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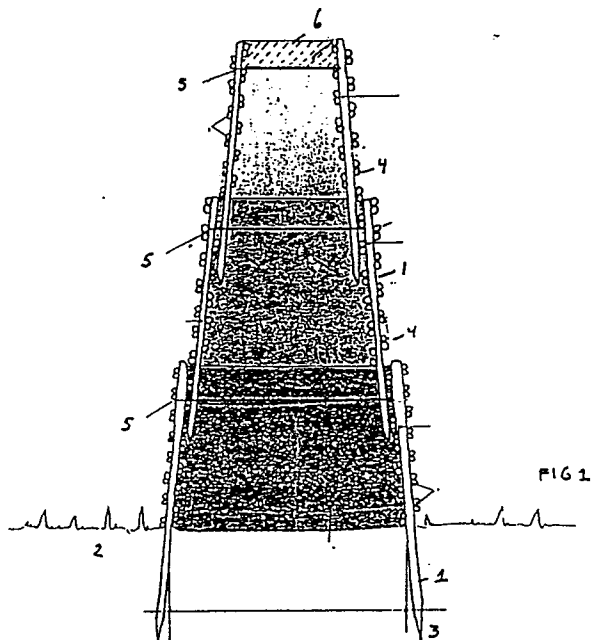
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NL-2811 GE Reeuwijk(NL)**(54) **Soundproof wall.**

(57) A live willow-faced, earth-core noise barrier is built by setting two spaced parallel rows of spaced willow stakes (1) into the ground (2), horizontally interweaving in each row osiers (4) with the stakes (1), and filling with soil the space between those two woven walls which have been previously interconnected by tension wires (5) linking the top part of stakes (1) thereof.

The barrier is built to the required height in successive stages, the further stakes being set into the soil fill of the previous section.

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Process for erecting a soundproof wall based on poles with or without roots as well as application of the wall obtained by this process.

The invention relates to a process for erecting a soundproof wall by placing woodpoles which may or may not possess roots in the soil adjacent to each other and having them grow in such a way that they are at least partly able to grow between and against each other. Such a soundproof wall is known from the Dutch Patent Application 8202277, wherein the woodpoles are closely placed in the soil and means, such as amongst others a corrugated plate, are connected with the poles in order to obtain a substantially closed wall immediately after placing the woodpoles. To simplify the dense placing of the woodpoles the poles can a.o. be connected by transversally to the longitudinal direction of the poles extending and in spaced relationship placed threads, ropes and so on, which intertwine around the consecutive poles, in such a way that a kind of weaving is obtained. This construction is based on wall formation as a consequence of the increasing thickness of the densely placed willowwood poles in the course of time. Owing to the natural properties of the planted willowwood poles in course of time also holes will be formed. There is further the objection that one uses corrugated plates and other materials, while also the erection of relatively high walls causes problems because straight willowwood poles with a length of more than two metres are not easily obtainable and moreover difficult to manipulate.

The process of the invention is intended to alleviate these objections and to offer the possibility of erecting the soundproof wall in steps to a desirable height.

Thus the process as indicated in the preamble is according to the invention characterised in that willowwood poles, which preferably are pointed, are placed in spaced relationship in the soil and between these vertical willowwood poles in longitudinal direction osiers are woven, which walls are connected with each other by reinforcements placed in the vicinity of the tips of the poles and between the formed walls a soil blend is applied. Although this process is in principle not limited to a particular dimension of the poles, one will in practice start from easily available materials, by means of which a soundproof wall with a length of at least one meter can be erected. Thus one preferably starts from pointed willowwood poles which are put in the soil at a relative distance of 30-70 cm and preferably about 50 cm, a second row being applied at a distance of at least 120 cm and preferably about 160 cm. Preferably one uses poles with such a length that they will rise about 1 metre above the soil. Poles with dimensions of $1\frac{1}{2} \times 2$

metres which are placed a sufficient distance in the soil are very suitable to form a dense composite. A very suitable dimension is about 175 cm. Between the willowwood poles vertically put in the soil osiers are woven in longitudinal direction to build up the wall. For this purpose osiers of 2 to 3 years old are very suitable because of their resilience and elasticity. The wall obtained is now finished by placing a good moisture containing soil blend between the two erected rows of woven poles. To control sagging of the edges as a consequence of the lateral soil pressure, reinforcement materials, like in particular tightening wires, are inserted between both rows of poles. Especially suitable materials are inert plastic wires like nylon wires, which wires are interwoven e.g. 10 cm below the top of the poles, as well as prefabricated tightening wires of for example plated iron. It is to be understood that also other types of inert strong wire materials are possible.

