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

Case Number: T 1380/15 - 3.2.08

Application Number: 04787615.6

Publication Number: 1723348

IPC: F16G1/28

Language of the proceedings: EN

Title of invention:

Use of a toothed belt in oil and relative timing control system

Patent Proprietor:

DAYCO EUROPE S.r.l.

Opponent:

The Gates Corporation

Headword:

Relevant legal provisions:

EPC Art. 123(2), 111(1), 56, 84

Keyword:

Amendments - main request - claim 1 - no intermediate
generalisation - claim 22 - not allowable - auxiliary request
2 - not allowable
Appeal decision - remittal to the department of first instance
(no)
Inventive step - auxiliary requests 1,5,6 (no)
Claims - clarity - auxiliary requests 3,4 (no)

Decisions cited:

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1380/15 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 22 November 2018

Appellant: DAYCO EUROPE S.r.l.
(Patent Proprietor) Via Papa Leone XIII, 45
Frazione Chieti Scalo
Chieti (IT)

Representative: Bergadano, Mirko
Studio Torta S.p.A.
Via Viotti, 9
10121 Torino (IT)

Appellant: The Gates Corporation
(Opponent) 1551 Wewatta Street
Denver, CO 80202 (US)

Representative: Cockerton, Bruce Roger
Carpmaels & Ransford LLP
One Southampton Row
London WC1B 5HA (GB)

Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
6 May 2015 concerning maintenance of the
European Patent No. 1723348 in amended form.**

Composition of the Board:

Chairwoman P. Acton
Members: M. Foulger
P. Schmitz

Summary of Facts and Submissions

- I. With the decision dated 6 May 2015, the opposition division decided that the patent could be maintained in amended form according to the then valid second auxiliary request.
- II. Appellant 1 (patent proprietor) and appellant 2 (opponent) filed appeals against this decision.
- III. Oral proceedings took place before the Board on 22 November 2018.
- IV. Appellant 1 (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained as granted, or in the alternative that
 - the case be remitted to the opposition division, in case claim 1 of the patent as granted met the requirements of Article 123(2) EPC,
 - that the patent be maintained as found allowable by the opposition division, i.e. the then valid second auxiliary request, or
 - that the patent be maintained on the basis of one of the requests labelled first to fifth auxiliary sets of claims filed with letter of 21 January 2016.

Appellant 2 (opponent) requested that the decision under appeal be set aside and that the patent be revoked. Additionally, they requested that the comparative data filed by appellant 1 (patent proprietor) with letter of 22 October 2018 not be admitted into the proceedings.

- V. a) Main request (patent as granted)

Claim 1 reads:

"**(a)** Use in direct contact with oil or partially immersed in oil **(b)** of a toothed belt (1) comprising **(b1)** a body (2), **(b2)** a plurality of teeth (4) extending from at least a first surface of said body, **(b3)** said teeth being coated by a first fabric (5), and **(b4)** a plurality of resistant inserts (3); **characterized in that (c)** said resistant inserts are produced from at least a first and a second material chosen in the group constituted by glass fibres, aramid fibres, polyester fibres, PBO fibres and carbon fibres, **(d)** said first material entirely surrounds said second material; **(e)** and said body comprises as main elastomeric material a copolymer formed from a diene and from a monomer containing nitrile groups in a percentage between 33 and 49 weight % with respect to the final copolymer."

(Feature numbering added by the Board in bold)

Claim 22 reads

"Timing control system for a motor vehicle engine comprising at least one drive pulley, one driven pulley, a toothed belt (1) comprising the features of the toothed belt as described in any of the preceding claims and means for maintaining said toothed belt (1) in oil-wet condition."

b) First auxiliary request (as found allowable by the opposition division)

Claim 1 has the following features added to claim 1 of the main request:

"**(f)** said fabric is externally by a resistant layer which comprises a fluorinated elastomer, a first

elastomeric material and a vulcanising agent,
(g) said fluorinated plastomer is present in said resistant layer in an amount greater than said first elastomeric material."

