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D E C I S I O N
of 27 June 1995

Case Number: T 0614/92 - 3.2.3

Application Number: 85308548.8

Publication Number: 0184366

IPC: E03F 3/06, F16L 58/06

Language of the proceedings: EN

Title of invention:
Sewer renovation system

Patentee:
DANBY PTY LTD

Opponent:
Menzel, S. W. O.

Headword:
Lining of sewers

Relevant legal provisions:
EPC Art. 56, 104(1)

Keyword:
"Inventive step (yes)"

Decisions cited:
T 0002/81, T 0596/90

Catchword:
-



Case Number: T 0614/92 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 27 June 1995

Appellant: Menzel, S. W. O.
(Opponent) 5095 Adelaide (AU)

Representative: Goddar, Heinz J., Dr.
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Respondent: DANBY PTY LTD
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Representative: Lawrence, Malcolm Graham
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office dated 14 May 1992 rejecting
the opposition filed against European patent
No. 0 184 366 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: C. T. Wilson
Members: J. B. F. Kollar
L. C. Mancini

Summary of Facts and Submissions

I. European patent No. 0 184 366 comprising three claims was granted to the Respondent.

Claim 1 of this patent reads:

"1. A method of lining a sewer pipe including the steps of:

continuously forming a liner of helically wound and inter-engaging strip and feeding it into a sewer to be lined;

sealing the end portions of the liner to the sewer pipes;

setting removable plugs into the ends of the liner; pressurizing the liner by introducing fluid thereinto under pressure;

pumping a cementitious grout under pressure into the space between the line and the pipe, the grout being introduced initially by inlet pipes to a lower part of the space and subsequently by further inlet pipes to the upper part of the space; and

removing the plugs from the liner after the grout has set."

II. The Appellant filed an opposition against the above European patent, citing the documents

D1: DD-A-122 129, dated 12 September 1976.

D2: EP-B-0 011 916, dated 13 April 1983.

D3: Spirex Systems, Report No. 83/9, dated October 1983.

D4: WRC Ext. Report 53E, date January 1982.

D5: "Sewer Rehabilitation", Surveyor Magazine, dated 15 December 1983.

D6: WRC Ext. Report 65E, dated June 1982.

- D7: Affidavit of P. B. Menzel, dated 14 May 1990.
- D8: Affidavit of R. M. Grubb, date 14 May 1990.
- D9: WRC letter, dated 20 March 1990.
- D10: DE-B-2 212 330

and requesting that said patent be revoked on the grounds mentioned in Article 100(a) EPC.

During the oral proceedings held on 9 December 1991 the Respondent filed the following documents:

- D11: Affidavit of V. H. Stratford, dated 4 December 1991.
- D12: Affidavit of S. Molyneaux, dated 4 December 1991.
- D13: Affidavit of A. Krumins, dated 3 December 1991.
- D14: Affidavit of K. Reed, dated 5 May 1991.

During said oral proceedings the Appellant filed the following document:

- D15: Post Conference Paper "Sewer Renovation - Spirex System", undated but with a handwritten annotation "Mid 1984".

III. According to the decision of the Opposition Division dispatched on 14 May 1992, the opposition was rejected. The Opposition Division, which considered document D1 (DD-A-122 129) to be the closest prior art, accepted that documents D4 and D6 were public before the priority date, but did not find sufficient evidence to be able to decide whether the disclosure of document D3 was public before the priority date. The Opposition Division took the view that the subject-matter of Claim 1 was novel and involved an inventive step because none of the documents cited by the Opponent, even if document D3 were public before the priority date, guided the skilled

person to improve the teaching of document D1 by steps claimed in Claim 1.

IV. The Appellant appealed against this decision on 2 July 1992 paying the appeal fee on the same day. The Statement of Grounds of Appeal was received on 24 September 1992.

V. The arguments presented by the Appellant in the written submissions and at the oral proceedings held on 27 June 1995 can be summarised as follows:

The subject-matter of Claim 1, even if formally novel, cannot be regarded as involving an inventive step in the light of the disclosure of the documents D1, D3, D4 and D6. The Appellant points out that in respect of inventions, the individual features of which are known in the prior art, as in the present case, the examination should concentrate on the question whether the person skilled in the art had to overcome a prejudice in order to combine such features and if such combination results in a synergistic effect - he stresses that said kind of examination is missing in the contested decision and that the first instance thus failed to recognise, that, in view of the disclosure of documents D4 and D6, there is no significance for the method steps of Claim 1 whether the sewer to be treated will be relined by a helically wound and inter-engaging strip according to Document D3 or by a "simple" pipe. As to the grouting conditions specified in Claim 1, the Appellant took the view that the grouting processing was obvious in the light of documents D4 and D6 and that grout was used in the test described in D3 while it was immaterial whether polyurethane foam or cementitious grout was used.

