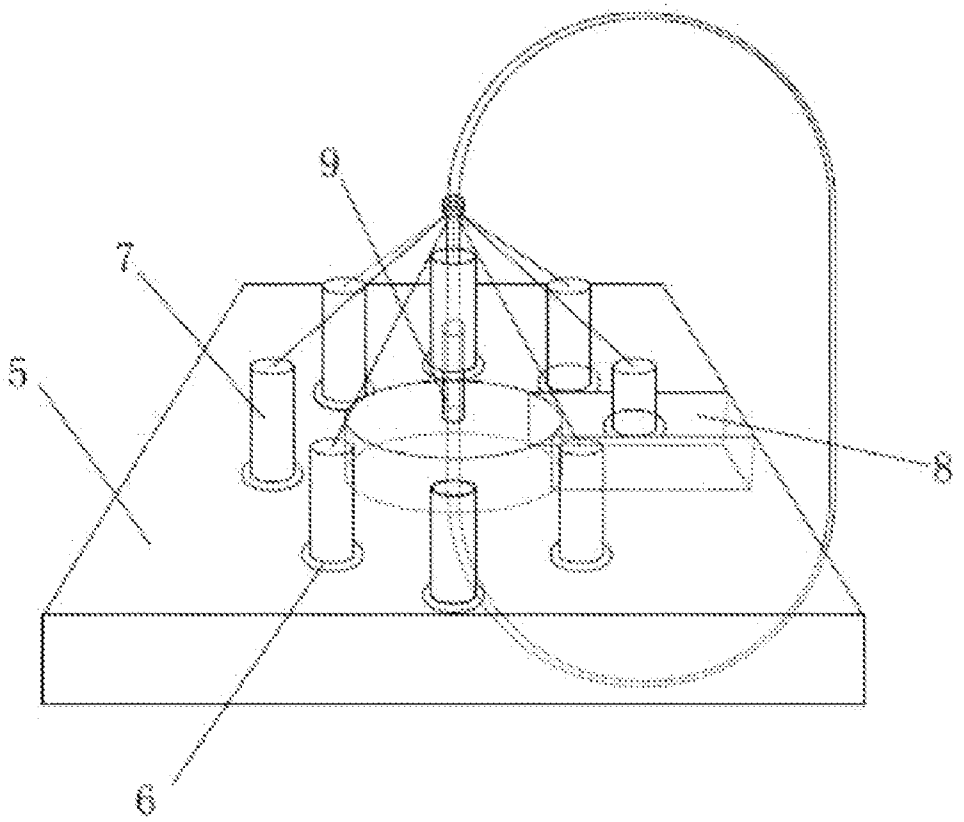
(57) **ABSTRACT**

The present invention discloses a seamless webbing loop of a rock climbing quickdraw, a textile machine and a textile method. The seamless webbing loop of a rock climbing quickdraw contains a plurality of tubular webbing layers, one surrounded by another, among which there is at least one indication layer. The indication layer is adjacent to the outermost one among the plurality of tubular webbing layers or is the innermost one among the plurality of tubular webbing layers. Such a multilayered structure of the webbing loop enhances the strength of the webbing loop for the quickdraw, but does not cause a seam to the webbing loop. Further, the indication layer contained in the webbing loop functions to remind a user of timely replacement of the webbing loop when the webbing loop is worn, and thus the webbing loop is safe in use. With the movable spindle assembly arranged on the textile machine, it is convenient to remove the webbing loop from the textile machine. In addition, the webbing loop disclosed in the present invention has a simple structure without any seam, and is strong, safe and durable.



