Petitioner Henkel's Demonstratives

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT AND TRIAL AND APPEAL BOARD

HENKEL CORPORATION
Petitioner
v.
H.B. FULLER COMPANY
Patent Owner
Case IPR2014-00606
Patent 6,833,404

Summary Of Petitioner Henkel's Argument

- "Holt Melt Adhesive" is not a claim limitation.
- There is no picking and choosing: the examples of hot melt adhesives in the Eastotac Reference anticipate claims 22, 23, 25, 28, 31 and 32.
- The example compositions in the Exxon Reference are hot melt adhesives and therefore anticipate claims 22-25 and 28.
- Litz provides both the motivation and the know-how to optimize the Eastotac and Exxon compositions to make compositions with a peel value of greater than about 70ºC (claim 27).

See, e.g., Pet. at 13-29, 29-38, 40-43; Reply at 3-8, 8-10, 11-13, 13-15.

Hot Melt Adhesives

- Both parties agree that hot melt adhesives are broadly defined.

> Hot melt adhesives are adhesive materials that "are 100[%] solid thermoplastic materials that flow when heated" and then form a "final bond . . . when the temperature has fallen to the ambient one, i.e., that of the material being glued." (Hsu Decl. (Ex. 1015) ¶ 15.) Hot melt adhesives "can bond wide possible ranges of paper stock," (*id.*) and generally include "polymers, tackifying resins, and waxes" (*id.*). Hot melt adhesives also "have the distinct advantages of being capable of extremely high tack with medium to very fast setting speeds." (*Id.*)

Patent Owner's Response (citing Henkel's expert, Dr. Hsu)

- The parties also agree that hot melt adhesives generally comprise polymers, tackifying resin, and waxes.

See, e.g., Pet. at 6-9; Resp. at 5; Reply at 4-5; Hsu at ¶15-26.

The Instituted Claims

- Claim 22 is representative of the instituted claims.

> **22**. A hot melt adhesive composition comprising:
>
> a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65° C.;
>
> b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/α-olefin interpolymer, and mixtures thereof.

- Fuller argues that the preamble is a limitation, even though the body of the claim recites specific percentages and amounts of tackifying resins and thermoplastic base polymers.

See, e.g., Resp. at 11-15; Reply at 4, 5.

The Preamble is an Intended Use

- A preamble is not limiting "where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use." *Catalina Mktg. Int'l v. Coolsavings.com, Inc*., 289 F.3d 801, 808 (Fed. Cir. 2002).

- Fuller never explains what structure is missing from the claims.

See, e.g., Resp. at 11-15; Reply at 1-2, 3-4, 6.

The Preamble Is Not A Limitation

- The claims are specific AND the body of the claim is structurally complete:

22. A hot melt adhesive composition comprising:

a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65° C.;

b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/α-olefin interpolymer, and mixtures thereof.

= **10-50% of a tackifier** that will begin to flow when heated to greater than 65°C and will solidify at room temperature.

= **10-80% of a polymer** that will soften when heated and will solidify at room temperature.

See, e.g., Reply at 4, 5-6.

The Prior Art Compositions are Hot Melt Adhesives

- *Even if* the preamble is limiting, the claims are still anticipated (claims 22-25, 28, 31 and 32) or rendered obvious (claim 27) because the prior art compositions are hot melt adhesives.
- Fuller offers only attorney argument in response.

13. Each and every element of claims 22-25 and 28, 31, and 32 is disclosed in the Eastotac Brochure and/or the Exxon Reference such that one of ordinary skill in the art could have made and used the claimed inventions without undue experimentation in light of the general knowledge available in the art. Specifically, the Eastotac Brochure discloses a hot melt adhesive composition comprising 30 to 50% by weight of Eastotac® hydrocarbon tackifying resin and 50 to 70% by weight of an amorphous polyalphaolefin (referred to herein as "the Amorphous Polyolefin Composition"). (Eastotac Brochure (Ex. 1002), Table 3.) The Eastotac Brochure also discloses a hot melt adhesive composition comprising 30 to 60% by weight of Eastotac® hydrocarbon tackifying resin and 30 to 50% by weight of ethylene-vinyl acetate copolymer (referred to herein as "the EVA Composition"). (Eastotac Brochure (Ex. 1002), Table 3.) It is Eastotac® H-142, is derived, at least in part, from dicyclopentadiene and has a glass transition temperature of greater than about 65 °C. Indeed, it is listed in the '404 patent as an example for use in the invention. Thus all of the limitations of claim 22 are disclosed. Similarly, the Exxon Reference discloses a hot melt composition comprising 40% by weight of a hydrocarbon tackifying resin, 20% by weight of Escorene UL 7750 as a thermoplastic base polymer, and 40% by weight of 158 °F MP paraffin wax. (Exxon Reference (Ex. 1003) at 2, FN 1.) The Exxon

See, e.g., Pet. at 13-38, 40-43; Resp. at 24-29, 31-37; Reply at 8-9, 10, 11-13.

Henkel's Expert Dr. Hsu is An Expert in Hot Melt Adhesives

- Fuller relies only on attorney argument in an attempt to discredit Henkel's expert, Dr. Hsu, but at the same time relies on aspects of his testimony.

Professor
Department of Polymer Science and Engineering

The University of Massachusetts

Education: Ph. D., Physics, The University of Michigan; BS, Physics, Rutgers University

Professional Affiliations:

American Physical Society High Polymer Physics Division
American Chemical Society Polymer Division

Honors and Awards:

Phi Beta Kappa
Danforth Foundation Fellow
Sigma Xi Honorary Research Society
National Science Foundation Creativity Award
American Physical Society Fellow
University of Massachusetts Conti Faculty Fellow
University Outstanding Faculty Leadership Award
USDA National Panel Manager Bioenergy Production and Byproducts
Chair, Advanced Materials Platform Panel, Taiwan (2008-present)
SPSJ (Japan) International Award

Refereed Publications

178. International Journal of Adhesion and Adhesives, 25, 39-46 (2005) (with Duffy, D. J.; Heintz, A. M.; Stidham, H. D.; Suen, W.; Paul, C. W.)
"The Competitive Influence of Specific Interactions and Extent of Reaction on the Miscibility of Ternary Reactive Polymer Blends: Model for Polyurethane Adhesives"

188. International Journal of Adhesion and Adhesives, 26(8): 600-608 (2006) (with Jeong, Y. G.. Hashida, et al)
"Morphology evolution and associated curing kinetics in reactive blends."

