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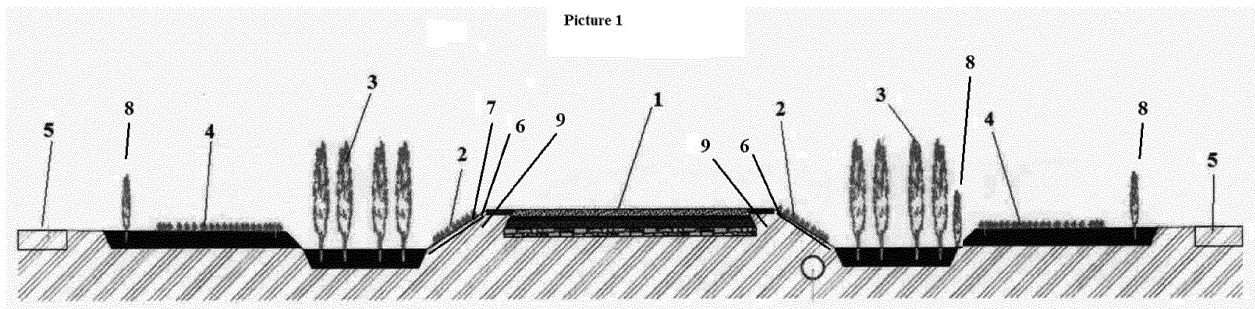
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(54) **ALIGNMENT OF SECTION ALONG THE LINE CONSTRUCTIONS OR ALONG WATER COURSES OR ROUND WATER AREAS**

(57) Along the borders of the line construction 1 or borders of the water course 1 or border of the water area 1 there is first lane 2 built with planted energy grass. After first lane 2 there is second lane 3 with planted fast-grow-

ing energy wood plant. Then after second lane 3 there is third lane 8 with the weaved barrier and fourth lane 4 with planted energy grass. After this fourth lane 4 there is soil 5.



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Description

Field of technique

[0001] The invention covers alignment of sections along line constructions or along water courses or round water areas.

Current state of technique

[0002] At present, during building of new or reconstructed roads, railways, electric lines, piping systems or beds of rivers, streams or channels or water areas, the borders of these constructions are not adjusted in any special manner. In case of highways and expressways, noise barriers shall be erected on the required places, road borders are equipped with crash barriers and a fence to prevent animals entering the road. Railway tracks are equipped with noise barriers. Banks of rivers, streams, or channels as well as banks of water areas are not specially adjusted, but for flood barriers. High voltage lines, piping systems such as water mains, sewerage systems, gas mains, oil ducts - their surroundings during construction or reconstruction are not specifically adjusted and the soil in their vicinity is not used.

Substance of the invention

[0003] To the significant extent, the mentioned disadvantages are eliminated by the solution described in this registration which consists in the fact that along the borders of the line construction or borders of the water course or borders of the water area, there is the first adjusted lane with minimum width of 0.5 m in the aligned subbase of which the reinforcing natural jute cloth and/or textile from coco fibres with minimum thickness of 5 mm is inserted in dependence on the slope inclination which is covered by a layer of soil with planted grass and/or energy grass. Furthermore, after first lane there is second lane with minimum width of 2 m with planted fast-growing energy wood plant. Then on the outer border of second lane there may be third lane formed of densely planted fast-growing wood plant which is shaped during its growth from time to time by weaving until it creates impassable protective barrier fulfilling both the function of the wind break or snow barrier and safety function to prevent animal entry. The height of the mentioned weaved barrier is being modified within the interval from 1 to 2 meters.

[0004] Third lane may be followed by fourth lane in the aligned subbase of which the reinforcing natural jute cloth and/or textile from coco fibres with minimum thickness of 5mm is inserted in dependence on the slope inclination which is covered by a layer of soil with planted grass and/or energy grass. Furthermore, after fourth lane there might be another lane with fast-growing wood plant or soil used as arable soil or meadow or there is a forest, grove or orchard (fruit) planted on such soil. In case of

borders of the water course or water area, in first lane with planted energy grass there are wood plants such as trees and bushes. Fourth lane with planted energy grass may be used as field unpaved road used as access road for second lane with fast-growing energy wood plant and for first lane with planted energy grass for planting and collection.