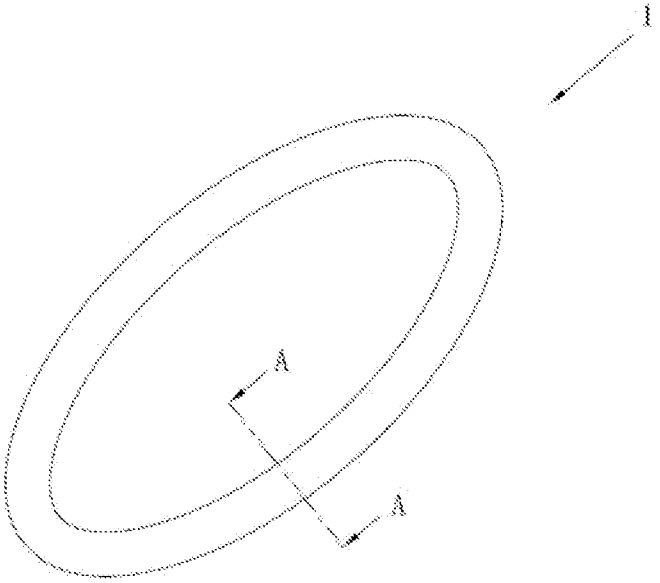


FIGURE 1

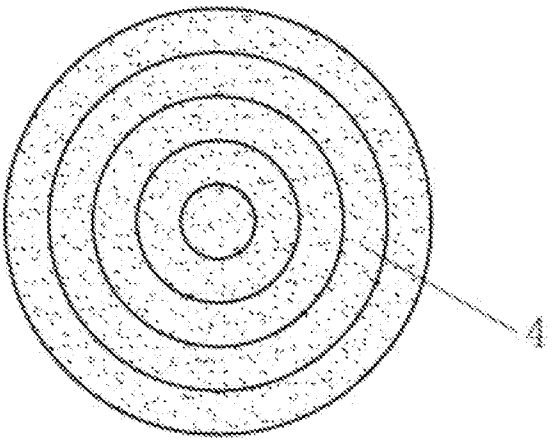


FIGURE 2

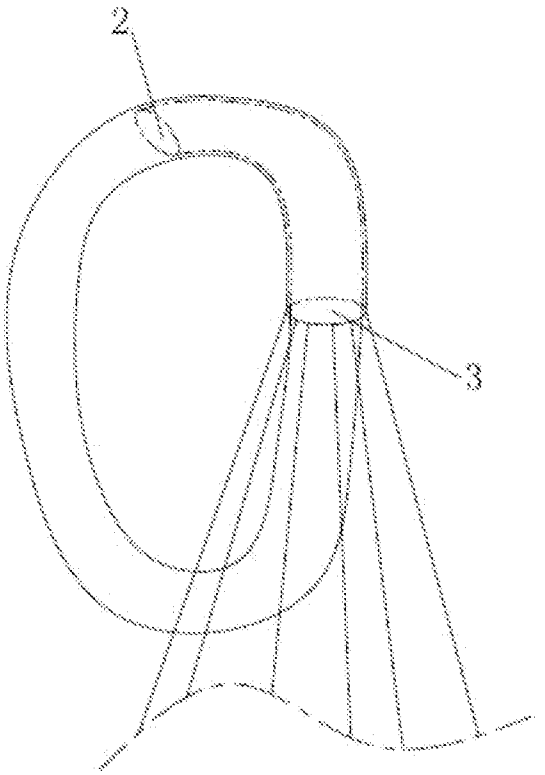


FIGURE 3

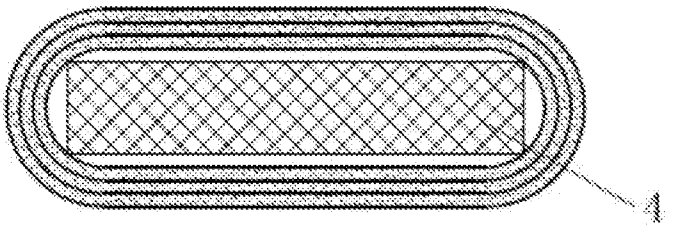


FIGURE 4

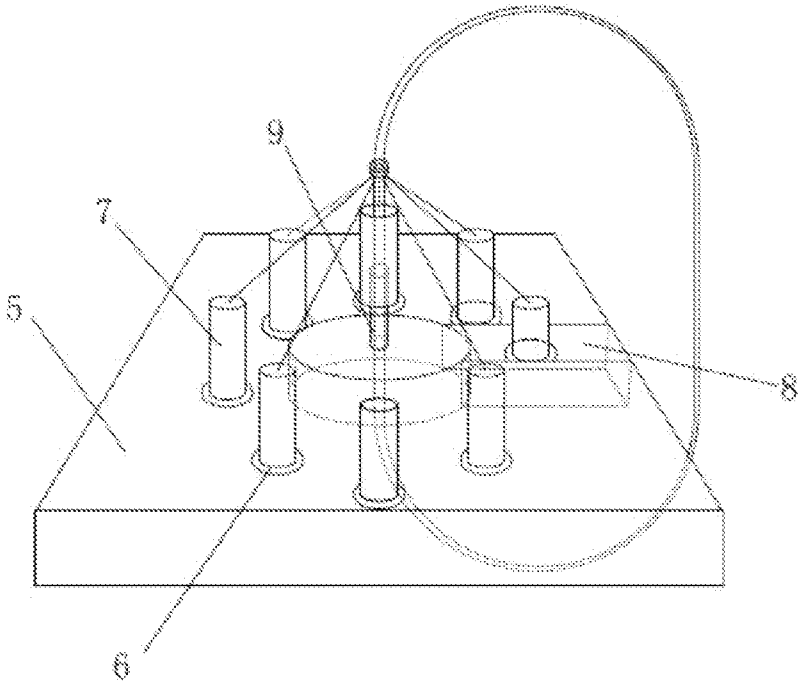


FIGURE 5

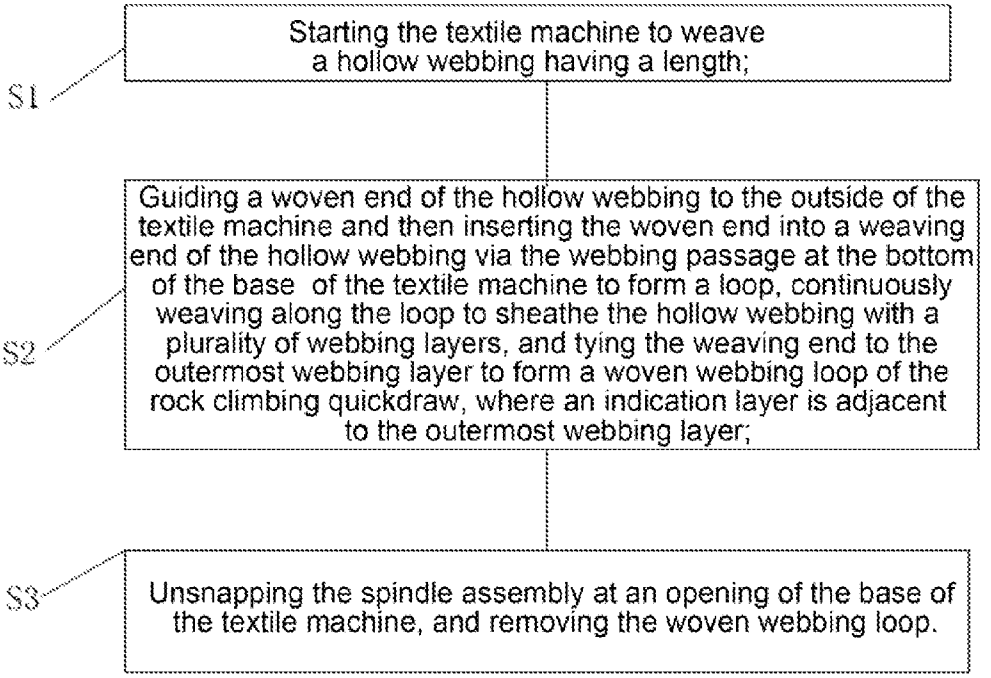


FIGURE 6

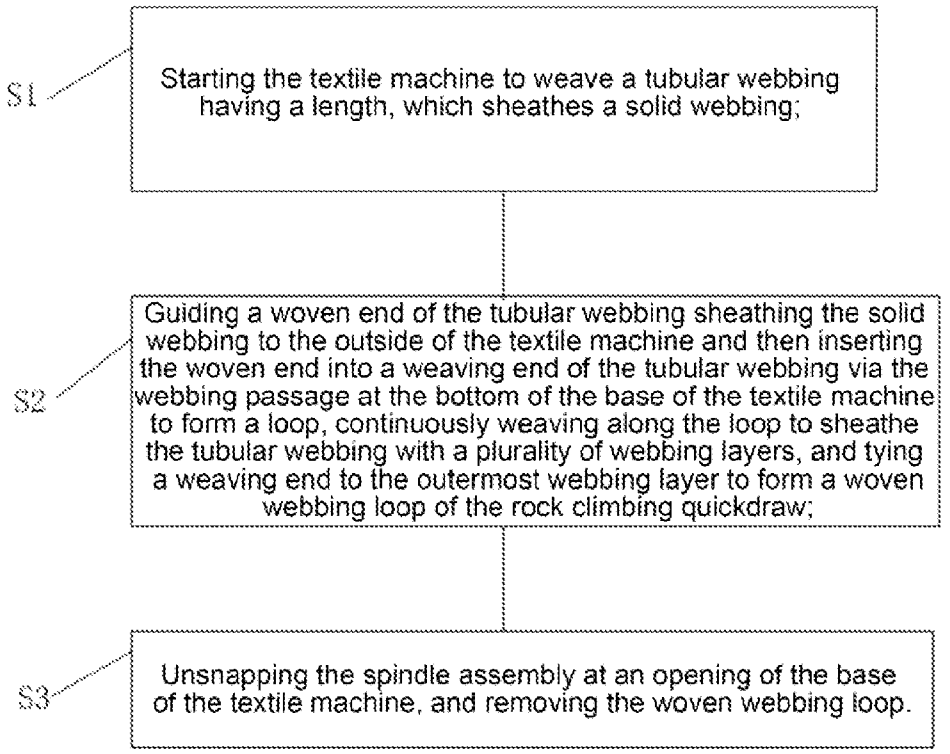

S1
Starting the textile machine to weave a tubular webbing having a length, which sheathes a solid webbing;
S2
Guiding a woven end of the tubular webbing sheathing the solid webbing to the outside of the textile machine and then inserting the woven end into a weaving end of the tubular webbing via the webbing passage at the bottom of the base of the textile machine to form a loop, continuously weaving along the loop to sheathe the tubular webbing with a