

Internal distribution code:

- (A) Publication in OJ
(B) To Chairmen and Members
(C) To Chairmen
(D) No distribution

**Datasheet for the decision
of 15 December 2008**

Case Number: T 1193/06 - 3.2.06

Application Number: 99301932.2

Publication Number: 0974698

IPC: D07B 1/02

Language of the proceedings: EN

Title of invention:

Braided rope

Patentee:

PUGET SOUND ROPE CORPORATION

Opponent:

Industrieverband Tauwerk und Technische Garne e.V.

Headword:

-

Relevant legal provisions:

RPBA Art. 12(2) und (4)

Relevant legal provisions (EPC 1973):

EPC Art. 56

Keyword:

"Inventive step (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 1193/06 - 3.2.06

DECISION
of the Technical Board of Appeal 3.2.06
of 15 December 2008

Appellant: Industrieverband Tauwerk und Technische Garne e.V.
(Opponent) Moltkestraße 19
D-48151 Münster (DE)

Representative: Einsel, Martin
Patentanwälte Einsel & Kollegen
Jasperallee 1a
D-38102 Braunschweig (DE)

Respondent: PUGET SOUND ROPE CORPORATION
(Patent Proprietor) 1012 Second Street
Anacortes, WA 98221-1956 (US)

Representative: Bayliss, Geoffrey Cyril
Boulton Wade Tennant
Verulam Gardens
70 Gray's Inn Road
GB-London WC1X 8BT (GB)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 24 May 2006
rejecting the opposition filed against European
patent No. 0974698 pursuant to Article 102(2)
EPC 1973.

Composition of the Board:

Chairman: P. Alting Van Geusau
Members: M. Harrison
R. Menapace

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. 0 974 698.
- II. The opposition division considered that the grounds of opposition under Article 100(b) and 100(a) EPC did not prejudice the maintenance of the patent. In its appeal grounds, the appellant stated broadly that it had a different opinion regarding the findings of the opposition division in regard to its objections under Article 100(b)/Article 83 EPC and to its objection of lack of novelty, but that the appeal would concentrate on the matter of inventive step.
- III. The following documents cited in the decision under appeal were also cited in the appeal proceedings:
- D1: *Theorie der Seilherstellung und Seilprüfung*, Wolfgang Weber, 1987, Aegis Verlag, pages 21, 22;
D2: *Skippers Knotenbuch*, J. Altimiras, Verlag Delius Klasing & Co., 1982, pages 14 to 19;
D3: GB-A-1 344 290;
D8: Photographs of an analyzed rope of the company Geo. Gleitstein & Sohn GmbH, Bremen (DE), 1984.
- IV. Together with the grounds of appeal, the appellant also submitted *inter alia* the following document:
- D9: DIN 83305, part 3, June 1990.
- V. In preparation for oral proceedings, the Board issued a communication in which it was stated that no reason was

apparent for reconsidering objections other than the objection to lack of inventive step, since the other objections were not substantiated in the appeal grounds and attention was drawn in this regard to Article 12(2) of the Rules of Procedure of the Boards of Appeal (RPBA). The Board also questioned *inter alia* whether the term "pick multiplier" as used in the claims was necessarily equatable with the term "Flechtlänge" (referred to in D9) divided by " πd ".

VI. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

VII. The respondent (proprietor) requested that the appeal be dismissed.

VIII. The independent claims of the patent read as follows:

"1. A method of construction of a large-diameter braided rope (10), said method comprising the steps of twisting a multiplicity of fibres (16) together so as to form a plurality of twisted yarns (14), braiding a plurality of twisted yarns together so as to form a plurality of braided strands (12) and braiding a plurality of braided strands together so as to form large-diameter braided rope (10); characterised by low-elongation fibres being twisted together at a twist factor in the range from about 125 to about 145 so as to form said twisted yarns (14), the twisted yarns being braided together at a pick multiplier in the range from about 1.0 to about 2.0 so as to form said braided strands (12) and said braided strands being braided together at a pick multiplier in the range from

about 2.0 to about 3.6 so as to form said large-diameter braided rope (10).

12. A large-diameter braided rope comprising a multiplicity of fibres (16) twisted together so as to form a plurality of twisted yarns (14), a plurality of twisted yarns braided together so as to form a plurality of braided strands (12) and a plurality of braided strands braided together so as to form large-diameter braided rope (10); characterised by low-elongation fibres (16) twisted together at a twist factor in the range from about 125 to about 145 so as to form said twisted yarns (14) the twisted yarns braided together at a pick multiplier in the range from about 1.0 to about 2.0 so as to form said braided strands (12) and said braided strands braided together at a pick multiplier in the range from about 2.0 to about 3.6 so as to form said large-diameter braided rope (10)."

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

D9 had already been mentioned in the notice of opposition. It was therefore not late filed. It had been filed in the appeal proceedings as evidence of the knowledge of the skilled person, this being done in light of the reasoning in the decision under appeal. D9 should therefore be admitted into proceedings.

Ropes having a double-braided structure according to the preamble of claim 1 were well known in the art, as could be seen from D3 or D8 each of which could be regarded as representing the closest prior art. D9 also

disclosed a double-braided rope on page 4 and could thus likewise be used as the closest prior art.

