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D E C I S I O N
of 10 August 1994

Case Number: T 0349/93 - 3.3.2

Application Number: 88908085.9

Publication Number: 0382746

IPC: A01G 13/02

Language of the proceedings: EN

Title of invention:
Root-Growth-Inhibiting Sheet

Applicant:
Battelle Memorial Institute

Opponent:
-

Headword:
Root Growth/BATTELLE

Relevant legal norms:
EPC Art. 56

Keyword:
"Inventive step (yes) - remote prior art"

Decisions cited:
T 0002/83, T 0024/81

Headnote/Catchword:
-



Case Number: T 0349/93 - 3.3.2

D E C I S I O N
of the Technical Board of Appeal 3.3.2
of 10 August 1994

Appellant: Battelle Memorial Institute
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Ohio 43201-2693 (US)

Representative: Evans, David Charles
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Decision under appeal: Decision of the Examining Division of the European
Patent Office dated 10 November 1992 refusing
European patent application No. 88 908 085.9
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: P. A. M. Lançon
Members: I. A. Holliday
J. A. Stephens-Ofner

Summary of Facts and Submissions

I. European patent application No. 88 908 085.7 (publication No. W0 89/01284) was refused by a decision of the Examining Division for lack of inventive step based on the following documents:

- (1) US-A-3 891 423
- (2) US-A-4 350 678

The Examining Division considered document (1), which relates to a water permeable fabric coated on one side with a binder containing herbicide to be the closest prior art. A combination of the teaching of (1) with that of document (2), which relates to a protective plastics sheet having a pattern of pesticide coatings, in the Examining Division's view, led in an obvious manner is the subject-matter of the present application.

II. In appealing against the decision of the Examining Division, the Appellant argued essentially that the cited prior art was not concerned with the same problem. The sheets in accordance with document (1) are useful in protecting woody plants from infestation by weeds, especially when growing in pots. The Appellant referred to passages in (1) which indicated that the inhibition of weed growth was effective over a period of months. In contrast the root growth inhibiting sheet in accordance with the present application was likely to be effective over many years. A paper, Journal of Controlled Release, 15(1991), 15 to 27 (3) by authors including the present inventors, was filed in support of this argument. Field trials over a seven year period indicated a potential life of up to 100 years.

The Appellant questioned the relevance of document (2) which related to spots on stripes of pesticide applied to a plastics film, for example by coating a dispersion of the pesticide in polyethylene glycol. The amount of pesticide applied according to (2) would be relatively small and in no way comparable with the "buttons" or "elongated beads" in accordance with the present application. Thus, argued the Appellant, no combination of documents (1) and (2) could lead in an obvious manner to the subject-matter of the present application.

Accompanying the Statement of Appeal, the Appellant filed a first schedule of amended claims (main request) in which Claim 1 was stated to contain a number of clarifying amendments; Claims 2 to 13 were based on dependent claims as refused by the Examining Division. A second (reserve) schedule of amended claims (auxiliary request) was also filed. The Appellant also made a conditional request for oral proceedings if the Board were unable to allow either of the requests.

III. Claim 1 according to the main request read as follows:

"1. An article adapted to be buried in soil for inhibiting root elongation in juxtaposition therewith; said article comprising a sheet of water-permeable material (2, 6) and being characterised in that said sheet (2, 6) carries a plurality of spaced bodies (4, 8) formed from a polymer blended with 2 to 30% of a 2,6-dinitroaniline; wherein in use the 2,6-dinitroaniline is released slowly from the bodies (4, 8) into the soil; the rate of release of 2,6-dinitroaniline being controlled substantially by the rate of diffusion of 2,6-dinitroaniline through the polymer."

In accordance with Claim 1 of the auxiliary request, the polymer is blended with carbon black in addition to the 2,6-dinitroaniline.

- IV. The Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the first schedule of amended claims (main request) or on the second schedule of amended claims (auxiliary request).

