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(54) **Construction element for building a wall with particulate filling**

(57) The invention relates to a construction element for constructing a wall, comprising; a container having at least one sidewall formed of wire-mesh and an inner chamber suitable for receiving and retaining a particulate filling; characterised in that; the inner chamber has a

width, X, of less than 8cm; the wire-mesh comprises apertures of a first size, Y, greater than the width X; and a gauze-mesh is provided adjacent the wire-mesh, the gauze-mesh having apertures of a second size smaller than Y, and being adapted to retain a particulate filling having a diameter of less than X.

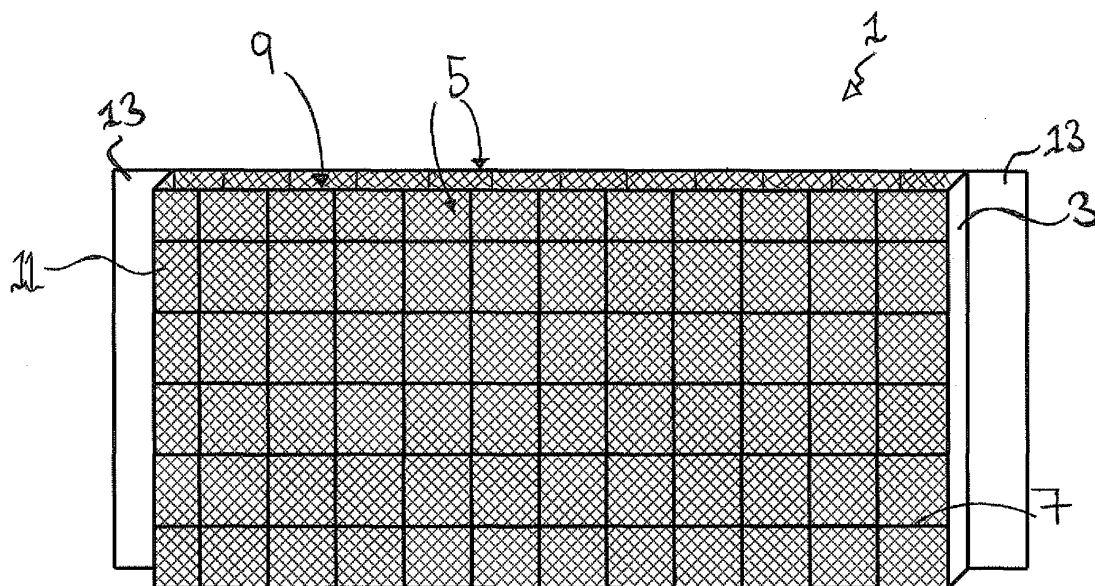


Fig. 3

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The invention relates to a construction element for constructing a wall; the invention further relates to a kit of parts for constructing a wall; and to a wall comprising the constructional element.

2. Description of the Related Art

[0002] Constructional elements made of wire cages are known for use in constructing walls. They are filled with large stones such as riprap and are commonly used to form erosion defences. In particular they are used as hydraulic erosion defences. Such wire cages filled with stone are often referred to as gabions.

[0003] Dutch patent application number 1026455 describes a gabion-type structure used to construct a garden partition or a garden wall. The described wall is provided with vertical, parallel sidewalls of a single thickness of wire-mesh having 75mm by 75mm apertures and having 5mm thick wire. Such wire-mesh is commonly used for gabions. The wire-mesh sidewalls form an inner chamber which is filled with cobbles to complete construction of the wall.

[0004] Such structures suffer from the disadvantage that they occupy a relatively large area of ground. It is desirable that self standing walls, for example boundary walls, as might be used to demarcate a garden, should occupy as little ground area as possible in order to avoid unnecessary loss of ground space.

BRIEF SUMMARY OF THE INVENTION

[0005] In accordance with the invention there is provided a construction element for constructing a wall, comprising; a container having at least one sidewall formed of wire-mesh and an inner chamber suitable for receiving and retaining a particulate filling; characterised in that the inner chamber has a width X of less than 8cm; the wire-mesh comprises apertures of a size Y greater than X; and a gauze-mesh is provided adjacent the wire-mesh, the gauze-mesh having apertures of a size smaller than Y and being adapted to retain a particulate filling having a diameter of less than X.

