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Datasheet for the decision of 20 June 2007

Case Number: T 1530/05 - 3.3.09

Application Number: 98307315.6

Publication Number: 0903388

IPC: C09J 7/02

Language of the proceedings: EN

Title of invention:
Coated substrates having improved release characteristics

Applicant:
GENERAL ELECTRIC COMPANY

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - no"

Decisions cited:
-

Catchword:
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Case Number: T 1530/05 **-** 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 20 June 2007

Appellant: GENERAL ELECTRIC COMPANY
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Representative: Herrmann, Uwe
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 22 July 2005 refusing European application No. 98307315.6 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: P. Kitzmantel
Members: J. Jardón Álvarez
K. Garnett

Summary of Facts and Submissions

I. This appeal lies from the decision of the Examining Division, issued in writing on 22 July 2005, refusing European patent application No. 98 307 315.6 in the name of GENERAL ELECTRIC COMPANY, filed on 10 September 1998 and directed to "Coated substrates having improved release characteristics".

The decision was based on a set of nine claims filed with letter dated 15 March 2004.

Claim 1 read as follows:

"1. A release laminate comprising:

a) a first laminate layer comprising a cured silicone composition comprising a substantially branched alkenyl silicone having the formula:

$M^{VI}_aT_bD_cM_d$

where

M^{VI} = $R_{3-p}R^1_pSiO_{1/2}$, where R is selected from the group consisting of one to forty carbon monovalent hydrocarbon radicals and R^1 is selected from the group consisting of two to forty carbon atom terminal olefinic monovalent hydrocarbon radicals, where p ranges from 1 to 3;

T = $R^2SiO_{3/2}$ where R^2 is selected from the group consisting of R and R^1;

$D = R^3R^4SiO_{2/2}$ where R^3 and R^4 are each independently selected from the group consisting of R and R^1; and

$M = R_3SiO_{1/2}$ where each R is as previously defined and is independently selected; wherein a and b have values ranging from 2 to 5, c is an integer ranging from about 50 to about 1,000 and d has a value ranging from 0 to about 0.5; and

b) a second laminate layer in contact with the first layer comprising a silicone pressure sensitive adhesive."

II. The Examining Division refused the application, because the subject-matter of the claims was considered to lack inventive step (Article 56 EPC). The Examining Division further pointed to an inconsistency between the claims and the description (Article 84 EPC).

The following documents were mentioned in the appealed decision:

D1: US - 5 616 672

D2: US - 5 578 381

D3: US - 4 736 048

D4: US - 5 082 706

D5: US - 4 956 231 and

D6: US - 4 665 127

The Examining Division in its decision noted that while Claim 1 was directed to a release laminate comprising a first and a second laminate layer, the subject-matter of the invention, according to the description, should rather be designated a "coated substrate carrying two superposed coats". This inconsistency between the claims and the description was contrary to the requirements of Article 84 EPC.

Concerning inventive step, the Examining Division considered D1 as the closest prior art. This document disclosed branched alkenyl silicone polymer compositions and their use in laminates comprising a release paper coated with a pressure sensitive adhesive. The Examining Division considered it obvious to apply this teaching to pressure sensitive adhesives of the silicone type not disclosed in D1. It arrived at that conclusion in spite of the known problems occurring when combining a silicone release coating with silicone pressure sensitive adhesives (cf. D2 to D6), because no evidence was available that the choice of these silicone pressure sensitive adhesives was accompanied by any unexpected technical advantage as compared to the acrylic pressure sensitive adhesives exemplified in D1.

III. On 21 September 2005 the Appellant (Applicant) filed a Notice of Appeal against the above decision and paid the appeal fee on the same day.

The Statement setting out the Grounds of Appeal was filed on 23 November 2005. With the statement the Appellant filed a (first) auxiliary request intended to

overcome the Article 84 EPC objection raised by the Examining Division.