[0005] Third lane formed of the weaved barrier may be built in dependence on natural geomorphological conditions only after second lane or/only after every further lane of the mentioned alignment in case of line constructions - road network.

[0006] Fast-growing energy wood plant is for example improved Swedish willow with deep root system filtering heavy metals and maximum root thickness up to 60 mm and energy grass is for example reedtop, smooth brome, tall fescue, tall oat-grass. Line construction means a road for vehicles such as a highway, expressway, 1st, 2nd or 3rd class road or a railway or electric line on posts or surface or underground pipelines such as oil ducts, gas mains, water mains, sewerage pipes. Water course means a river, a stream or a water channel.

[0007] Moreover, second lane with planted energy wood plant along the road for vehicles fulfils the function of the protective barrier because if the vehicle goes down from the road, it does not crash into a solid barrier, it will be slowed down by fast-growing energy wood plant which is softer and more elastic than the grown deciduous or coniferous trees. The mentioned plants naturally reinforce road slopes thus protecting mainly embankment parts of roads from weather condition, in particular from erosion. Those plant species retain heavy metals by their root and branch systems thus functioning as an ecological filter.

Overview of pictures on drawings

[0008] The attached pictures show cross section by alignment of sections along the road and river.

Examples of implementation

[0009]

1. Along the borders of the line construction 1 or borders of the water course 1' or border of the water area 1' there is first lane 2 built with minimum width of 0.5m in the aligned subbase 9 of which the reinforcing natural jute cloth and/or textile from coco fibres 6 with minimum thickness of 5 mm is inserted in dependence on the slope inclination which is covered by a layer of soil 7 with planted grass and/or energy grass. After first lane 2 there is second lane 3 with planted fast-growing energy wood plant. Then after second lane 3 there is third lane 8 formed of densely planted fast-growing wood plant which is shaped during its growth from time to time by weaving until it creates impassable protective barrier ful-

filling both the function of the wind break or snow barrier and safety function to prevent animal entry, while the height of the mentioned weaved barrier is being modified within the interval from 1 to 2 meters. Third lane is followed by fourth lane 4 with minimum width of 0.5 m, in the aligned subbase of which the reinforcing natural jute cloth and/or textile from coco fibres 6 with minimum thickness of 5 mm is inserted in dependence on the slope inclination which is covered by a layer of soil 7 with planted grass and/or energy grass. After fourth lane 4 there might be another lane with planted fast-growing wood plant or soil 5 used as arable soil or meadow or there is a forest, grove or orchard (fruit) planted on such soil. The beneficial solution locates third lane 8 after fourth lane 4.

2. Along the borders of the water course 1' or borders of the water area 1' there is first lane 2 built with minimum width of 0.5 m in the aligned subbase 9 of which the reinforcing natural jute cloth and/or textile from coco fibres 6 with minimum thickness of 5 mm is inserted in dependence on the slope inclination which is covered by a layer of soil 7 with planted grass and/or energy grass. After first lane 2 there is second lane 3 with planted fast-growing energy wood plant while first lane 2 with planted energy grass includes planted wood plants such as trees and bushes. Fourth lane 4 with planted grass and/or energy grass may be used as field unpaved road used as access road for second lane 3 with fast-growing energy wood plant and for first lane 2 with planted grass and/or energy grass for planting and collection.

[0010] Fast-growing energy wood plant is for example improved Swedish willow and energy grass is for example reedtop, smooth brome, tall fescue, tall oat-grass. Line construction 1 means a road for vehicles such as a highway, expressway, 1st, 2nd or 3rd class road or a railway or electric line on posts or surface or underground pipelines such as oil ducts, gas mains, water mains, sewerage pipes. Water course 1 means a river, a stream or a water channel.

[0011] Second lane 3 with planted energy wood plant along the road for vehicles fulfils the function of the protective barrier because if the vehicle goes down from the road, it does not crash into a solid barrier, it will be slowed down by fast-growing energy wood plant which is softer and more elastic than the grown deciduous or coniferous trees.

