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**Datasheet for the decision
of 28 October 2016**

Case Number: T 2381/11 - 3.2.05

Application Number: 02704125.0

Publication Number: 1350055

IPC: F16M1/08

Language of the proceedings: EN

Title of invention:

Low growth power transmission belt

Patent Proprietor:

The Gates Corporation

Opponent:

Dayco Europe S.r.l.

Headword:

Relevant legal provisions:

EPC 1973 Art. 100(b), 111(1)

Keyword:

Sufficiency of disclosure - enabling disclosure (yes)
Remittal to the department of first instance (yes)

Decisions cited:

Catchword:



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Case Number: T 2381/11 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 28 October 2016

Appellant: The Gates Corporation
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 9 September
2011 revoking European patent No. 1350055
pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman M. Poock
Members: P. Lanz
C. Schmidt

Summary of Facts and Submissions

- I. The appeal by the patent proprietor is against the decision of the opposition division to revoke European patent EP-B-1 350 055 on the grounds that it did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.
- II. During the opposition proceedings, the opponent raised the grounds for opposition according to Article 100(a) (lack of novelty and lack of inventive step) and 100(b) EPC 1973.
- III. Oral proceedings were held before the board of appeal on 28 October 2016.
- IV. The appellant requests that the decision under appeal be set aside, that the board holds that the disclosure of the invention in the patent as granted is sufficient and that the case be remitted to the opposition division. As an auxiliary measure, it is requested that the board holds that the disclosure of the invention in the patent according to the first auxiliary request as filed with the statement setting out the grounds of appeal of 1 June 2012 is sufficient and that the case be remitted to the opposition division.
- V. The respondent (opponent) requests that the appeal be dismissed.
- VI. During the appeal proceedings reference has been made to the following documents:

D8: Declaration of William Fraser Lacy, accompanied by annexes 1, 2 and 3;

D9: GM Europe Engineering Standard GME 60468 (August 2002);

D10: GM Europe Engineering Standard GME 60469 (September 2002).

VII. Independent claims 1 and 8 as granted read as follows:

"A power transmission belt (10) comprising a belt body (12) formed of a cured elastomer composition; a tensile member (18) of helically spiraled cord comprising at least one yarn formed of a carbon fiber embedded in the belt body, wherein the carbon fiber possesses a tensile modulus in the range of from 50 GPa to 350 GPa; and a cord treatment composition comprising an elastomer latex coating at least a portion of said carbon fiber, characterized in that:

a) said cord treatment composition further comprises a resorcinol formaldehyde reaction product;

b) said cord treatment composition possesses at least one of an elastic modulus at 20°C in the range of from $1.0 \times 10^6 \text{ Nm}^{-2}$ to $5.0 \times 10^7 \text{ Nm}^{-2}$ and an elastic modulus at 100°C in the range of from $5.0 \times 10^5 \text{ Nm}^{-2}$ to $4.0 \times 10^7 \text{ Nm}^{-2}$, and

c) said belt exhibits permanent belt growth of not more than 0.1 % change in said belt length at 100°C after 48 hours as determined by the High Temperature Belt Growth Analysis method defined herein."

"A process for manufacturing a toothed belt possessing improved belt growth resistance and comprising a belt body of a cured elastomer composition; belt teeth formed of the body and spaced apart at a pitch; a tensile member of helically spiraled cord comprising at least one carbon fiber yarn embedded in the belt body

wherein the carbon fiber possesses a tensile modulus in the range of from 50 GPa to 350 GPa; and a cord treatment composition coating at least a portion of said carbon fiber, said process comprising the steps of:

a. applying said cord treatment composition comprising an elastomer latex and a resorcinol formaldehyde reaction product to the cord to form a treated cord, wherein said cord treatment composition possesses at least one of an elastic modulus at 20°C in the range of from $1.0 \times 10^6 \text{ Nm}^{-2}$ to $5.0 \times 10^7 \text{ Nm}^{-2}$ and an elastic modulus at 100°C in the range of from $5.0 \times 10^5 \text{ Nm}^{-2}$ to $4.0 \times 10^7 \text{ Nm}^{-2}$;

b. exposing the treated cord under conditions of temperature and time sufficient to bring the water content of said treated cord to a level in the range of 1% to 25% by weight based on the weight of the treated cord, to form a processed treated cord;

b. [sic] incorporating the processed treated cord into an un-cured elastomer composition to form an assembly; and

c. curing the assembly, wherein the elastic modulus of said cord treatment composition and said conditions of temperature and time are selected to result in said belt possessing permanent belt growth of not more than 0.1 % change in said belt length at 100°C after 48 hours as determined by the High Temperature Belt Growth Analysis method defined herein."

