



(11) **EP 1 867 789 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 158(3) EPC

(43) Date of publication:
19.12.2007 Bulletin 2007/51

(51) Int Cl.:
E02D 17/20 (2006.01) E01F 9/011 (2006.01)

(21) Application number: **05817083.8**

(86) International application number:
PCT/ES2005/000623

(22) Date of filing: **16.11.2005**

(87) International publication number:
WO 2006/053925 (26.05.2006 Gazette 2006/21)

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**

(30) Priority: **16.11.2004 ES 200402806**
08.07.2005 ES 200501665

(71) Applicant: **Mimcord S.A.**
E-08560 Manlleu (ES)

(72) Inventor: **VILAMALA I SALA, Jordi**
E-08560 Manlleu (ES)

(74) Representative: **Maldonado Jordan, Julia**
Linares, 7
46018 Valencia (ES)

(54) **BIODEGRADABLE MESH**

(57) The invention relates to a biodegradable mesh for temporary structures. The inventive mesh consists of a textile (1) comprising a plurality of yarns, staples or narrow fabrics (11), wherein the yarns, staples or narrow fabrics (11) that form the textile (1) are obtained from fibres of paper or a non-woven cellulose fabric. The textile (1) can comprise a plurality of holes (12), preferably through which vegetation can grow. At least some of the yarns, staples or narrow fabrics (11) can comprise dyed

segments (11a) in order to define signs (2).

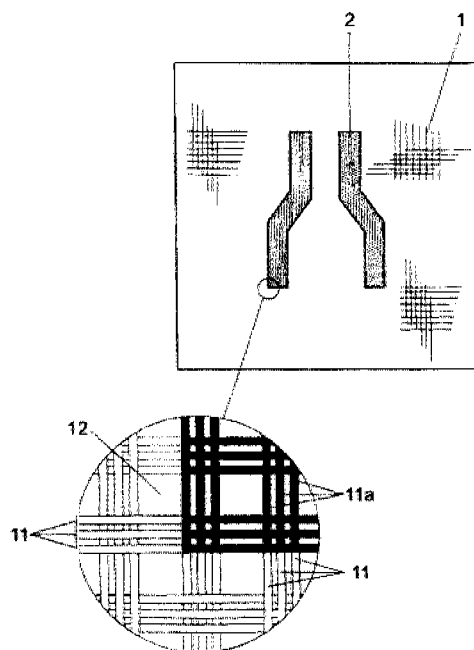


Fig. 1

Description

[0001] This present invention refers to a biodegradable mesh for temporary structures, and its use as a retaining mesh for slopes or as an element for signs.

BACKGROUND TO THE INVENTION

[0002] The technique of using meshes of differing sizes and compositions for temporary structures is already known, that is, structures that are applied where, after a time, the mesh is no longer needed and it is advisable to remove it or neutralise it in some way.

[0003] For example, currently it is a frequent practice to place some meshes on slopes that act as a fixing element or for the holding of earth for a time that is sufficient to allow the vegetation to grow, the roots subsequently acting as support or fixing elements for the land.

[0004] These meshes are mainly made up of plastic materials or with wire, and in some cases with coconut fibres, these elements presenting different problems related to the high cost of manufacture and/or the lengthy period required for their decomposition.

[0005] Specifically, the plastic meshes are not biodegradable and have a high cost, whilst the wire meshes are degradable over a very long time, it being possible to cause a problem both for the maintenance workers and for animals for a long time.

[0006] In that which refers to coconut, the high cost must be highlighted.

[0007] Another example of the application of meshes or fabrics where their use is limited in terms of time, and which must then be removed, are the elements for temporary signs, for example in the areas of public works; these elements are traditionally made up from a flexible plastic sheet material onto which the signs are printed.

[0008] These types of elements for signs, due in part to their plastic material composition and, on the other hand, to continual exposure to the atmospheric agents, resulting from their use outside, deteriorate with a certain rapidity, their renewal being essential and the removal of those that have deteriorated from use.

[0009] This elimination constitutes a problem, as the plastic material is not biodegradable and it is therefore necessary to take the deteriorated sign elements to a selective collection point for their recycling or to a company that is specialised in the treatment of these types of materials. Taking into account that these operations mean additional costs, it is also frequent for these unusable sign elements start to accumulate in the warehouses of the companies that use them, constituting a nuisance or, in the worst of the cases, they are dumped in uncontrolled tips, with the consequent visual and environmental pollution.

[0010] Finally, the known meshes for these types of provisional applications have a relatively high cost, of manufacture and/or elimination, and bring about disadvantages after their installation. It would be desirable to

have a suitable mesh for these types of applications that were low in cost and at the same time reduced the problems that arise after their installation and use, thus simplifying their management and the costs associated with same.

DESCRIPTION OF THE INVENTION

[0011] According this objective, a first aspect of the present invention makes reference to a biodegradable mesh for temporary structures that comprises of fabric with a plurality of yarns, staples or strips that form the fabric obtained from fibres of paper or a non-woven cellulose fabric.

