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D E C I S I O N
of 13 December 2002

Case Number: T 1128/00 - 3.3.5

Application Number: 94910165.3

Publication Number: 0746593

IPC: C09C 1/50

Language of the proceedings: EN

Title of invention:
Carbon blacks

Patentee:
CABOT CORPORATION

Opponent:
DEGUSSA AG, Patentabteilung- Zweigniederlassung Wolfgang

Headword:
Carbon blacks/CABOT

Relevant legal provisions:
EPC Art. 123(2), 54, 56

Keyword:
"Disclaimer not allowable, no accidental anticipation but
closest prior art"
"Inventive step (no)"

Decisions cited:
T 0932/94, T 0863/96, T 0917/94, T 0013/97, T 0608/96,
T 1071/97, T 0323/97

Catchword:
-



Case Number: T 1128/00 - 3.3.5

D E C I S I O N
of the Technical Board of Appeal 3.3.5
of 13 December 2002

Appellant:
(Opponent)

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Respondent:
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Decision under appeal:

Interlocutory decision of the Opposition Division
of the European Patent Office posted 25 September
2000 concerning maintenance of European patent
No. 0 746 593 in amended form.

Composition of the Board:

Chairman: R. K. Spangenberg
Members: M. M. Eberhard
M. B. Günzel

Summary of Facts and Submissions

I. The appeal is from the decision of the opposition division according to which European patent No. 0 746 593 in an amended form meets the requirements of the Convention. The patent was granted in response to European patent application No. 94 910 165.3.

Granted claim 1 has the following wording:

"1. A furnace carbon black having an I₂ No. of 12-18 mg/g and a DBP of 28-33 cm³/100g."

The decision under appeal was based on the claims as granted as the main request and on two sets of amended claims filed on 19 July 2000 as the first and second auxiliary requests respectively.

II. In its decision, the opposition division considered that the subject-matter of claim 1 as granted lacked novelty over the disclosure of D1, namely "Rubber Chemistry and Technology, Vol. 45, No. 1, March 1972, pages 145-159". It held that granted claim 1 stated a range of iodine number of 12-18, whereas the examples of the patent in suit also mentioned the first decimal place. This was an indication that the patent in suit encompassed iodine numbers within the margins of a normal experimental error. Claim 1 of the first auxiliary request contravened Article 123(2) EPC. The disclaimer was not allowable since D1 was not an accidental disclosure. The subject-matter of claim 1 according to the second auxiliary request represented a selection from the broad range disclosed in D1 and was thus novel. Inventive step was illustrated by the comparative examples in Table 6 of the patent in suit.

III. The appellant (proprietor of the patent) filed three auxiliary requests with the statement of grounds of appeal dated 24 January 2001. Claim 1 of the first auxiliary request reads as follows:

"1. A furnace carbon black having an I₂ No. of 12-18 mg/g and a DBP of 28 to 30 or 32 to 33 cc/100g."

Claim 1 of the second auxiliary request differs from granted claim 1 only by the addition of the following disclaimer at the end of the claim: **"excluding a furnace carbon black having a I₂ No. of 12 mg/g and a DBP of 31 cc/100g"**. A new third auxiliary request was submitted on 12 November 2002 and then withdrawn during the oral proceedings which took place on 13 December 2002. At the oral proceedings the respondent (opponent) handed over the ASTM-standard 1510-70 (hereinafter D3).

IV. The appellant requested that the decision under appeal be set aside and that the patent be maintained as granted as the main request, or, as the first and second auxiliary requests, with the claims of the first and second auxiliary requests filed with the appellant's letter dated 24 January 2001, or, as the third auxiliary request, with the amended claims as maintained by the opposition division. The respondent requested that the appeal be dismissed.