Claim 22 has been cancelled.

c) Second auxiliary request

"continuous" has been added to claim 1 of the first auxiliary request i.e. claim 1 now reads: "Use in continuous direct contact.."

d) Third and fourth auxiliary requests

Claim 1 of the first auxiliary request has been amended such that, in the third auxiliary request, claim 1 reads "use... in substitution of chains and gears" and, in the fourth auxiliary request, claim 1 reads "use ...in replacement of chains and gears, said belt operating..."

e) Fifth auxiliary request

The feature whereby "said first material has a lower modulus with respect to said second material" has been added to claim 1 of the first auxiliary request

f) Sixth auxiliary request

The feature whereby "said first material is glass fibre and second material is carbon fibre" has been added to claim 1 of the fifth auxiliary request.

VI. Appellant 2 (opponent) argued essentially the following:

a) Main request - Added subject-matter

i) Claim 1

Claim 1 was based on claims 1, 3 and 8 as originally filed while feature (e) was taken from the description. There was an unallowable intermediate generalisation because on p. 8, l. 13 - 21 the resistant layer was described, in combination with feature (e), as being essential for solving the problem of the application. Hence, omitting the feature of the resistant layer went beyond the subject-matter of the application as originally filed.

ii) Claim 22

The application as originally filed did not give any basis for a generalised feature such as "means for". The passages referred to by the appellant 1 (proprietor) did not provide any detail of such a means, there was in fact no device described that could be considered a "means for" nor could these embodiments be generalised to "means for". The subject-matter of this claim therefore went beyond that of the application as originally filed.

b) Remittal to the opposition division

Inventive step had already been discussed before the opposition division. The case should not therefore be remitted.

c) Admittance of comparative test filed with letter of 22 October 2018

The comparative test was filed one month before the oral proceedings. The test did not fully explain which parameters had been altered and it was not possible to reproduce the test with the information provided.

d) First auxiliary request (patent as maintained by the opposition division) - inventive step

i) Closest prior art

D22 was the closest prior art because this document disclosed the use of a timing belt in oil (feature (a)). In particular, col. 3, l. 18 - 22) mentioned "applications which require oil resistance" and then cited as an example "timing belts". Furthermore, the whole point of D22 was to provide a belt which was resistant to oil, see col. 6, l. 16 - 21.

Furthermore, D22 disclosed features (b1), (b2), (c) and (e) of claim 1. In particular D22 disclosed the use of different types of fibres in combination with each other (col. 2, l. 41 - 47).

The subject-matter of claim 1 therefore differed from the use of a toothed belt known from D22 by features (b3), (d), (f) and (g).

ii) Problem to be solved

The features identified above contribute to extending the working life of the belt (cf. patent paragraph [0017]). They do this however through different mechanisms - feature (b3) contributes to reducing the abrasion of the teeth and feature (e) contributes to reducing delamination within the body. Therefore, two partial problems may be identified:

- to improve the abrasion resistance of the belt,
- to reduce delamination of the belt.

iii) Solution

D4 taught reducing abrasion by using a fabric to coat the teeth surfaces. Furthermore, D10 taught using inserts made from two different materials and thus provided more details about how the teaching of D22, using different types of fibres (see i) above) could be put into practice.

e) Second auxiliary request - added subject-matter

Claim 1 now reads "use in continuous direct contact with oil or partially immersed in oil". The term "continuous" was not literally disclosed in the application as filed. The passages cited by appellant 1 (proprietor) did not provide a basis for "continuous direct contact" because all of them could simply be referring to a partially immersed belt i.e. the other alternative of claim 1, for example where the timing belt passed through the engine sump.

The subject-matter of claim 1 therefore extended beyond that of the application as originally filed.

f) Third and fourth auxiliary requests - clarity

It was not possible to determine whether the belts were used in substitution for or in replacement of another element. Claim 1 of these requests was therefore not clear.

g) Fifth and sixth auxiliary requests - inventive step

The added features of these claims were also known from D4 and D10. The combination of the teachings of D22, D4 and D10 would therefore also have led the skilled person to the subject-matter of claim 1 without requiring an inventive step.