[0012] Third lane 8 formed of densely planted fast-growing wood plant which is shaped during its growth from time to time by weaving until it creates impassable protective barrier fulfilling both the function of the wind break or snow barrier, noise barrier and safety function to prevent movement of bigger animals.

Industrial efficiency

[0013] The mentioned solution is utilizable in the field of civil engineering during building or reconstruction of line construction or adjustment of banks of rivers, streams, water channel or area building and reconstructions of their banks. Moreover, the solution of the road surroundings fulfils the function of the protective barrier or if the vehicle goes down from the road, it does not crash into a solid barrier, it will be slowed down by fast-growing energy wood plant which is softer and more elastic than grown deciduous or coniferous trees. The mentioned plants naturally reinforce road slopes thus protecting mainly embankment parts of roads from weather condition, in particular from erosion. Those plant species retain heavy metals by their root and branch systems thus functioning as an ecological filter.

Claims

1. Alignment of sections along the line constructions or along water courses or round water areas **typical features of which are that** along the borders of the line construction (1) or borders of the water course (1') or border of the water area (1') there is first lane (2) built with minimum width of 0.5m in the aligned subbase (9) of which the reinforcing natural jute cloth and/or textile from coco fibres (6) with minimum thickness of 5 mm is inserted in dependence on the slope inclination which is covered by a layer of soil (7) with planted grass and/or energy grass. After first lane (2) there is second lane (3) with planted fast-growing energy wood plant. Then after second lane (3) there is third lane (8) formed of densely planted fast-growing wood plant which is shaped by weaving while the height of the mentioned weaved barrier is being modified within the interval from 1 to 2 meters followed by soil (5).
2. Alignment of sections along the line constructions or along water courses or round water areas according to the claim 1 **typical features of which are that** third lane is followed by fourth lane (4) with minimum width of 0.5 m, in the aligned subbase of which the reinforcing natural jute cloth and/or textile from coco fibres (6) with minimum thickness of 5 mm is inserted in dependence on the slope inclination which is covered by a layer of soil (7) with planted grass and/or energy grass. After fourth lane (4) there might be another lane with fast-growing wood (3) followed by soil (5).
3. Alignment of sections along the line constructions or along water courses or round water areas according to the previous claims **typical features of which are that** third lane (8) is formed also or only after fourth lane (4).

4. Alignment of sections along the line constructions or along water courses or round water areas according to the previous claims **typical features of which are that** borders of the water course (1') or water area (1') are in first lane (2) with planted energy grass 5
planted as wood plants such as trees and bushes.
5. Alignment of sections along the line constructions or along water courses or round water areas according to the previous claims **typical features of which are that** fast-growing energy wood plant is fast-growing willow (Swedish willow). 10
6. Alignment of sections along the line constructions or along water courses or round water areas according to the previous claims **typical features of which are that** energy grass is redtop, smooth brome, tall fescue, tall oat-grass. 15