[0006] The present invention provides a constructional element for easy construction of a wall, in particular of a garden wall. To build a wall, the constructional element of the present invention is located appropriately, for instance in or around a garden, and the inner chamber is then filled with a particulate filling material of appropriate size, such as gravel

[0007] The wire-mesh of the constructional element provides support to the sides thereof and prevents excessive bowing under the weight of the contained filling.

The gauze, which is a finer mesh than the wire-mesh, acts to retain the filling material, which in order to fit within the width X of the inner chamber must have a diameter smaller than X. Thus the gauze retains the filling material that would otherwise pass through the apertures of the wire-mesh. The filling material may be gravel or pebbles.

[0008] The laminate of a strong wire-mesh with a small aperture gauze provides a solidly constructed wall which can be filled with a filling of relatively small particulates. This is of great advantage compared to gabions which are typically filled with stones of from 15cm to 75cm and greater in diameter and would be incapable of retaining smaller particulates.

Filling a gabion cage with large stones, even cobbles, is labour intensive and often requires the aid of machinery.

[0009] The present invention overcomes this problem by providing a construction in which a small particulate filling can be used. This allows manual filling of the element, for example with gravel, obviating the need for machinery. The invention is particularly applicable to garden walls or garden partitions, where intensive labour and the use of machinery is particularly undesirable.

[0010] Further to the above, the preparation of such laminated mesh sidewalls, which are able to retain small particulate fillings while also being strong, allows the construction of thin walls. Thin walls do not take up a large ground area and are easily stacked and transported without needing to be knocked down, as is the case with known gabions.

[0011] It is preferably the case that two spaced laminated mesh sidewalls are provided to form the inner chamber. These may be strengthened by providing ties in form of rods or chord linking the two sidewalls internally. These ties act to reduce any outward bowing that may occur under the weight of the filling.

Wire-Mesh

[0012] The wire-mesh is selected to provide a supporting sidewall and as such is constructed from a strong wire-mesh. Suitable meshes are those typically used for the reinforcement of concrete. Such meshes are commonly constructed from a criss-cross of steel wires welded together.

[0013] The apertures of the wire-mesh are selected to be as large as possible taking into account the limiting factors that the sidewalls should not be unduly weakened and that adequate support should be provided to the gauze-mesh. The gauze-mesh should be prevented from splitting or bulging excessively under the weight of the filling. The use of larger apertures provides a lighter construction element as well as providing a transparent sidewall through which the filling can be seen; this is considered to provide a more attractive wall as a result.

[0014] Preferably the apertures are greater than 75mm by 75mm, more preferably they are greater than 100 by 100mm and most preferably they are 150mm by 150mm or greater. The apertures are preferably no greater than

300mm by 300mm.

[0015] The wire-mesh is preferably constructed of steel wire of at least 3mm in diameter, more preferably of at least 4mm in diameter.

[0016] In order to prevent rusting of the steel wire, so as to maintain both structural integrity and a pleasing appearance, the wire-mesh is preferably galvanized.

Gauze-Mesh

[0017] The gauze-mesh is selected to have apertures of a size which provides a membrane for retaining the particulate filling while at the same time providing a transparency to the wall such that the filling material can be seen. Large apertures provide a better transparency and a lighter weight construction. The apertures are therefore preferably as large as possible while at the same time being small enough to retain the particulate filling.

[0018] Preferably the gauze comprises apertures of less than 40 mm, 30mm, 10mm, 8mm, 6mm or 4mm. Preferably the gauze comprises apertures of a size greater than 2mm. In the most preferred embodiment of the invention the apertures are about 8mm.

[0019] The size of an aperture in the gauze-mesh is measured as the distance across the narrowest point of the aperture.

[0020] Preferably the gauze is metal, such as steel wire, and is galvanized to prevent rusting. Materials other than metals may be used to form the gauze-mesh.

[0021] The gauze-mesh can be attached to the inner or outer surface of the wire-mesh by welding, soldering, ties or adhesion. Alternatively the gauze-mesh when provided on the inside surface need not be attached to the wire-mesh but may just be provided adjacent thereto. Preferably the gauze-mesh is attached to the inside surface of the wire-mesh.