VII. Appellant 1 (patent proprietor) argued essentially the following:

a) Main request - Added subject-matter

i) Claim 1

Claim 1 was based on claims 1, 3 and 8 together with p. 5, l. 9 - 11 of the description, all as originally filed. The skilled person would not consider the resistant layer as being essential for the invention as defined by claims 1, 3 and 8. Thus there was no unallowable intermediate generalisation and the subject-matter of claim 1 did not extend beyond that of the application as originally filed.

ii) Claim 22

The feature "means for maintaining the toothed belt in oil-wet condition" was directly and unambiguously derivable from the application as originally filed. In particular, the application disclosed two specific discrete embodiments of different means which justified a generalisation to means. These were on p. 3, l. 27 and p. 13, l. 34 where a partial immersion in an oil bath was described and on p. 14, l. 8 - 9 where the oil was sprayed directly onto the belt by means of a pipe. Moreover, the replacement of chains and gears

(see p. 15, l. 5 - 7) made it implicit that such means were present.

Thus the subject-matter of claim 22 was directly and unambiguously derivable from the application as originally filed.

b) Remittal to the opposition division

As the opposition division had not decided on inventive step of the subject-matter of claim 1 of the main request, the case should be remitted to the opposition division for consideration of this.

c) Admittance of comparative test filed with letter of 22 October 2018

The comparative test was filed one month before the oral proceedings and in reaction to the communication of the Board. In the letter accompanying the comparative tests, the structure of belts tested was described and so the test could easily have been reproduced by appellant 2 (opponent).

d) First auxiliary request (patent as maintained by the opposition division) - inventive step

i) Closest prior art

D22 could not be regarded as the closest prior art because this document did not disclose the use of a timing belt in oil (feature (a)). Furthermore, D22 did not disclose features (b3), (d), (f) and (g).

ii) Problem to be solved

The distinguishing features over D22 allowed the use of a toothed belt in oil maintaining the mechanical properties of adhesion, precision of meshing and noise emission without decreasing the performance of the belt. Moreover, the distinguishing features provided a synergetic effect which went beyond the simple sum of their individual effects. Thus the partial problem approach suggested by appellant 2 (opponent) was not correct.

iii) Solution

The documents D4 and D10, relied upon by appellant 2 (opponent), did not mention the use of a belt in oil. The skilled person would not therefore recognise that the teaching of these documents was relevant in solving the problem posed. The skilled person would moreover have no motivation to add a low friction layer to a belt which was to work in oil.

The subject-matter of claim 1 therefore involved an inventive step.

e) Second auxiliary request - added subject-matter

The term "continuous" had been added to claim 1. The following passages gave a basis for continuous direct contact with oil:

- description p. 2, l. 14 - 15 "function with oil or even partly immersed in oil",
- description p. 13, l. 28 - 29 "the toothed belts 1, 20, 31 are in direct contact with oil",
- description p. 15, l. 3 - 5 "narrower belts which are able to function in direct contact with oil".

The amendment to claim 1 was therefore supported by the

application as originally filed.

f) Third and fourth auxiliary requests - clarity

Claim 1 of these requests further defined the claimed use. They were therefore clear.

g) Fifth and sixth auxiliary requests - inventive step

The configuration in claim 1 of these requests allowed a better result when the belt was used in oil. As D10 did not mention oil then it could not teach towards the claimed solution.

Claim 1 of both fifth and sixth auxiliary requests involved an inventive step.

Reasons for the Decision

1. Main request - Added subject-matter

1.1 Claim 1

The features (a) - (d) of granted claim 1 are to be found in claims 1, 3 and 8 as originally filed.

Appellant 2 (opponent) pointed out that on page 8, lines 13 to 21 it is stated that it is the specific combination of the composition of the belt's body (feature (e)) with the resistant layer that makes it possible to prevent a decrease in the mechanical properties, decreased adhesion, poorer meshing and decreased resistance to wear. Since the presence of the resistant layer was essential for the alleged invention, omitting it led to an intermediate generalisation.

However - as pointed out by appellant 1 (proprietor) - feature (e) is also disclosed in the originally filed description on page 5, lines 9 to 11. This part of the description refers to the composition of the belt's body without any reference to the remaining parts of the belt such as the fabric or the resistant layer.

Moreover, the belt's body must however be made of something and the material of feature (e) was directly and unambiguously disclosed on page 5. Thus, the skilled person would recognise from the application as originally filed that in order to carry out the teaching of claims 1, 3 and 8 as originally filed the material of feature (e) is to be used.

Hence, the subject-matter of claim 1 is directly and unambiguously derivable from the application as originally filed.

