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**Datasheet for the decision  
of 22 November 2018**

**Case Number:** T 0536/14 - 3.2.05

**Application Number:** 04788823.5

**Publication Number:** 1700061

**IPC:** F16L55/179

**Language of the proceedings:** EN

**Title of invention:**

Device and method for repairing pipe using hydrophilic seals

**Patent Proprietor:**

LMK Enterprises, Inc.

**Opponent:**

Per Aarsleff A/S

**Headword:**

**Relevant legal provisions:**

EPC 1973 Art. 56  
RPBA Art. 13(1)

**Keyword:**

Inventive step - main request (no)  
Late-filed auxiliary request - admitted (no)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
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Case Number: T 0536/14 - 3.2.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.05**  
**of 22 November 2018**

**Appellant:** LMK Enterprises, Inc.  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 8 January 2014  
revoking European patent No. 1700061 pursuant to  
Article 101(3) (b) EPC.**

**Composition of the Board:**

**Chairman** M. Poock  
**Members:** P. Lanz  
D. Rogers

## **Summary of Facts and Submissions**

- I. The appeal by the patent proprietor is against the decision of the opposition division to revoke European patent EP-B-1 700 061.
- II. During the opposition proceedings, the opponent had raised the grounds for opposition according to Articles 100(a) (lack of inventive step), 100(b) and 100(c) EPC 1973.
- III. Oral proceedings were held before the board of appeal on 22 November 2018.
- IV. The final requests of the appellant (patent proprietor) were to set aside the decision under appeal and to maintain the patent upon the basis of the Main Request, filed under cover of a letter dated 6 May 2014, or alternatively, to maintain the patent upon the basis of the Auxiliary Request, filed at the oral proceedings before the Board on 22 November 2018.
- V. The respondent's (opponent's) final request was to dismiss the appeal.
- VI. Reference is made to the following documents:  
  
D1: WO 00/04318 A1;  
  
D2: EP 0 564 741 A1.
- VII. Claim 1 of the Main Request reads as follows:  
  
"Apparatus for repairing a main pipe line (50) and a lateral pipe line (52) said main pipe line and lateral

pipe line connected and in communication by a T or a y pipe joint; said apparatus comprising:

a carrier tube (12) including carrier side walls (18) forming a cylinder, a carrier end cap (20) and a carrier end wall (22), all of which form a carrier tube cavity (48), said carrier tube locatable within the main pipe line (50) adjacent the T or y pipe joint, and the carrier tube side walls have an opening (46) therein;

the carrier tube (12) having mounted thereto a liner assembly (14);

a bladder assembly (16) comprising a main bladder tube (34) and a lateral bladder tube (36) which are connected and in communication with one another;

the liner assembly comprising a main liner tube (38) and a lateral liner tube (40) which are connected and in communication with one another;

the lateral bladder tube (36) and the lateral liner tube (40) locatable within the lateral pipe line (52), with the lateral bladder tube being Inside *[sic]* the lateral liner tube and with the lateral liner tube locatable between the lateral pipe line and the lateral bladder tube;

the main bladder tube (34) and the main liner tube (38) locatable within the main pipe line, (50) *[sic]* with the main bladder tube being inside the main liner tube and with the main liner tube locatable between the main pipe line and the main bladder tube;

wherein when the lateral pipe line and the main pipe line are joined together in a T-shaped configuration, the liner assembly and bladder assembly are also T-shaped in configuration and conform generally to the T-shaped configuration of the lateral pipe line and the main pipe line;

wherein when the lateral pipe line and the main pipe line are joined together in a y-shaped configuration

with the lateral pipe line extending in an oblique direction away from the main pipe line, the liner assembly and the bladder assembly are also y-shaped in configuration and conform generally to the y-shaped configuration of the lateral pipe line and the main pipe line;

the bladder tube connection and the liner tube connection locatable at the T or y pipe joint of the main pipe and the lateral pipe;

a fluid pressure inlet for introducing fluid pressure to the interior of the bladder assembly for urging the main bladder tube and the lateral bladder tube in an outward radial direction to press the main liner tube against the main pipe line and to press the lateral liner tube against the lateral pipe line;

a liquid material capable of curing and hardening and impregnating the T or y shaped [sic] liner assembly; characterized by