The Appellant came to the conclusion that the skilled person starting from D1 was not deterred from combining the teaching of said prior art documents and doing it he would arrive at a method of lining a sewer pipe claimed in Claim 1 of the contested patent without involving an inventive skill.

VI. In contesting these arguments, the Respondent submitted that the claimed method involve an inventive step.

(i) In respect of document D1 forming the closest state of the art he points to the fact that the Appellant has not produced new arguments in the appeal proceedings but only relied on arguments already discussed before the Opposition Division. It is known from D1 to insert a tube into a sewer pipe and then to grout the space between them. It is emphasised that D1 does not, however, disclose nor suggest that the pipe can be a helically wound liner as used in the present invention.

(ii) It is submitted that even if one assumes prior publication of documents D3, D4 and D6, which questioned by the Respondent, these documents do not take the reader further than the documents which were already considered during the opposition proceedings.

(iii) In particular, the Respondent pointed out that document D3 records the insertion of a liner of helically wound strip (Rib-Loc tube) into **an above ground smooth bore** EW (earthenware) pipe. Epoxy grout is mentioned to have been used "to seal Rib-Loc to EW pipe." It could be used to seal **an end** of an annulus but would be a very expensive choice for grouting the whole length

of the 60 meters long annulus the size of which at a probable 5 mm approximately being too small for full annulus grouting. There is no pressure grouting equipment in the photograph of document D3. This document does not, in the Respondent's view, disclose annulus grouting of cementitious grout under pressure in the sense meant in the patent in suit.

- (iv) Neither of documents D4 and D6, even if considered public, adds anything of significance to the closest prior art document D1. Both are concerned with refinements to slip-lining techniques using HDPE (heavy duty pipe) pipe.
- (v) The contribution of the present invention to the prior art represented by D1 is seen by the Respondent in establishing a method of lining a sewer which not only provides for an inexpensive and simple forming and feeding of the liner into the sewer but moreover results in a reliable structure of lining resistant against collapse during pressure grouting of a cementitious grout between the liner and the sewer; it has been submitted that said effect is achieved by a combination of features closer specified in Claim 1 of the patent in suit.
- (vi) Previous to the present invention when lining a sewer, the successful trend consisted in installing a tube of HDPE kind by the slip-lining technique in the damaged sewer and, after it has been installed, grout was pumped into the sewer pipe about the tube. Documents D1 and even D4 and D6 were good examples illustrating the aforementioned trend of the prior art. It was however well known that slip-linings of HDPE

pipe could collapse under grouting procedures and this was widespread knowledge amongst contractors and specifiers to the point of constituting a general fear of collapse. As a matter of fact, documents D4 and D6 not only pointed out the importance of the strength of the liner, but also suggested the lining may be filled with water at a pressure just above the grout pressure in order to diminish the danger of buckling and to reduce the deformation. Said teachings thus not only confirmed a trend but also formed a **prejudice** that for achievement of good results it was essential to introduce into sewers to be rehabilitated special liners which were sufficiently resistant against deformation caused by external pressure and by pressure and uplift of the cementitious grout. The idea is not only based on empirical experience but represents an essential principle for grouting processes of bodies in cementitious like grouts.

(vii) Taking into account the above teaching and starting from document D1 representing the closest prior art, the skilled person would have been inhibited from feeding helically wound strip into a sewer to be lined since he would have doubted that pressure grouting of a strip lined sewer could be conducted without collapse of the wound liner.

(viii) However, it was demonstrated by the Patentee's commercial success deriving from the technical features of the present invention documented in the opposition and appeal procedures (cf observations received on 5 December 1991 and on 13 August 1993, especially pages 11 and 28, 29 respectively), that with the use of the claimed

method surprising results, evaluated in terms of optimal performance of the method concerned in the practice (cf. Affidavits-D11 to D14), were nevertheless obtained although the skilled person starting from D1 had no incentive to operate in this way for the above reasons. Therefore, there was a surprising effect arising from the claimed method which, for the reasons stated above, meets the requirements for novelty and involves an inventive step over the cited prior art.

VII. The Appellant requests that the impugned decision be set aside and the patent be revoked.

The Respondent requests to dismiss the appeal and to maintain the patent as granted. An apportionment of costs was requested based on the alleged unreasonable conduct of the Appellant.

Reasons for the Decision

1. The appeal is admissible.
2. *Novelty*

The Board is satisfied that the method as claimed is novel over each document mentioned during the proceedings. Since this has never been disputed by the Appellant there is no need for further detailed substantiation of this matter.