VIII. The appellant's submissions may be summarised as follows:

In the impugned decision the opposition division had essentially held that the definition of the "High Temperature Belt Growth Analysis" referred to in

granted claims 1 and 8 was not sufficiently disclosed in the patent in suit, so that the claimed invention could not be performed in a reliable manner. In particular, the opposition division had considered the following information regarding the testing apparatus of Figure 2 and the results of the examples contained in Table 2 of the patent to be missing:

- (a) the exact distances of the pulleys from each other,
 - (b) the exact diameters of the pulleys,
 - (c) the material of the pulleys, and
 - (d) the shape of the pulleys and of the belt.
- (e) The deficiencies (a) to (d) had a considerable cumulative effect.

(f) The skilled person could not rely on examples 2, 4 and 6 to determine the missing parameters (a) to (d) by trial and error, since this would require trying an excessive number of combinations. Moreover, Table 2 showed that the variation of the belt growth after 48 hours was high, in particular in view of the claimed maximum belt growth of 0.1%. Consequently, one could not distinguish whether the variation in the belt growth was due to changes of the test parameters or caused by variations between the tested sample belts. Table 2 could thus not be used to fine-tune the testing apparatus. Additionally, the claimed maximum belt growth of 0.1% was very low, so that even a minor deviation in the parameters (a) to (d) could be decisive for a belt falling within or outside of the scope of the claim.

(g) The skilled person could not adapt the test to belts falling under the claims but having a length or tooth geometry different from the specific belts described in the opposed patent.

However, none of these conclusions by the opposition division could withstand scrutiny. It had to be borne in mind that an invention was in principle sufficiently disclosed if at least one way was clearly indicated enabling the skilled person to carry out the invention without undue burden. The opposed patent contained several detailed examples and gave a fully self-sufficient technical teaching that enabled the skilled person to carry out the high temperature belt growth test. The most relevant parts of the opposed patent were paragraph [0045] and Figure 2, which disclosed all of the following key parameters of the test: the temperature (100 °C), the duration of the test (48 hours), the tension on the belt (200 N), the load on the belt (none), the rotation speed (6200 rpm applied at the driver pulley 32), and the pulley arrangement (Figure 2). In addition, paragraph [0045] stated that driver pulley 32 and pulley 40 each possessed 19 sprocket grooves for meshing with the belt teeth, at a 9.525 pitch. Pulley 36 possessed 20 sprocket grooves for meshing with the belt teeth, at a 9.525 pitch. Pulleys 34, 38 were plain, i.e. non-toothed pulleys each measuring 50 mm in diameter; tensioned pulley 42 was also plain and measured 70 mm in diameter. The outside diameter of all of the pulleys could be calculated from this information, so that objection (b) was void.

The relative positions of the pulleys and the pathway along which the belt was flexed in the test were shown in Figure 2. The skilled person would recognise that

variations could be made within the scope of this schematic arrangement without changing the results of the test, in particular since there was no evidence on file that such small variations within the scope of the schematic depiction in Figure 2 would make a difference to the measured belt growth. Consequently, objection (a) was not convincing.

Regarding objections (c) and (d), the skilled person would use steel or another metal for the pulleys as a matter of course. It was merely necessary for the pulleys to have dimensional stability and high wear resistance. Even if a different material were used for the pulleys, the effect on belt growth would be minimal since belt growth was determined by the extension of the reinforcing cord due to repeated flexing under tension of the reinforcing cord. The surface properties and surface wear of the belt were immaterial to the belt growth. This was also true for the shape of the teeth and of the pulleys. Furthermore, the belt temperature was held at a constant 100 °C during the test and any frictional heating of the belt above this temperature would be minimal.

The supposed accumulated effects of deficiencies (a) to (d) were speculative and not backed up by evidence.

Concerning issue (f), the tests of Table 2 were carried out with two belts per example. This sample was too small to determine a standard deviation. Moreover, some of the variation in belt growth could be due to variation between the two belts tested rather than to unreliability of the measurement. However, as shown in the experimental data of document D8, annex 3, the random variations between individual measurements for different belts and different operators were small, so

that it was only necessary to test a small number of belts to arrive at a reliable value for the measured belt growth of about 0.065%.