plurality of webbing layers, and tying a weaving end to the outermost webbing layer to form a woven webbing loop of the rock climbing quickdraw;
S3
Unsnapping the spindle assembly at an opening of the base of the textile machine, and removing the woven webbing loop.

FIGURE 7

SEAMLESS WEBBING LOOP OF ROCK CLIMBING QUICKDRAW, TEXTILE MACHINE AND TEXTILE METHOD

TECHNICAL FIELD

[0001] The present disclosure relates to the field of rock climbing equipment and technologies, in particular, to a seamless webbing loop of a rock climbing quickdraw, a textile machine and a textile method.

TECHNICAL BACKGROUND

[0002] With social development and popularity of sports, more and more people participate in physical exercise, and more and more sporting equipment emerges accordingly. In the field of rock climbing equipment and technologies, a typical quickdraw for rock climbing includes two non-locking carabiners connected together by a pre-sewn webbing loop, which is formed by sewing together both ends of a webbing of a high strength. Such pre-sewn webbing loop has a low cost and is easy to produce. However, the seam of the pre-sewn webbing loop is weak compared with the remaining portion of the webbing loop, and may be likely broken due to the stress concentrated at the seam in the use of the quickdraw, leading to a security risk. In addition, an indication that indicates the wear of a webbing loop is not provided internal to the webbing loop, even if the webbing loop has a multi-layered structure, and hence the user will not be timely reminded of the replacement of the worn webbing loop and there is a considerable security risk.

