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EXAMINER
GRESO, AARON J

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte WERNER JENNINGER,
BURKHARD KOHLER and JAOCHIM WAGNER

Appeal 2012-000107
Application 12/569,533
Technology Center 1700

Before FRED E. McKELVEY, RICHARD TORCZON and PETER F. KRATZ, *Administrative Patent Judges*.

McKELVEY, *Administrative Patent Judge*.

DECISION ON APPEAL

Statement of the case

Bayer MaterialScience AG ("applicant"), the real party in interest (Brief, page 1), seeks review under 35 U.S.C. § 134(a) of a final rejection dated 22 July 2010.

The earliest priority date claimed by applicant is based on German Patent Application 10 2007 005 960.6 (7 Feb. 2007).

The application has been published as U.S. Patent Application Publication 2010/0022706 A1.

In support of prior art rejections, the Examiner relies on the following evidence.

Long et al. "Long"	U.S. Patent 7,255,924 B1	14 Aug. 2007 filed 13 Jan. 2004 published as 2005/0153130 A1 14 July 2005
Mager et al. "Mager"	U.S. Patent Application Publication 2005/0222365 A1	6 Oct. 2005
Guiffard et al. "Guiffard"	*Enhanced Electric Field-Induced Strain in Non-Percolative Carbon Nanopowder/polyurethane Composites*, 39 J. Physics D: Applied Physics 3053	2006

Applicant does not contest the prior art status of the evidence relied upon by the Examiner.

We additionally refer to the following evidence.

Yang et al. "Yang"	Published International Application WO 02/088225 A1	7 Nov. 2002
Hu et al. "Hu"	*A Novel Method for Preparing Polyurethane Based Conductive Composites with Low Percolation Threshold*, 15 Chinese Chemical Letters 1001	2004
Saunders & Frisch	2 POLYURETHANES CHEMISTRY AND TECHNOLOGY 304	1964
"Lubrizol"	Estane® 58887 TPU Technical Data Sheet (2 pages)	2012

"Lubrizol" (copy attached) was downloaded from the internet on 14 Jan. 2013 and was available at:
http://bluecoat-02/?cfru=aHR0cDovL3d3dy5sdWJyaXpvbC5jb20vVFBVL0VzdGFuZS81ODg4Ny5wZGY=

We have jurisdiction under 35 U.S.C. § 134(a).

The invention

Claims 8 and 10-14 are on appeal. Brief, page 1; Answer, page 2.

The invention is readily understood from the claims.

Claim 8, which we reproduce from pages 8-9 of the Claim Appendix of the Brief, reads (some paragraphing added):

> Dielectric materials in energy converters for converting mechanical energy into electrical energy and electrical energy into mechanical energy, said dielectric materials comprising polyurethane compositions filled with carbon black, the compositions comprising:
>
> A) from 99.9 to 70 weight % of polyether polyurethanes

which are the reaction products of one or more polyisocyanates and one or more polyol components, the polyol components being comprised of

a) from 50 to 100 weight % of polyalkylene oxides produced by DMC catalysis, and

b) from 0 to 50 weight % of polyols free from catalyst residues,

wherein said one or more polyiosocyanates are allophanate prepolymers

and

B) from 0.1 to 30 weight % of carbon black.

Rejections

In the Answer, the Examiner maintains the following rejections.

Rejection 1: Claims 8, 10 and 12-13 under § 103(a) as being unpatentable over Guiffard and Mager. Answer, page 3.

Rejection 2: Claims 11 and 14 under § 103(a) as being unpatentable over Guiffard, Mager and Long. Answer, page 5.

In connection with Rejection 1, applicant does not argue the separate patentability of claims 10 and 12-13.

In connection with Rejection 2, applicant does not present any argument apart from its argument in connection with Rejection 1.

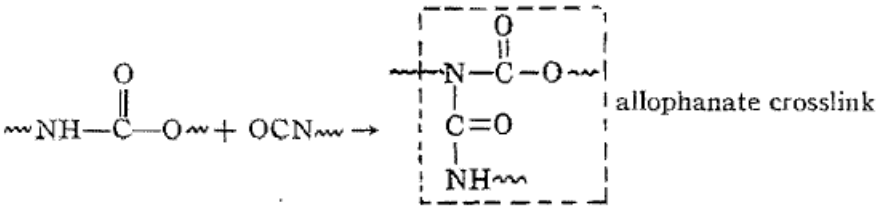
Accordingly, we decide the appeal on the basis of Claim 8. 37 C.F.R. § 41.37(c)(1)(vii).