Claim 1 of this request read as follows:

"1. A coated substrate comprising:

a) a first layer comprising a cured silicone compositions comprising a substantially branched alkenyl silicone having the formula:

$M^{VI}_aT_bD_cM_d$

where

M^{VI} = $R_{3-p}R^1_pSiO_{1/2}$, where R is selected from the group consisting of one to forty carbon monovalent hydrocarbon radicals and R^1 is selected from the group consisting of two to forty carbon atom terminal olefinic monovalent hydrocarbon radicals, where p ranges from 1 to 3;

T = $R^2SiO_{3/2}$ where R^2 is selected from the group consisting of R and R^1;

D = $R^3R^4SiO_{2/2}$ where R^3 and R^4 are each independently selected from the group consisting of R and R^1; and

M = $R_3SiO_{1/2}$ where each R is as previously defined and is independently selected; wherein a and b have values ranging from 2 to 5, c is an integer ranging from about 50 to about 1,000 and d has a value ranging from 0 to about 0.5; and

b) a second layer in contact with the first layer comprising a silicone pressure sensitive adhesive."

IV. A communication of the Board was issued on 9 May 2007 by the Board. The Board gave its preliminary view concerning the issue of inventive step. The Board pointed out that it agreed provisionally with the finding in the appealed decision that document D1 represented the closest prior art and that the claimed subject-matter did not appear to involve an inventive step in the light of the cited prior art.

V. In preparation for the oral proceedings, the Appellant, by letter dated 6 June 2007, submitted amended Claims 1 to 8 for a second auxiliary request (auxiliary request II).

VI. Oral proceedings were held before the Board on 20 June 2007.

During the oral proceedings, after discussion of the inventive step issue in relation to all the requests, the Appellant withdrew its previous main request and auxiliary request II and maintained as its main (and only) request Claims 1 to 9 filed as the auxiliary request with the Statement setting out the Grounds of Appeal (see above point III).

VII. The arguments presented by the Appellant in its written submissions and at the oral proceedings may be summarized as follows:

– The Appellant considered D1 as the closest prior art. The difference between D1 and the patent in suit was the use of a second layer comprising a silicone pressure sensitive adhesive (Claim 1, feature b)).

– The problem to be solved by the application was to provide a coated substrate having improved properties when compared with the prior art, in particular low release forces against silicone pressure sensitive adhesives and only a small increase of the release force with increasing delamination speed.

– In its opinion it was not obvious for the skilled person to combine the release coatings made from branched silicone compositions of D1 with the silicone pressure sensitive adhesives disclosed in D2 to D4 because of the known high adhesive aggressiveness of these silicone pressure sensitive adhesives. Moreover, documents D2 to D4 referred only to release coatings made from linear silicone compositions and could not therefore provide any clue as to the properties of branched silicones.

– The Appellant further pointed out that the examples and comparative examples in Tables 5 and 7 of the application as filed showed that the branched alkenyl silicones provided lower release values than their linear counterparts. Considering that the prior art established a preference for linear species with only minimal branching, the advantageous use of the branched alkenyl silicones according to Claim 1 was non-obvious.

VIII. The Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of Claims 1 to 9 according to the auxiliary request filed on 23 November 2005 with the Statement setting out the Grounds of Appeal.

Reasons for the Decision

1. The appeal is admissible.

2. *Inventive step (Article 56 EPC)*.

2.1 The patent in suit concerns a coated substrate comprising:

(a) a first layer comprising a cured silicone composition comprising a substantially branched alkenyl silicone having the formula $M^{VI}_aT_bD_cM_d$, and

(b) a second layer in contact with the first layer comprising a silicone pressure sensitive adhesive.

2.1.1 The examples in the specification show that the cured coated compositions comprising branched alkenyl silicones have low release values against methyl and phenyl silicone pressure sensitive adhesives. The results in Tables 5 and 7 further show that the branched alkenyl silicones gave lower release values than the corresponding linear alkenyl silicones.

2.2 *Closest prior art*.

2.2.1 The Board agrees with the Appellant and with the finding in the decision under appeal that D1 represents the closest state of the art.

2.2.2 Claim 1 of D1 discloses substantially branched curable alkenyl silicones having the formula $M^{VI}_aT_bD_cM_d$, this formula being identical to the formula of Claim 1 of the present application.

These branched alkenyl silicones are applied to paper substrates to aid in the release of adhesive materials (see column 1, lines 6 - 8; see also column 3, lines 50 - 51). The examples in D1 show the release properties of these silicones against acrylic pressure sensitive adhesives. The delamination forces of substrates cured with the branched silicones are reduced at all delamination speeds when compared with linear alkenyl silicones (see examples in D1, for instance Tables 1 and 10).