Filling Material

[0022] The filling material is selected such that it is able to fit within the width X of the inner chamber.

[0023] Preferably the filling comprises particulates having diameters in the range of 2mm to 75mm, more preferably in the range 4mm to 60mm and most preferably in the range of 6 to 40 mm. Preferably the filling material consists of particles of less than 40mm.

[0024] The filling material is preferably stone in the form of gravel or pebbles.

Constructional Element Sizes

[0025] In a preferred embodiment of the invention, the constructional element is shaped as a thin planar structure.

[0026] Preferably the constructional element has a length from 0.5m to 3m, more preferably from 1m to 2.5m and most preferably 1.8m.

[0027] Preferably the constructional element has a

height of between 0.2m to 2m, more preferably from 0.3m to 1.5m and most preferably 0.45m or 0.9m.

[0028] Preferably the constructional element has a width of 3cm to 12cm, more preferably a width of from 4cm to 8cm and most preferably 5cm to 6cm. The width of the constructional element is measured as the narrowest outer part of the element.

[0029] Preferably the constructional element has a length of about 1.8m, a height of about 0.9m and a width of about 0.3m; or has a length of about 1.8m, a height of about 0.45m and a width of about 0.3m.

[0030] Preferably the inner chamber has a width X of less than 7cm, more preferably less than 6cm, more preferably less than 5cm, more preferably less than 4cm and most preferably a width X of from 2cm to 4cm. The width X of the inner chamber is taken as the narrowest point of the inner chamber. In a cuboid structure the width X will be substantially the same at any point within the chamber. However, the construction element may be provided with alternative cross-sections such that the width may vary at different points.

[0031] In alternative embodiments the constructional element may be shaped other than as a cuboid. For example the constructional element may be provided with a circular wire-mesh sidewall, or be contoured along its height or length.

[0032] Preferably the construction element is provided as a prefabricated unit for sale. Because the construction elements are thin they can be more easily prefabricated at a factory and transported to a point of sale or a location of use. This is not the case with known gabions which are typically large cages that can only be transported in a dismantled form and hence require onsite construction before filling can take place.

[0033] The invention also relates to a kit of parts for constructing a wall, the kit of parts comprising one or more of the above-described constructional elements, preferably provided as prefabricated units, and filling material.

BRIEF DESCRIPTION OF THE DRAWINGS

[0034] The invention will be explained in further detail and by way of example only with reference to the accompanying drawings, in which:

[0035] Figure 1 shows a construction element provided with a single thickness wire-mesh sidewall;

[0036] Figure 2 shows a construction element provided with a double thickness wire-mesh sidewall;

[0037] Figure 3 shows the construction element of Figure 2 additionally provided with connection members.

DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0038] In figure 1 there is shown a construction element 1 comprised of two vertical endwalls 3, and two vertical sidewalls 5. The sidewalls 5 are comprised of a single thickness of a galvanised steel wire-mesh having

square apertures of 150mm by 150mm, and a wire diameter of 4mm. The sidewalls have a length, L, of 1.9m and height, H, of 0.9m. The wire-mesh is the type of mesh which is typically used to reinforce concrete.

[0039] A hollow inner chamber 9 is formed between the sidewalls 5. This inner chamber has a width, X, of 40mm, with the spacing of the sidewalls 5 being adjusted appropriately to achieve this. The width, X, of the inner chamber 9 is measured as the width of the chamber at its internally narrowest point. In the cuboidal structure of figure 1, the width X can be measured at any point because the walls remain parallel. With alternative cross-sections the width X may vary through the structure, in this case the width X is taken as the narrowest point of the inner chamber.

[0040] According to the invention, and as shown in figure 2, a gauze-mesh 11 is provided on the internal side of the wire-mesh sidewalls 5. The gauze-mesh forms a barrier of small apertures within the larger apertures wire-mesh. The gauze-mesh 11 is a hexagonal woven mesh of steel wire having apertures of about 8mm. Such a gauze-mesh is commonly used as chicken-wire.

[0041] The gauze-mesh 11 need not be affixed to the wire-mesh 7 but is preferably affixed thereto by welding, soldering, ties or adhesion.

