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Datasheet for the decision of 22 January 2009

Case Number: T 1080/06 - 3.2.06

Application Number: 98959017.9

Publication Number: 1040221

IPC: D07B 1/16

Language of the proceedings: EN

Title of invention:
Rope for conveying systems

Patentee:
BRIDON PLC

Opponent:
FATZER AG Drahtseilfabrik

Headword:
-

Relevant legal provisions:
RPBA Art. 12(2) and 13(1)

Relevant legal provisions (EPC 1973):
EPC Art. 56

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1080/06 - 3.2.06

D E C I S I O N
of the Technical Board of Appeal 3.2.06
of 22 January 2009

Appellant: (Opponent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 09 May 2006 rejecting the opposition filed against European patent No. 1040221 pursuant to Article 102(2) EPC 1973.

Composition of the Board:

Chairman: P. Alting Van Geusau
Members: M. Harrison
W. Sekretaruk

Summary of Facts and Submissions

I. The appellant (opponent) filed an appeal against the decision of the opposition division rejecting the opposition against European patent No. 1 040 221.

II. The appellant requested revocation of the patent and filed arguments based on Article 100(a) and 100(b) EPC 1973. In support of its arguments in respect of Article 100(a) EPC 1973, the appellant cited the following documents:

D1: US 5 669 214
D5: GB 2 280 686
D7: US 2 136 865
D8: US 2 136 866
D12 "Eidesstattliche Versicherung" of Dr. Andorfer

Arguments against the presence of an inventive step in the subject matter of claim 1 were based on D1 and D5 in combination.

The appellant further requested that evidence be taken regarding the education and technical knowledge of a skilled person in the technical field.

III. The respondent (proprietor) requested dismissal of the appeal and filed the following document in support of its arguments:

D13: Statutory Declaration of Mr Walton

IV. With the appellant's letter dated 30 October 2007, the following documents were filed:

D14: "Kunststoffkunde", 2nd edition, 1988, pages 117 to 119

D15: "Kunststoff- und aramidfaserverstärkte Kunststoffe", VDI-Gesellschaft Kunststofftechnik, 1977, pages 30 and 31.

V. In preparation for oral proceedings, the Board issued a communication in which it was stated that the Board did not intend to take evidence regarding the education and knowledge of a skilled person and that the objections made under Article 100(b) EPC 1973 were found unconvincing. Regarding inventive step, the Board stated *inter alia* that the objective problem to be solved did not appear to be the same as the problem stated in the patent when starting from D1 as the closest prior art.

VI. With its letter of 7 January 2009, the proprietor filed an auxiliary request.

VII. With its letter of 12 January 2009, the appellant filed

D16: Wikipedia extract relating to modulus of elasticity,

D17: ""Kunststoff Handbuch" Volume 1, 1975, pages 234 to 237 and pages 292 to 295,

D18: "Kunststoffkompendium, 5th Edition, 2000, Tables 7.4.8 and 11.7.

Additionally, further arguments were made concerning the alleged lack of inventive step in the subject matter of claim 1 based on a combination of D7 with D5.

VIII. During the oral proceedings, the appellant maintained its request that the patent be revoked based on Article 100(a) EPC 1973 but withdrew its objections based on Article 100(b) EPC 1973.

The respondent confirmed its request for dismissal of the appeal or alternatively that the patent be maintained on the basis of its auxiliary request filed on 7 January 2009.

IX. The sole independent claim of the patent reads as follows:

"1. A wire rope comprising a central core (11;21;31;41;51), a plurality of helical outer strands (17;47;57) over the central core, and a plurality of separate pre-formed filler elements (18;48;58), in which one filler element is located between each adjacent pair of outer strands and interlocks with the adjacent strands, the filler elements extending to the imaginary cylindrical envelope of the rope, characterised in that each filler element (18;48;58) consists of an elastomeric or polymeric material having an oriented molecular structure due to solid-state deformation, the oriented molecular structure being aligned along the filler element."

X. The arguments of the appellant may be summarised as follows:

D1 disclosed the features in the preamble of claim 1. Additionally, the materials used in D1 corresponded to the "elastomeric or polymeric material" defined in the characterizing portion. Claim 1 did not define any

