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IMPROVED TEMPORARY SURFACE COVERING

5 The present invention relates to an improvement in the type of temporary surface covering particularly for movement of vehicles on sandy, muddy or marshy ground, which is the object of French patent No. 2 718 158 in the name of the applicant.

10 The above patent discloses a covering characterized in that it is constituted by a woven structure formed from weft threads of the monofilament type disposed in a single layer and warp threads also disposed in a single layer, the weave of the woven structure being such that each warp thread intertwines with the following weft threads, preferably and very proximately, half of the intersections of the rows and columns of the weave, the warp thread being left in the remaining intersections, such that for each warp thread, there is obtained at least one single and tight weave region followed by a float region, the alternation of the above different zones giving rise to retightening the weft threads creating a substantial relief of the fabric thus produced.

15 For certain applications, it appears to be useful or necessary to improve the load-bearing capacity of this covering so as particularly to reduce the phenomenon of rutting that can result from the conjunction, on the one

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hand, of the inconsistent nature of the ground, and, on the other hand, of the weight of the vehicle and its mode of movement over the ground.

From EP0 617 160 there is known a composite covering structure constituted by a woven structure clad on its two surfaces with an elastomeric layer.

From place to place in this composite structure are provided pockets adapted to receive flexible or rigid elements, or to be inflated with the help of a fluid under pressure.

To this end, certain of the warp and weft threads of the woven structure are separated from the other threads so as locally to divide the original woven structure.

Such a covering structure is necessarily made fragile in line with the pockets and its physical properties are very substantially modified and altered because of the loss of integrity of the woven structure adjacent the pockets.

The present invention has precisely for its object to overcome the drawbacks of the above coverings.

To this end, the invention has for its object a temporary surface covering, particularly for the movement of vehicles over sandy, muddy or marshy ground, of the type with a woven structure formed of warp and weft threads whose weave is such that each warp thread intersects or intertwines with following weft threads, preferably and very proximately, half

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the intersections of the rows and columns of the weave, the warp thread being left at the remaining intersections, such that, for each warp thread, there is obtained at least one region of simple and tightened weave followed by a region of floats, characterized in that a second auxiliary woven structure is superposed and comprises a layer of warp threads and a layer of weft threads, the connection between the two woven structures being effected in the course of a same weaving operation simultaneously with the overlapping of the structures, so as to constitute between the two structures, from place to place, tubular pockets oriented according to the warp threads or according to the weft threads, said pockets serving for the reception of elements provided for various purposes.

According to an application of the invention to the reinforcement of the rigidity of the covering, the pockets thus constituted receive at least one elongated rigidification element, for example a bar of composite material of several tens of millimeters in diameter.

Such bars, and particularly when they are inserted in the pockets constituted transversely to the covering, which is to say parallel to the weft threads, substantially improve the load-bearing capability whilst reinforcing the gripping of the contacting surface in particular with the tires of vehicles moving on such a covering.

When the pockets are provided in the direction of

the warp threads, along the longitudinal axis of the covering, the elements constituted for example by flexible tubes inflated by a fluid under pressure, permit conferring on the assembly of the covering a substantial rigidity and a high stability.

Other applications of the device of the invention can be envisaged, for example the detection in or on the ground on which the covering is deployed, or dangers such as mines or hidden pits, in which case the pockets constituted in the covering can receive any detection means or device and/or device for the destruction of mines.

Other characteristics and advantages will appear from the description which follows of embodiments of the invention, which description is given solely by way of example and with respect to the accompanying drawings, in which:

- Figure 1 is a very schematic and partial view of the section of the assembly according to the invention comprising two superposed woven structures,

- Figure 2 is a perspective view of a covering according to the invention provided with transverse rigidification elements, and

- Figure 3 is a perspective view of a covering according to the invention provided with longitudinal rigidification elements.

In Figure 1 there is schematically shown at numeral

1 the profile through a woven structure forming a covering,
of the type described in French patent 2.718.158.

5 This covering has on its two surfaces an embossed
structure with transverse ribs formed by projections S and
hollows C, which gives to the covering its properties of
gripping vehicles tires that move over this covering.

10 According to the invention, to this woven structure
1 is added, in superposition, a second woven structure shown
at 2, constituted by a layer of warp threads and layer of
weft threads, these threads being parallel to the
corresponding threads of the structure 1.