[0042] In constructing a wall, the inner chamber 9 of the construction element 1 is filled with a gravel mix having particles in the size range of from 6mm to 36mm. The largest particles of gravel (36mm) are able to fit into the width X of the inner chamber 9 (40mm) while all particles, including the smallest gravel particles (6mm) are substantially retained by the gauze-mesh.

[0043] A filling material such as the mentioned gravel is readily available for domestic use. Such gravel is also easily handled making the task of filling the construction element possible without machinery and without intensive labour. The result is an attractive and easily constructed wall.

[0044] To construct a wall having a length longer than one construction element, a number of such elements are placed end to end. For this purpose, as shown in figure 3, connector brackets 13, formed of L-section steel, are welded to the sidewall wire-mesh to form endwalls 3.

[0045] These connector brackets 13 are joined to the adjacent construction element by screws, brackets, ties or other suitable elements. In this manner a fence, for example a demarcation fence for a garden can be constructed.

[0046] Stabilising features may also be provided to ensure that the wall remains upright. These may take the form of poles attached to the ends of the construction elements. Such poles may be sunk partially into the ground on which the wall is constructed, preventing the wall from tipping.

[0047] The invention also relates to pillar elements having sidewalls of a similar laminate wire-mesh and gauze-mesh construction as that used for the construction element, and being filled with gravel or pebbles.

These may be used to link together individual construction elements. Such pillar elements have triangular or square cross-sections corresponding in size to the mesh size.

[0048] The top of the inner chamber 9 is left open in those preferred embodiments shown in the figures. However, a solid or wire top may be added if desired. This will advantageously strengthen the structure.

[0049] The construction element shown in the figures is not provided with a base. On deconstruction of a wall this advantageously allows easy removal of the filling from the construction element. The construction element is simply moved upwardly allowing the filling to spill out through the open base of the inner chamber 9. In an alternative embodiment (not shown) a solid or wire base may be provided which is releasably attached to the sidewalls by brackets, ties or the like. On deconstruction the base can be detached from the sidewalls allowing them to be moved upwardly.

[0050] Inner ties (not shown) in the form of metal rods or chord are provided linking the sidewalls together. This gives additional strength to the sidewalls avoiding outward bowing of the sidewalls under the weight of the filling.

[0051] In a preferred embodiment (not shown) the endwalls are also constructed from wire-mesh and gauze-mesh laminate as is the case with the sidewalls.

[0052] The total width, W, of the construction element is equal to X plus the thickness of the sidewalls.

[0053] In an alternative preferred embodiment (not shown) the sidewalls have a height, H, of 0.45m.

Claims

1. A construction element for constructing a wall, comprising;

a container having at least one sidewall formed of wire-mesh and an inner chamber suitable for receiving and retaining a particulate filling;

characterised in that;

the inner chamber has a width, X, of less than 8cm;

the wire-mesh comprises apertures of a first size, Y, greater than the width X; and

a gauze-mesh is provided adjacent the wire-mesh, the gauze-mesh having apertures of a second size smaller than Y, and being adapted to retain a particulate filling having a diameter of less than X.

2. A construction element according to claim 1 wherein the inner chamber has a height of from 20cm to 200cm.

3. A construction element according to claim 1 or claim

2 wherein the construction element is substantially cuboidal and has a length of from 0.75 to 3 metres.

4. A construction element according to any of the preceding claims wherein the wire-mesh forms apertures of greater than 75mm by 75mm; more preferably the apertures are 150mm by 150mm or greater. 5

5. A construction element according to any of the preceding claims wherein the gauze-mesh comprises apertures of from 2mm to 8mm. 10

6. A construction element according to any of the preceding claims wherein a base portion of the container is open allowing passage of the particulate filling material. 15

7. A construction element according to any of the preceding claims wherein 20

the inner chamber is formed between the wire-mesh sidewall and a second, similar wire-mesh sidewall, the wire-mesh sidewalls being substantially parallel to one another. 25

8. A construction element according to any of the preceding claims comprising L-section endwalls to which the sidewall or sidewalls are welded to form a prefabricated unit. 30

9. A wall comprising a construction element according to any one of claims 1 to 8 filled with a particulate filling material; preferably gravel having a diameter of from 2mm to less than the width of the inner chamber X. 35

10. A kit of parts for building a wall, comprising; 40

components for constructing the construction element of any of claims 1 to 8, and 40

a particulate filling material; preferably gravel having a diameter of from 2mm to less than the width of the inner chamber X.