3. *Inventive step*

3.1 Considering document D1 as the starting point for the invention, the objective technical problem to be solved over this prior art can be formulated. It is, as specified in the introductory part of the patent in suit, to be seen in the provision of an efficient but relatively inexpensive method of lining sewer which fulfils all the requirements set forth particularly by relining and renovating existing but damaged sewer lines. This includes, as pointed out by the respondent during the opposition and appeal proceedings, the requirement of prevention of collapse of a liner inserted in a sewer pipe during sewer pressure grouting.

The problem is plausibly solved by the technical steps defined in Claim 1.

3.2 The arguments of the Respondent (cf. Sections VI(vi) to VI(viii) above) according to which the skilled person would be inhibited from using a liner of helically wound strip in the method of lining sewer pipe according to Claim 1 are convincing, because the consequent teaching of the prior art represented by the relevant documents D1, D4 and D6 repeatedly puts strong emphasis on the requirement that the sewer lines should be sufficiently resistant against deformation caused by both the external pressure and pressure and uplift of the cementitious grout.

The Board accepts the Respondent's conclusion (cf. Section VI(vii) above) that the disclosures illustrated the established trend of the prior art, namely that to achieve good results and avoid collapse of the liners, it was essential to install only stable-type tubes being

resistant against collapse and buckling in the sewer to be renovated, and subsequently to pump grout about said tube.

3.3 The main question to be considered in the issue of the assessment of the inventive step in the present case is whether the skilled person, in view of the prior art, would find it obvious to try continuously forming a liner of helically wound strip and feeding it into a sewer to be lined and subsequently to apply the steps following within the scope of Claim 1 in the expectation of improvement of operational characteristics in the lining of sewers.

3.4 This question must be answered in the negative. In view of the established trend in the prior art represented by documents D1, D4 and D6 the skilled person would, as pointed out in Section 3.2 above, be prejudiced from applying the steps specified in the method of Claim 1. Thus the prior art shows that there was a trend in another direction pointing away from the invention. Acting against such a prejudice or trend, as in the present case, may be considered to indicate the existence of inventive step (cf. T 2/81 "Methylenebis (phenyl isocyanate)", OJ 1982, 394 and T 596/90 of January 1993 - unpublished). It follows that the combination of features in Claim 1 was non-obvious in the light of the existing problem.

3.5 The Board has also found it necessary to address the question of whether the skilled person, aware of the disclosure of document D3, if it is considered to be prepublished, would either be led directly by the teaching of this document, or would be led by it to modify D1, so as to arrive at the claimed invention.

- 3.6 This question must also be answered in the negative. Document D3 refers to forming and feeding a liner of helically wound strip into an **above ground** smooth bore EW (earthenware) pipe. In such an application the external pressures experienced by the pipeline in use and formation are negligible and there is no meaningful impediment to advancement, through winding of strip, of wound pipe on the surface. In contrast, in sewer relining the external pressures experienced by the pipeline in use can be considerable and experience shows that said pressures can be sufficient to collapse the lining completely; furthermore, because a sewer is in practice beneath ground, irregular in direction, irregular in profile due to damage and dropped points (the very reason rehabilitation is needed) and frictionally resistive, there is often substantial impediment to continued introduction of tubular lining.
- 3.7 The Board thus does not see any significant similarity in the lining method of the present invention and the method of D3 and finds moreover in the latter, a critical point in the size of the annulus between the liner and the pipe which appears to be too small for full annulus grouting and it is thus questionable whether such grouting could really be performed. It is pointed out in this respect that it is admitted in the "Conclusion" of document D3 that it "wanted more work to be done on...grouting...within the drain".
- 3.8 The Board is therefore in agreement with the arguments of the Respondent (cf. Section VI(iii) above) - namely that the disclosure of D3 can give no teaching to the skilled person starting from D1 in the direction of the claimed invention.

3.9 For the foregoing reasons the Board is of the opinion that the subject-matter of Claim 1 involves an inventive step in the sense of Article 56 EPC.

3.10 Since Claims 2 and 3 are dependent on Claim 1, they too are directed to subject-matter which is novel and inventive, and therefore patentable.

4. *Costs*

According to Article 104(1) EPC each party shall normally meet the costs he has incurred. The Board sees no reasons or facts which would justify ordering a different apportionment of costs. The request for apportionment of costs is therefore refused.

Order

For these reasons it is decided that:

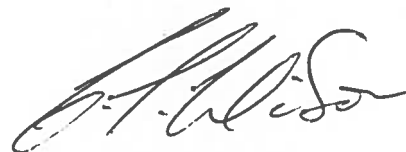
1. The appeal is dismissed.
2. The request for apportionment of costs is refused.

The Registrar:




N. Maslin

The Chairman:



C. T. Wilson

 2570.D