SUMMARY OF THE INVENTION

[0003] A seamless webbing loop of a rock climbing quickdraw is disclosed. The webbing loop is easy to produce, but is strong and safe, and has a function of reminding a user of the wear of the webbing loop in time.

[0004] The present invention adopts the following technical solution.

[0005] A seamless webbing loop of a rock climbing quickdraw includes a plurality of tubular webbing layers, one surrounded by another, among which there is at least one indication layer, which is adjacent to the outermost one among the plurality of tubular webbing layers or is the innermost one among the plurality of tubular webbing layers.

[0006] The indication layer may be a solid webbing having a rectangle or elliptic cross section, and is the innermost layer among the plurality of webbing layers of the webbing loop.

[0007] The indication layer may be a hollow tubular webbing section with a warning sign, and the hollow tubular webbing section is adjacent to the outermost webbing layer among the plurality of webbing layers.

[0008] The hollow tubular webbing section has a single-layer structure.

[0009] A textile machine for weaving the above seamless webbing loop of a rock climbing quickdraw includes a base, pads arranged on the base, and a spindle arranged on each of the pads, where the base is provided with an opening, and a movable spindle assembly fitting with the opening is arranged at the opening.

[0010] The spindle assembly includes a base unit, a pad arranged on the base, and the spindle arranged on the pad.

[0011] The textile machine is provided with a plurality of spindles, which are arranged in a circle, and a webbing passage running through the base is arranged at the center of the circle.

[0012] A gear shaft connecting with a plurality of gears is arranged in the base unit, one end of the gear shaft is connected with the spindle, and the other end of the gear shaft is connected with a power unit of the textile machine, so that the spindle is driven by the power unit, and the base unit is hinged to a side of the opening and may be snapped on the other side of the opening.

[0013] A textile method for weaving the above seamless webbing loop of a rock climbing quickdraw using the above textile machine, where the textile method includes steps of:

[0014] S1) starting the textile machine to weave a hollow webbing having a length;

[0015] S2) guiding a woven end of the hollow webbing to the outside of the textile machine and then inserting the woven end into a weaving end of the hollow webbing via the webbing passage at the bottom of the base of the textile machine to form a loop, continuously weaving along the loop to sheathe the hollow webbing with a plurality of webbing layers, and tying the weaving end to the outermost webbing layer to form a woven webbing loop of the rock climbing quickdraw, where an indication layer is adjacent to the outermost webbing layer; and

[0016] S3) unsnapping the spindle assembly at an opening of the base of the textile machine, and removing the woven webbing loop.

[0017] A textile method for weaving the above seamless webbing loop of a rock climbing quickdraw using the above textile machine, where the method includes steps of:

[0018] S1) starting the textile machine to weave a tubular webbing having a length, which sheathes a solid webbing;

[0019] S2) guiding a woven end of the tubular webbing sheathing the solid webbing to the outside of the textile machine and then inserting the woven end into a weaving end of the tubular webbing via the webbing passage at the bottom of the base of the textile machine to form a loop, continuously weaving along the loop to sheathe the tubular webbing with a plurality of webbing layers, and tying a weaving end to the outermost webbing layer to form a woven webbing loop of the rock climbing quickdraw; and

[0020] S3) unsnapping the spindle assembly at an opening of the base of the textile machine, and removing the woven webbing loop.

[0021] The beneficial effects of the invention are as follows. The webbing loop of the quickdraw contains a plurality of tubular webbing layers, one surrounded by another, among which there is at least one indication layer. The indication layer is adjacent to the outermost one among the plurality of tubular webbing layers or is the innermost one among the plurality of tubular webbing layers. Such a multilayered structure of the webbing loop enhances the strength of the webbing loop for the quickdraw, but does not cause a seam to the webbing loop. Further, the indication layer contained in the webbing loop functions to remind a user of timely replacement of the webbing loop when the webbing loop is worn, and thus the webbing loop is safe in use. With the movable spindle assembly arranged on the textile machine, it is convenient to remove the webbing loop from the textile machine. In addition, the webbing loop disclosed in the present invention has a simple structure without any seam, and is strong, safe and durable.