V. The appellant's arguments can be summarised as follows:

The opposition division's view that claim 1 as granted encompassed iodine numbers within the margins of a normal experimental error broadened the literal scope of claim 1 to the region of equivalents. The examples of the patent in suit mentioned the first decimal place

and, thus, were to be seen as an indication of the exactness of the values given. Furthermore, even if the precision given in point 6.11.1 of D3 were applied to the iodine number of 11.8 given in Table I of D1, then the calculated deviation would be such that the value would still lie outside the range 12-18. D1 neither specified the unit for the iodine number nor the specific ASTM Test method used for its measurement. From the brochure "Was ist Ruß" (hereinafter D2), it was clear that the iodine absorption was commonly expressed in mg/g but that a unit in m²/g had also to be considered. Therefore, it was impossible to the skilled person to undoubtedly evaluate whether or not carbon black XC-31 of D1 had a iodine number within the claimed range. Regarding the iodine number of 12 given in Table III, the skilled person would unambiguously have derived from D1 that it was a rounded value, the exact iodine number being 11.8 as reported in Table I. With respect to inventive step, the appellant argued that the technical problem with respect to the closest prior art D1 consisted in providing a furnace carbon black which was capable of replacing the thermal carbon blacks in rubber and plastic compositions and which exhibited better processing properties. According to the Table on page 158 of D1, a synthetic rubber composition containing carbon black XC-31 exhibited a Shore hardness and a tensile strength which were similar to those obtained with a composition including a thermal carbon black. On the contrary the patent in suit showed that an EPDM composition containing the claimed carbon black had a lower Shore hardness and a lower tensile strength than an EPDM composition containing a thermal carbon black. These improved properties illustrated that a synthetic rubber composition containing the claimed carbon black had

improved processing characteristics compared with a composition containing the XC-31 carbon black. It was apparent that with a material having a lower hardness, the equipment had a longer life time. These results were independent of the rubber or plastic composition. Furthermore, the results obtained in the example of the patent in suit with a carbon black having a iodine number of 16.5 were valid not only for this specific carbon black but also for the whole range of 12-18 mg/g.

The ranges indicated in claim 1 of the first auxiliary were not disclosed in the PCT application. However, these ranges were in fact introduced into claim 1 to exclude the carbon black disclosed in D1 and having a DBP value of $31\text{cm}^3/100\text{g}$. The case law of the boards of appeals on disclaimers was not uniform since according to some decisions a disclaimer was generally allowable without any further requirement, whereas other decisions required that the disclosure in the document be an accidental anticipation. Disclaimers should generally be allowed to limit the claimed subject-matter.

VI. The respondent presented i.a. the following arguments:

The iodine number of 12 and the DBP value of 31 disclosed in Table III of D1 destroyed the novelty of the claimed carbon blacks. The carbon black of Table III could be another sample of the class of products XC-31. Application of the precision given in point 6.11.2 of D3 to the iodine number of 11.8 disclosed in Table I of D1 led to a value which fell within the claimed range of 12-18. Even if the claimed carbon blacks were considered to be novel, they would

be obvious in view of D1 which disclosed the same use and concerned the same problem of replacement of a thermal carbon black. The two carbon blacks compared in Table 6 of the patent in suit exhibited different structures and surface areas. It was well-known that these parameters had an influence on the hardness of the mixture. The appellant had provided no evidence in support of his allegation that a EPDM mixture having a lower hardness was achieved with the claimed carbon blacks compared with a thermal carbon black having the same analytical properties. A comparison of the data given in the Table on page 158 of D1 with those of the patent in suit was difficult since D1 neither disclosed the exact iodine number of the thermal carbon black used in the compound nor the compound composition. As the values of the Shore hardness reported in this Table substantially differed from those indicated in Table 6 of the patent in suit, it could be inferred that the rubber recipes were different. It was well-known that the properties of the cured product depended on the composition of the mixture to be cured and could not be transferred from one recipe to a different one. Furthermore there was no evidence that results achieved with a carbon black having a iodine number of 16.5 would also be obtained with a carbon black having a iodine number of 12. Therefore, no improvement had been shown. Disclaimers were allowable for establishing novelty with respect to a pre-published document only if the disclosure in this document was an accidental anticipation, ie if the document was directed to the solution of another technical problem (see T 932/94). As in the present case the technical problem was the same as in D1, the disclaimers introduced in claim 1 of the first and second auxiliary requests were not allowable.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. D1 discloses a large particle furnace carbon black suitable for use in rubber compositions and having an ASTM DBP number (dibutyl phthalate number) of 31 cm³/100g and an ASTM iodine number of 11.8: see page 147, Table I, carbon black XC-31; page 148, Table, LPF, XC-31; page 145, last paragraph for the unit of the DBP number. Regarding the ASTM iodine number, the appellant's argument that it was not clear which unit was used to express the value is not convincing. According to D1 the iodine numbers reported therein are the ASTM iodine numbers (see page 147, paragraph with the heading "general properties"). The appellant has provided no evidence that before the date of D1, there was another ASTM standard than the ASTM D 1510 for the measurement of the iodine adsorption number of carbon blacks. In the ASTM-standard D3 of 1970 existing before the publication date of D1 (1972), it is indicated that the iodine adsorption number is expressed in mg of iodine adsorbed per gram of carbon black (mg/g): see page 37, point 6. In case the skilled person would have had doubts about the units used for this well-known parameter in the field of carbon blacks, a simple look at the ASTM-standard would have confirmed that this parameter is expressed in mg/g. D2 disclosed that in 1991 the iodine adsorption was commonly expressed in mg/g and that a conversion in m²/g, the so-called "iodine surface area", did not become accepted. It is unambiguously derivable from D2 that the parameter expressed in m²/g was designated "iodine surface area"