Referring to objection (g), it was noted that the method of the opposed patent could readily be adapted to belts of different lengths by moving the pulley 36 of Figure 2 to the left or the right to vary the length of the belt path without varying the number of times the belt was flexed per cycle. The high temperature belt growth test described in standard document D9 illustrated just such a pulley movement to measure belts of different lengths. Declaration D8 confirmed that this kind of routine variation was well within the knowledge of a skilled person. The fact that document D9 was silent regarding the tooth geometry indicated that it had no influence on the belt growth. The high temperature belt growth was a conventional, standardised property important for the durability of the belt. Reference was made to standard D9, which required a belt growth of less than 0.08%. This value corresponded closely to the claimed limit of 0.1%, which was thus not arbitrary. Standard document D9 further confirmed that it was possible to accurately measure changes of 0.08% or less in the length of a belt, that the choice of material made no difference to the test, that the size and shape of the belt teeth and the diameter of the pulleys were not important to the test, that the test could be adapted to belts of different lengths without loss of accuracy by relative movement of pulleys z_1 and z_4 and that it was not an undue burden to test a sufficient number of belts to remove experimental/measurement variability (cf. D9, page 2 stating that *"at least 10 toothed belts shall be tested"*).

It was important to recall that there was no evidence on file supporting any of the opposition division's conclusions on the alleged deficiencies. Rather, the opposition division's finding was based on speculation. The same was true for the respondent/opponent's submissions during the appeal proceedings, in particular its assertions about the importance of the missing testing parameters. The slight differences in the results of examples in the patent and the appellant's tests in document D8 were within the standard variation and thus statistically acceptable. It would have been up to the respondent/opponent to demonstrate by its own experiments that the test as indicated in the patent led to substantially different results and that this was due to missing information on the testing conditions. Equally, the argument that the testing conditions given in the patent were not suitable for V-belts was not backed up by any evidence, although the respondent/opponent bore the burden of proof.

Lastly, according to the case law, questions relating to the measurement of parameters were not issues of insufficiency but fell under Article 84 EPC, which was not a ground for opposition. Measurement errors did not make it impossible to determine whether one was operating within the scope of the claim. Grey areas at the periphery of the claim almost always arose when an invention was defined in terms of one or more parameters. As long as the measured values were not totally arbitrary, this was generally accepted.

In view of the above, the disclosure in the patent was sufficient to enable a skilled person to carry out the invention without undue burden.

IX. The respondent's arguments are essentially as follows:

According to established case law, the disclosure of the invention was only sufficient if the patent (application) enabled the skilled person to obtain substantially all embodiments falling within the ambit of the claims. According to the case law of the boards of appeal, in the absence of relevant information (which test method to apply, how to correctly apply a test), reliance on chance amounted to undue burden.

In the present case, contested claim 1 was directed to power transmission belts in general. According to paragraph [0001] of the patent, the term "power transmissions belt" included not only toothed belts but also V-belts, which had a different purpose and a different design. Since toothed belts served as timing belts, the belt growth test was relevant to ensure proper synchronisation; corresponding standards for testing and measuring the belt growth, like those of documents D9 and D10, were known for this type of belt, even if they did not fully correspond to the 48 hours high temperature belt growth test of paragraph [0045] of the patent in suit. V-belts, however, worked on the basis of friction, so that their belt growth was in practice less relevant and its measurement not standardised. The test rig shown in Figure 1 of document D9 could not be adapted for V-belts of variable length since the external diameters of the rollers, their material and the distance between rollers z_1 and z_4 were undefined (cf. objections (a) to (d) and (g) under point VIII.). This information gap was not filled by the examples in the patent and in document D8, which the appellant had submitted during the appeal proceedings in support of sufficiency of disclosure, since they all related exclusively to

toothed belts. Moreover, even the examples of Table 2 of the patent relating to toothed belts suffered from the deficiencies that multiple parameters were varied and that only two belts were measured for each type. Also, their results were inconsistent (cf. the variation of 0.022% in example 2 and 0.038% in example 4). The same was true for the experiments of document D8, annex 3, for which sixteen belts per type were measured, so that a comparison with the examples disclosed in the patent was not possible (cf. objection (f) under point VIII.).

Furthermore, as a matter of principle, an insufficient disclosure could not be remedied later by filing new tests and adding new information about the number of belts to be tested, the number of operators performing the measurements or the submission of a new test specification, as the appellant had done in the present case with document D8. As to the substance, the experimental results of document D8 were not suitable for overcoming the opposition division's specific objections as set out above in point VIII.

Regarding objections (a) to (d), the following observations could be added:

(a) Distances of the pulleys from each other

Document D8 stated that the distance between the pulleys was not irrelevant and depended on the size of the bearing housing. However, the patent specification did not contain any information in that respect. It was noted that document D8, annex 2, additionally indicated that a weight was applied, information which again was missing from the patent specification.