[0012] This mesh has a low cost, it is light and easy to install, and thanks to its biodegradable characteristics the problems are drastically reduced that are associated with these structures when their useful working life has ended.

[0013] Their use in the restoring of slopes to protect the land from erosion from rain and wind, thus protecting the seeds; in addition, it helps the development of the vegetation because it improves the environmental conditions for germination and growth, making the evaporation-transpiration of the soil easier, increasing the humidity thanks to its water absorption capacity, and contributing organic material that makes a fertiliser, thanks to the nature of the raw material used in the manufacture.

[0014] In another aspect the invention makes reference to the use of a mesh like the one being described, as a mesh for the restoring of slopes.

[0015] In a subsequent aspect, the invention makes reference to the use of a mesh like the one being described, as an element for signs.

[0016] The invention likewise makes reference to a biodegradable mesh to fix slopes and soils that comprises of fabric with yarns and/or staples and/or strips obtained from paper and/or a non-woven cellulose fabric and which is completely biodegradable, said fabric having a plurality of holes of any shape and size through which the vegetation can grow.

[0017] The invention likewise makes reference to an element for signs, being of the type which has a flexible sheet arrangement that is the carrier for the sign motifs, made up of a biodegradable mesh or fabric made from a plurality of paper yarns, staples or strips and/or a non-woven interlaced or crossed cellulose fabric, the yarns, staples or strips having some coloured parts along all or part of the length, in order to define the motifs corresponding to a specific sign.

A BRIEF DESCRIPTION OF THE DRAWINGS

[0018] In order to complement the description that is being made and for the purpose of giving a greater understanding of the nature of the invention, a set of descriptive drawings is attached to this present description that is by way of illustration and without being by way of

limitation and which represents a practical case for an embodiment of the invention.

[0019] In said drawings, Figure 1 shows a view of the mesh in accordance with an embodiment of the invention, with an expanded section of same.

A DESCRIPTION OF PREFERRED EMBODIMENTS

[0020] Figure 1 shows a mesh 1 in accordance with an example of an embodiment of the invention, which, as can be seen in the expanded section, is made up of a fabric 1 made from long elements 11, interlaced or crossed, that between them define a plurality of openings 12.

[0021] The fabric can be made from yarns, staples or strip, in turn obtained from long cellulose fibres. The cellulose pulp is obtained from wood from conifer trees, with a kraft process in which the woodchips are subjected to heating in a bath of sulphites and caustic soda, for the purpose of extracting the lignin.

[0022] This process allows very resistant threads to be obtained, both dry and damp; this high resistance when damp allows the incorporation of additives such as, colourings.

[0023] By way of an example, some yarns that are suitable for a mesh in accordance with the invention can be around 10.3 Nm (metres per gram), although the fabric can be made with yarns, staples or strips of different weights per metre.

[0024] Thus with yarns, staples, strips or a combination of same, the mesh is woven, which in each case will have the dimensions and thicknesses suited to the application being sought: for example a mesh for the restoring of slopes can have a weight of some 280 gr/m², and can have holes approximately of 10mm x 40mm, so that the vegetation can grow through same.

[0025] The mesh fabric can be made by any known textile technique (weaving, knitting/knitwear, "rachel" methods,...).

[0026] It has been designed so that the fabric or the material from which the fabric is made can be subjected, in accordance with that which is advisable, to a treatment with natural waxes in order to make handling easier, a treatment with surface treatment products, also by preference biodegradable, for resistance to dampness, or a fungicidal and bactericide treatment to prevent the mesh from being able to deteriorate with excess speed as a result of attack from insects, moulds, bacteria or similar items, given its use outside.

[0027] The fabric can be treated, for example, with pH neutral resins.

[0028] It has been seen that the mesh with these characteristics can last from between 6 months and 2 years once installed in the slope, depending on the climatic and soil conditions.

[0029] It has also been designed so that the fabric can be treated with a fire retardant product, preventing the elements making up the mesh from becoming combus-

tible in the event of that the area where the mesh is installed being affected by a fire.

[0030] In order for its use a sign element, the mesh has some yarns, staples or strips with coloured portions, in such a way that the different coloured portions define the required sign motifs.

[0031] In figure 1, some coloured portions of the paper yarns 11 have been references as 11a; in the example shown, the coloured parts affect a part of its length, and define the motif 2 to be used as the sign on the mesh or fabric.

[0032] Experts in the subject will be able to introduce variations and modifications to the mesh described in accordance with the specific requirements for each case, and replace any element for another that is technically equivalent, without this meaning the abandoning of the scope of the protection defined by the attached claims.