Table 7 of D9 disclosed "Flechtlänge" (braid length) values of a braided rope of diameter d , for ropes made of hemp or other polymer fibres. The braid length value had a maximum falling in the range of $3.7d$ to $3.9d$ for different fibre types. The property "Flechtlänge" measured the length of the reoccurrence of a particular yarn in a braided rope. It corresponded to the pick of the rope in relation to the rope diameter. Consequently the division of the values indicated in Table 7 of D9 by πd (to provide the relationship in terms of the rope circumference instead of the rope diameter) resulted in values falling within the range defined for the pick multiplier in the claims. D1 disclosed a similar range for the lay length of a laid rope which corresponded to the braid length of a braided rope. Since the braid length corresponded to the pick, the values indicated in D1 also anticipated the claimed range of the pick multiplier.

Although the cited prior art documents did not disclose the range of twist factor and the two ranges for the pick multiplier as defined in the claims in combination, these ranges were obvious given the common general knowledge of the skilled person as evident from e.g. D2 and were moreover derivable from standards as in e.g. D9. The variation and adaptation of the different parameters during the production of the rope were always considered by the skilled person each time a material was changed due to variations such as e.g. the humidity of a natural fibre material. In paragraph [0026] of the patent, a twist factor was disclosed of

"about 150" for double braided ropes having conventional twisted strand construction, whereas the claims defined a slightly reduced twist factor in the range of 125 to 145. This variation in yarn property would be contemplated by the skilled person when constructing a rope from commonly known low-elongation polymer fibres. Similarly, the rope maker would experiment with the settings of the braiding machine so as to obtain convenient pick multiplier values, without using inventive skill.

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

D9 should not be admitted into the proceedings, since it was late filed and not *prima facie* more relevant than the documents already on file. D9 did not disclose a rope with a double braided structure, nor did it disclose the use of low-elongation fibres. Furthermore, D9 failed to disclose any of the three parameters, let alone the specific ranges of said parameters defined in claim 1.

The photographs forming D8 were illegible. D3 represented the closest prior art. The rope shown on page 4 of D9 was a twisted rope, not a braided rope.

The property "Flechtlänge" mentioned in D9 could not be equated to the pick of a braided rope, since a pick required crossing of one strand over/under a strand going in the opposite direction. The braid length ("Flechtlänge") of a braided rope also could not be equated with a lay length. The appellant's assertion that the pick multiplier was indicated in D1 was

incorrect; D1 related to a laid hawser rope in which picks did not exist. The appellant had failed to show how the braid and lay lengths that it had calculated from D1 and D9 corresponded to pick multiplier values in any sense. The Board had already stated this in its preliminary opinion and the appellant had filed no further evidence. Moreover, the claims specified two different ranges for the pick multipliers of the braided yarns and braided strands, and it was anyway not clear to which of these the braid/lay length referred to by the appellant was intended to relate.

The appellant had failed to establish in any sense that the claimed parameters could be derived from the prior art, let alone that they would be used in the context of a rope defined in D3 to arrive at the claimed invention.

Reasons for the Decision

1. The appeal is admissible.
2. As the Board had noted in its communication sent to the parties in preparation for oral proceedings, the objection to lack of novelty and the objections under Article 83 EPC appearing in the decision under appeal were not substantiated in the appeal grounds. These objections are therefore not part of the appeal procedure (see Article 12(2) and (4) RPBA) and are thus not considered further.
3. D9 is admitted into the proceedings. The document was already referred to by the opponent (appellant) when filing its notice of opposition, even though the

document itself was not filed. The document itself was admittedly first filed together with the grounds of appeal, but this was done in support of the appellant's submissions concerning the knowledge of the person skilled in the art of rope making. The opposition division in its decision on inventive step (item 2.6) had indeed concluded that the skilled person had no guidance to arrive at the various parameter ranges as claimed and moreover that none of the cited documents gave a hint concerning the pick multiplier defined in the independent claims. The Board thus concludes that the filing of D9 constitutes a legitimate response to the reasoning contained in the decision under appeal.

4. Amongst the cited documents D3 represents the closest prior art to the subject-matter of claims 1 and 12. As agreed by the parties, D3 discloses the features of the preamble of claims 1 and 12, but none of the features of the characterizing portion of either claim.

The rope shown e.g. on page 4 of D9 does not comprise a braided structure but is a cable-laid construction with three twisted strands. The ropes on page 5 of D9 are of a single braided construction and thus do not correspond to the double braiding as defined in the preamble of claim 1. D9 is therefore not a closer prior art starting point than D3.

5. The appellant's central argument to demonstrate that the claimed invention does not involve an inventive step is based on the allegation that the property "Flechtlänge" of a braided rope, as indicated in Table 7 of D9, can be equated with, or at least corresponds to the pick of a rope, so that from the

values given in Table 7 the pick multiplier of a braided rope may be calculated.