("Jodoberfläche"). D1, however, refers to ASTM iodine numbers and not to a "iodine surface area". Therefore, the skilled person would directly and unambiguously derive from the disclosure in D1 that the ASTM iodine number in Table 1 and in the other Tables thereof is expressed in mg/g.

In Table III of D1, which is concerned with the properties of the carbon blacks in rubber recipes, values of 12 and 31 are reported for the ASTM iodine number and the DBP number of XC-31 carbon black respectively. These values fall within the claimed range. The appellant argued that the value of 12 for the iodine number was a rounded value, the exact value being 11.8 as indicated in Table I where the physical properties of the LPF blacks were reported and not the properties of rubber recipes. Furthermore, according to the appellant even if the precision indicated in point 6.11.1 of the ASTM standard D3 were applied to the value of 11.8 indicated in Table 1, then the value would still lie outside the claimed range, whereas the respondent considered that the precision indicated in point 6.11.2 had to be considered, which led to a iodine value lying within the claimed range. The board is of the opinion that the questions whether or not 12 is a rounded value and which data of the ASTM standard have to be considered to calculate the deviation can remain open since even if the subject-matter of claim 1 were considered to be new over the disclosure of D1, it would lack an inventive step for the reasons given below.

3. For the assessment of inventive step it is accordingly considered in favour of the appellant that (i) the iodine number of 12 reported in Table III of D1 is not

the exact value for carbon black XC-31 and (ii) the value of 11.8 reported in Table I lies outside the claimed range even when considering the precision of the ASTM test method D3 and, thus, does not destroy the novelty of the claimed product.

- 3.1 D1 represents the closest prior art, in particular the LPF carbon black XC-31 disclosed in Table 1 and having an ASTM iodine number of 11.8 mg/g and a DBP number of 31 cm³/100g.

According to the appellant, the technical problem solved by the patent in suit with respect to this closest prior art was to provide a furnace carbon black which was suitable for replacement of the thermal carbon blacks in rubber and plastic compositions and which exhibited improved Shore hardness and tensile strength, thus leading to better processing properties. The appellant further alleged that a longer life time of the equipment was achieved with the claimed carbon blacks. The respondent contested that the comparative examples of the patent in suit showed the alleged improvement, and thus that the said problem had been solved. Therefore, the question arises whether an improvement has actually been achieved compared with the carbon black XC-31 of D1.