Reasons for the Decision

1. The appeal is admissible.
2. *Amendments*
 - 2.1 Claim 1 according to the main request is based on the originally filed Claim 1 with the following features. The expression "a plurality of bodies" is not **expressis verbis** to be found in the original documents, however, support exists in the description on page 4, lines 11 to 21 and the accompanying Figures 3 and 4. The original Claim 1 refers to 2 to 25% of a 2,6-dinitroaniline but a basis for the range 2 to 30% is to be found **inter alia** on page 3, lines 29 to 31. Relating the rate of release of the 2,6-dinitroaniline to its rate of diffusion through the polymer finds support on page 2, lines 11 to 15.
 - 2.2 The requirements of Article 123(2) are accordingly satisfied.
3. *Novelty*

Neither of the documents (1) and (2) nor any other of the documents cited in the International Search Report

disclose all the features of Claim 1 of the main request. Novelty can accordingly be recognised. In any event, novelty is not in dispute.

4. *Problem and solution*

4.1 As argued by the Appellant, the documents relied upon by the Examining Division are not concerned with inhibition of root growth, particularly the exclusion of roots from areas in which they are undesirable. The Board observes that in no part of the file is such a document to be found. Even the US patent applications mentioned in the introductory part of the description (pages 1, lines 3 to 5) are not state of the art in terms of Articles 54 EPC. Amongst the available documents, insofar as it relates to a water permeable substrate bearing a herbicide, the Board acknowledges document (1) as the closest prior art. The substrate of document (1) may be a cotton cloth, polypropylene scrim or a non-woven nylon/rayon fabric (column 5, lines 9 to 16). One side of the cloth is coated or padded with a herbicide in a polymeric binder. A typical binder is a polyacrylic ester, (column 2, lines 49 to 50). One of the herbicides listed in column 4, 4(methylsulphonyl)-2,6-dinitro-N,N-dipropylaniline and which is used in Example 3 falls within the definition of the patent in suit. This sheet is used above ground to prevent weed growth.

4.2 Starting from (1), the purpose of which is clearly remote from the application in suit, it appears that the problem raised by the Appellant (pages 1, lines 6 to 8) corresponds to a new concept. Therefore the problem quoted above as defined by the Appellant can be endorsed by the Board, in other words to provide an article suitable for the inhibition of root growth.

4.3 The problem is solved by the water permeable sheet to be buried in soil, in accordance with Claim 1 of the main request. Having regard to the paper (3) filed by the Appellant, the Board is satisfied that the problem has indeed been solved.

5. *Inventive step*

5.1 The sheet in accordance with the present application differs from that known from (1) in that, instead of a continuous thin coating of herbicide in a polymeric binder, the sheet has a distribution of "buttons" or "elongated beads" of plastics containing a 2,6-dinitroaniline. Although Claim 1 of the application does not specify the dimensions of the spaced bodies, it is apparent from the description that these represent much greater quantities of herbicide than the continuous layers of (1). In contrast to the layers of herbicide disclosed in (1), e.g. 2.4% to 15.2% solids added in relation to a fabric of ca. 32.5 g/m², the sheets according to the application have buttons with a diameter 6 to 9 mm (Claim 10) and beads of corresponding dimensions.

5.1.1 In use the sheet according to (1) is not buried in the ground but used as a surface protection. The illustrated use (Figures 1 and 2) is to cover the entire surface of a plant pot in which a woody plant, e.g. a rhododendron, is growing. During and after rainfall, water leaks through the covering sheet according to (1), slowly releasing herbicides, so that the pot is protected against weed growth over the growing season, i.e. a period of several months. Thus document (1) considered alone provides no hint which might lead to the root growth inhibiting sheet in accordance with the present application which is effective over a period of many years (document (3)).

