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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 151 / 82

DECISION

of the Technical Board of Appeal 3.5.1

of 20.01.84

Appellant: SOUTH AFRICAN INVENTIONS DEVELOPMENT CORPORATION

Representative: Taylor, Derek George
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Decision under appeal: Decision of Examining Division 052 of the European Patent Office dated 4 June 1982 refusing European patent application No 79 302 630.3 pursuant to Article 97(1) EPC

Composition of the Board:
Chairman: G. Korsakoff
Member: K. Jahn
Member: P. Ford

SUMMARY OF FACTS AND SUBMISSIONS

I. European Patent Application No. 79 302 630.3 filed on 20 November 1979 and published on 23 July 1980 under publication No. 0 013 477, claiming the priority of the South African prior application of 22 November 1978, was refused by Decision of the European Patent Office dated 4 June 1982 on the basis of Claim 1 with the following wording:

"An electric cable comprising a conductive core surrounded by a sheath, and a moisture-sensitive swelling agent within said sheath which, when contacted by moisture which has penetrated the sheath, is capable of swelling characterised in that the conductive core comprises a plurality of separately insulated conductors and that the said moisture-sensitive swelling agent is carried on a plurality of separate carrier strands which extend length-wise within the sheath adjacent and parallel to the insulated conductors, and are located in the interstices between the insulated conductors, the swelling agent being capable of swelling substantially to prevent further moisture penetration."

II. The stated ground for the refusal was that the subject matter of this claim does not involve an inventive step in view of DE-C-899 388 and DE-A-2 007 163.

DE-C-899 388 discloses an electric cable having a sheath enclosing a conductive core comprising a plurality of conductors, separately insulated, the sheath also enclosing a plurality of separate fibres or strands acting

as a carrier for a waterproofing agent, e.g. a moisture/water absorbing material. Furthermore, the plurality of separate fibres or strands extend lengthwise within the sheath adjacent and parallel to the insulated conductors and are located between the interstices of the insulated conductors.

The subject matter of Claim 1 differs from the disclosure of this citation in that the waterproofing material within the cable sheath and carried by said strands is a moisture-sensitive swelling agent which when contacted by moisture which has penetrated the sheath is capable of swelling to prevent further moisture penetration.

DE-A-2 007 163 discloses an electric cable comprising a sheath and a conductive core, the sheath enclosing a ribbon/tape shaped carrier which carries a water/moisture sensitive swelling agent which when contacted by moisture/water, which has penetrated the sheath swells to restrict the further ingress of moisture.

Both documents relate to the problem of waterproofing/-containment of ingress of moisture in electric cables having an outer, normally waterproof, sheath enclosing a conductive core, the waterproofing agent being provided between the sheath and the core. Since the core of the cable is arbitrarily constructed it is implied that said method of waterproofing is applicable to any core, e.g. a plurality of insulated conductors as disclosed in DE-C-899 388.

III. On 3 August 1982 the appellant lodged an appeal against the decision dated 4 June 1982. On 30 September 1982 a Statement of Grounds was filed, the substance of which

is as follows: these two entirely separate items of prior art should not be combined to substantiate an argument that the subject matter of Claim 1 does not involve an inventive step. These two documents were published in 1953 and 1971 respectively, with a gap of eighteen years therebetween. The more recent of the two publications, namely DE-A-2 007 163 teaches no more than placing a band of swellable material around the core and immediately adjacent the outer sheath. DE-C-899 388 describes filler strands, in particular extending parallel to the axis of a cable, in spaced apart relationship for "accomodating" moisture which has entered the cable through a "more or less moisture-permeable" sheath. No suggestion is made of the moisture-accomodating filler strands swelling. This suggestion can only be introduced, by hindsight, from a consideration of DE-A-2 007 163 published eighteen years thereafter and not relating to moisture absorbing strips spaced apart around the core of a cable.

With a view to drawing a sharper distinction between the present invention and the prior art, the applicants submit an amended Claim 1 which reads as follows:

"An electric cable comprising a conductive core surrounded by a sheath, and a moisture-sensitive swelling agent within said sheath which, when contacted by moisture which has penetrated the sheath, is capable of swelling characterised in that the conductive core comprises a plurality of separately insulated conductors and that the said moisture-sensitive swelling agent is carried on a plurality of separate carrier strands which extend continuously lengthwise within the sheath adjacent and parallel to the insulated conductors, and are located in

the interstices between the insulated conductors, the swelling agent being capable of swelling on contact with moisture, in the event of a breach of the sheath, to form a plug within the conductive core to seal off the breach and substantially to prevent further moisture penetration and passage of water along the cable."