particular tensile strength or elastic modulus values, and even the preferred values for the oriented material of above 100MPa tensile strength and above 2GPa modulus of elasticity given in the patent were at least one order of magnitude lower than those of steel (see e.g. D16 to D18), so the problems stated in the patent were not "objective" when starting from D1. D1 also disclosed filler elements optionally containing fibre/filament reinforcement providing a tensile strength, as shown by D14 and D15, which was the same as that for oriented plastics; high tensile strength was therefore clearly kept in mind in D1 when designing the filler element reinforcement. Starting from D1 where the filler elements did not necessarily require fabric reinforcement, the correct objective problem to be solved was to widen the choice of available materials, or properties thereof, for use as filler elements. D5 disclosed that prior art cores were disadvantageous due to material restrictions and properties; D5 thus addressed the same problem and solved this by using an axially oriented polymeric core. Although D5 did not disclose filler elements, the knowledge of the skilled person, as exemplified in D12, was that fillers and cores were subject to the same forces, while D1 disclosed that the same material could indeed be used for both. Also, filler elements could perform the function of the core by supporting the strands, thus obviating the core entirely. To use the same material for the core and filler elements was also easier from a production point of view. Applying axial orientation as taught by D5 to the filler elements in D1 thus involved no inventive step as this was merely the result of using the same material for the core and filler elements.

D7 was more relevant than D1 and it had been mentioned in the appeal grounds together with a mention of D8. The new line of attack based on a combination of D7 with D5 arose from the respondent's arguments and the Board's opinion concerning D1. D7 disclosed not only filler elements without fabric reinforcement but also embodiments where the core was formed either integrally with, or separately from, the filler elements. This latter disclosure demonstrated that the functions of the separate or integrated elements were fully interchangeable. It also disclosed that the same material could be used for both. The objective problem to be solved over D7 was to provide a larger range of materials for use as filler elements. D5 mentioned this problem and solved it by providing an axially oriented core. Since the core of D5 used an improved material, the skilled person would also use the same improved material for the filler elements, in particular because essentially the same forces were applied to the core as to the filler elements and because the rope would be easier to produce, thereby making it preferable to use the same material for both. No inventive step was therefore involved.

XI. The arguments of the respondent may be summarised as follows:

D1 was the closest prior art, not D7. D1 proposed consistently the use of fabric reinforced filler elements, in particular by extrusion. To then orient these extruded products would destroy the fabric/polymer integral connection. As the fabric was essential to all embodiments, this would be contrary to

D1. The problem to be solved by the subject matter of claim 1 was stated in the patent and was concerned with the underlying different material properties between steel and polymeric filler elements, which gave rise to difficulties during stranding of the wire rope. An increase in tensile strength of the filler elements due to orientation, as defined, brought their properties closer to those of steel and thus made production easier. If this problem were not accepted as being objective by the Board, the problem of providing an alternative to the fabric-reinforced filler elements of D1 was also addressed by the arguments. As regards the appellant's suggested problem of providing a larger choice of materials, this was not objective and, even if it were, D5 did not deal with that problem but dealt with specific problems concerning manufacture of a prior art core. D5 was hardly relevant as it did not mention filler elements, only cores, and these were subject to different forces as was evident from the discussion in D1 concerning the torsion and bending forces on filler elements. D1 mentioned the possibility of using the same materials for the core and the filler elements, but did not suggest also adapting the core in the same way as its fabric-reinforced filler elements. There was no evidence that the use of the same material for both core and filler elements should provide an improvement from the point of view of manufacture, in particular when one of these had been optimised for a specific purpose.

D7 was further remote than D1. The appellant's allegation that D7 disclosed a preference for using the same material for the core and filler elements had no basis. D7 disclosed no integral fabric but the object

of the invention was not to obviate the use of fabric. D7 merely stated that each of the materials for the core and filler elements should be softer and more resilient than that of the wire strands, and that the materials used could be the same or different. Starting from D7 and combining this with the teaching of D5 brought the skilled person no closer to the subject matter of claim 1 than when starting from D1.

The subject matter of claim 1 was thus not obvious.

Reasons for the Decision

1. *Objections under Article 100(b) EPC 1973*

Since the appellant withdrew its objections under Article 100(b) EPC 1973 and since the Board finds no reason for objection in this regard, these objections will therefore not be considered further.

2. *Inventive step*

2.1 The features of the preamble of claim 1 are known from D1, as also stated in the opposed patent in paragraph [0007]. This matter is also not in dispute between the parties.

2.2 Although no objection has been raised concerning a lack of novelty of the subject matter of claim 1, it is still important to establish to what extent the features of the characterizing portion may be known from D1. In this regard, although D1 does disclose filler elements *per se* which may be of polymeric of

elastomeric material (see e.g. column 4, lines 6 to 11 and lines 62 to 64), there is no disclosure of such polymeric or elastomeric filler elements also being axially oriented via solid-state deformation nor that the oriented molecular structure is aligned along the filler element.

2.3 The problems to be solved as stated in the patent in paragraphs [0002] and [0004] are already solved by D1. These are therefore not objective problems when starting from D1.