15 Two woven structures 1 and 2 are made and connected
to each other in the course of a same weaving operation, in
the course of which are constituted pockets such as those
shown at 3 in Figure 1, by localized separation of the two
woven structures 1 and 2, for example in line with the
projections S. To this end, the two layers of warp threads
for the two woven structures 1, 2 are unrolled from two
separate warp thread feeding rollers and brought to a weaving
20 machine provided with two dobbies each associated with one of
the two layers and working simultaneously and in coordination
to carry out the overlapping of the two layers and their
localized separation in line with the pockets to be provided,
under the control of a suitable program. Such a weaving-
assembling technique of two woven structures is conventional.

25 Each pocket 3 is provided transversely to the

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covering 1, which is to say, in the direction of the warp threads and extends from one edge to the other of the covering, as shown in Figure 2.

5 The pockets 3 are provided from place to place, at regular intervals.

The pockets 3 receive, at the moment of weaving or thereafter, an elongated rigidification element 4, such as a bar for example of composite material of several tens of millimeters in diameter.

10 The bars 4, for example of the type of glass fibers and polyester resin and 25 mm in diameter, are trapped in the pockets 3 between the two woven structures 1, 2 and give to the covering an increased load bearing capability whilst reinforcing the projecting nature of the regions S in which
15 said bars 4 are inserted.

The material, the diameter and length of the bars 4 can vary. If desired, several bars 4, of reduced diameter, can be inserted in a same pocket 3.

20 The nature and the diameter of the threads of the woven structure 2 can of course vary, according to the envisaged uses.

The nature of the structure 1 is according to what is given in said patent No. 2.718.158.

25 Figure 2 shows a covering according to the invention with transverse rigidification elements 4.

Figure 3 shows a covering according to the

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invention with rigidification elements 4' inserted in pockets 3' along the longitudinal axis of the covering 1', which is to say in the direction of the warp threads of the woven structure of said covering.

5 The pockets 3' are also made in the manner described above, by conventional means, in the course of weaving and assembly of the two woven structures (1', 2'). They can receive rigidification elements 4', in particular flexible tubes, for example of 70 mm in diameter, which can
10 be inflated with the help of a fluid under pressure, such as water, from a suitable source 5.

 The tubes 4' extend from one end to the other of the covering 1' and, inflated for example with water under a pressure of 6 to 8 bars, give to the assembly a remarkable
15 rigidity and stability, making it unnecessary in certain cases to secure the covering to the ground.

 The inflation with water of the tubes 4' also permits deploying the assembly 1', 2' on an extent of water, to permit crossing a body of water for example, the assembly
20 immersing itself without trouble and coming to rest on the bottom.

 In an application of the invention to safety, for example the detection of possible mines on the path of vehicles and/or personnel, or the detection of other dangers
25 such as the subsurface presence of cavities, the covering (1, 1') can be provided with devices or means disposed in the

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pockets (3, 3') ensuring the detection of the pockets or mines and if desired their destruction.

Any other measuring apparatus can be disposed in said pockets.

5 These same pockets can be provided with self-destructing means rendering the covering unusable after use.

CLAIMS

1. Temporary surface covering particularly for the movement of vehicles on sandy, muddy or marshy soil, of the type with a woven structure (1) formed of warp threads and weft threads whose wave is such that each warp thread intertwines with the following weft threads, preferably and very approximately half the intersections of the rows and columns of the weave, the warp threads being left in the remaining intersections, such that for each warp thread, there is obtained at least one simple and gripped weave region followed by a region of floats, characterized in that a second auxiliary woven structure (2) is superposed and comprises a layer of warp threads and a layer of weft threads, the connection between the two woven structures (1, 2) being carried out in the course of a same simultaneous weaving operation with overlapping of the structures, so as to constitute between the two structures, from place to place, tubular pockets (3, 3') oriented in the direction of the warp threads or the weft threads, said tubular pockets containing elements (4, 4') included therein.

2. Covering according to claim 1, characterized in that the pockets (3, 3') receive at least one elongated rigidification element (4).

3. Covering according to claim 2, characterized in that the elongated element (4) is a bar of composite material.

4. Covering according to claim 2, characterized in that the elongated element (4') is a flexible tube adapted to be inflated with the help of a fluid under pressure.

5. Covering according to claim 1, characterized in that the pockets (3, 3') receive a device or means for detection or measurement.

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6. Covering according to claim 1, characterized in that the pockets (3, 3') receive a destruction means.