11. A kit of parts for building a wall, comprising 45

one or more prefabricated construction elements according to any of claims 1 to 8; and 50

a particulate filling material; preferably gravel having a diameter of from 2mm to less than the width of the inner chamber X. 55

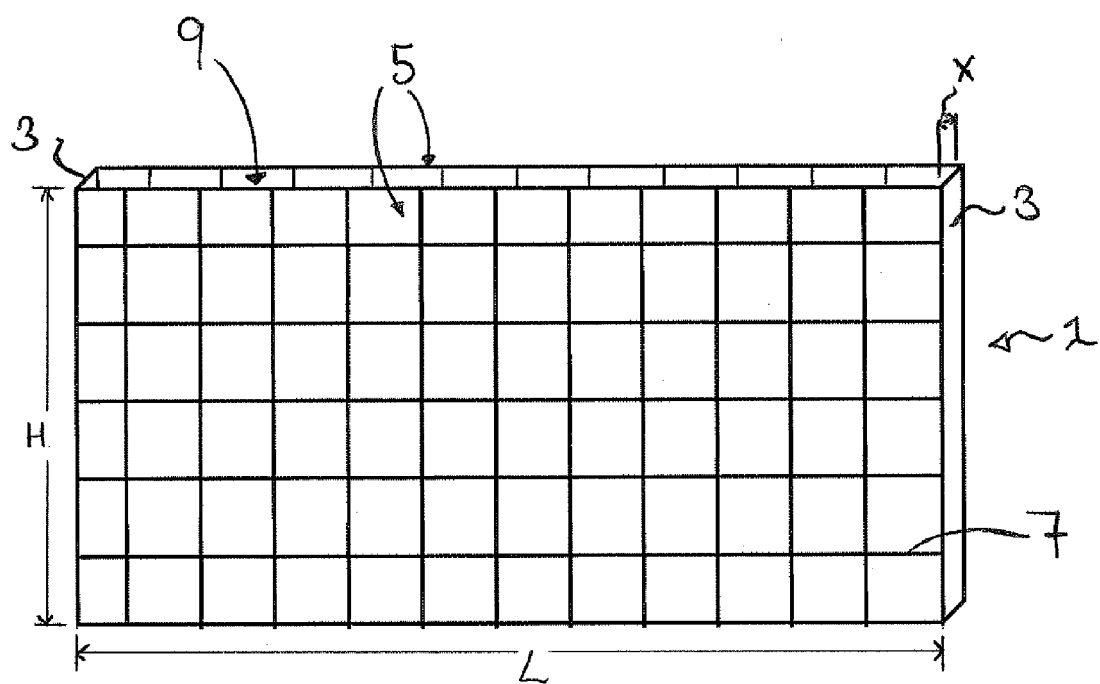


Fig. 1

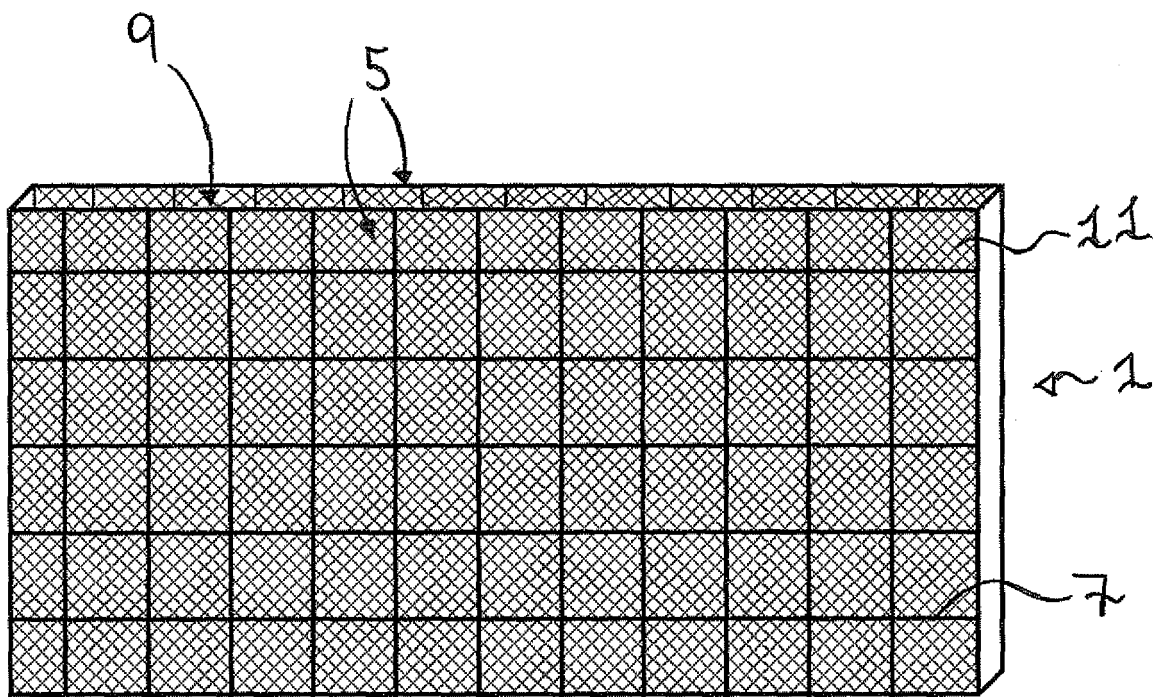