2.2.3 In summary, D1 discloses the same branched alkenyl silicones (feature (a) of Claim 1) and their use as release coating compositions towards pressure sensitive adhesives. However, D1 does not disclose the specific use of silicone pressure sensitive adhesives (feature (b) of Claim 1).

2.3 *Problem to be solved and its solution*.

2.3.1 The technical problem to be solved by the application in relation to said prior art can thus be formulated as to provide an alternative, similarly effective

combination "branched silicone release coating/pressure sensitive adhesive".

2.3.2 This technical problem is credibly solved by the claimed coated substrates. Although the exact nature of the silicones used in the examples is not given (the definitions of R, R^1, R^2, R^3 and R^4 are missing in the examples), it can be assumed that these examples fall within the scope of the claims, in particular because the compounds and formulations used in the examples are said to be similar to those used in D1 (see page 14, third paragraph of the present application; the reference to US 5 516 672 is erroneous and should read US 5 616 672). The results of the examples show the low release force of the branched silicone compositions when using methyl and phenyl silicone pressure sensitive adhesives (cf. Tables 1 - 7). Moreover they exhibit improved performance relative to the linear silicone compositions (see Tables 5 - 7).

2.4 *Inventive step.*

2.4.1 It remains to be decided whether the claimed subject-matter is obvious having regard to the documents on file.

2.4.2 As already mentioned above (see 2.2.2), D1 discloses the use of the "inventive" branched silicones for "paper release applications", including pressure sensitive adhesives of the acrylic type. The question to be answered in relation to inventive step is therefore merely whether it would have been obvious for the skilled person to apply the teaching of D1 to the

pressure sensitive adhesives of the silicone type now used.

2.4.3 In this respect the Board agrees with the finding in the appealed decision (see points 2.3-2.4) that, taking account of the general teaching of D1, the skilled person would not hesitate to combine the release coatings made from the branched alkenyl silicones of D1 with other conventional pressure sensitive adhesives such as the silicone pressure sensitive adhesives now used. The skilled person would have had no reason to think that they would not work with said silicone pressure sensitive adhesives which are undisputedly well known in the art (see D2 - D4).

2.4.4 The Board cannot agree with the Appellant's argument that the skilled person would be discouraged by the known aggressive adhesiveness of silicone pressure sensitive adhesives as described, for instance, in column 1, lines 10 - 13 of D4 and by the fact that documents D2 to D4 mainly used linear silicone compositions as coating.

This argument does not take into account that document D1 already discloses that branched silicone release coatings provide distinctive advantages over linear silicone release coatings with regard to the strength of their release force, and also the dependency of such force on the speed with which the coating is delaminated from (acrylic) pressure sensitive adhesives (see Tables 1, 3, 4, 7, 8 10). It is thus apparent that going from linear to branched silicone release coatings considerably alleviates the problem of the "aggressive adhesiveness". There is no reason for the skilled

person to assume that this tendency would not apply to silicone pressure sensitive adhesives because the cohesion of a release coating to an adhesive composition is dependent on the physical "adhesiveness" of both surfaces and a reduction of the adhesiveness of one surface will normally lead to a reduction of the cohesion between the surfaces. At the very least it would have been obvious to try out this combination. The reduction of the release force of branched *versus* linear release coatings exhibited according to the application in suit does not therefore support the presence of an inventive step.

Moreover, the Appellant is wrong in restricting the prior art teaching - which indeed offers different solutions to the "adhesiveness problem" between silicone release coatings and silicone pressure sensitive adhesives - to linear silicone release coatings, because document D2 in fact exemplifies branched units $SiO_{3/2}$ (Example 2) and also document D3 envisages the possible presence of such groups (Claim 1, in the event that a+b = 0)

The teaching of D2 to D4 would therefore certainly not have discouraged the skilled person from combining release coatings comprising the branched alkenyl silicones of D1 with silicone pressure sensitive adhesives.

2.5 In view of the above findings, the subject-matter of Claim 1 of the application lacks an inventive step (Article 56 EPC). Consequently the request of the Appellant is not allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Röhn P. Kitzmantel