DESCRIPTION OF DRAWINGS

[0022] FIG. **1** is a schematic diagram showing the structure of a seamless webbing loop of a rock climbing quickdraw according to an embodiment of the present invention;

[0023] FIG. **2** is a schematic diagram showing the structure of a cross-section of the webbing loop taken along a line A-A in FIG. **1**;

[0024] FIG. **3** is a schematic diagram showing the weaving of the seamless webbing loop of the rock climbing quickdraw according to the embodiment of the present invention;

[0025] FIG. **4** is a schematic diagram showing an variant of the cross-section of the webbing loop taken along the line A-A in FIG. **1**, and a solid webbing is contained in the variant;

[0026] FIG. **5** is a schematic diagram of a textile machine for weaving the seamless webbing loop of the rock climbing quickdraw;

[0027] FIG. **6** is a flow chart showing a process of weaving the seamless webbing loop of a rock climbing quickdraw, where an indication layer is adjacent to and surrounded by the outermost webbing layer of the webbing loop; and

[0028] FIG. **7** is a flow chart showing a process of weaving the seamless webbing loop of a rock climbing quickdraw, where a solid webbing is provided in the innermost of the webbing loop.

[0029]

List of the reference numerals:

1: Quickdraw;	2: Woven End;	3: Weaving End;
4: Indication Layer;	5: Base;	6: Pad;
7: Spindle;	8: Opening;	9: Webbing Passage.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0030] The technical solution of the present invention will be further described by way of embodiments below in conjunction with the accompanying FIGS. **1** to **7**.

[0031] A seamless webbing loop of a rock climbing quickdraw is disclosed. The webbing loop **1** of the quickdraw contains a plurality of tubular webbing layers, one surrounded by another, among which there is at least one indication layer **4**. The indication layer **4** is adjacent to the outermost one among the plurality of tubular webbing layers or is the innermost one among the plurality of tubular webbing layers. Such a multilayered structure of the webbing loop enhances the strength of the webbing loop for the quickdraw, but does not cause a seam to the webbing loop. Further, the indication layer contained in the webbing loop functions to remind a user of timely replacement of the webbing loop when the webbing loop is worn, and thus the webbing loop is safe in use. In addition, the webbing loop disclosed in the present invention has a simple structure without any seam, and is strong, safe and durable.

[0032] In an embodiment, the indication layer **4** is a solid webbing having a rectangle or elliptic cross section, and is the innermost layer among the plurality of webbing layers of the webbing loop. In the case that a red elongated solid webbing having a rectangle cross section is used as the indication layer **4**, the red elongated solid webbing is woven into the webbing loop as its innermost layer. Accordingly, the webbing loop has a cross-sectional shape that varies with the cross-sectional shape of the solid webbing. To ensure the consistency of the cross-sectional shape of the webbing loop with the cross-sectional shape of the solid webbing, the solid webbing in the present embodiment is surrounded with three webbing layers. However, the number of the webbing layers in the webbing loop may be adjusted as desired in the production.

[0033] In an embodiment, the indication layer **4** is a hollow tubular webbing section with a warning sign, and the hollow tubular webbing section is adjacent to the outermost webbing layer among the plurality of webbing layers of the webbing loop.

[0034] In another embodiment, the webbing loop may be woven in a manner as shown in FIG. **3**. After a section of hollow tubular webbing is woven, a woven end **2** of the hollow tubular webbing is placed into a weaving end (i.e. an end being woven) **3** of the hollow tubular webbing, so that the webbing which is previously woven is surrounded with a webbing which is subsequently woven during the weaving process. The wire used for weaving the layer located below the outermost webbing layer of the webbing loop may be in red or any other color different from the color of the outermost webbing layer, so that the layer located below the outermost webbing layer forms the indication layer after being woven. It is easy for a user to detect the wear of the outmost layer of the webbing loop as disclosed in the invention and replace the webbing loop in time, thus eliminating the security risks.