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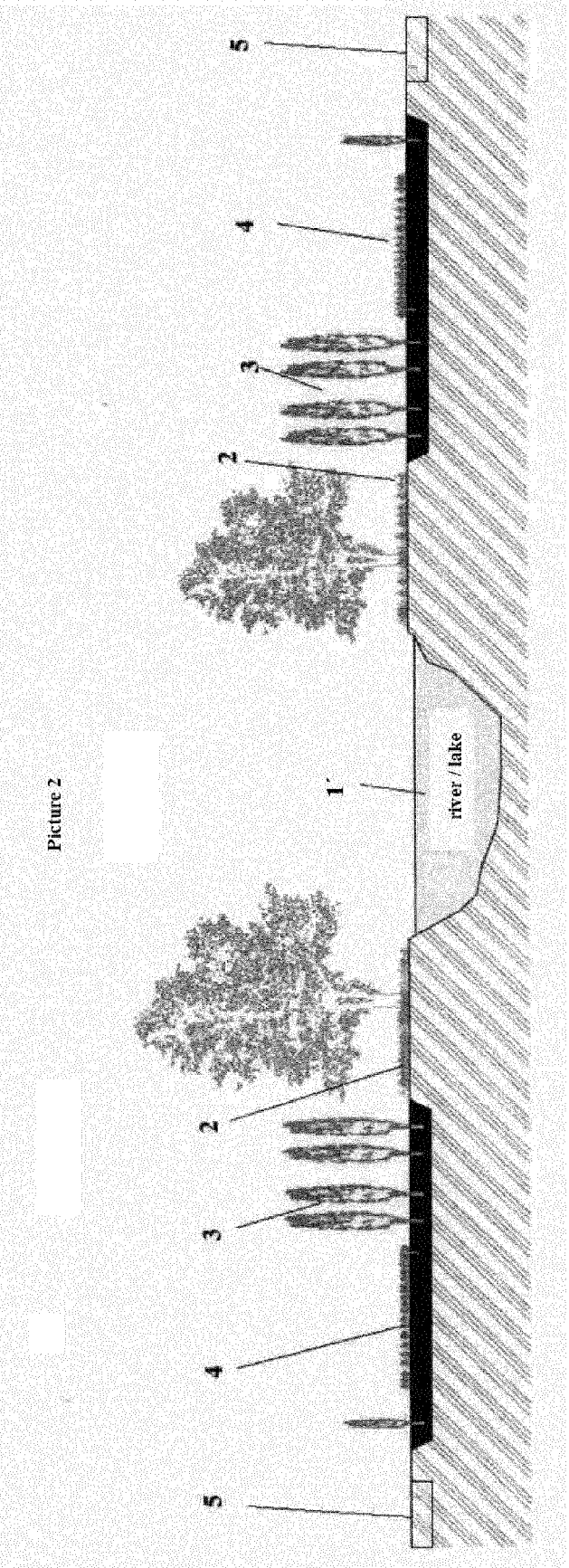
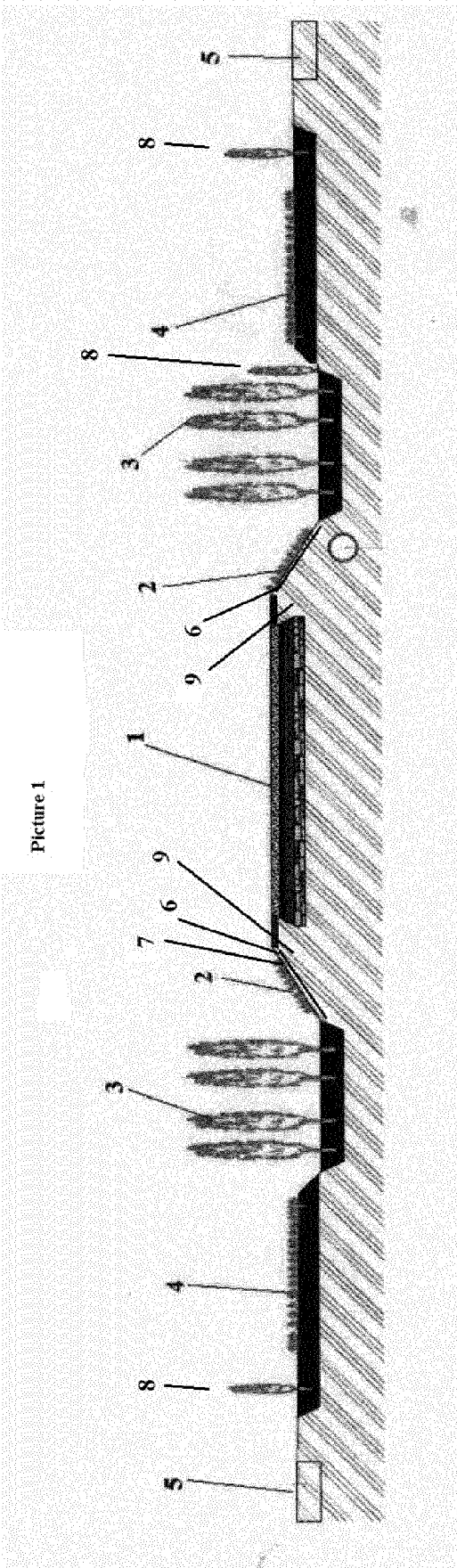
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EUROPEAN SEARCH REPORT

 Application Number
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Place of search Munich		Date of completion of the search 17 November 2017	Examiner Flores Hokkanen, P
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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