(b) External diameters of the pulleys

Document D8 confirmed that the external diameters of the pulleys were relevant parameters of the belt growth test. Moreover, according to page 2 of document D8 a belt specific value referred to as "PLD" was needed for their calculation. The patent specification, however, was silent as to the importance and specification of this value.

(c) Material of the pulleys

Document D8 only stated that it *"should be obvious that to obtain repeatability the main requests are dimensional stability and high wear resistance"*. It did not however indicate the material of the pulleys.

(d) Shape of the pulleys and of the belt

The tests of document D8, annexes 1 and 2, were said to be performed with belts having an "RU" profile. This information was obviously relevant but not given in the patent specification.

In addition to the deficiencies set out in the contested decision, the disclosure of the patent was insufficient regarding the selection of parameters in order to arrive at the claimed elastic modulus of the cord treatment composition and regarding the exact procedure for measuring the length of the belt.

In summary, the general lack of information and the inconsistencies in the appellant's own experimental results showed that the claimed belt growth test could not be reliably repeated. The skilled person could, hence, not reproduce the invention.

Reasons for the Decision

1. Sufficiency of disclosure

1.1 According to established case law (cf. Case Law of the Boards of Appeal of the European Patent Office, 8th edition 2016, II.C.8), an insufficiency objection presupposes that there are serious doubts, substantiated by verifiable facts. Otherwise it is unlikely to succeed. In order to establish insufficiency, the burden of proof is upon the opponent to establish on the balance of probabilities that a skilled reader of the patent, using his common general knowledge, would be unable to carry out the invention. If the opponent can discharge its burden by convincingly arguing that common general knowledge would not enable the skilled person to put a contested feature into practice, it is then up to the patent proprietor to prove the contrary, i.e. that the skilled person's common general knowledge would enable him to carry out the invention.

1.2 In the present case, the opposition division followed the opponent/respondent's argument that not all parameters of the high temperature belt growth analysis of claims 1 and 8 were sufficiently disclosed in the patent in suit, with the result that the claimed invention could not be performed. In particular, the opposition division and the respondent considered that relevant information about the distances of the pulleys from each other, the external diameters of the pulleys, the material of the pulleys, and the shape of the pulleys and of the belt was missing from the patent. Moreover, the claimed maximum belt growth of 0.1% was very low, so that even a minor deviation in the above

parameters could be decisive for a belt falling within or outside the scope of the claim. Finally, according to the decision under appeal, the skilled person could not adapt the test to belts falling under the claims but having a length or tooth geometry different from the specific belts described in the opposed patent.

- 1.3 In its statement of grounds of appeal, the appellant relies on the experimental evidence submitted as document D8 (including annexes 1 to 3) and on standard documents D9 and D10 to prove that the information given in the opposed patent, in particular in paragraph [0045] and Figure 2, was in fact sufficient to comprehensively define a high temperature belt growth analysis.

- 1.4 The board observes that documents D9 and D10 define standardised test methods relating to the measurement of the belt elongation of toothed belts at elevated temperatures. They were apparently issued by General Motors in August and September 2002, which is after the filing date of the patent in suit. They therefore do not belong to the state of the art as defined in Article 54(2) EPC 1973. Following the settled jurisprudence of the boards of appeal (cf. Case Law of the Boards of Appeal of the European Patent Office, 8th edition 2016, II.C.5.8), a post-published document cannot cure any insufficiency of disclosure; it can, however, be of use as evidence for showing that the invention as disclosed in the patent specification could be put into practice without undue burden at the priority date. In the light of the above, not only the experimental evidence of document D8 but also the post-published standards D9 and D10 are to be taken into account for deciding on the alleged insufficiency of disclosure.

1.5 Turning to the content of the opposed patent, particular reference is made to paragraph [0045] and Figure 2, which disclose the following parameters of the test in question: the temperature (100 °C), the duration of the test (48 hours), the tension on the belt (200 N), the load on the belt (none), the rotation speed (6200 rpm applied at the driver pulley 32), and a schematic indication of how the pulleys are to be arranged (Figure 2). In addition, paragraph [0045] states that driver pulley 32 and pulley 40 each possesses 19 sprocket grooves for meshing with the belt teeth, at a 9.525 pitch. Pulley 36 possesses 20 sprocket grooves for meshing with the belt teeth, at a 9.525 pitch. Pulleys 34, 38 are plain, i.e. non-toothed pulleys each measuring 50 mm in diameter, and tensioned pulley 42 is plain and measures 70 mm in diameter.