According to the patent in suit, the results set forth in Table 6 indicate that, at a carbon black level of 200 phr, the EPDM compositions containing the carbon blacks of the invention have a higher extrusion rate and lower hardness, viscosity, mixing energy and compression set than the EPDM compositions including two control carbon blacks. Therefore, the former EPDM compositions exhibit better processing characteristics

than the EPDM compositions with the control carbon blacks (see page 9, lines 43 to 46). In Table 6 a carbon black having a iodine number of 16.5 mg/g and a DBP of 30.0 cm³/100g is used to illustrate the claimed carbon blacks and the two control carbon blacks are a **thermal** carbon black with a iodine number of 8.2 mg/g and a DBP of 37.5 cm³/100g (Control A) and a **SFR** (semi-reinforcing furnace) carbon black having an iodine number of 29.9 mg/g and a DBP of 68.5 cm³/100g. Table 6 actually shows the said improvement over Control A and Control B; however the iodine number and DBP values of the SFR carbon black (Control B) are very different from those of the XC-31 furnace carbon black of D1, and the carbon black of Control A, ie a thermal carbon black, also exhibits a iodine number and a DBP value which are far more removed from the claimed ranges than those of the furnace carbon black XC-31 of D1. In view of these differences neither Control A nor Control B can be regarded as being illustrative of the furnace carbon black of the closest prior art having a iodine number of 11.8 mg/g and a DBP of 31 cm³/100g. Therefore, it cannot be inferred from Table 6 or from the description of the patent in suit that the claimed furnace carbon black would lead to a similar improvement with respect to the furnace carbon black XC-31 of D1. Furthermore, taking into account that the claimed carbon black differs from carbon black XC-21 of D1 only by the extremely small difference between the two iodine numbers, namely 12 mg/g instead of 11.8 mg/g, the appellant's allegation that an improvement would also be achieved with respect to the known XC-31 of D1 is not credible in the absence of any evidence.

The appellant's arguments based on the comparison of the Shore hardness and tensile strength given in Table 6 of the patent in suit with those reported in the Table of page 158 of D1 and the conclusion drawn therefrom as regards the improved processing characteristics of a synthetic rubber composition containing the claimed carbon black (see point V above), are also not convincing for the following reasons. Assuming that the thermal carbon black FT mentioned in the Table of page 158 of D1 has the characteristics stated on page 148 for a typical thermal FT, namely a DBP value of 37 cm³/100g and a iodine number of 9-12 mg/g, it is still not clear what the iodine number of the specific thermal carbon black used in the composition was, and thus, whether or not it was similar to that of control A of Table 6 of the patent in suit. Furthermore, it cannot be inferred from D1 which material and which composition were used to achieve the properties given in the Table of page 158. Not only the rubber composition but also the carbon black loading might have been very different from those used for Table 6 of the patent in suit. As the Shore hardness and tensile strength of a composition including a carbon black depend *inter alia* on the kind of composition used (compare for example the two different recipes used in Table III and IV on page 153 of D1), the comparison of Table 6 of the patent in suit with the Table on page 158 of D1 cannot lead to any reliable conclusion in the absence of information concerning the kind of composition used for obtaining the results stated on page 158.

3.2 For the preceding reasons, the board cannot accept the appellant's allegation that an improvement with respect to carbon black XC-31 of D1 has actually been achieved and thus that the technical problem defined by the appellant has actually been solved.

3.3 The technical problem with respect to D1 can therefore only be seen in the provision of another furnace carbon black which is likewise capable of replacing thermal carbon black in rubber or plastic compositions.

It is proposed to solve this problem by the furnace carbon black as defined in claim 1, ie a furnace carbon black which differs from that of D1 only by the iodine number being from 12 to 18 mg/g instead of 11.8 mg/g. It is credible that this problem has actually been solved by the claimed carbon black. This was not disputed.

D1 discloses that LPF blacks, in particular the furnace carbon black carbon XC-21, which has a iodine number of 11.8 mg/g and a DBP value of 31 cm³/100g, are a potential replacement for thermal blacks. Applications such as tire bead stocks, windshield wiper blades, tire innerliners, brake cups are cited in D1 (see page 157, 2nd paragraph; page 158, the four first paragraphs). In view of this teaching, it is obvious to the skilled person faced with the problem of providing another furnace carbon black suitable for the replacement of thermal blacks, that a furnace carbon black having a similar iodine number (for example 12 mg/g or slightly above 12 mg/g) and an identical or a similar DBP value would also solve the said problem. This was not

disputed by the appellant at the oral proceedings. Therefore, the subject-matter of claim 1 of the main request does not involve an inventive step as required by Articles 52(1) and 56 EPC, and the main request has to be refused.