[0035] A textile machine for weaving the seamless webbing loop of a rock climbing quickdraw is also disclosed herein, and the textile machine includes a base **5**, pads **6** arranged on the base **5**, and a spindle **7** arranged on each of the pads **6**. The base **5** is provided with an opening **8**, where a movable spindle assembly fitting with the opening **8** is arranged.

[0036] The spindle assembly includes a base unit, a pad **6** arranged on the base unit and a spindle **7** arranged on the pad **6**. The spindle assembly may be fastened on the base by a screw. Alternatively, a pivot is arranged at one side of the opening of the base, to pivotally connect the spindle assembly to the pivot. Thus, the spindle assembly may be conveniently detached to remove the woven webbing loop, and attached to the base for the purpose of weaving.

[0037] The textile machine is provided with a plurality of the spindles **7**, which are arranged in a circle. A webbing passage **9** running through the base is arranged at the center of the circle on which the plurality of the spindles **7** are arranged. Some transmission mechanism may be provided in the webbing passage to move the woven hollow webbing during the weaving.

[0038] A gear shaft connecting with a plurality of gears is arranged in the base unit. One end of the gear shaft is connected with the spindle **7**, and the other end of the gear shaft is connected with a power unit of the textile machine, so that the spindle **7** is driven by the power unit. The base unit is, for example, hinged to a side of the opening **8**, and may be snapped on the other side of the opening **8**. In another embodiment, the spindle assembly is operated through the engagement between gears on the gear shaft arranged on one side of the base unit and gears on a motor shaft arranged on the rack of the textile machine. When it is required to remove the woven webbing loop from the textile machine, the base unit is unsnapped so that the spindle assembly may be rotated aside to remove the woven webbing loop. However, the invention is not limited thereto, and the base unit may be locked and unlocked in any other manner.

[0039] A textile method for weaving a seamless webbing loop of a rock climbing quickdraw using the above textile machine includes the following steps of:

[0040] S1) starting the textile machine to weave a hollow webbing having a length;

[0041] S2) guiding a woven end of the hollow webbing to the outside of the textile machine and then inserting the woven end into a weaving end of the hollow webbing via the webbing passage **9** at the bottom of the base **5** of the textile machine to form a loop, continuously weaving along the loop to sheathe the hollow webbing with a plurality of webbing layers, and tying the weaving end to the outermost webbing layer to form a woven webbing loop of the rock climbing quickdraw, where an indication layer is adjacent to the outermost webbing layer; and

[0042] S3) unsnapping the spindle assembly at an opening of the base of the textile machine, and removing the woven webbing loop.

[0043] A textile method for weaving a seamless webbing loop of a rock climbing quickdraw using the above textile machine includes the following steps of:

[0044] S1) starting the textile machine to weave a tubular webbing having a length, which sheathes a solid webbing;

[0045] S2) guiding a woven end of the tubular webbing sheathing the solid webbing to the outside of the textile machine and then inserting the woven end into a weaving end of the tubular webbing via the webbing passage **9** at the bottom of the base **5** of the textile machine to form a loop, continuously weaving along the loop to sheathe the tubular webbing with a plurality of webbing layers, and tying a weaving end to the outermost webbing layer to form a woven webbing loop of the rock climbing quickdraw; and

[0046] S3) unsnapping the spindle assembly at an opening of the base of the textile machine, and removing the woven webbing loop.

[0047] In a variant of the present embodiment, a webbing section with a distinguishing color may be woven in the weaving of the textile machine, and woven into the webbing loop to form the indication layer adjacent to the outermost webbing layer of the webbing loop, so that a user may be reminded of the wear of the webbing loop and the replacement of the webbing loop in time. Furthermore, the solid webbing may have a different shape as desired, to form the webbing loop having cores-sectional shape as required.