5.2 Document (2) relates to a plastic protective sheet used to cover plants during growth. Such sheets, in contrast to those of the present application, are essentially impervious to water. Especially during the night there is a build up of moisture under the film, which condensate drops back on to the growing plants. The interior surface of the protective sheet is coated with pesticide which may be in the form of stripes or spots (Figures 2 and 4; column 1, lines 57 to 62). The pesticide is carried by the drops of condensate on to the plants which are thus protected against insect and fungal attack (column 2, lines 12 to 29).

5.2.1 According to (2), the pesticide coating is relatively thin in relation to the thickness of film, a reference occurs in column 1, lines 54 to 56 to 0.2 to 10 kg of pesticide per hectare of soil. It is thus apparent that the spots and stripes of such coated sheets are quite different from the buttons and beads in accordance with the patent in suit. According to (2), the spots and stripes are applied as a means of economising the use of herbicide. It is also to be noted that (2) is concerned with a different problem, i.e. protecting plants from fungal and insect attack during a single growing season. In other words, the growth of the plant is enhanced by the protection afforded.

5.2.2 Accordingly, in the Board's judgement the sheet of document (2), which is used above the ground to protect and enhance the growth of plants, is not comparable with the sheet of the present application which is used below the ground to inhibit the growth of roots. There is also no teaching in document (2), which might incite the person skilled in the art to adapt or modify the protective sheet known from document (1), which is also

intended for use above the ground, so as to arrive at present application. (cf. Decisions T 2/83, OJ EPO 1984, 265; T 24/81, OJ EPO 1983, 133).

5.3 None of the other documents cited in the International Search Report, either taken alone or in combination with document (1) contain information which might lead one skilled in the art in the direction of the sheet according to the present application.

5.3.1 US-A-3 384 993 concerns a plastic sheet containing plant nutrients. In an example, an ionomer polymer is blended with ammonium nitrate and the mixture extruded (column 2, lines 43 ff.). The films are used to cover the surface over crops, with holes for growth of the desired plants or as a liner for irrigation ditches.

5.3.2 US-A-3 939 606 relates to a mulch for horticultural use. This comprises a sheet of paper coated on one side with a water impervious material, e.g. polyethylene and on the opposite side with a water insoluble fungicide. Such a sheet is used on the surface to protect areas adjacent to crop growth from weed infestation. Such use is in no way related to underground root inhibition.

5.3.3 FR-A-1 597 108 is again concerned with a film usable as a mulch. The film incorporates selected herbicides which are not 2,6-dinitroanilines. Although showing that herbicides can be incorporated into plastics, as in the case of the buttons and beads of the present application, the use of a mulch above ground in the form of a continuous sheet is remote from the subject-matter currently claimed.

5.4 It is apparent from the preceding paragraphs that the subject-matter of the present application is not foreshadowed by the cited prior art. Accordingly, on the

basis of the documentation currently available, an inventive step for the subject-matter of Claim 1 of the main request can be recognised. The dependent claims derive their patentability therefrom.

6. Since the Board is in a position to grant the Appellant's main request it is not necessary to consider the auxiliary request, nor is it necessary to convene oral proceedings.
7. The Board proposes to use its powers conferred by Article 111 EPC to remit the case to the Examining Division in order to adapt the description to the amended claims. In particular the references to "copending US applications" should be deleted from page 1. As far as the Board is aware, the said copending applications led only to two US patents published after the priority date of the present application.

Order

For these reasons it is decided that:

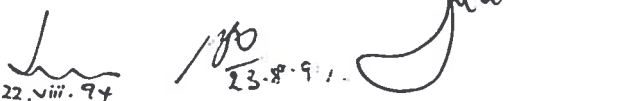
1. The decision under appeal is set aside.
2. The case is remitted to the Examining Division with an order to grant a patent on the basis of Claims 1 to 13 of the first schedule of amended claims filed on 11 March 1993 and a description to be adapted.

The Registrar:

The Chairman:

P. Martorana

P. A. M. Lançon


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