Analysis

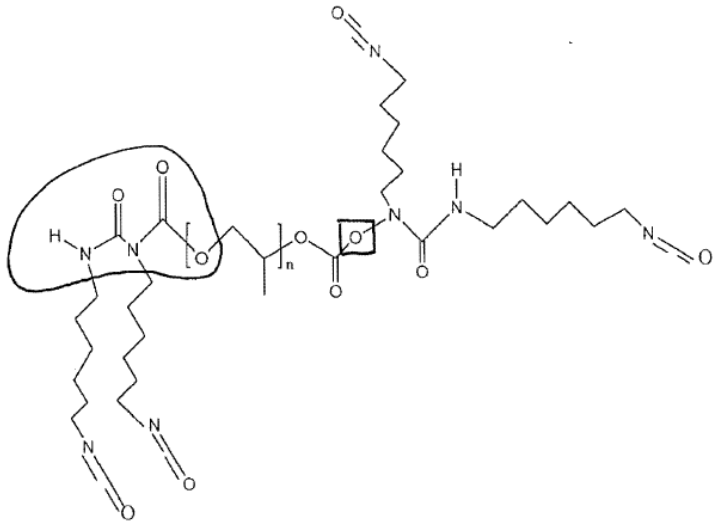
The Examiner found that Guiffard differs from the subject matter of Claim 8 in that Guiffard does not describe the claimed polyurethanes. Answer, page 4.

Claim 8 calls for a polyurethane made from polyisocyanates that "are allophanate prepolymers."

A prepolymer with an allophanate group is made by reacting an isocyanate with a urethane as shown by Saunders & Frisch (portion of page 304 reproduced below):



An idealized formula of an example of an allophanate prepolymer contemplated by applicants is shown in Claim 12:



Formula (I) n= 30-38

where the allophanate group is shown in a circle.[1]

Guiffard describes the combination of a polyurethane ("PU") and carbon black. Page 3053, col. 2: ("The studied filler is carbon black (C) powder" and "[i]n the present study, we show that the single carbon nanopowder filling leads to an enhancement of the field-induced strain of a simple PU polymer matrix which is not associated with a rise in the dielectric constant.")

In its experimental procedure, Guiffard states that "[t]he studied PU is the elastomer 58887 TPU (Estane)." Page 3054, col. 1.

Applicant says that Estane® 58887 TPU differs from the polyurethane called for by Claim 8. The Examiner seems to agree. However, we note that

[1] We believe there may be an error in the formula of Claim 12 due to an "extra" oxygen (—O—) (shown in a square). *Compare* the formula of Claim 12 *with* that on page 5 of the Specification which appears to be correct. *See also* Mager, ¶ 0059, formula (II). In the event of further prosecution, any error may be corrected.

neither the applicant nor the Examiner have cited any evidence to describe the nature of Estane® 58887 TPU. Our investigation via the internet into the matter reveals that in 2012, Estane® 58887 TPU is described as an "aromatic Polyether-Based Thermoplastic Polyurethane (TPU)". Lubrizol, page 1. We have no reliable means of determining whether the 2012 version of Estane® 58887 TPU is the same as the version as that mentioned in the Guiffard article. For the purpose of deciding the appeal, we will assume that Estane® 58887 TPU as reported by Guiffard is a polyurethane made with an aromatic diisocyante (possibly TDI or MDI) and a polyether.

Mager describes allophanate prepolymers that are the same as those contemplated by applicant. Mager, ¶¶ 0059-0065.

The Examiner reasoned that given Guiffard's description of a combination of a polyurethane and carbon black and Mager's description of allophanate prepolymers, that it would have been obvious to use the Mager allophanate prepolymer to make a combination of polyurethane and carbon black for the purpose described by Guiffard.

Applicant maintains that "the skilled artisan would derive no motivation from Guiffard to substitute the Estane . . . [described] in Guiffard with allophanate-containing polyurethanes of Mager." Brief, page 5.

The Examiner notes that Mager's polyurethanes are said to have improved viscosity storage. Mager ¶ 0068. Mager's principal utility appears to be use of the polyurethanes as coatings—a use different from that of applicant or Guiffard.

The evidence in the record leaves little doubt of the correctness of the Examiner's obviousness conclusion.