1.2 Claim 22

The feature "means for maintaining the toothed belt in oil-wet condition" was added in examination proceedings. It is not disputed that this feature is not literally disclosed in the application as filed. Appellant 1 (proprietor) argues however that the application as filed discloses two ways of achieving the above feature so the level of generalisation was justified. These are the partial immersion in an oil bath (p. 13, l. 34) or an arrangement with a tensioner and a pipe to spray oil onto the belt (p. 14, l. 8 - 9). In the first case it is not described what the "means for" should actually be. In the second case it is not apparent how this disclosure could justify a generalisation to "means for". Moreover, the mere fact that the belt replaces a chain does not automatically mean that such means are present. The Board therefore considers that "means for maintaining said toothed belt in oil-wet condition" is not directly and unambiguously derivable from the application as originally filed.

Claim 22 does not comply with the requirements of Article 123(2) EPC. The main request is thus not allowable.

2. Remittal to the opposition division

Appellant 1 (proprietor) requested remittal to the opposition division in the event that the Board decided that claim 1 of the main request complied with the requirements of Article 123(2) EPC.

The Board did indeed decide that claim 1 complied with the requirements of Article 123(2) EPC. However, given the age of the patent (filing date 29 September 2004) and that the opposition division did decide on inventive step, albeit for a more restricted claim, the Board decided not to remit the case but rather to decide on the outstanding issues (Article 111(1) EPC).

3. Admittance of comparative test filed with letter of 22 October 2018

The comparative test was filed one month before the oral proceedings. This in itself did not give appellant 2 (opponent) sufficient time to evaluate the test especially as the test had a duration of 1100 hours (see p. 10 of the letter of 22 October 2018).

The question of whether there was synergy between the different differentiating features of claim 1 had already been present in the proceedings before the opposition division, see for example the attacked decision paragraph [5.3]. Thus the filing of the comparative test could not be seen as a reaction to the Board's communication dated 7 June 2018 which pointed out that this question would have to be discussed.

For the above reasons the Board did not admit the comparative test into the proceedings (Articles 13(1) and (3) RPBA).

4. First auxiliary request (patent as maintained by the opposition division) - inventive step

- 4.1 Closest prior art

The Board considers D22 to be the closest prior art because this document discloses the use of a toothed belt in oil (feature (a)). In particular, col. 3, l. 20 - 22 states that the belt is for applications which require oil resistance. An example of such a belt is given at l. 24 as timing belts used in internal combustion engines. Timing belts are cited in this context as a part of a list of applications which "undergo repeated bending and deformation in air or oil at high temperatures." Thus, the Board considers that the use of a belt in direct contact with oil is known from D22.

Furthermore, D22 discloses the following features of claim 1:

(b) of a toothed belt (col. 3, l. 24 "timing belt" which implicitly has teeth) comprising

(b1) a body,

(b2) a plurality of teeth (see b) extending from at least a first surface of said body, and

(b4) a plurality of resistant inserts (col. 2, l. 41-47)

(c) said resistant inserts are produced from at least a first and a second material chosen in the group constituted by glass fibres, aramid fibres, polyester fibres, PBO fibres and carbon fibres (col. 2, l. 41-47), wherein

(e) said body comprises as main elastomeric material a copolymer formed from a diene and from a monomer containing nitrile groups in a percentage between 33 and 49 weight % with respect to the final copolymer (see col. 3, table 1).

4.2 Differentiating features

It is common ground that the following features are not

known from D22:

the teeth are coated by a first fabric (feature (b3)),
the first material entirely surrounds the second
material (feature (d)),
the fabric is externally by a resistant layer which
comprises a fluorinated elastomer, a first elastomeric
material and a vulcanising agent (feature (f)),
the fluorinated elastomer is present in the resistant
layer in an amount greater than the first elastomeric
material (feature (g)).

4.3 Problem to be solved

Appellant 1 (proprietor) suggests that the problem to be solved is to replace the timing chain with a toothed belt without having to make any adjustments to the drive system which implies that the use must take place in the presence of oil (cf. application, p. 2, l. 14 - 15). Moreover, it implies that the belt should be narrower than those used in dry conditions. The distinguishing features identified above allow this use of a narrow belt in oil.