The willowwood poles put in the soil will form roots during the growing season and become thicker, so that the strength above as well as below the soil will increase. The horizontally woven willow twigs (osiers) will by contact with the soil applied and by the locally preliminary elimination of the rind at the soil side also form roots, so that a dense composite will arise. Such a construction offers the advantage that after finishing the weaving of the osiers by the connection with nylon wire and supplying soil, the soundproof wall can again be erected in the same approximate height by again inserting willowwood piles at the inner side of the weaving in the soil applied and to repeat the already mentioned steps. In practice a soundproof wall with a height of about 3 metres can in three stages be built up. For the construction of this soundproof wall one uses particularly willow materials because of their fast way of growing. Depending on the constitution of the soil, the plants growing on the spot and other circumstances one can however also use other types of branch (pole) material beside each other or blended together.

As to the filling of the soundproof wall one will preferably make use of types of soil which have sufficient moisture retaining power to promote the growth of the osiers. In principle it is possible to use even blends that satisfies these conditions. Suitable soil blends are sandy clay ground, peat ground or clay ground, which may or may not be mixed with other materials. On very soft types of

soil with less bearing power one may use lighter soil blends, for instance by blending the soil referred to with expanded clay pellets, for example in amounts of 1-3 per cent or more.

The provision of water to the soil between the rows in dry periods takes place by means of a dripping system which is in the upper part of the wall. To prevent unnecessary evaporation and to replenish the possibly set soil the split up prunings of the emerged willows may as a top layer be applied on the soil in question. The mowing of the willows after these are emerged, should maximally take place once a year and minimally once per three years.

Owing to shortage of space not all horizontally woven willows will take roots. A part of the interwoven fence has real life chances. This part will gradually replace the osiers died so that a dense combination will be retained. The osiers, which have made no roots, will retain their strength about 4-5 years. The construction of the soundproof wall in stages with the help of relatively short willowwood poles with a diameter of 4-5 cm has the advantage that the pole length is in itself not binding and that there is a large supply of well manipulable willowwood poles below 2 metres. For poles longer than 2 metres the weaving thereof will also become more difficult. The shorter willowwood poles may be younger and so will easier form roots. Because the vertical poles have a large relative distance, about 50 cm, which distance is necessary to avoid a too large root competition in the soil, one may if no formation of roots takes place simply put a thinner pole beside the died pole in the mat. The thicker but died pole will also in the first years provide further firmness. In case of greater lengths of the poles one would have to use stretching means which constrict the pole halfway so that the chance of mortality becomes greater. In the present process the necessary stretching wires only constrict the willowwood poles at the top. It is to be understood that if the soundproof wall has by the favourable development obtained a greater stability, one may if need be construct a fourth stage. It is evident that it is to be preferred to use the willowwood poles and osings directly after cutting them. This cutting should take place in the period between November and April.

The invention will now further be illustrated by means of the drawing, wherein:

Figure 1 is a cross-section of the soundproof wall wherein three stages are indicated from which the wall is built up;

Figure 2 shows a panoramic view of a poles construction according to the invention; and

Figure 3 is a variation of Figure 2.

In Figure 1 with 1 the willowwood poles are indicated which are used in the three stages. By way of example, the willowwood pole may in the first stage have a length of 175 cm, in the second stage a length of 150 cm and in the third stage a length of 150 cm, with a diameter of in general 4-5 cm. The tips 3 of the poles are put in the soil, wherein the soil is indicated by 2. The woven osiers are indicated with 4, and the stretching wires with 5. The moisture containing soil in the various stages is indicated by different types of black gradation. At the top of the wall the shaded part 6 shows the layer of scrapped wood material, by which the setting of the soil may in the course of time be controlled.

In Figure 2, wherein the same reference numerals have the same meaning, a part of the weaving with willow osiers of 2-3 years is shown, and further the stretching wires 5, which are fixed from below upwards, each time for supplementing soil to a stage, are clearly indicated.