First auxiliary request

4. Claim 1 of the first auxiliary request has been limited by introduction of two ranges for the DBP values, namely 28 to 30 and 32 to 33 cc/100g. These two ranges are not disclosed in the original PCT application which only indicates the range 28-33 cc/100g in combination with a iodine number of 12-18 mg/g. This was not contested by the appellant at the oral proceedings. The DBP value of 30.0 is stated in the example of Table 6, but in combination with a iodine number of 16.5 mg/g. The combination of this specific DBP value with any of the iodine number from 12-18 mg/g is not disclosed in the PCT application. Therefore, amended claim 1 of this request does not meet the requirements of Article 123(2) EPC.

4.1 The appellant further argued that the two new ranges of DBP values were introduced into claim 1 to exclude the furnace carbon black disclosed in D1 and represented a disclaimer which, according to the jurisprudence, was allowable even in the absence of support in the application as filed. Even if it were assumed in favour of the appellant that the amendments in claim 1 correspond, in the result, to a disclaimer excluding a novelty-destroying disclosure in D1, then the appellant's arguments concerning the allowability of this disclaimer would not be convincing for the following reasons. A disclaimer based on the disclosure

of a novelty-destroying document forming part of the state of the art pursuant to Article 54(2) EPC was considered to be allowable in decision T 433/86 (of 11 December 1987) without any further conditions, in the absence of support for the excluded subject-matter in the application as filed. However, additional requirements were subsequently developed in the jurisprudence. According to the subsequent jurisprudence, the introduction of disclaimers having no basis in the original application into a claim was considered to be allowable only in exceptional situations. The novelty-destroying disclosure has in particular to be an **accidental** anticipation (see T 932/94 of 13 January 1998; T 863/96 of 4 February 1999; T 917/94 of 28 October 1999; T 13/97 of 22 November 1999; T 608/96 of 11 July 2000; T 1071/97 of 17 August 2000; T 323/97, OJ EPO 2002, 476, point 2.2 of the reasons; Case Law of the Boards of appeal, 4th edition point III.A.1.6.3, pages 210 to 211). Although the notion of "accidental anticipation" has been defined in the jurisprudence in different ways at least as regards the wording used, a prior art document representing the closest prior art was never regarded as an accidental anticipation. It was not disputed that, in the present case, D1 represents the closest prior art and is not an accidental anticipation. Accordingly, even if the amendments introduced into claim 1 were considered as a disclaimer with respect to D1, then the further condition required in the jurisprudence, ie that the anticipation be an "accidental" one, would not be fulfilled. The amendments in claim 1 thus contravene the requirements of Article 123(2).

The board further observes that, in some decisions, for example T 710/92 of 11 October 1995, the introduction of a disclaimer having no basis in the original application into the claim was considered as an amendment allowable under Article 123(2) without requiring the anticipation to be accidental. However inventive step was then assessed as if the disclaimer did not exist. If this approach were used in the present case, the subject-matter of claim 1 would be considered as not involving an inventive step for the reasons given in points 3 to 3.3 above.

Second auxiliary request

5. Claim 1 of the second auxiliary request contains the disclaimer **"excluding a furnace carbon black having a I₂ No. of 12 mg/g and a DBP of 31 cc/100g"**, which excludes carbon black XC-31 as defined in Table III of D1. This disclaimer has no basis in the original PCT application. Even if it were considered, for the sake of argument, that the parameters reported in Table III of D1 destroy the novelty of claim 1 not containing the disclaimer, amended claim 1 of this request would not be allowable under Article 123(2) EPC since D1 is not an accidental anticipation, but the closest prior art: see the reasons given in point 4.1 above which apply likewise to the present disclaimer.

If, for the sake of argument, it were considered that claim 1 of this request meets the requirements of Article 123(2) EPC and that the claimed carbon black is

novel over the disclosure of D1, then the subject-matter of claim 1 would still not involve an inventive step for the reasons indicated above in points 3 to 3.3. Therefore, the second auxiliary request must also fail.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

U. Bultmann

R. Spangenberg