20 Claims

1. A biodegradable mesh for temporary structures, that is made up of a fabric (1) with a plurality of yarns, staples or strips (11), **characterised in that** the yarns, staples or strips (11) that make up the fabric (1) are obtained from paper fibres or from a non-woven cellulose fabric.
2. A mesh according to Claim 1, **characterised in that** said fabric (1) has a plurality of holes (12).
3. A mesh according to Claim 2, **characterised in that** said holes (12) are appropriate to allow the growth of the vegetation through them.
4. A mesh according to any of the previous claims, **characterised in that** at least some of the yarns, staples or strips (11) have coloured sections (11a) over at least a part of their length so as to define motifs for signs (2).
5. A mesh according to any of the previous claims, **characterised in that** the paper fibres or the cellulose fabric is obtained from conifer trees by means of a kraft process.
6. A mesh according to any of the previous claims, **characterised in that** the fabric (1) is subjected to a surface treatment with biodegradable products.
7. A mesh according to any of the previous claims, **characterised in that** the fabric (1) is subjected to a treatment with natural waxes.
8. A mesh according to any of the previous claims, **characterised in that** the fabric (1) is subjected to a treatment with fungicides and bactericides.

9. A mesh according to any of the previous claims, **characterised in that** the fabric (1) is subjected to a treatment with fire retardant products.
10. The use of a mesh according to any of the Claims 1 to 9 as a mesh for the restoring of slopes. 5
11. The use of a mesh according to any of the Claims 1 to 9 as an element for making signs. 10
12. A biodegradable mesh for fixing on slopes and earth, **characterised in that** it is comprised of the fabric (1) of yarns, staples or strips (11) obtained from paper and/or from a non-woven cellulose fabric, and completely biodegradable, said fabric having a plurality of holes (12) of any shape and size designed to allow the vegetation to grow through them. 15
13. An element for making signs, of the type having a flexible sheet arrangement to carry the motifs for signs, **characterised in that** it is made up of a biodegradable mesh or fabric (1) comprising a plurality of paper yarns, staples or strips (11) and/or a non-woven cellulose fabric, interlaced or crossed, the yarns, staples or strips (11) having some coloured portions (11a) on part or all of the length so as to define the motifs (2) corresponding to a specific sign. 20 25 30

35

40

45

50

55

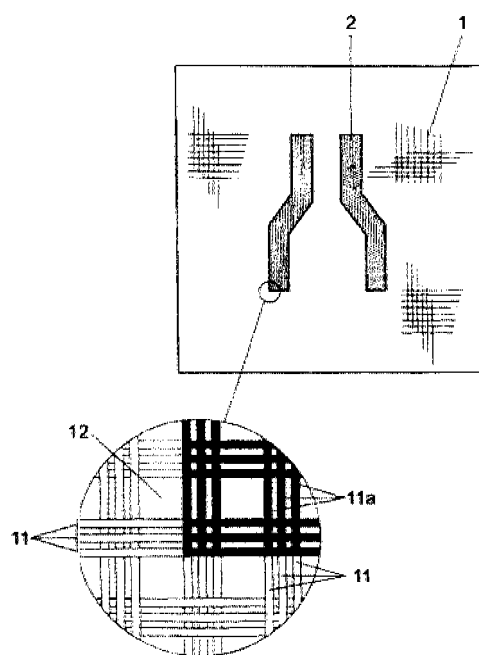


Fig. 1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 2005/000623

A. CLASSIFICATION OF SUBJECT MATTER		
E02D 17/20 (2006.01) E01F 9/011 (2006.01)		
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)		
E02D, E01F		
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)		
CIBEPAT, EPODOC, WPI, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	FR 2632251 A1 (LANCHIER, J.M.) 08.12.1989, the whole document	1-4,6,8 5
Y A	ES 2133983 T3 (GUILLEMAIN PALLEAU, J.S.) 16.09.1999, the whole document	5 1-4,6,12
X	EP 0951819 A1 (CREATERRA INC.) 27.10.1999, the whole document	10,12
X	DE 20102164 U (SUOMEN NAUHATEHDAS OY TAMPERE) 10.05.2001, the whole document	11,13
A	JP 7224430 A (NIPPON SHOKUSEI KK) 22.08.1995 (abstract) [in line][retrieved on 07.02.2006] Retrieved from: EPOQUE EPODOC Database.	1-3,6,8,12
A	CN 1231817 A (GU WEI) 20.10.1999(abstract) [in line] [retrieved on 09.02.2006] Retrieved from: EPOQUE EPODOC Database.	1-3,10,12
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
14 February 2006 (14.02.06)		20 February 2006 (20.02.06)
Name and mailing address of the ISA/ S.P.T.O.		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT
 Information on patent family members

 International Application No
 PCT/ ES 2005/000623

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2632251 A1	08.12.1989	NINGUNO	
ES 2133983 T3	16.09.1999	FR 2737079 A CA 2228688 A WO 9704641 A EP 0841848 A1 AT 179299 T DE 69602270 D US 5946854 A DK 841848 T DE 69602270 T	31.01.1997 13.02.1997 13.02.1997 20.05.1998 15.05.1999 02.06.1999 07.09.1999 08.11.1999 30.12.1999
EP 0951819 A1	27.10.1999	JP 2000004680 A	11.01.2000
DE 20102164 U	10.05.2001	NONE	
JP 7224430 A	22.08.1995	JP 2594228 B	26.03.1997
CN 1231817 A	20.10.1999	CN 1074237 C	07.11.2001