In Figure 3 a same construction is shown, however with the difference that prefabricated stretching wires of plated iron 5' are used, which are attached between two opposite poles. As follows from the Figures the soundproof wall also has an inclination, which is favourable to prevent reflection of sounds, for instance over a highway. In the soundwall as shown at the upper part a sharp delimitation is present, by which dispersion of sound is prevented. Thus the invention provides a soundproof wall, separation means or windbreaker, which is favourable for the environment and more or less forms part thereof.

The invention offers the advantages that the willow material provides various functions, i.e. a constructive function providing strength, a sound proofing function i.e. absorbing sound waves, and an esthetic function as forming part of the environment. It further has the inherent advantage of emerging on own force, necessitating of course the use of living willow branches.

Claims

1. Process for erecting a soundproof wall or a wall used for other purposes by planting in the soil branches which may or may not have already roots and which are grown in such a way that they may at least partly grow into each other and against each other, characterised in that willowwood poles pointed at the bottom are put in the soil in spaced relationship to each other and between these vertical willowwood poles in longitudinal direction osiers are woven, and between the walls formed a soil

blend is placed, after the walls have been connected with each other by means of stretching wires placed adjacent to the tips of the poles.

2. Process according to claim 1, wherein the soundproof wall as applied is heightened by repeating the process according to claim 1.

3. Process according to claim 2, characterised in that a soundproof wall is built up in three stages.

4. Process according to claims 1-3, characterised in that the poles are put in the soil at such a relative distance that there is enough space to control the large root competition in the soil.

5. Process according to claims 1-4, characterised in that willowwood poles are used in lengths not greater than 2 metres.

6. Soundproof wall or wall serving other purposes which may be built up in stages, obtained according to a process of one or more of the preceding claims.