Hu, cited in applicant's Specification (page 1:25) describes experiments with two polyurethanes in combination with carbon black. A first polyurethane is made from isophorone diisocyanate (a cycloaliphatic diisocyante) and a polyester. A second polyurethane is made from toluene diisocyanate (TDI) (an aromatic diisocyanate) and a polyether. The reported results indicate that in emulsion and solution blended polyurethane/carbon black combinations, room temperature conductivity decreased up to a point with increasing carbon black loading. *See* Figures 1 and 2, reproduced below:

Figure 1 Room temperature conductivity (σ) and CB concentration in the emulsion blended composites

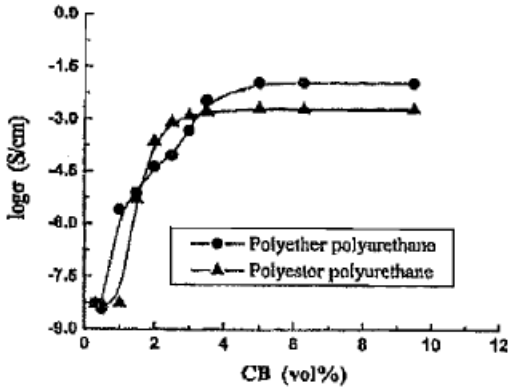
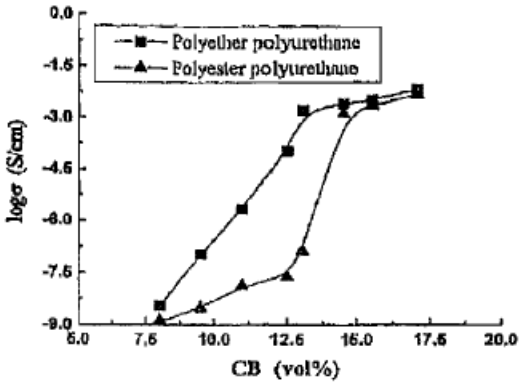


Figure 2 Room temperature conductivity (σ) and CB concentration in the solution blended composites



Applicant called Yang to the attention of the PTO. Yang confirms that a variety of polymers, including polyurethanes (page 6, ¶ 0022:5), may be used in combination with filler, including carbon black (page 6, ¶ 0021:2 and page 14, ¶ 0014:2), to achieve conductive materials, including capacitors (page 4:3 and page 19, claim 24), characterized by a dielectric constant greater than 200 (page 4, ¶ 0014:4).

Based on the evidence in the application on appeal, it appears that applicant is using a known polyurethane (Mager) in combination with carbon black in a manner taught by the prior art (Guiffard, Hu and Yang) to achieve an entirely expected result, *i.e.*, making dielectric materials such as capacitors. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007) (a combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results).

Decision

Upon consideration of the appeal, and for the reasons given herein, it is

ORDERED that the decision of the Examiner rejecting the claims on appeal under § 103(a) over the prior art is *affirmed*.

FURTHER ORDERED that since we have cited additional prior art and our rationale somewhat differs from the rationale of the Examiner, our affirmance is designated as a new rejection. 37 C.F.R. § 41.50(b).

FURTHER ORDERED that our decision is not a final agency action.

FURTHER ORDERED that within **two (2) months** from the date of our decision, appellant may further prosecute the application on appeal by exercising on of the two following options:

Option 1: Request that prosecution be reopened by submitting an amendment or evidence or both. 37 C.F.R. § 41.50(b)(1).

Option 2: Request rehearing on the record presently before the Board. 37 C.F.R. § 41.50(b)(2).

FURTHER ORDERED that no time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

New Rejection 37 C.F.R. § 41.50(b)

bar

ESTANE®
THERMOPLASTIC POLYURETHANES

Technical Data Sheet

Estane® 58887 TPU

Type: Estane® 58887 is an 87A aromatic Polyether-Based Thermoplastic Polyurethane (TPU).

Features: Excellent hydrolysis resistance, low temperature performance, clarity and wide processing window for extrusion.

Uses: Blown and flat die/cast film extrusion, Injection and blow molding; cable jacketing and profile extrusion.

Physical Properties	Value (Metric)	Unit	Test Method
Hardness (5 sec)	**87 +/- 3**	Shore A	ASTM D-2240
Specific Gravity	**1.12**		ASTM D-792
Tensile Strength	**7500 (51.7)**	psi (MPa)	ASTM D-412
Ultimate Elongation	**500**	%	"
Tensile Stress at			
- 100 % Elongation	**1000 (6.9)**	psi (MPa)	ASTM D-412
- 300 % Elongation	**1800 (12.4)**	psi (MPa)	"
Tear Strength			
Graves	**500 (8.9)**	lb/in (kg/mm)	ASTM D-624 (die C)
Trouser	**150 (2.7)**	lb/in (kg/mm)	ASTM D-470
Taber Loss (1000 rev)	**0.00141 (40)**	oz (mg)	ASTM D-3389 (H18, 1000g)
T_m (by DSC)	**284 (140)**	°F (°C)	Lubrizol Advanced Materials
T_g (by DSC)	**-49 (-45)**	°F (°C)	Lubrizol Advanced Materials

- Prior to testing samples were conditioned at 23°C for 48 hours.
- Based on extruded sheet (30 mils).
- Listed values are "typical (average) values" and should / can not be applied for specification purposes.