214. Int. Journal of adhesion and adhesives (submitted for publication) (with Kalish, J; Ramalingam, S; Wu, Y; Vyavahare, O; Wamuo, O; Paul, CW; Eodice, A)
"An Analysis of the Role of Ethylene based Additives in Hot Melt Adhesives"

DEPOSITION of SHAW LING HSU, PH.D.

Q. What have been -- What have been other sources of your funding for research over the years?

A. National Science Foundation, Army Research Office, various industrial sources, and the government from abroad.

Q. What have been your sources of funding -- let's just focus on the last five years. In the last five years, what have your sources of research funding at University of Massachusetts been from?

A. National Science Foundation, Henkel, Saint Gobain, Abbott Pharmaceutical, and Chemtura, and so on. NatureWorks, Dow Chemical.

See, e.g., Resp. at 5-8, 12, 17-22, 25-26, 32-33, 35-36; Reply at 2-3.

The Prior Art Compositions are Hot Melt Adhesives

- Litz explains that the combination of tackifier, polymer and wax results in a hot melt adhesive and varying the amounts alters the properties.

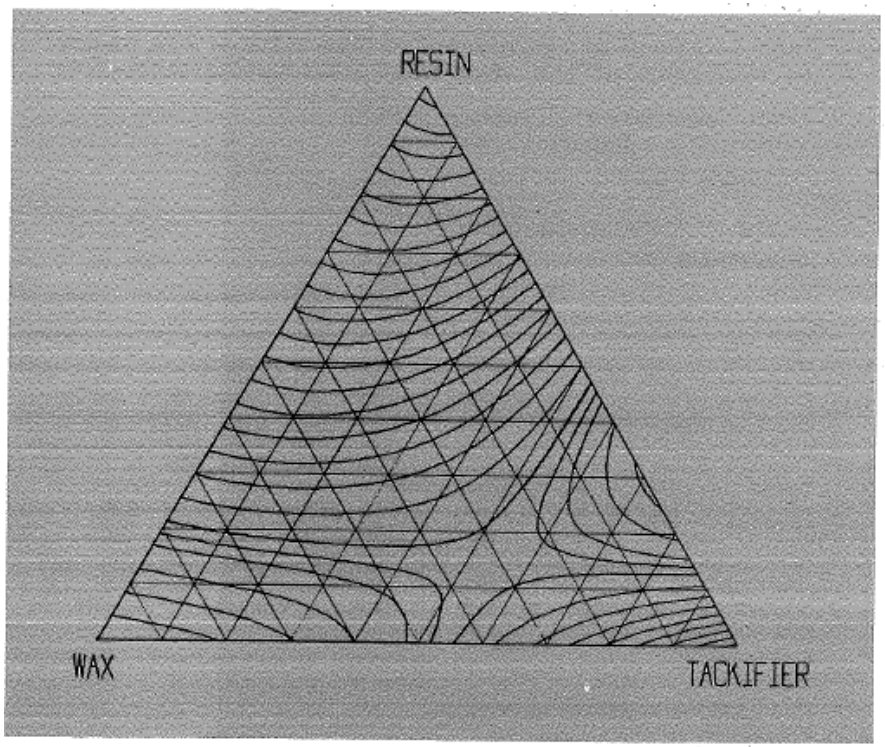


Figure 2 — Computer-developed viscosity-composition profile for tertiary hot melt adhesive systems.

Formulating with Computers. Perhaps the most exciting development on the horizon for hot melts is the use of computers to determine the performance characteristics and physical properties of innumerable compositions. The computer could be used to develop a hot melt adhesive formulation, then optimize the system according to required performance parameters. Proper programming will also enable the formulator to determine replacements for raw materials with a minimal effect on performance.

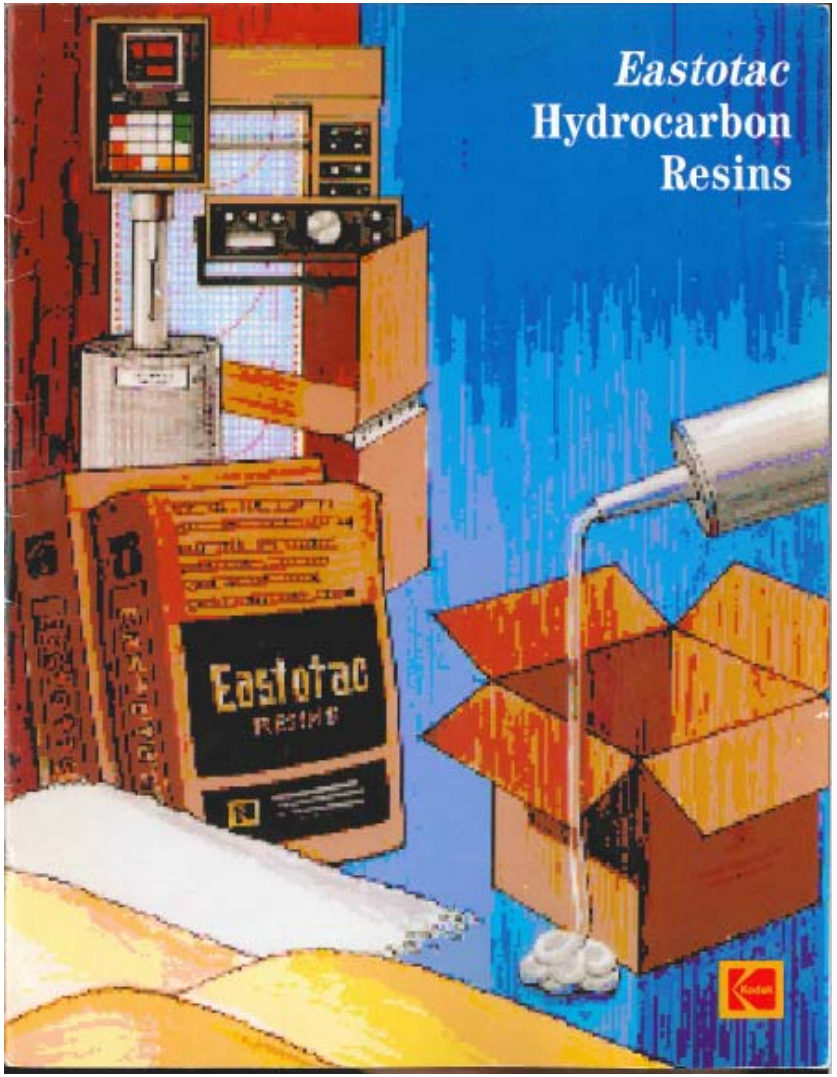
An example of the virtually limitless versatility of the computer is illustrated in Figure 2. Any tertiary hot melt adhesive system is selected. The viscosity of each of the three components is determined individually, and at several intermediate compositions. The computer can then map out the melt viscosity at any composition of the given polymer, tackifier, and wax.