According to paragraph [0002] of the patent, the dimensionless parameter pick multiplier (PM) of a braided rope of diameter d is given by the number of picks (N_p) per unit length (L) times the ropes circumference, i.e.

$$PM = N_p/L * \pi d.$$

D9 is a German DIN standard defining requirements for fibre ropes. In Table 7 the property of maximum "Flechtlänge l_2 " of a round braided rope is indicated as varying as a function of the rope's diameter d and of the material in the range of

$$l_2 = (3.7 \dots 3.9) * d.$$

From the accompanying drawing in D9 it can be inferred that the property "Flechtlänge" corresponds to the length of the reoccurrence of a particular yarn element in a braided rope.

However, D9 does not mention the terminology "pick" (which according to the respondent means a crossing of one strand over or under a strand going in the opposite direction), "pick number" or "pick multiplier" of a braided rope. It is also silent about any relationship between pick and l_2 . In this regard it is also noted that, despite the provisional opinion of the Board, the appellant filed no document which supports its allegation that a correspondence exists between the braided length and the pick multiplier, let alone that

the values of pick multiplier defined in the claims can indeed be equated with the values in D9.

Although the appellant argued that the values in D9 divided by πd , i.e. $(3.7 \dots 3.9) \cdot d / \pi d$ were equal to values of 1.18 ... 1.24, which values fall within one of the braided yarn pick multiplier ranges of claims 1 and 12, this similarity, without additional supporting evidence, cannot be regarded as being more than a purely arbitrary occurrence.

Because the alleged correspondence between the feature "pick multiplier" used in the claims and the property "Flechtlänge l_2 " indicated in D9 is not based on documentary evidence of any type, the Board concludes that the ranges of values for the pick multiplier defined in the claims cannot be derived from D9.

Starting from a braided rope as known from D3 and attempting to solve the problems indicated in paragraph [0009] of the patent specification, i.e. to provide a rope and a method for its construction, where the rope has a high degree of translational efficiency, especially when using low-elongation fibre materials, and avoids the use of excessively large twisted yarns for a large diameter construction, the teaching of D9 therefore cannot lead a skilled person to the subject-matter of claims 1 and 12.

Similarly, no teaching towards the claimed invention can be derived from D2, as this document concerns only very general principles of rope making and makes no mention of e.g. pick or pick multipliers or the

principles which might be involved in arriving at appropriate values of these in braided ropes.

6. Even if it had been convincingly shown that a pick multiplier value falling within the range of 1.0 to 2.0 were indeed derivable from Table 7 of D9, the appellant has anyway failed to show where a value falling within the second pick multiplier range for braiding the strands defined in claim 1 and 12 (i.e. from about 2.0 to about 3.6) is disclosed in, or rendered obvious by, D9, let alone why a value falling within each of these ranges together with the claimed range for the twist factor would have been selected by the skilled person, irrespective of the fibre material used even though claims 1 and 12 both define low elongation fibres.

7. As regards D1, this only deals with laid/twisted ropes and not braided ropes. A lay length as disclosed in D1 is not a braided length. Furthermore, the appellant failed to provide any documentary evidence that a lay length was equatable with a braided length let alone a pick multiplier value as defined in the claims. Thus D1 is still further removed from the claimed invention than D9.

8. The appellant also argued that the skilled person would arrive at the claimed rope by trial and error and using normal rope making criteria, since the deviation of the claimed twist factor ("about 125 to about 145") from the conventional value of "about 150" indicated in paragraph [0026] of the patent constituted only a trivial variation, which would have been considered anyway by the skilled person during the design of a rope. This was allegedly because the rope maker had to

adapt the braider settings to the specific material properties and would simply experiment with the braiding parameters "twist factor" and "pick multiplier" in order to obtain the desired properties in the final rope.

The Board is not convinced by these arguments however, since the appellant failed to show why a skilled person using common general knowledge of rope making would inevitably arrive at the claimed combination of low-elongation fibres with a reduced twist factor (compared to conventional ropes) in combination with a value lying within each of the two different ranges of the pick multiplier defined for the yarns and the strands when forming the large diameter rope. Whilst the skilled person could have arrived at the subject-matter of claims 1 and 12 by varying the mentioned parameters in different ways, there is no teaching for a skilled person in any cited document as to the way in which the parameters defined in the claims should be varied when designing a rope known from D3 in order to solve the problems identified in paragraph [0009] of the patent, let alone when designing a rope comprising low elongation fibre materials.

9. As to the appellant's further argument that D8 might be considered an even closer prior art than D3 since it allegedly discloses not only a rope according to the preamble of claim 1 but also one which comprises low-elongation fibres, this would not alter the foregoing findings which are valid even irrespective of the fibre type involved.

The photographs constituting D8 are unclear, such that very little information can anyway be unambiguously derived therefrom. However, as stated above, and even on the assumption that D8 does disclose the alleged additional feature, the finding on inventive step when starting from D3 or D8 would anyway remain unaltered.

10. The Board therefore finds no reason to deviate from the decision of the opposition division on this issue whereby the subject matter of claims 1 and 12 involves an inventive step.

The Board thus concludes that the requirement of Article 56 EPC 1973 is fulfilled.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar

The Chairman

M. Patin

P. Alting van Geusau