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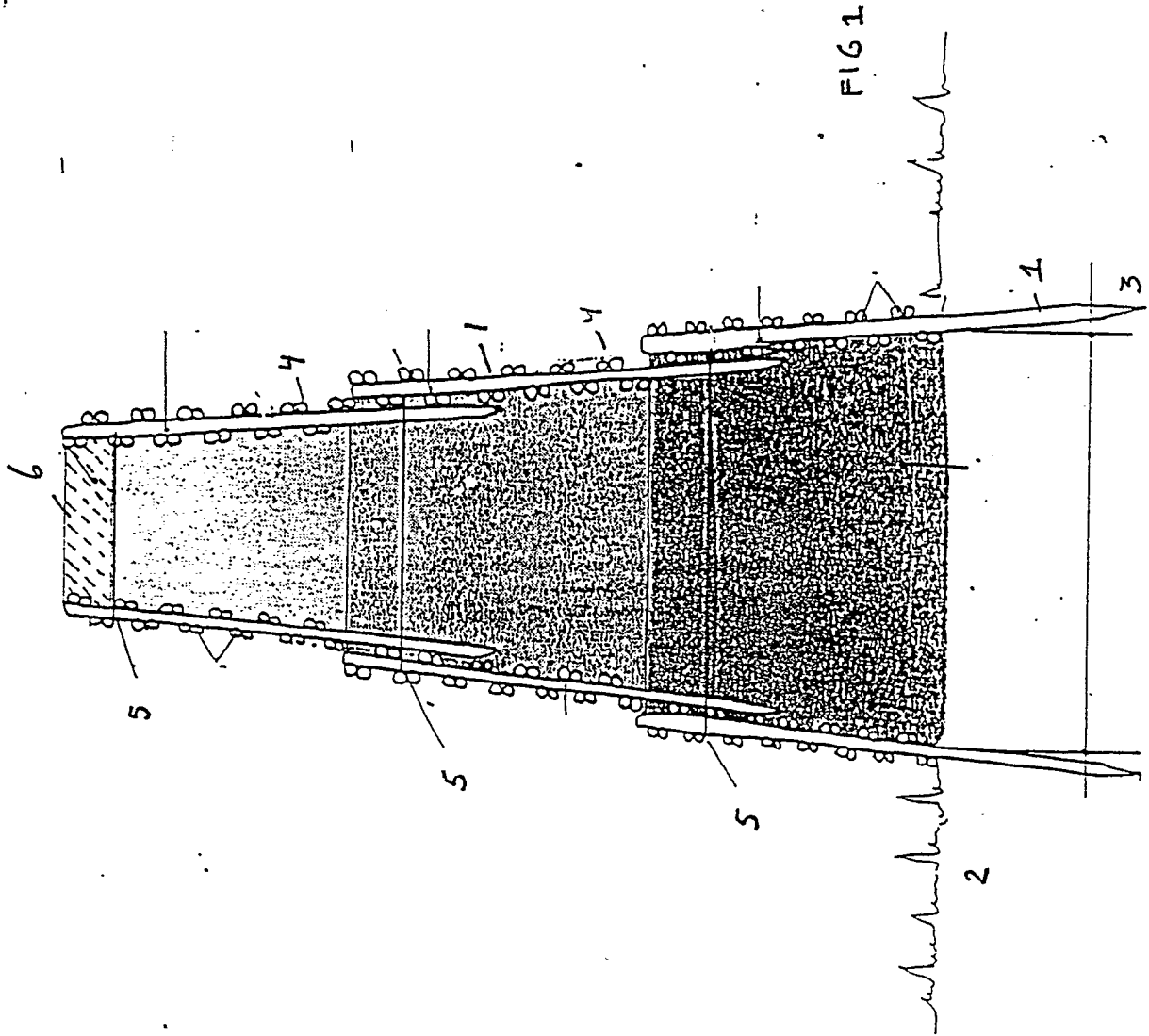
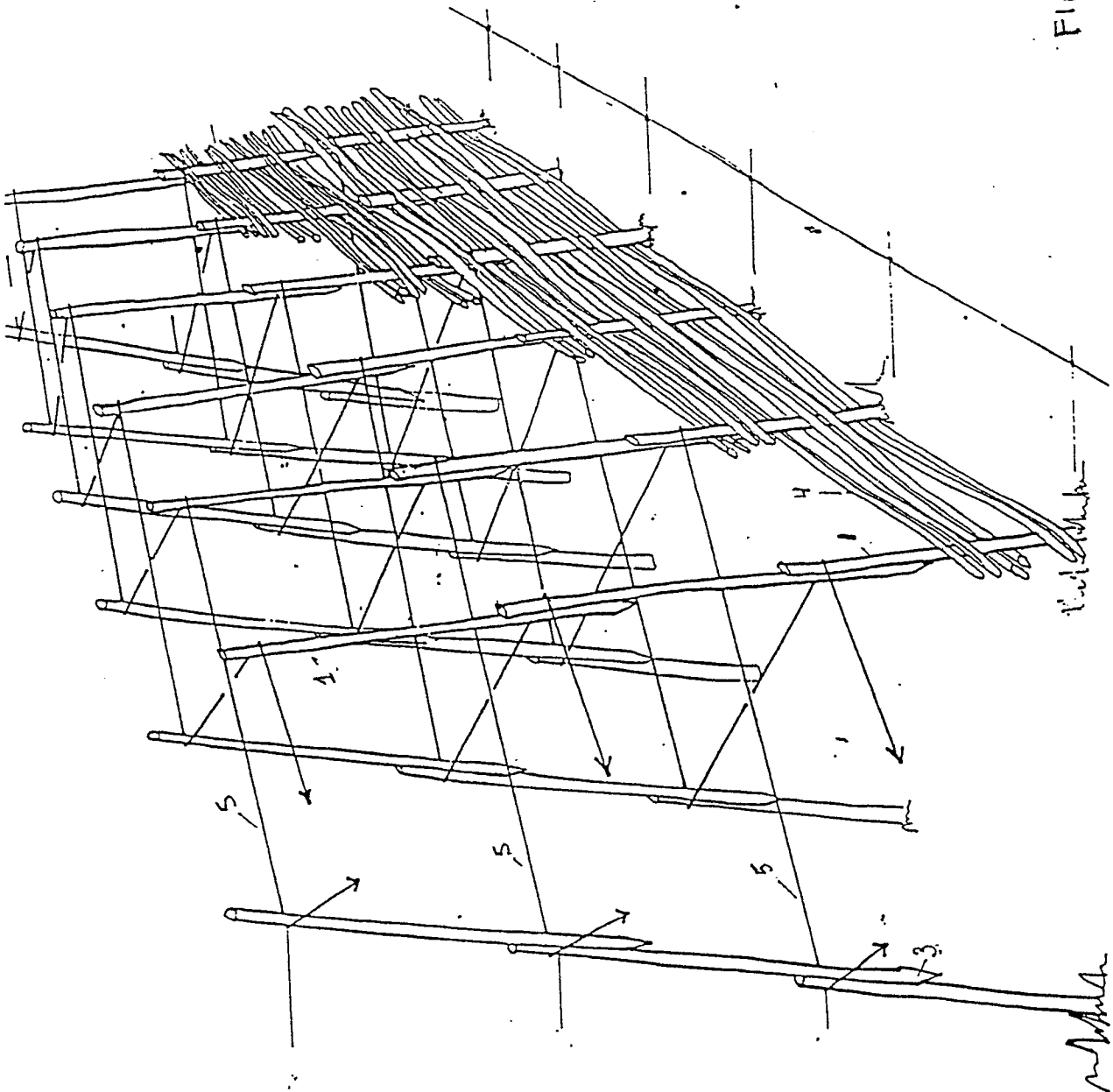