See, e.g., Pet. at 41-42; Reply at 5, 12, 14.

The Eastotac Reference

- The Eastotac Reference is 102(b) prior art published more than 5 years (1992) before ’404 priority date.

- The Eastotac Reference anticipates claims 22, 23, 25, 28, 31 and 32 of the ’404 patent.



See, e.g., Pet. at 3-4, 13-29; Reply at 8-10.

The Eastotac Compositions Anticipate the Claims

22. A hot melt adhesive composition comprising:

a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65° C.;

b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/α-olefin interpolymer, and mixtures thereof.

(H-142)

Table 3

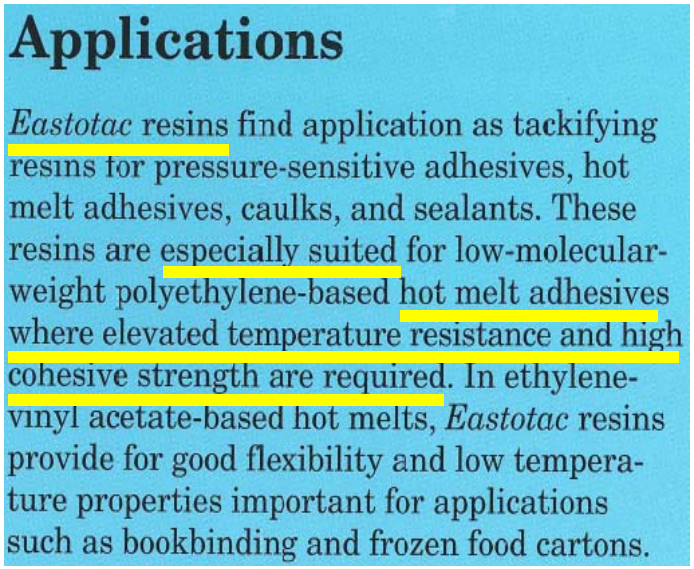
General Composition Ranges for *Eastotac* Resins in Hot Melt Adhesives

Materials	Compositions, % by Weight		
	PE Base	APP Base	EVA Base
Eastotac resin	10–40	30–50	30–60
Low-molecular-weight polyethylene wax	60–90	0–20	—
Amorphous polyolefin	—	50–70	—
Ethylene-vinyl acetate copolymer	—	—	30–50
Petroleum wax or Fischer-Tropsch wax	—	—	0–20
Antioxidant	0.25–0.5	0.25–0.5	0.25–0.5

See, e.g., Pet. at 13-29; Reply at 8-10.

The Eastotac Reference

- As the Board recognized, the Eastotac Brochure "expressly states that the resins listed therein are 'especially suited' for hot melt adhesives where 'elevated temperature resistance and high cohesive strength are required."



Applications

Eastotac resins find application as tackifying resins for pressure-sensitive adhesives, hot melt adhesives, caulks, and sealants. These resins are especially suited for low-molecular-weight polyethylene-based hot melt adhesives where elevated temperature resistance and high cohesive strength are required. In ethylene-vinyl acetate-based hot melts, *Eastotac* resins provide for good flexibility and low temperature properties important for applications such as bookbinding and frozen food cartons.

See, e.g., Pet. at 13-29; Reply at 8 (citing Decision at 14).

The Eastotac Reference Discloses Three Examples of Hot Melt Adhesives

- The Eastotac Reference shows examples of hot melt adhesive compositions using different thermoplastic base polymers in combination with the four Eastotac resins in Table 1.

Table 3

General Composition Ranges for *Eastotac* Resins in Hot Melt Adhesives

Materials	Compositions, % by Weight		
	PE Base	APP Base	EVA Base
Eastotac resin	10–40	30–50	30–60
Low-molecular-weight polyethylene wax	60–90	0–20	—
Amorphous polyolefin	—	50–70	—
Ethylene-vinyl acetate copolymer	—	—	30–50
Petroleum wax or Fischer-Tropsch wax	—	—	0–20
Antioxidant	0.25–0.5	0.25–0.5	0.25–0.5

Any Eastotac Resin

Thermoplastic base polymers

See, e.g., Pet. at 14-17; Reply at 9-10.

Table 3 Directs One to the Resins in Table 1

Table 3

General Composition Ranges for *Eastotac* Resins in Hot Melt Adhesives

Materials	Compositions, % by Weight		
	PE Base	APP Base	EVA Base
Eastotac resin	10–40	30–50	30–60
Low-molecular-weight polyethylene wax	60–90	0–20	—
Amorphous polyolefin	—	50–70	—
Ethylene-vinyl acetate copolymer	—	—	30–50
Petroleum wax			
Antioxidant			