a first hydrophilic band (56) surrounding the main liner tube and being positionable between the main liner tube and the main pipe line on one side of the T or y pipe joint of the main pipe line to the lateral pipe line;

a second hydrophilic band (58) surrounding the main liner tube and being positionable between the main liner tube and the main pipe line on the other side of the T or y pipe joint of the main pipe line to the lateral pipe line;

the first and second hydrophilic bands are made of hydrophilic material capable of swelling in both an outward and inward radial direction relative to the main pipe line in response to being exposed to a liquid, thereby forming a seal between the main liner tube and the main pipe line on opposite sides of the pipe joint of the main pipe line to the lateral pipe line; and

a third hydrophilic band (60) surrounding the lateral liner tube and being positionable between the lateral liner tube and the lateral pipe line, wherein the third hydrophilic band is made of hydrophilic material capable of swelling in both an outward and inward radial direction relative to the lateral pipe line in response to being exposed to the liquid so as to form a seal between the lateral liner tube and the lateral pipe line."

VIII. Compared with the Main Request, claim 1 of the Auxiliary Request is supplemented by the following features:

"characterized in that the main bladder tube is provided on the exterior of the carrier tube (12) and the lateral bladder is provided on the inside carrier tube (12), the T or y shaped [*sic*] bladder assembly having a bladder tube connection between the main bladder tube and the lateral bladder tube that extends through the opening (46) in the carrier tube (12), and wherein the main liner tube is provided on the exterior of the carrier tube and the main bladder tube and the lateral liner tube is provided inside the carrier tube and the lateral bladder tube, the T or y shaped [*sic*] liner assembly having a liner tube connection between the main liner tube and the lateral liner tube that extends through the opening in the carrier tube, and wherein the third hydrophilic band is inside the lateral liner tube that is within the lateral bladder tube and the carrier tube, and is positionable between the lateral liner tube and the lateral pipe line after the inversion of the lateral liner tube into the lateral pipe line, the third hydrophilic band forming a seal between the lateral liner tube and the lateral pipe line in response to exposure to the liquid, and

the lateral bladder tube and the lateral liner tube are capable of inversion outwardly from the interior of the carrier tube through the opening in the carrier tube and into the lateral pipe line whereby the lateral liner tube is between the lateral bladder tube and the lateral pipe line."

- IX. The arguments of the appellant in the written and oral proceedings can be summarised as follows:

*Main Request, inventive step*

Document D1 formed the closest prior art, from which the subject-matter of claim 1 differed in the features relating to the hydrophilic sealing bands. The technical problem underlying the invention was to repair damage at the junction of a main pipeline and a lateral pipeline. From an objective point of view, the skilled person would not combine documents D1 and D2, which had disclosures relating to pipelines in general but which steered the skilled person in opposite directions: document D1 related to the leakage from the pipeline, while document D2 related to leakage into the pipeline. Document D1 was directed to the repair of joints in pipelines, while document D2 related to the repair of straight, non-jointed pipelines. In particular, the coiled liner of document D2 (see Figures 2(a), 2(b) and 3) was specifically designed for straight pipelines and could not be used for repairing damage at the junction of a main pipeline and a lateral pipeline. Moreover, the felt material of the liner of document D2 was too stiff to be used for repairing a pipeline junction. Also the types of resins mentioned in documents D1 and D2 were incompatible: document D1 concerned the use of thermosetting resins; document D2 suggested the use of ultraviolet-curing resin. The



latter required to be cured by an ultraviolet lamp which could only be used in straight pipelines. Finally, document D2 aimed at repairing short sections of the pipe and taught away from using hydrophilic seals on pipes of a significant length since the intrusion of water into the interior of long pipelines was negligible. However, even if document D2 were to be taken into account, a combination of documents D1 and D2 would not lead to the claimed invention since it did not disclose that the sealing bands were entirely made of hydrophilic material which attracted water and that three sealing bands were needed.

*Auxiliary Request, admissibility*

The amendments of claim 1 of the Auxiliary Request were based on granted claims. Moreover, the appellant did not expect the board's negative conclusion on the Main Request. The filing of the Auxiliary Request was the last chance to save the contested patent. For these reasons, the Auxiliary Request should be admitted.