IV. The Board of Appeal then, in a Communication to the appellant, ventured the initial view that, from the point of view of the problem underlying the present application, i.e. a twofold task, its solution as presented by the appellant would appear obvious.

The appellant contested this opinion by submitting that it was all based on hindsight.

DE-A-2 007 163 (hereafter referred to as DEA) is concerned with preventing moisture entering a cable through a fault. It chose to do so by use of a tape-like support coated with a swellable material and applied between the core and sheathing. If this failed, or was damaged, presumably the cable had to be replaced as suggested in paragraph 2 of that document. The inventor of DEA could hardly have been unaware of this possibility, so he either ignored it or failed to see a way of overcoming it. If he had recognised that it could be a problem he could have suggested a solution but only if the solution had been apparent to him. The much earlier published DE-C-899 388 (hereafter DEC), in the same language but in a different field, was available to him but it evidently suggested nothing to him if he was aware of it.

The applicants have made a development which is admittedly novel, which strongly arguably possesses material

advantages in relation to the production of the cable, the cost thereof, the waterproofing charateristics and the retention of good telecommunication characteristics and it is not seen how the Board of Appeal can in the light of these advantages and the admitted novelty, declare the applicants invention to be obvious over old publications which have not led to the applicant's development in the substantial period since such prior publications became available.

Furthermore, the supporting evidence of a Mr. Harold Hughes, whose experience in the design and production of cables extends over some 30 years, demonstrates that the references do not, singly or in combination, suggest the construction of the present invention.

The appellant requests that the decision under appeal be set aside and that the patent sought should be granted on the basis of the above amended Claim 1 in combination with claims 2 to 5 received on 1 December 1981. Additionally the reimbursement of the appeal fee is requested.

REASONS FOR THE DECISION

1. The appeal is in accordance with Articles 106-108 and Rule 64 EPC; it is therefore admissible.

2. The question as to whether or not claim 1 is adequately supported by the original documents can be left in abeyance since the application fails for other reasons.

3. The Board considers DEA as representing the closest pior art, since this document relates likewise to the lengthwise waterproofing of insulated electric cables. This specification describes a cable, particularly a telecommunication cable, which has, as usual, a plurality of insulated conductors in its core and incorporates between the conductive core and an outer sheath at least one layer of a moisture-sensitive swelling agent on a ribbon-like carrier (see Claim 1). This should have the capability of acting as a barrier against water (cf. page 2 lines 12 to 16).

The introductory part of the description of this document explains how water spreads out once it found its way through the cable sheath. In this context, its spreading between the sheath and the core is well distinguished from that within the interstices formed by the separate conductors of this core (cf. page 1 lines 12 to 16). From this, it can be concluded that this document only aims at preventing water from ingressing into the core of the cable by providing a barrier against water outside the core, although the skilled reader would be aware that water would travel along the separate conductors once the layer containing the swelling agents had been penetrated following damage to, or resulting from a serious fault in, that layer.

The skilled man who wished to take precautions against the last mentioned situation and, therefore, addressed himself to the problem of providing an electric cable comprising a plurality of insulated conductors as a core within a sheath so that the cable could resist the spreading of water within the core along the interstices formed by the conductors following a breach beyond the

sheath, could fairly be expected to take advantage of the teaching of DEA in order to solve this problem. From the point of view of the problem, it must be considered to have been abundantly clear to the addressee of this document that the arrangement of the swelling agent had to be extended from merely being around the core to being around the individual conductors. By strict adherence to the teaching of DEA, the skilled man would envisage bandaging of each and every one of the numerous insulated conductors forming the core of the cable with a ribbon-like carrier loaded with swelling agent. The manufacture of a cable in this way would clearly be very expensive and this fact would induce the skilled person to modify the design of the carrier to a form which would also allow economic manufacture of the cable.

This position is corroborated by the appellant in pointing out the material advantages which a cable according to the application in suit offers in relation to its production and cost (cf. present application page 6 lines 3 to 5 and the appellants letter dated 16 November 1983, page 2 last paragraph lines 4 to 6). The position taken here is also in accordance with another Board's decision which stipulates that advantages which are effectively achieved must be considered in the assessment of the technical problem and hence of the inventive step (cf. T 20/81 "Shell Aryloxybenzaldehyd", OJ EPO 1982, 217, 221 especially paragraphs 2 and 3).