Table 1

Typical Properties of *Eastotac* Hydrocarbon Resins*

PROPERTY	H-100E	H-100R	H-100L	H-100W	H-115E	H-115R	H-115L	H-115W	H-130E	H-130R	H-130L	H-130W	H-142R
Ring & Ball Softening Point, °C (°F)	100 (212)	100 (212)	100 (212)	100 (212)	115 (239)	115	115	115	130	130	130	130	142
Physical Form	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake
Gardner Color (Molten)	8	4	2	<1	8	4	2	<1	8	4	2	<1	4
Gardner Color (in 50% Toluene)	6	2	<1	<1	6	2	<1	<1	6	2	<1	<1	2
Acid Number	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Density	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Viscosity, *Brookfield Thermosel*, 190°C (374°F), cP	200	200	200	200	400	400	400	400	1200	1200	1200	1200	3000
Bromine Number	15	5	3	1	15	5	3	1	15	5	3	1	5
Chlorides, total, ppm	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ash, %	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001
Flash Point, Cleveland Open Cup, °C (°F)	242 (468)	242 (468)	242 (468)	242 (468)	257 (495)	257 (495)	257 (495)	257 (495)	299 (570)	299 (570)	299 (570)	299 (570)	321 (610)
Fire Point, Cleveland Open Cup, °C (°F)	266 (510)	266 (510)	266 (510)	266 (510)	283 (542)	283 (542)	283 (542)	283 (542)	325 (617)	325 (617)	325 (617)	325 (617)	335 (635)

*Reported for information only. Eastman makes no representation that the material in any particular shipment will conform exactly to the values given.

- No picking and choosing.
- Reference provides hot melt adhesive examples using each resin in Table 1.

See, e.g., Pet. at 14, 16; Reply at 9-10.

Table 1 Discloses Four Tackifying Resins

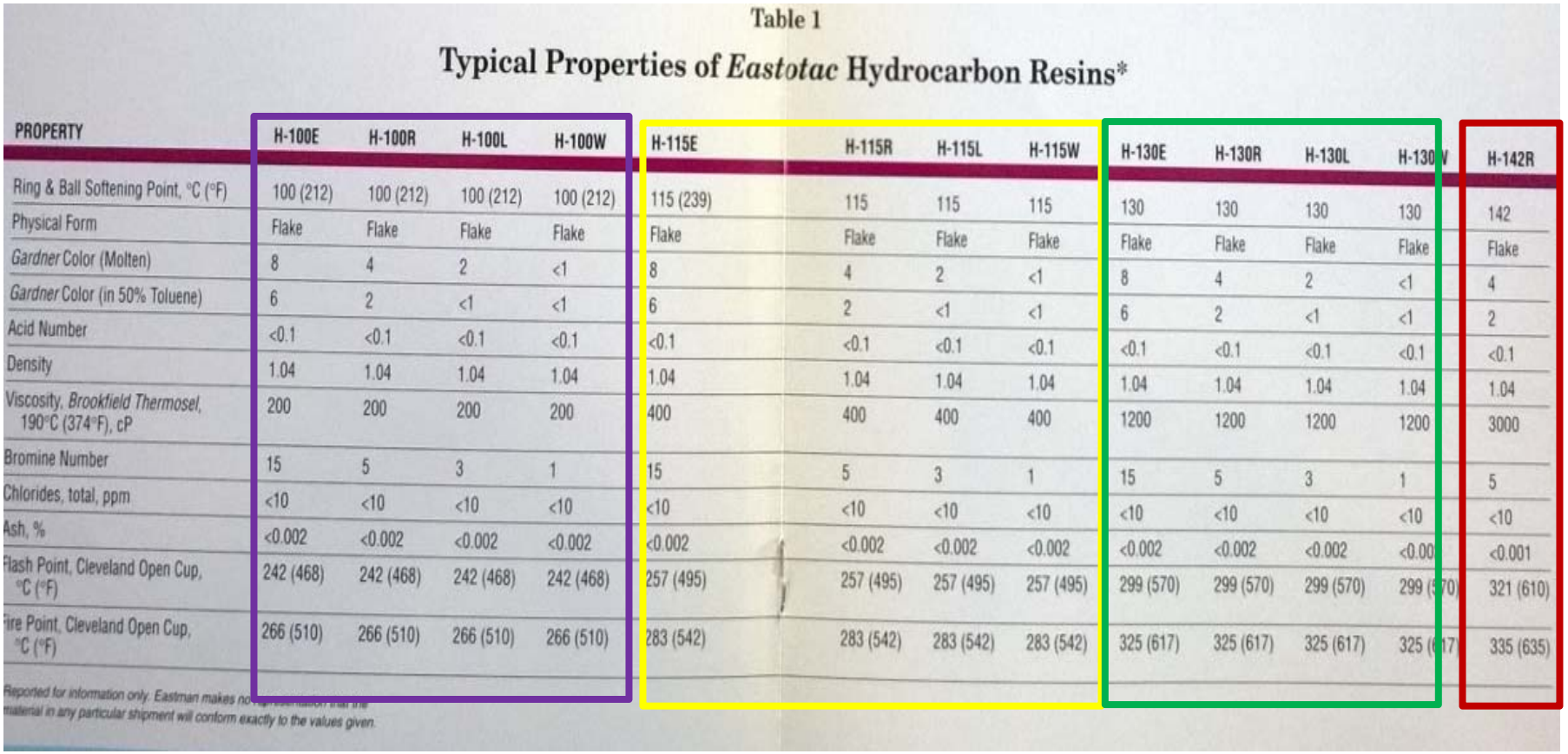


Table 1

Typical Properties of *Eastotac* Hydrocarbon Resins*

PROPERTY	H-100E	H-100R	H-100L	H-100W	H-115E	H-115R	H-115L	H-115W	H-130E	H-130R	H-130L	H-130W	H-142R
Ring & Ball Softening Point, °C (°F)	100 (212)	100 (212)	100 (212)	100 (212)	115 (239)	115	115	115	130	130	130	130	142
Physical Form	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake
Gardner Color (Molten)	8	4	2	<1	8	4	2	<1	8	4	2	<1	4
Gardner Color (in 50% Toluene)	6	2	<1	<1	6	2	<1	<1	6	2	<1	<1	2
Acid Number	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Density	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Viscosity, *Brookfield Thermosel*, 190°C (374°F), cP	200	200	200	200	400	400	400	400	1200	1200	1200	1200	3000
Bromine Number	15	5	3	1	15	5	3	1	15	5	3	1	5
Chlorides, total, ppm	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ash, %	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.00	<0.001
Flash Point, Cleveland Open Cup, °C (°F)	242 (468)	242 (468)	242 (468)	242 (468)	257 (495)	257 (495)	257 (495)	257 (495)	299 (570)	299 (570)	299 (570)	299 (570)	321 (610)
Fire Point, Cleveland Open Cup, °C (°F)	266 (510)	266 (510)	266 (510)	266 (510)	283 (542)	283 (542)	283 (542)	283 (542)	325 (617)	325 (617)	325 (617)	325 (617)	335 (635)

Reported for information only. Eastman makes no representation that the material in any particular shipment will conform exactly to the values given.