[0048] The technical principles of the present invention have been described in conjunction with the embodiments as above. The description is only intended to explain the principles of the present invention, but not to limit the invention. Based on the explanation herein, other embodiments can be conceived by those skilled in the art without any creative work, thus these embodiments should be included within the protection scope of the invention.

1. A seamless webbing loop (**1**) of a rock climbing quickdraw, comprising a plurality of tubular webbing layers, one surrounded by another, among which there is at least one indication layer (**4**), which is adjacent to the outermost one among the plurality of tubular webbing layers or is the innermost one among the plurality of tubular webbing layers.

2. The seamless webbing loop of claim **1**, wherein, the indication layer (**4**) is a solid webbing having a rectangle or elliptic cross section, and is the innermost layer among the plurality of webbing layers of the webbing loop.

3. The seamless webbing loop of claim **1**, wherein, the indication layer (**4**) is a hollow tubular webbing section with a warning sign, and the hollow tubular webbing section is adjacent to the outermost webbing layer among the plurality of webbing layers.

4. The seamless webbing loop of claim **3**, wherein, the hollow tubular webbing section has a single-layer structure.

5. A textile machine for weaving a seamless webbing loop of a rock climbing quickdraw of claim **1**, comprising a base (**5**), pads (**6**) arranged on the base (**5**), and a spindle (**7**) arranged on each of the pads (**6**), wherein, the base (**5**) is provided with an opening (**8**), and a movable spindle assembly fitting with the opening (**8**) is arranged at the opening (**8**).

6. The textile machine of claim **5**, wherein, the spindle assembly comprises a base unit, a pad (**6**) arranged on the base (**5**), and the spindle (**7**) arranged on the pad (**6**).

7. The textile machine of claim **6**, wherein, the spindles (**7**) are arranged in a circle, and a webbing passage (**9**) running through the base is arranged at the center of the circle.

8. The textile machine of claim **6**, wherein, a gear shaft connecting with a plurality of gears is arranged in the base unit, one end of the gear shaft is connected with the spindle (**7**), and the other end of the gear shaft is connected with a power unit of the textile machine, so that the spindle (**7**) is driven by the power unit, and the base unit is hinged to a side of the opening (**8**) and is snapped on the other side of the opening (**8**).

9. A textile method for weaving a seamless webbing loop of a rock climbing quickdraw using a textile machine of claim **8**, wherein the textile method comprises steps of:

S1) starting the textile machine to weave a hollow webbing having a length;

S2) guiding a woven end of the hollow webbing to the outside of the textile machine and then inserting the woven end into a weaving end of the hollow webbing via the webbing passage (**9**) at the bottom of the base (**5**) of the textile machine to form a loop, continuously weaving along the loop to sheathe the hollow webbing with a plurality of webbing layers, and tying the weaving end to the outermost webbing layer to form a woven webbing loop of the rock climbing quickdraw, where an indication layer is adjacent to the outermost webbing layer; and

S3) unsnapping the spindle assembly at an opening of the base of the textile machine, and removing the woven webbing loop.

10. A textile method for weaving a seamless webbing loop of a rock climbing quickdraw using a textile machine of claim **8**, wherein the method comprises steps of:

S1) starting the textile machine to weave a tubular webbing having a length, which sheathes a solid webbing;

S2) guiding a woven end of the tubular webbing sheathing the solid webbing to the outside of the textile machine and then inserting the woven end into a weaving end of the tubular webbing via the webbing passage (**9**) at the bottom of the base (**5**) of the textile machine to form a loop, continuously weaving along the loop to sheathe the tubular webbing with a plurality of webbing layers, and tying a weaving end to the outermost webbing layer to form a woven webbing loop of the rock climbing quickdraw; and

S3) unsnapping the spindle assembly at an opening of the base of the textile machine, and removing the woven webbing loop.

* * * * *