FIG. 2



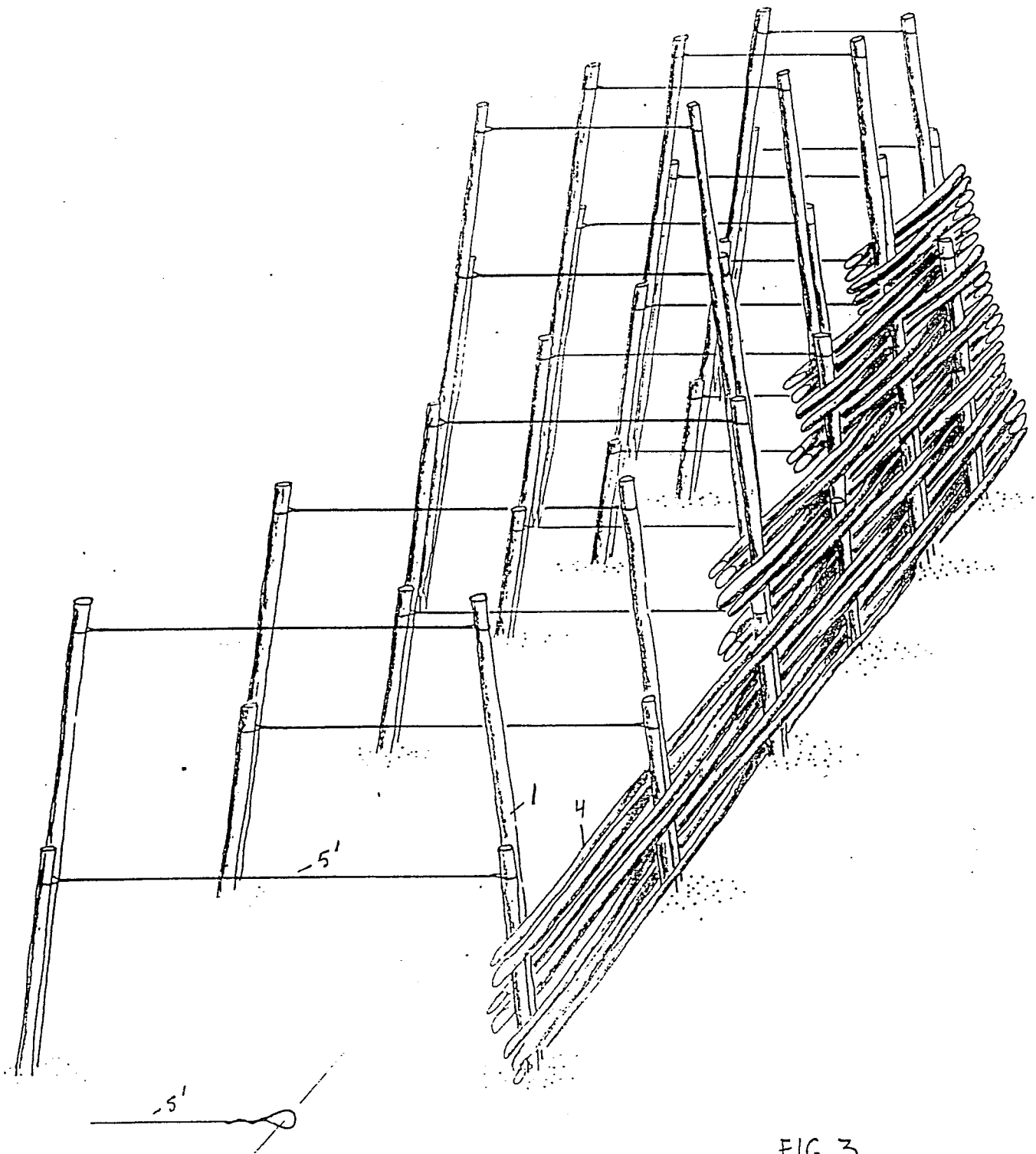


FIG. 3



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A	EP-A-0 128 245 (OP DE KAAI BEHEERSMAATSCHAPPIJ) * Page 1, lines 4-6, 26-28; page 2, lines 1, 2, 12-23; page 3, lines 10-12, 16-18, 24-26, 31-34; page 4, lines 1, 14, 14; page 5, lines 16-24, 31-35; figures 1, 2 *	1	E 01 F 8/00
A	--- POLYTECHNISCH TIJDSCHRIFT/GELUID EN TRILLING, vol. 35, no. 4, August 1980, pages 101-108, STAM tijdschriften, Rijswijk, NL; J.C. HEEMROOD: "Lessen uit de geluidschermenprijsvraag NSG" * Page 108, drawings top left, center *	1	
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A	--- DE-C- 459 870 (WIECHULA) * Page 1, lines 18-28, 32-41; figure 1 *	1, 4	E 01 F A 01 G
A	--- DE-C- 386 940 (WIECHULA) * Page 1, lines 1-4, 7, 8, 14-25, 29-33, 39-41; figures 2, 4 *	1, 4	
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 15-12-1986	Examiner SCHUMAN · R.
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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A	HIGHWAYS AND ROAD CONSTRUCTION, vol. 43, no. 1781, January 1975, page 16, Embankment Press Ltd, London, GB: "New safety barrier on German autobahn" * Whole article *	1	
A	--- WO-A-8 503 317 (BEHRENS et al.) * Page 1, lines 1-4; page 2, lines 1-6; page 9, lines 8-12; page 11, lines 5-10,21-23; page 12, lines 1-7; page 13, lines 4-9; figure 1 *	1	
A	--- DE-A-3 027 442 (WAYSS & FREYTAG) * Page 2, lines 23-25; page 3, lines 1-4,8,9,25-27; page 4, lines 9-16,19-21; figure 2 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl. ⁴)
A	--- DE-A-3 034 131 (LÜFT GmbH) * Page 2, lines 1-3,21-25; page 3, lines 13-18,23-26; page 4, lines 28-31; page 5; figure 2 *	1	
A	--- DE-A-2 361 577 (MACKELDEN) * Page 1, lines 1-8,14-16; page 3, lines 24,25; page 4, lines 1-4; figures 1,2 *	1	
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The present search report has been drawn up for all claims			
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A	DE-A-3 225 066 (STROMEYER INGENIEURBAU) * Page 5, lines 1,2; page 9, lines 18,19,23-26; page 10, lines 1-18,21-29; figures 1,2,5,6 *	1,2	
A	NL-A-8 105 242 (PLAATWERKERIJ EN VERZINKERIJ V/H P. BAMMENS & ZN.) * Page 2, lines 18-22,29-33,37,38; page 3, lines 1,5,6; page 4, lines 2-4; figures 5,6 *	1	
A	ROUTE ET TRAFIC, vol. 64, no. 4, 13th April 1978, pages 134-139, V.S.S., Zurich, CH; K. WOODTLI: "Erfahrungen mit Lebendverbaumethoden" * Page 135, right-hand column, lines 12,13,27-34; page 136, left-hand column; right-hand col- umn, lines 1-16; figures 3-5; page 137, left-hand column, lines 12-20; right-hand column, lines 1-3; figures 7,8 *	1,4,5	
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