Eastotac resins are available in four color levels

See, e.g., Pet. at 14, 16; Reply at 9-10.

One of the Four Eastotac Resins is a Claimed Tackifying Resin

Table 1

Eastotac Hydrocarbon Resins*

H-142R
142
Flake
4
2
<0.1
1.04
3000
5
<10
<0.001
321 (610)
335 (635)

US 6,833,404 B2

The resins of the present invention preferably contain a high weight percent (based on the weight of the resin) of component(s) derived from dicyclopentadiene, although some resins having a lower concentration of the total unit derived from dicyclopentadiene have also been found to be useful. One such resin is Eastotac® H-142R having a bromine number of about 5 and a softening point of about 140° C. and available from Eastman Chemical Co. in Kingsport, Tenn. The Eastotac® resins are produced from a mixed feedstream of dicyclopentadiene, C_5's and other monomers. The Eastotac® resins are typically described as cycloaliphatic resins.

The resins for use in the invention are available from several sources including the Exxon Chemical Co. in Houston, Tex., Hercules, Inc. in Wilmington, Del. and Eastman Chemical Co. in Kingsport, Tenn. DCPD resins are also available from Nippon Zeon of Japan. Specific examples include ECR-158, a substantially aliphatic hydrocarbon resin having a T_g at onset of about 81° C. and Escorez® 5340, a substantially aliphatic hydrocarbon resin having a T_g at onset of about 76° C. both available from Exxon Chemical Co.; Regalite® T-140, a substantially aliphatic hydrocarbon resin having a T_g at onset of about 68° C.; Eastotac® H-135, a substantially aliphatic hydrocarbon resin having a T_g at onset of about 73° C. and Eastotac® H-142, a substantially aliphatic (i.e. cycloaliphatic) hydrocarbon resin having a T_g at onset of about 82° C.

(Col. 5, lines 16-25; col. 6, lines 14-29.)

See, e.g., Pet. at 14-15, 16; Reply at 9.

The Eastotac Compositions Meet All the Limitations of the Claims

- Table 3 discloses three examples of hot melt adhesives and directs one to the tackifying resins of Table 1. Table 1 discloses four examples of tackifying resins, one of which meets the elements of the claims.

Case IPR2014-00606

Patent 6,833,404

DEPOSITION of SHAW LING HSU, PH.D.

Q. Here so here is my question, sir: Is it correct that Table 3 does not identify a specific resin that can be used with a hot melt adhesive?

A. It does not identify specific resin but includes all the resin in the previous Table 1.

- Fuller has no evidence to the contrary and relies only on attorney argument.

See, e.g., Pet. at 14-17; Reply at 8-10.

Fuller's Arguments are Flawed: There is No Picking and Choosing

- Fuller argues that arriving at the claims requires "picking, choosing and combining."
- But anticipation does not require that the claim elements be "expressly spelled out" and does not require "actual performance" of the combining the elements.

the United States." 35 U.S.C. § 102(b) (2006).[3] A prior art reference can only anticipate a claim if it discloses all the claimed limitations "arranged or combined in the same way as in the claim." *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1361 (Fed.Cir.2012) (quoting *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370 (Fed.Cir.2008)). However, a reference can anticipate a claim even if it "d[oes] not expressly spell out" all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would "at once envisage" the claimed arrangement or combination. *In re Petering*, 49 CCPA 993, 301 F.2d 676, 681 (1962).

Though it is true that there is no evidence in Grab of "actual performance" of combining the ruthenium binder and PVD coatings, this is not required. *Novo Nordisk Pharm., Inc. v. Bio–Tech. Gen. Corp.*, 424 F.3d 1347, 1355 (Fed.Cir.2005) (quoting *Bristol–Myers Squibb Co. v. Ben Venue Labs., Inc.*, 246 F.3d 1368, 1379 (Fed.Cir.2001)). "Rather, anticipation only requires that those suggestions be enabled to one of skill in the art." *Id.* (quoting *Bristol–Myers Squibb*, 246 F.3d at 1379).

***Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376 (Fed. Cir. 2015)**

See, e.g., Resp. at 24-29; Reply at 10.