The patent does not contain any explicit indication of the distances of the pulleys from each other, the external diameters of the grooved pulleys, the material of the pulleys, and the shape of the pulleys and of the belt. Moreover, the patent is silent as to whether the specified test is, in principle, also suitable for (toothless) V-belts. In fact, the parties' dispute hinges on the significance of this information for the outcome of the high temperature belt growth analysis.

1.6 The board notes that, like the description of the patent, the test specification of document D9 indicates the number of teeth on the grooved pulleys and the diameter of the plain pulley (cf. D9, point 5.3.1.1). It does not however refer to the diameters of the grooved pulleys, to the material of the pulleys, and to the shape of the pulleys and of the belt. The test

specified in document D9 is not limited to a certain belt length or shape (cf. D9, point 1). Regarding the distance between the pulleys, document D9 defines the relative positions of pulleys z_2 , z_3 and the back roller (cf. D9, Figure 1). However, it does not specify either the distance of pulleys z_1 and z_4 or the shape of the pulleys. Hence, a comparison of the disclosure in the patent with standard document D9 leads to the conclusion that the exact external diameter of the grooved pulleys, the material of the pulleys, the shape of the pulleys and of the belt, and the belt length (on which the exact relative positions of the pulleys depend) are of limited significance when testing the belt growth. This is in line with the experimental data of document D8, in particular tests Nos. 16494 and 16495 relating to the influence of the length and shape of the belt.

Moreover, the upper limit for an acceptable belt extension according to document D9 is 0.08%, which is in the same order of magnitude as the upper limit of 0.1% claimed in contested claim 1.

- 1.7 It also has to be taken into account that the opposition division appears to have based its conclusions regarding the significance of the distances of the pulleys from each other, of the external diameters of the grooved pulleys, of the material of the pulleys, and of the shape of the pulleys and of the belt on subjective reasons rather than verifiable evidence. Similarly, the respondent has not demonstrated, for example by its own experiments, that the disclosure of the patent was insufficient regarding the claimed elastic modulus of the cord treatment composition and that the high temperature belt growth test as indicated in the patent led to substantially

different results due to missing information about the testing conditions. Equally, the argument that the measuring and testing conditions given in the patent were not suitable for V-belts and/or for belts of different lengths is not backed up by any evidence.

In the light of the above and based on the submissions by the appellant during the appeal proceedings, the board is satisfied that the appellant has discharged its burden of proof by convincingly arguing that the information given in the patent in suit, combined with common general knowledge, is indeed sufficient to enable the skilled person to carry out the invention, in particular to establish the permanent belt growth according to the high temperature belt growth analysis.

- 1.8 For the sake of completeness it is added that a distinction has to be made between the requirements of Article 84 EPC 1973 on the one hand and those of Articles 83 and 100(b) EPC 1973 on the other. With respect to sufficiency, the relevant question is whether the patent in suit provided sufficient information enabling the skilled person, taking into account common general knowledge, to reproduce the invention (cf. Case Law of the Boards of Appeal of the European Patent Office, 8th edition 2016, II.C.5.6.5 and II.C.7.2). Thus, the concern of knowing whether or not one is working within the forbidden area of the claims is a question of the limits of protection conferred by the claims, and thus relates to Article 84 EPC 1973 rather than Article 100(b) EPC 1973.

2. *Remittal to the department of first instance*

2.1 The appellant requests that the case be remitted to the opposition division for consideration of novelty and inventive step.

2.2 Under Article 111(1) EPC 1973 the board of appeal may either decide on the appeal or remit the case to the department which was responsible for the decision appealed. The appropriateness of remittal to the department of first instance is decided by the board on the merits of the particular case. Even if there is no absolute right to have every issue decided upon by two instances, it is the primary function of an appeal to give the losing party the possibility of having the correctness of the first-instance decision judicially reviewed. Further criteria which can also be taken into account when deciding on a remittal include the parties' requests, the general interest that proceedings are brought to a close within an appropriate period of time and whether or not there has been a comprehensive assessment of the undecided issues during the appeal proceedings.

2.3 In view of the fact that during the oral proceedings before the opposition division only the issue of sufficiency of disclosure was discussed, and since neither of the parties has presented its case on novelty and inventive step during the appeal proceedings, the board finds it appropriate to allow the appellant's request for remittal of the case to the department of first instance.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division for further prosecution.

The Registrar:

The Chairman:



L. Malécot-Grob

M. Poock

Decision electronically authenticated