- X. The respondent's arguments during in the written and oral proceedings were essentially as follows:

*Main Request, inventive step*

Document D1 formed the closest prior art, from which the subject-matter of claim 1 differed in the features relating to the hydrophilic sealing bands. The technical effect achieved by these differing features was to prevent water from penetrating into the pipeline through the room between the liners and the pipeline wall. In view of that, the technical problem to be solved was to prevent water from penetrating into the pipeline.

As regards the proposed solution to this problem, the skilled person would turn to document D2 which belonged to the same technical field. It suggested to provide annular hydrophilic sealing bands (see D2, column 5, lines 8 to 11) between the pipeline and the liner adjacent to the respective ends of the liner in order to prevent the entry of water into the pipeline through the damaged pipe section. Applying these instructions to the pipeline arrangement of document D1 would directly lead the skilled person to the solution according to present claim 1. In fact, the contested claim was silent on the dimension and materials of the pipeline. It was not excluded that thermosetting resins and resins cured with ultraviolet light could be combined. Finally, the patent specification did not distinguish between water leaking from the soil into the pipe or in the inverse direction. The opposition division was correct that a combination of documents D1 and D2 rendered obvious the subject-matter of claim 1.

*Auxiliary Request, admissibility*

The respondent could not expect that amended claims according to the present Auxiliary Request would be filed during the oral proceedings. Since the amended request was not filed in due time, the respondent could not adequately prepare for a discussion of its merits during the oral proceedings. The Auxiliary Request was filed too late and should therefore not be admitted.

## **Reasons for the Decision**

### *1. Main Request, inventive step*

#### 1.1 Closest prior art

It is uncontested that document D1 forms the closest prior art for the subject-matter of claim 1. Moreover, it is not disputed that the subject-matter of claim 1 differs from the disclosure of document D1 in the following features:

- a first hydrophilic band surrounding the main liner tube and being positionable between the main liner tube and the main pipe line on one side of the T or y pipe joint of the main pipe line to the lateral pipe line;
- a second hydrophilic band surrounding the main liner tube and being positionable between the main liner tube and the main pipe line on the other side of the T or y pipe joint of the main pipe line to the lateral pipe line;
- the first and second hydrophilic bands are made of hydrophilic material capable of swelling in both an outward and inward radial direction relative to the main pipe line in response to being exposed to a liquid, thereby forming a seal between the main liner tube and the main pipe line on opposite sides of the pipe joint of the main pipe line to the lateral pipe line; and

- a third hydrophilic band (60) surrounding the lateral liner tube and being positionable between the lateral liner tube and the lateral pipe line, wherein the third hydrophilic band is made of hydrophilic material capable of swelling in both an outward and inward radial direction relative to the lateral pipe line in response to being exposed to the liquid so as to form a seal between the lateral liner tube and the lateral pipe line.

## 1.2 Technical effect and objective technical problem

Following the problem-solution approach, the objective technical problem is formulated on the basis of the technical effect achieved by the differing features over the closest prior art. In the case at hand, the patent in suit describes the technical effect of the sealing bands as the prevention of seepage of ground water through the damaged pipeline portion into the interior of the main pipeline and the lateral pipeline (see for example paragraphs [0004] to [0007] and [0037] to [0039]).

In view of that, the objective technical problem of the claimed invention resides in the prevention of seepage of ground water through the damaged pipeline portion into the interior of the main pipeline and the lateral pipeline.

## 1.3 Obviousness of the proposed solution

Document D2 is directed to repairing damaged sections of straight pipelines (see abstract) using a bladder (see Figure 1, inflatable tube 19) for urging an inner liner (see Figure 3, sheet-like material 20) against the inner pipeline wall. Water absorbing hydrophilic

sealing bands are provided between the pipeline wall and the inner liner adjacent to the respective ends of the liner (see column 3, lines 11 to 17 and Figure 3, reference sign 24) in order to avoid fluid leaking out from the pipeline or underground water leaking into it (see column 1, lines 4 to 8 and lines 34 to 42: "... *the passage of underground water entering the pipeline through its damaged part.*"). Hence, prior art documents D1 and D2 belong to the same technical field as the claimed invention. Moreover, document D2 not only concerns the same technical problem as the present invention but also suggests the same solution in the form of hydrophilic bands which swell by absorbing water and which are applied between the pipeline and the inner liner at the respective ends of the repaired section along the pipeline. In view of this teaching, the skilled person is prompted to apply the hydrophilic sealing bands of document D2 between the pipeline and the inner liner adjacent to the respective ends of the inner liner of document D1 and thereby arrives at the claimed solution without an inventive step.