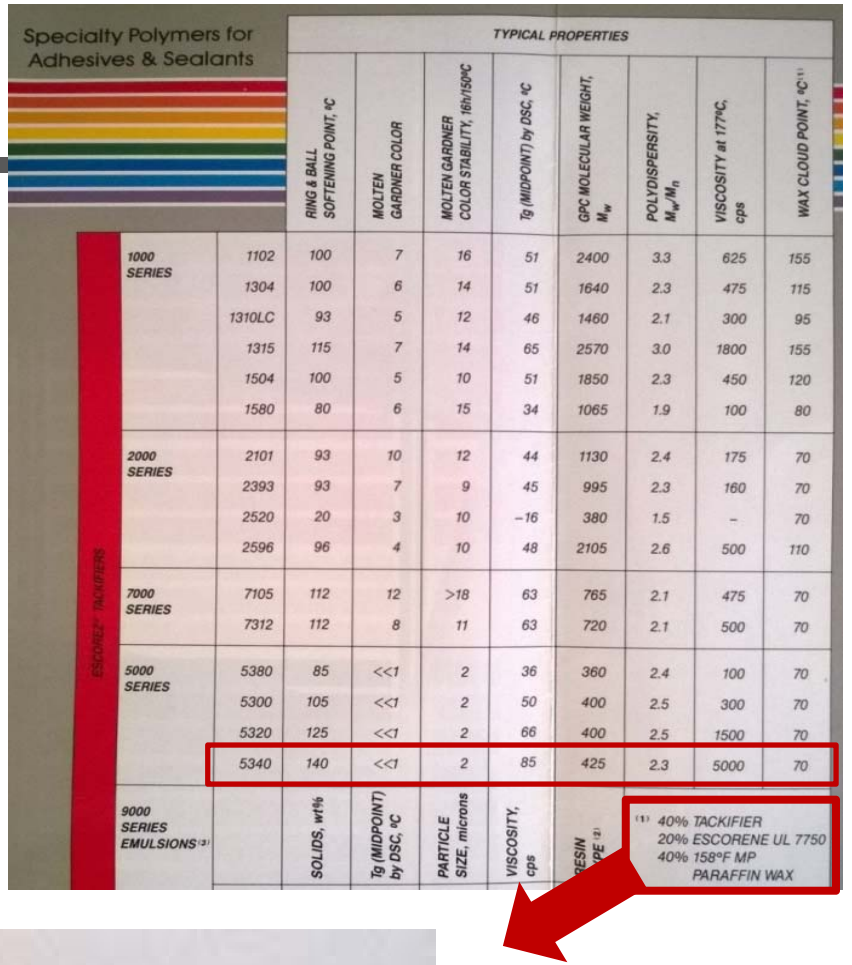
The Exxon Reference

- The Exxon Reference is 102(b) prior art published 8 years (1990) before the ’404 priority date.
- The Exxon Reference anticipates claims 22-25 and 28 of the ’404 patent.
- The Exxon Reference relates to adhesives.

See, e.g., Pet. at 3-4, 29-38; Reply at 11-13.

The Exxon Reference

- The Exxon Composition meets the limitations of the claims.



Specialty Polymers for Adhesives & Sealants

TYPICAL PROPERTIES

		RING & BALL SOFTENING POINT, °C	MOLTEN GARDNER COLOR	MOLTEN GARDNER COLOR STABILITY, 16h/150°C	Tg (MIDPOINT) by DSC, °C	GPC MOLECULAR WEIGHT, M_w	POLYDISPERSITY, M_w/M_n	VISCOSITY at 177°C, cps	WAX CLOUD POINT, °C[1]
ESCOREZ™ TACKIFIERS									
1000 SERIES	1102	100	7	16	51	2400	3.3	625	155
	1304	100	6	14	51	1640	2.3	475	115
	1310LC	93	5	12	46	1460	2.1	300	95
	1315	115	7	14	65	2570	3.0	1800	155
	1504	100	5	10	51	1850	2.3	450	120
	1580	80	6	15	34	1065	1.9	100	80
2000 SERIES	2101	93	10	12	44	1130	2.4	175	70
	2393	93	7	9	45	995	2.3	160	70
	2520	20	3	10	−16	380	1.5	–	70
	2596	96	4	10	48	2105	2.6	500	110
7000 SERIES	7105	112	12	>18	63	765	2.1	475	70
	7312	112	8	11	63	720	2.1	500	70
5000 SERIES	5380	85	<<1	2	36	360	2.4	100	70
	5300	105	<<1	2	50	400	2.5	300	70
	5320	125	<<1	2	66	400	2.5	1500	70
	5340	140	<<1	2	85	425	2.3	5000	70

9000 SERIES EMULSIONS[3]	SOLIDS, wt%	Tg (MIDPOINT) by DSC, °C	PARTICLE SIZE, microns	VISCOSITY, cps	RESIN TYPE[2]

[1] 40% TACKIFIER
20% ESCORENE UL 7750
40% 158°F MP
PARAFFIN WAX

22. A hot melt adhesive composition comprising:

a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65° C.;

b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/α-olefin interpolymer, and mixtures thereof.

40% TACKIFIER
20% ESCORENE UL 7750
40% 158°F MP
PARAFFIN WAX

See, e.g., Pet. at 29-38; Reply at 11-13.

Fuller Does Not Deny that the Exxon Composition Meets the Limitations in the Body of the Claims

- Fuller does not, and *cannot*, deny that the Exxon composition meets the limitations in the body of the claims.
- Fuller contends only:

olefin interpolymers, and mixtures thereof. Before the '404 patent, no one had demonstrated the ability to use this combination of a hydrocarbon tackifying resin with a glass transition temperature above 65° C and polymer in a hot melt adhesive. In fact, while people had experimented with a different type of "high

See, e.g., Resp. at 9-10, 31-37; Reply at 4, 11.

Fuller Argues the Preamble Is Limiting

- Fuller argues that Henkel has not shown the Exxon composition would function as a "hot melt adhesive."
- But Henkel has shown, via Dr. Hsu, that the Exxon composition would function as a hot melt adhesive, which is consistent with Litz.

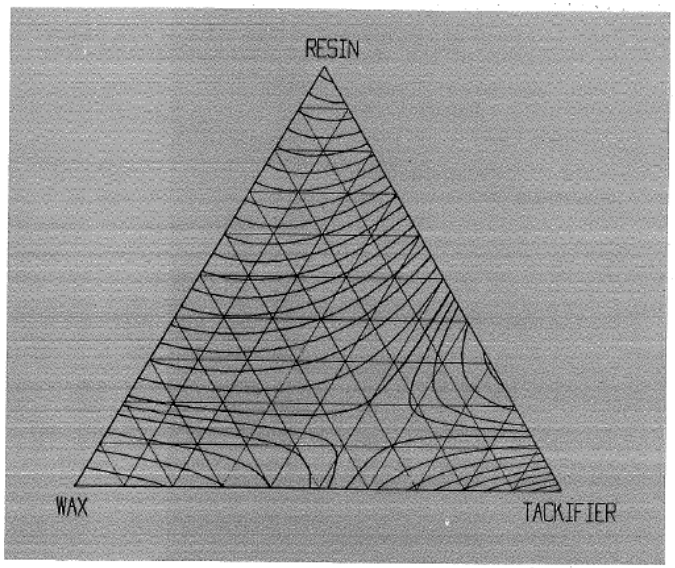


Figure 2 — Computer-developed viscosity-composition profile for tertiary hot melt adhesive systems.