The problems indicated in paragraphs [0005], [0006] and [0010], relating to the difference in physical properties and thereby handling problems between steel wires and plastic filler elements during manufacture, are not considered to be objective problems over D1 since claim 1 does not provide any indication of the tensile strength or modulus of elasticity of the oriented filler elements; the tensile strength and modulus of elasticity may therefore be the same as those in D1. In such a case, any handling problem would not be solved. In this regard it should be noted that preferred values of above 100MPa tensile strength and above 2GPa modulus of elasticity are mentioned only in dependent claims 4 and 5 and not in claim 1; moreover these values are anyway considered by the Board to be significantly less than the corresponding values for steel wires (see e.g. D16 to D18).

The objective problem underlying the subject matter of claim 1 when starting from D1 is therefore different.

The appellant argued that the problem to be solved starting from D1 was either to provide a wider range of materials for the filler elements or to provide a wider range of properties for the filler elements. However, the Board concludes that these problems are also not objective, since nothing in D1 or the patent gives any hint to such problems and D1 already discloses generally that other materials, therefore materials with varying properties, may be used (see e.g. column 4, line 11). Also, any apparent need for a wider range of properties would normally require that the existing properties would be insufficient for some specific purpose, for which however no basis in D1 has been provided by the appellant.

The Board thus concludes that the objective problem to be solved by the features of claim 1 when starting from D1 is the provision of alternative filler elements to those in D1.

2.4 In order to better deal with the forces placed on the filler elements (termed "inserts" in D1), in particular pressure forces, torsion forces and bending forces (see D1 e.g. column 2, lines 30 to 51), the filler elements of D1 are reinforced in at least their concave central regions by means of an integrated fabric, possibly arranged entirely internally in the filler element (see e.g. Fig. 9). Although D1 discloses embodiments using non-reinforced filler elements, these are not disclosed in the context of being an optimised filler element. Additionally, although further optimisation can be achieved in D1 by the use of longitudinal filaments (see e.g. Fig. 8 and column 5, lines 22 to 27), such filaments are always disclosed as being additional to

the fabric provided in the area of the concave central portions. It is thus of no relevance whether D14 or D15 discloses fibres or filaments able to withstand tensile stress to the same extent as oriented plastics materials of the patent.

2.5 Turning to D5 to find a suitable alternative to the fabric reinforced filler elements of D1, the skilled person is presented only with an axially oriented core element for wire ropes. No separate filler elements are disclosed. D5 discloses only a core element which is a solution to a prior art core element produced by two manufacturing operations (see e.g. paragraph bridging pages 1 and 2). In particular, it is stated that the invention in D5 is directed to overcoming drawbacks with that prior manufacturing method which itself is restrictive in terms of production speed and available material properties. In axially orienting the core, it is stated on page 4, last paragraph that this enhances tensile strength and elastic modulus. Further, in the paragraph bridging pages 5 and 6, additional benefits which may be obtained from some enhanced transverse properties of the core are mentioned, such as withstanding the crushing forces exerted by the rope strands. However, when searching for an alternative to the fibre reinforced filler elements in D1, which are able to resist particular forces, the skilled person finds no teaching in D5 that the forces to which filler elements are subjected are the same as those present in the core, nor that axially orientated plastic cores are in some way an alternative to fabric reinforcement used anywhere else, let alone in plastic filler elements, nor is axial orientation disclosed as being a means of further strengthening fabric-reinforced extruded

elements. Indeed, in the latter case, the solid-state deformation provided in claim 1 would seemingly destroy any bonding existing between the reinforcement fabric and the co-extruded plastics of the filler element (see e.g. column 5, lines 1 to 3 and lines 28 to 34) if this were to be applied.

2.6 The argument of the appellant, that the skilled person would realise that filler elements and cores in wire ropes of this type are subject to the same forces, and so the skilled person would select the core material in D5 to replace the filler elements of D1, not least since D1 notes that both can be of the same material, is not found convincing by the Board. Firstly, the disclosure in D1 is directed to problems concerning forces which are applied to the filler elements and there is notably no disclosure that the optimised construction of the filler elements in D1 using fabric reinforcement should be applied to the core element in D1 for any reason. Indeed, whilst D12 (see e.g. item 4) contains a statement to the effect that core and filler elements should be handled similarly from a manufacturing point of view, this in no way implies that filler elements and cores are subject to similar forces in use nor that they should therefore be designed similarly. In terms of tensile strength for example, the (steel) wire ropes under consideration are largely unaffected by any tensile strength contribution attributable to the plastics, as these are far below those of steel. Thus, merely because D1 discloses that core and filler elements may be of the same material, this in no sense implies to a skilled person that an optimised core element made from a particular material

dictates that the filler elements should likewise be improved in the same way.