As to the appellant's arguments, it is observed that the cited prior art provides the skilled person with appropriate solutions for repairing straight or jointed pipeline sections (see documents D1 and D2). The fact that in document D2 the hydrophilic sealing bands are disclosed in the context of repairing a straight pipeline section would not prejudice the skilled person from using said sealing bands when seeking a solution to prevent the seepage of ground water into the interior of the T-shaped pipeline of document D1. Their sealing function is independent of whether the seals are applied to a straight or a jointed pipeline section, of whether fluid leaks into the pipeline or out from the pipeline and of the overall length of the

pipeline. Moreover, the use of the hydrophilic swelling sealing according to document D2 is not limited to a particular liner resin. In fact, it can be used in combination with a thermosetting resin (see D2, column 7, line 55 to column 8, line 9) or with an ultraviolet-curing resin (see D2, column 8, lines 21 to 26). Finally, in document D2 the hydrophilic sealing is applied (at least) to the ends of the repaired section in the form of sealing bands (see D2, Figures 1 and 3, reference sign 24), which, in the situation of a pipe joint as shown in document D1, requires to provide them at the respective ends of the repaired section along the main and the lateral pipeline.

For these reasons, the subject-matter of claim 1 of the Main Request is not based on an inventive step, Article 56 EPC 1973.

2. *Auxiliary Request, admissibility*

2.1 After the board had announced its conclusion on the issue of inventive step of the subject-matter of claim 1 of the only request then on file, the appellant announced that it would submit a further request. As to the admissibility of such a request, it essentially argued that it did not expect the board's negative opinion on the Main Request, that the amendments were based on granted claims and that the Auxiliary Request was the last chance to save the contested patent.

2.2 The filing of the Auxiliary Request constitutes an amendment of the appellant's case, the admission of which is at the board's discretion (Article 13(1) RPBA). Relevant criteria for exercising this discretion include, but are not limited to, the complexity of the

new subject-matter, the current state of the proceedings and the need for procedural economy.

- 2.3 In the case at hand, the board observes that the question of inventive step of the subject-matter of claim 1 in view of a combination of documents D1 and D2 already formed the basis of the opponent's objection under Article 100(a) EPC 1973 in the notice of opposition (see in particular pages 6 to 10). In its decision to revoke the patent, the opposition division essentially adopted the opponent's view and concluded that the subject-matter of claim 1 of the then Second Auxiliary Request did not involve an inventive step over a combination of documents D1 and D2 (see point 15.2 of the Reasons).

At the appeal stage, this Second Auxiliary Request was the appellant's only request (Main Request). In a preliminary opinion issued in advance of the oral proceedings, the board notified the parties that it provisionally considered that the subject-matter of claim 1 did not involve an inventive step in view of documents D1 and D2 and that it intended to dismiss the appeal (see point 6.4). In view of that, the board's final conclusions on inventive step as announced at the oral proceedings still followed the line set out in the notice of opposition, the impugned decision and the board's preliminary opinion. In fact, the respondent's case on the critical issue of inventive step has not changed since the outset of the opposition proceedings. Nor did the board raise any new issues. Consequently, the filing of the Auxiliary Request only at the end of the oral proceedings, after the board had announced its opinion on the Main Request, is not justified by unexpected developments during the appeal proceedings. Even if the Auxiliary Request was intended as an

attempt to save the opposed patent, the request could and should have been filed together with the statement setting out the grounds of appeal, or at the latest in advance of the oral proceedings in order for the respondent (and the board) to adequately prepare themselves for the discussion of the request. Since the respondent (and the board) were deprived of this opportunity, the admission of the Auxiliary Request would not only be contrary to procedural economy but also go against the principle of procedural fairness, even if the amendments of claim 1 are based on granted claims.

For these reasons, the late filed Auxiliary Request is not admitted into the appeal proceedings under Article 13(1) RPBA.



**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



M. H. A. Patin

M. Poock

Decision electronically authenticated