68. Specifically, the Exxon Reference discloses a hot melt composition comprising 40% by weight of a hydrocarbon tackifying resin, 20% by weight of Escorene UL 7750 as a thermoplastic base polymer, and 40% by weight of 158 °F MP paraffin wax. (Exxon Reference (Ex. 1003) at 2, FN 1.)

See, e.g., Pet. at 29-36; Resp. at 32-34; Reply at 12-13.

Fuller's Arguments are Flawed: There is No Picking and Choosing

- Fuller argues that arriving at the claims requires "picking, choosing and combining."
- But anticipation does not require that the claim elements be "expressly spelled out" and does not require "actual performance" of the combining the elements.

the United States." 35 U.S.C. § 102(b) (2006).[3] A prior art reference can only anticipate a claim if it discloses all the claimed limitations "arranged or combined in the same way as in the claim." *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1361 (Fed.Cir.2012) (quoting *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370 (Fed.Cir.2008)). However, a reference can anticipate a claim even if it "d[oes] not expressly spell out" all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would "at once envisage" the claimed arrangement or combination. *In re Petering*, 49 CCPA 993, 301 F.2d 676, 681 (1962).

Though it is true that there is no evidence in Grab of "actual performance" of combining the ruthenium binder and PVD coatings, this is not required. *Novo Nordisk Pharm., Inc. v. Bio–Tech. Gen. Corp.*, 424 F.3d 1347, 1355 (Fed.Cir.2005) (quoting *Bristol–Myers Squibb Co. v. Ben Venue Labs., Inc.*, 246 F.3d 1368, 1379 (Fed.Cir.2001)). "Rather, anticipation only requires that those suggestions be enabled to one of skill in the art." *Id.* (quoting *Bristol–Myers Squibb*, 246 F.3d at 1379).

***Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376 (Fed. Cir. 2015)**

See, e.g., Resp. at 24-29; Reply at 10.

Fuller's Arguments Are Inconsistent with the '404 Patent and the Art

- Fuller also tries to argue that 40% wax in an ethylene copolymer-based composition, such as the Exxon composition, is high and "inconsistent" with the '404 patent, but Fuller is wrong and provides NO expert support.

5,939,483

1. A hot melt adhesive useful for packaging, comprising:
a) from about 10% to about 40% by weight of a radial styrene-isoprene-styrene block copolymer;
b) up to about 20% of a compatible polymer, wherein the total polymer content does not exceed 40% by weight;
c) from about 25% to about 60% by weight of at least one tackifying resin;
d) from about 10% to about 40% by weight of at least one wax component; wherein the viscosity of the hot melt adhesive is less than about 1500 cPs at about 150° C.

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20. A hot melt adhesive composition comprising:
a) about 10% by weight to about 50% by weight of at least one tackifying resin having a glass transition temperature of at least 65° C.;
b) about 20% by weight to about 60% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/α-olefin interpolymer, and mixtures thereof; and
c) 0% by weight to about 40% by weight of at least one wax;
wherein said tackifying resin concentration is less than said thermoplastic base polymer concentration.

5,176,779

The layer of hot-melt adhesive includes, by weight:
20–50% thermoplastic copolymer,
15–50% tackifying resin, and
20–60% wax having a melting point of at least 60° C.

See, e.g., Resp. at 34-37; Reply at 2, 13.

Claim 27 Would Have Been Obvious

- The Eastotac compositions and the Exxon composition teach all the limitations of claim 22.
- The only difference between claim 22 and claim 27 is the recited peel value.

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27. The adhesive of claim **22** wherein the peel values are greater than about 70° C.

See, e.g., Pet. at 40-43; Reply at 13-15.

Motivation to Obtain the Claimed Peel Value was in the Prior Art

- Litz taught that peel values should be between -20°F and 165°F (-29°C and 74°C).

85. One of skill in the art would have been motivated to prepare a hot melt adhesive with a peel value of are greater than about 70 °C, and there would have been a reasonable expectation of success based on what was known in the art at the time regarding tackifying resins. Litz, for example, is a review article published in 1974 that discusses developments in ethylene-based hot melt adhesives. (Litz (Ex. 1005) at 35-38.) Litz explains that "one of the

"Rule 41" Hot Melt Adhesives. One of the most important reasons for the impressive growth of hot melts has been the ability of the formulators to meet the demanding requirements of diverse adhesive applications. A good example is the success achieved in conforming to the difficult standards of Rule 41.

Briefly, Rule 41 is a set of regulations issued by the Uniform Freight Classification Committee which governs the packaging requirements of all materials shipped by rail. Effective July 31, 1970, amended Section 7A permitted — for the first time — the use of hot melt adhesives in sealing corrugated containers up to a gross weight of 65 pounds.

The amendment also required that the hot melt be a 100 per cent solids thermoplastic material, and maintain a bond in temperatures between −20°F and +165°F. Further modification of

See, e.g., Pet. at 41-43; Reply at 14; Ex. 1005 at 2.

The Know-How Was in the Prior Art

- Litz, Kraus, and others provided the knowledge to increase the peel value to greater than 70°C.

Inter Partes Review of U.S. Patent No. 6,833,404
Case IPR: Unassigned
Declaration of Shaw Ling Hsu, Ph.D. (Ex. 1015)

22. By June 1998, it was known that the use of tackifiers in a hot melt adhesive would increase the use temperature of the adhesive, and particularly, using higher Tg tackifiers would increase the overall mechanical strength of the adhesive, and therefore increase the peel value and heat resistance of the adhesive. (*See, e.g.*, Kraus et al., *Tack and Viscoelasticity of Block Copolymer Based Adhesives*, J. Adhesion 10:221-36 (1979) ("Kraus") (Ex. 1018), Figure 1.) An adhesive with a higher Tg tackifier was thus known to deform at a higher temperature, which was preferable in certain applications. In addition to increasing peel value by using a higher Tg tackifier, it was routine in the art to increase peel value by varying the thermoplastic polymer and adding wax.