2.7 Further, the appellant alleged that like materials would be chosen for the core and filler elements in the knowledge of the improved properties of the core element in D5, because it is easier and better from a manufacturing point of view to choose the same materials. There is however no evidence supporting this allegation. Nothing in D1 or D5 suggests that, e.g. for manufacturing, the skilled person would adopt the specific structure or material of an optimised core or filler element and apply this material to the other of the two in order to ease or improve manufacturing. It is also noted that no evidence was supplied by the appellant to support its allegation in this regard.

2.8 The appellant also argued that the function of the core could be assumed by the filler elements, as was known from e.g. D1 (see the embodiments of Figs. 4 and 5) where filler elements but no core were used, and thus that the same requirement existed for the core and filler elements and consequently also for the material of these, so that the skilled person would use the same materials for both. However, this argument is also found unconvincing by the Board, since the disclosure concerning the embodiments in D1 is not such as to indicate an identical function of the core and filler elements, but merely that a core can be dispensed with if desired. Likewise, the fact that a core can be omitted does not teach a skilled person that when a core is indeed present (i.e. as is the case in claim 1 of the opposed patent), and where the core properties are to be improved such as by the use of a core from D5

(as argued by the appellant), the filler elements should then also be made from the same material to assume the functions which are performed by the core. As stated previously, but relevant also here, D1 discloses particular requirements put on filler elements due to the forces that these undergo, but does not disclose the same requirements for core elements.

2.9 Thus, the Board concludes that starting from D1 and trying to solve the problem of finding an alternative to the filler elements therein, the teaching of D5 does not lead the skilled person to the subject matter of claim 1 without the use of an inventive step.

2.10 The appellant also argued that the subject matter of claim 1 did not an involve an inventive step when starting from D7 and combining this with the teaching of D5.

This line of argument was introduced after the grounds of appeal were filed and thus was not part of the appellant's complete case in accordance with Article 12(2) of the Rules of Procedure of the Boards of Appeal (RPBA). However, in accordance with Article 13(1) RPBA, the Board has exercised its discretion to allow this new line of argument based on D7 as a change to the appellant's case, since the argument was made in writing before the proceedings, D7 is a very short document and its introduction does not delay proceedings, and moreover D7 indeed addresses the argument of the respondent concerning the presence of fabric reinforcement in the filler elements in D1.

2.11 D7 does not disclose any fabric reinforcement in central concave areas of the filler elements (termed "spacing members" in D7). Likewise D7 discloses, in relation to a core containing integrated filler elements (see e.g. page 1, left column, lines 42 to 45), that the core may be a combination of many substances including e.g. rubber or rubber fabric or combinations of these or other substances, and that the core should be softer than the wire strands. Similarly, it is also disclosed (see e.g. page 1, right column, lines 17 to 27) that the filler elements may be separate from the core, and that the core and filler elements may be of the same or different materials but that both core and filler elements should be of a softer or more resilient material than the wire strands.

2.12 The appellant argued that the problem to be solved by the subject matter of claim 1 starting from D7 was the same as the problem when starting from D1, it being noted that D7 disclosed the same features of claim 1 as D1. However, in the same way as explained above in relation to D1, nothing in D7 supports the appellant's view that any particular material characteristic is lacking or requires alteration to meet any specific purpose, and additionally a vast range of possible materials is already disclosed in D7.

The Board thus comes to the same conclusion regarding the problem to be solved as it does when starting from the filler elements of D1, namely that the objective problem to be solved is the provision of alternative filler elements to those in D7 which include filler elements having no fabric reinforcement.

2.13 D7 further discloses that the core and filler elements can be integrated in one piece or separately formed, and that the core and filler elements can be of the same or of different materials. The Board therefore concludes that the disclosure in D7 goes no further than that in D1 in providing a hint or teaching for the skilled person that the use of an improved or optimised material for the core, such as of the type known from D5 for solving particular core-related problems as explained above, should imply that the same material n should preferably be used for the filler elements. The skilled person is taught only that a wide range of possibilities exist, without being given any guidance as to the circumstances in which particular materials should be used for the core and/or filler elements. The explicit disclosure in D7 that the filler elements and core should both be softer or more resilient than the wire strands also does not imply that they must have the same properties, nor that they should both be designed in the same manner, but merely that an upper limit is set on the softness and resilience of these elements.

2.14 Thus, nothing in D7 provides a disclosure of more relevance to inventive step than the disclosure in D1, either in respect to the objective problem to be solved or to the combination of the disclosure in D7 with the teaching of D5.

2.15 The Board thus concludes that nothing submitted in the appeal case alters the conclusion reached by the opposition division, namely that the subject matter of claim 1 involves an inventive step.

The requirement of Article 56 EPC 1973 is thus fulfilled in respect of the prior art cited.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar | The Chairman

M. Patin | P. Alting van Geusau