Supply Form and Standard Packaging

- **Estane® 58887 TPU** is supplied in pellet form and packaged in 50 lb bags or 1000 lb boxes.

Material Preparation

- Prior to processing, **Estane® 58887 TPU** must be dried at **220°F (104°C)** for 2-4 hours.
- It is recommended to dry the material in a desiccant type dryer. Target dew point should be **-40°C.**
- Depending on the applied processing technique, the maximum moisture level should be 0.02%.

Processing Conditions

- **Estane® 58887 TPU** can be processed on any conventional extruder.

Recommended Starting Extrusion Temperature Profile:

March 2012
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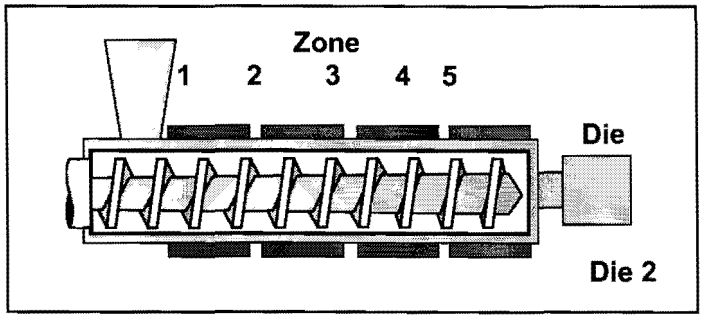


	°F/°C
Zone 1	350/177
Zone 2	360/182
Zone 3	370/188
Zone 4	380/193
Adapter (5)	380/193
Die Zone 1 (6)	380/193
Die Zone 2	380/193

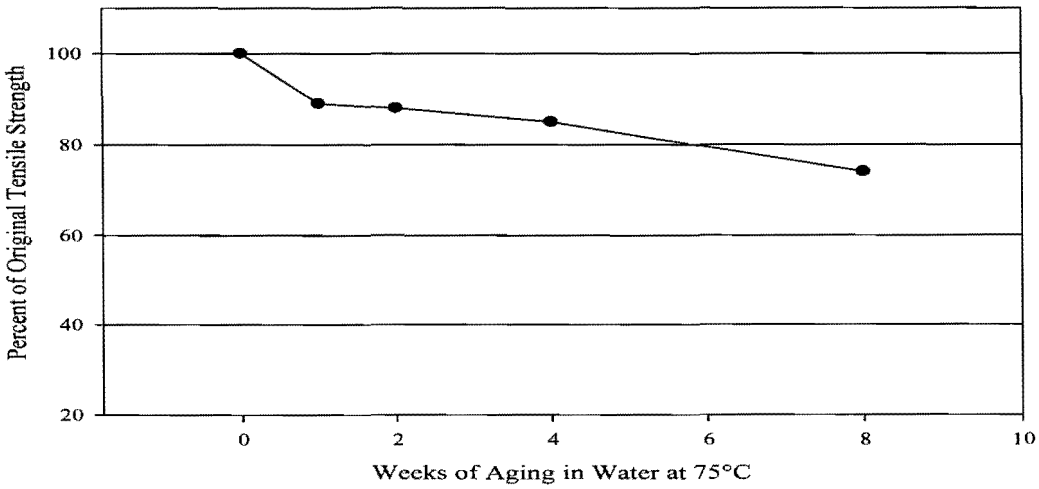
Melt Temp. Mid-Range: 375°F/191°C
Screen Pack Recommendation: 20/40/80

Application Information: High Performance Film & Sheet

Properties	Value (Metric)	Unit	Test Method
Tensile Set (200% elongation)	18	%	ASTM D-412
Kofler Melt Point	302 (150)	°F (°C)	Lubrizol Advanced Materials
Haze (pressed between glass)	1.0	%	ASTM D-1003
Volume Swell in Water (24h/23°C)	1.1	%	ASTM D-471
FDA 177.1680 (dry bulk foods)	Complies*		
FDA 177.2600 (wet/fatty foods)	Complies		
NSF 61 Status	Listed		

* Only for repeat use articles.

58887-035 Immersion in Water at 75°C
30 Mil Sheet



For further information refer to Lubrizol Advanced Materials processing guides.

March 2012
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