Fig. 2

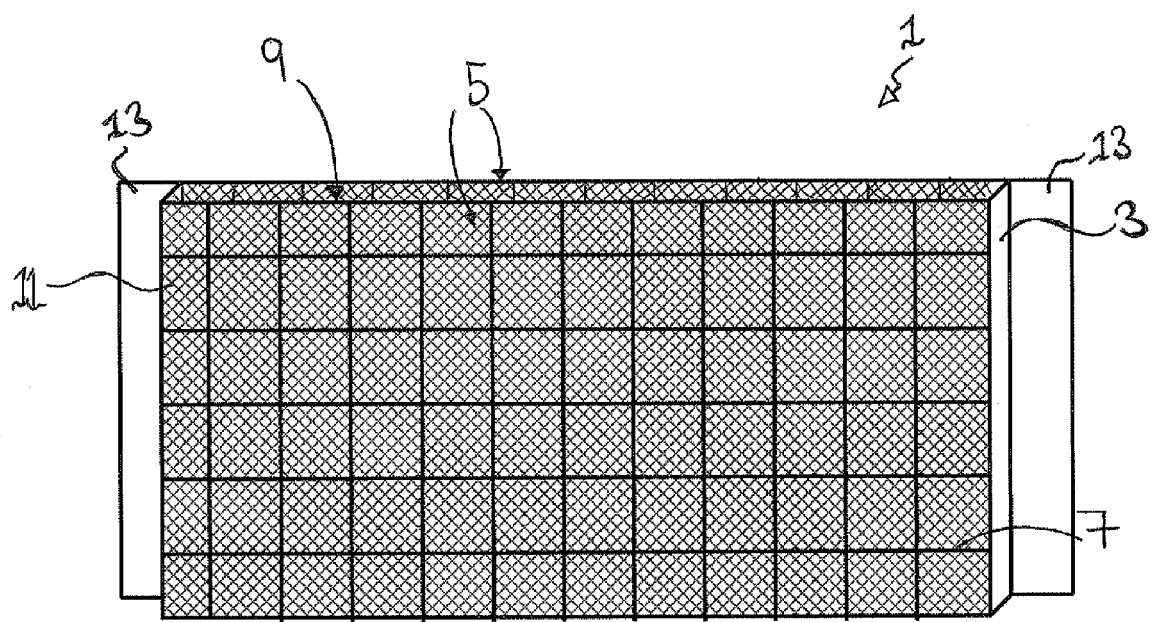


Fig. 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 11 6698

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 19 October 2007	Examiner Geiger, Harald
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 11 6698

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