The Board does not find the above argument persuasive because according to the problem-solution approach, the technical effect resulting from the distinguishing features is first to be identified and then the problem is formulated. In the present case, although the features identified above contribute to extending the working life of the belt (cf. patent paragraph [0017]) they do this however through different mechanisms; features (b3), (f) and (g) contribute to reducing the abrasion of the teeth and feature (e) contributes to reducing delamination within the body. Therefore, two partial problems are solved by the differentiating

features:

- i) to improve abrasion resistance of the belt,
- ii) to reduce delamination in the body of the belt.

4.4 Solution

D4 teaches using a fabric to coat the tooth surfaces - see paragraphs [0004], [0005], [0035] with the technical effect of reducing abrasion. The fact that the fabric has the additional effect of reducing friction would not dissuade the skilled person from applying the teaching of this document to an oil environment because of the clear teaching that it increases resistance to abrasion (see paragraph [0004]). Moreover, from paragraph [0005] it is clear that this is an additional effect over and above the effects described in the preceding paragraph.

D10 deals with rubber belts (p. 1, 1st para.) in particular timing belts p. 1, l. 25- p. 2, l. 7. Its object is to provide "a hybrid cord for rubber reinforcement having enough strength and excellent flexural fatigue resistance and also having excellent adhesion property relative to rubber and dimensional stability " (p. 3, l. 4 - 10). To solve this, it teaches having the first material around the second material. Appellant 1 (proprietor) disputes however whether this qualifies as "entirely surround[ing]" as required by the claim. The Board considers that Figs. 1 & 3b of D10 do clearly and unambiguously disclose that the first material entirely surrounds the second material.

In seeking to solve the partial problems identified above the skilled person would apply the teachings of D4 and D10 to the belt disclosed in D22. This would

have not required the exercise of inventive activity because the advantages are clearly taught in these prior art documents.

Hence, the subject-matter of claim 1 does not involve an inventive step.

5. Second auxiliary request (first auxiliary set of claims)

Claim 1 now reads "use in continuous direct contact with oil or partially immersed in oil". It is common ground that the term "continuous" is not literally disclosed in the application as filed. Appellant 1 (proprietor) argues however that the following passages give a basis for continuous direct contact with oil:

- description p. 2, l. 14 - 15 "function with oil or even partly immersed in oil",
- description p. 13, l. 28 - 29 "the toothed belts 1, 20, 31 are in direct contact with oil",
- description p. 15, l. 3 - 5 "narrower belts which are able to function in direct contact with oil"

These passages do not however provide a persuasive basis for "continuous direct contact" because all of them could simply be referring to a partially immersed belt i.e. the other alternative of claim 1, for example where the timing belt passes through the engine sump.

The subject-matter of claim 1 therefore goes beyond that of the application as originally filed.

6. Third and fourth auxiliary requests - clarity

Claim 1 of the third and fourth auxiliary request attempt to define the invention in that the belt is

used in substitution of chains and gears (third auxiliary request) or in replacement of chains and gears (fourth auxiliary request).

These formulations lead to the problem that, in looking at for example an engine with a belt running in oil, it is not possible to determine whether the belt is used in substitution or in replacement of chains and gears. Thus, the scope of protection is not unambiguously delimited. Consequently, the third and fourth requests are not allowable because claim 1 is not clear (Article 84 EPC).

7. Fifth and sixth auxiliary requests - fourth and fifth auxiliary sets of claims respectively - inventive step

The fifth auxiliary request adds the feature to claim 1 of the first auxiliary request that the first material has a lower modulus with respect to the second material. The sixth auxiliary request further specifies that the first material is glass fibre and the second material is carbon fibre.

D10, p. 3, l. 13 - 16 teaches using a fibre with a higher elastic modulus at the centre of the cord (i.e. insert in the language of the claim) and a fibre with a lower modulus at the skin side, as in the feature added to claim 1 of the fifth auxiliary request. Moreover, D10, see claims 6 and 7, teaches using carbon fibre in the centre and glass fibre at the skin, as in the additional features of the sixth auxiliary request.

Thus combining the teaching of D10 with the teachings of D22 and D4 as discussed above would also lead the skilled person to the subject-matter of claim 1 without

the exercise of inventive activity.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairwoman:



C. Moser

P. Acton

Decision electronically authenticated