4. In the absence of other evidence, the technical problem underlying the application in suit must be seen in a twofold task, namely providing an inexpensive and economically producible electric cable comprising a plurality of insulated conductors within a sheath, this cable

having the capability to resist the spreading of water along the interstices formed by the conductors as a consequence of a deeply-penetrating breach of the sheath affecting not only the conductors at the periphery of the core, but also those in its centre.

This problem is solved by a moisture-sensitive swelling agent carried on a plurality of separate carrier strands which extend continuously lengthwise within the sheath adjacent and parallel to the conductors, and are located in the interstices between these conductors.

5. A teaching so defined cannot be gathered from any of the publications before the Board. Therefore, the application in suit is deemed to be novel.

6. It is therefore to be examined whether the subject matter of the application is obvious in relation to the prior art.

As mentioned above, the skilled man starting from DEA could expect with regard to the teaching of this document that one part of the envisaged problem, namely barring penetrated water from spreading along the conductors within the core, could be solved by surrounding each conductor with a bandage of a tape-like carrier loaded with swelling agent. On the other hand, he would be well aware that such a cable construction would be expensive.

In order to solve this secondary-problem he would appreciate that he could benefit by applying the teaching of DEC which is in the same technical field. This document is concerned with an electric cable comprising a plurality of insulated conductors within a synthetic outer

sheath, and a moisture absorbing agent within or outside the conductive core (Claim 1). The moisture absorbing agent can be supported by a carrier in the form of strands (Claim 4) which extend parallel to the conductors (Figure 2). The mere naming of these strands as "Beiläufe" already points at their potentially advantageous use in economic cable maufacturing (cf. page 2 lines 29, 30, 53 to 56 and 82 in combination with figure 2). From the point of view of the problem underlying the present application, i.e. the twofold task, it must be considered obvious to replace these moisture-absorbing agents supported on strands running parallel to the conductors according to the above DEC by swelling agents disclosed in the above DEA.

7. In taking this position, the Board is aware that water absorbing agents on the one hand are designed in DEC to keep the interior of the cable dry, while the swelling agents as described in DEA on the other perform a different function, namely forming a plug against further spread of water. The fact that both agents solve a different technical problem in the same field of electric cables does not mean that the skilled man faced with the above twofold problem would only take into consideration documents which offer only a solution to the main problem. If, as in the present case, the skilled person has chosen for the principle which solves the main problem, i.e. to counter the undesired ingress of water by forming a plug with the aid of swelling agent, without finding an economically satisfactory design for the arrangement of the swelling agent in the relevant document, he will not stop, but continue to search within the same technical field of multi-conductor cables by concentrat-

ing his attention on documents which promise the solution of the envisaged subsidiary problem. DEC presents such a solution.

In advancing the argument that the water absorbing agent according to DEC must be accomodated at those points in the interior of the cable where it does not interfere with the operation of the cable, the appellant disregards the fact that there could be no doubt where the swelling agent had to be positioned. Having regard to the main problem, the only position which could be envisaged would be beneath the sheath and within the core of the multi-conductor cable, as claimed.

8. Furthermore, the appellant advances the following argument: the inventors of DEA could hardly be unaware of the possibility that damage affecting the layer loaded with swelling agent around the core would require a replacement of the cable. If they had recognised that it could be a problem they could have suggested a solution but only if the solution had been apparent to them. The much earlier published DEC which must be assumed available to them evidently suggested nothing to them. From this, the appellant seemingly draws the conclusion that the application in suit is not obvious.

The suggested approach cannot be accepted for three reasons. Firstly, it disregards the well established problem - solution approach in assessing inventive step (cf. "Metal refining" T 24/81, OJ EPO 1983, 133; "Carbonless copying paper" T 01/80, OJ EPO 1981, 206; "Shell-Aryloxybenzaldehyd" T 20/81, OJ EPO 192, 217; "Light-reflecting slates" T 39/82, OJ EPO 1982, 419; "Containers" T 26/81, OJ EPO 1982, 211; "Cleaning apparatus for conveyor belt" T 32/81, OJ EPO 1982, 225;

Electromagnetically operated switch" T 21/81 OJ EPO 1983, 15,18). As set out in the decision "Metal refining" (T 24/81) an ex-post-facto approach in the assessment of inventive step can be avoided if, by taking account of the technically relevant merits of the invention over the state of the art, the problem which objectively underlies the invention is defined and then the question is asked as to whether or not the solution of this problem as proposed by the applicant was obvious from the point of view of the problem. The Board has followed this principle in the present case. Therefore, the appellant's allegation that the Board's considerations about inventive step have been made with hindsight is unjustified.

Secondly, it starts from the wrong date. Inventive step has to be assessed from the filing date or (if applicable) the priority date of the European application.

The fact that the author of a publication did not take up an earlier teaching in spite of the obvious advantage of such a combination may well be irrelevant to the judgement of the inventive step of such a combination at a later date. The development of technique commonly proceeds in a series of short steps during the course of which the skilled man focuses his attention ever closer on questions which initially have been regarded as of lesser importance, and the fact that workers in a particular technical field had not earlier addressed themselves to solving a particular problem should not of itself be taken as a reliable indication that the solution eventually proposed was not obvious.

Thirdly, since some advantages can usually be claimed for the subject matter of any application, the approach suggested by the appellant would result in an undifferentiated and automatic recognition of inventive step on the ground that a combination has not been put into practice and is, therefore, novel.

9. If the appellant considers the gap of 18 years between the publication of the documents DEC (1953) and DEA (1971) as an indication of non-obviousness he overlooks the point that DEA can be regarded as a simple, nevertheless economic, proposal to protect the core of the cable as a whole. The inventors of DEA were apparently satisfied with suggesting surrounding the core with a single or multi-layer carrying the swelling agent and in doing so they did not aim at precautions against more serious damage of the cable beyond that layer. Therefore, there was no need for them to resort to the teaching of DEC.

On the other hand, the gap of seven years between DEA (1971) and the present application (1978) is much too small, even in a field of considerable activity, to be considered in isolation as an indication of the presence of inventive step.

10. As to the affidavit submitted to furnish evidence for inventive step, there is no doubt that Mr. Hughes is an expert in the field of manufacturing and testing electric cables. Nevertheless, his assessment of non-obviousness in respect to the present application must be regarded as a subjective one which cannot replace an objective judgement of this criterion.

The appellant particularly refers to paragraphs 12 and 13. However, nothing can be gained in the appellant's favour from paragraph 12 where it is stated that a cable according to DEA cannot prevent water from ingressing into the interstices between the separate conductors of the core in the event of deep-reaching damage of the cable. This is not in dispute. The other argument has already been dealt with in paragraph 8 of this decision.

Paragraph 13 states that "since the publication of DEA in about 1972 developments in the field of waterproofing of cables has included the use of intermittent water-blocks, the use of powder fillings and the use of hollow microspheres in jelly filled cables. All of these methods point in a direction quite different from the present invention and furthermore they suffer from material disadvantages in regard to speed and cost of production relative to the present invention."

This submisssion implies that the subject matter of an application cannot be deemed to be obvious, since technical progress has bypassed the appellant's cable construction, in spite of its advantages, and pursued other ideas. The fact that other ideas have been tried may mean no more than that skilled persons in the art did not search the literature for readily available ideas.

The appellant's submissions in this respect are not convincing.

The position of the Board in the present case is in accordance with the view of the Board in the above cited decision "Metal refining" (T 24/81). According to this decision, a mere investigation for indications of the

presence of inventive step is no substitute for the technically skilled objective assessment of the invention vis-à-vis the state of the art, pursuant to Article 56 EPC.

The technical advantage as claimed provides no basis for the presence of inventive step, since this was to be expected in view of the problem facing the skilled person.

11. Nor would the appellant have anything to gain from choosing the standard type of waterproofed petroleum jelly filled cable as starting point of the present application instead of the cable according to DEA (cf. introductory part of the description of the present application and the Affidavit paragraph 5). This would only mean that the skilled man who felt petroleum jelly filled cables unsatisfactory had primarily to look out for a different principle of sealing the cable against ingress of moisture.

According to the Affidavit, besides the method of sealing with swelling agent, there were the methods of using intermittent waterblocks and powder fillings at the skilled person's disposal. It has not been explained how these methods work but it is clear that they are uneconomic. In all the circumstances the choice of the method according to DEA from the three possibilites and its adaptation to the envisaged problem (DEC) cannot be regarded as anything lying beyond the ordinary skill of the cable designer.

12. The process outlined in claim 1 thus does not involve an inventive step. Claim 1 therefore cannot be allowed.

Claims 2 to 5 are dependent on claim 1 and fall with the latter in the absence of any auxiliary request from the appellant concerning them. Neither are there additional features in these claims which would appear to introduce patentability, nor have any of them been argued by the appellant to have such consequences.

13. Because the Board has not deemed the appeal to be allowable, it follows that the request for the rembursement of the appeal fee is rejected.

ORDER

It is decided that

1. The appeal against the decision of the Examining Division of the European Patent Office dated 4 June 1982 is dismissed.

2. The request to reimburse the appeal fee is rejected.

Pr.