Tack and Viscoelasticity of
Block Copolymer Based Adhesives†

G. KRAUS, K. W. ROLLMANN and R. A. GRAY

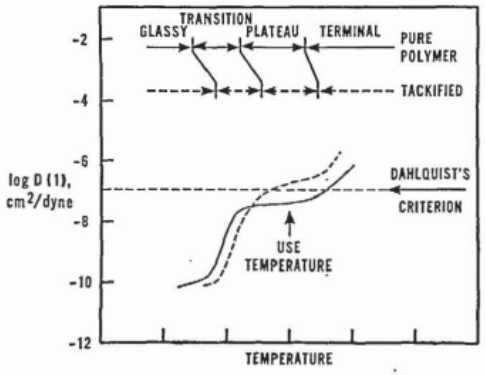

FIGURE 1 One second creep compliance vs. temperature of a high molecular weight amorphous polymer before (——) and after (- - - -) incorporation of a tackifier.

See, e.g., Pet. at 41-43; Reply at 14.

The Prior Art Compositions are Hot Melt Adhesives

- Litz explains that the combination of tackifier, polymer and wax results in a hot melt adhesive and varying the amounts alters the properties.

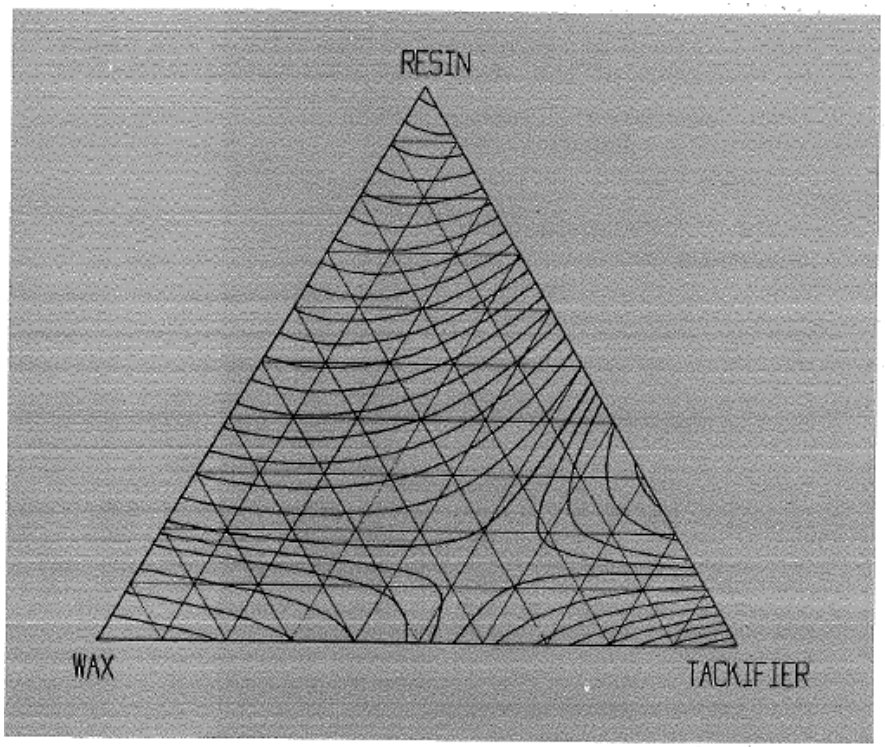

Figure 2 — Computer-developed viscosity-composition profile for tertiary hot melt adhesive systems.

Formulating with Computers. Perhaps the most exciting development on the horizon for hot melts is the use of computers to determine the performance characteristics and physical properties of innumerable compositions. The computer could be used to develop a hot melt adhesive formulation, then optimize the system according to required performance parameters. Proper programming will also enable the formulator to determine replacements for raw materials with a minimal effect on performance.

An example of the virtually limitless versatility of the computer is illustrated in Figure 2. Any tertiary hot melt adhesive system is selected. The viscosity of each of the three components is determined individually, and at several intermediate compositions. The computer can then map out the melt viscosity at any composition of the given polymer, tackifier, and wax.

See, e.g., Pet. at 41-42; Reply at 5, 12, 14.

Litz's Tackifiers are Not "Disclaimed" by the '404 Patent

- Fuller argues that the tackifiers in Litz are "disclaimed" by the '404 patent, but Litz is relied on for motivation and know-how to increase the peel value.
- Further, the '404 claims do not exclude the allegedly "disclaimed" tackifiers.

> **22**. A hot melt adhesive composition comprising:
>
> a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65° C.;
>
> b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/α-olefin interpolymer, and mixtures thereof.

- And the examples in Litz are exemplary compositions.

See, e.g., Reply at 39-40; Reply at 14-15.

Claim 27 Would Have Been Obvious

- As Dr. Hsu explained, claim 27 would have been obvious over the Eastotac Reference or the Exxon Reference in view of Litz.

Element	Eastotac	Exxon
27. The adhesive of claim **22**	APP hot melt adhesive & EVA hot melt adhesive	Footnote 1 hot melt adhesive
wherein the peel values are greater than about 70° C.	Litz	Litz

See, e.g., Pet. at 40-43; Reply at 13-15.

All Claimed Compositions Will Function As Hot Melt Adhesives

- Hot melt adhesives flow when heated and form a bond when cooled, and are generally comprised of a tackifying resin, base polymer, and optionally a wax. (Hsu Decl. (Ex. 1015) at ¶ 15.)

22. A hot melt adhesive composition comprising:

a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65° C.;

= **10-50% of a tackifier** that will begin to flow when heated to greater than 65°C and will solidify at room temperature.

b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/α-olefin interpolymer, and mixtures thereof.

= **10-80% of a polymer** that will soften when heated and will solidify at room temperature.

- Fuller does not attempt to argue that the *claimed* compositions will not always be hot melt adhesives, just that *all* compositions comprising a resin and a polymer are not hot melt adhesives.

See, e.g., Pet. at 6-9; Resp. at 13; Reply at 4-6.

Specification and Prosecution History Do Not Show that the Preamble is a Limitation

- The specification and prosecution history show that the applicant did *not* intend "hot melt adhesive" to be a limitation.

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In another embodiment, the present invention is an adhesive composition comprising from about 10 wt-% to about 80 wt-% of at least one hydrocarbon tackifying resin derived at least in part from dicyclopentadiene and having a Tg greater than about 65° C. and from about 10 wt-% to about 80 wt-% of at least one amorphous polyalphaolefin and/or block copolymer. The tackifying resin is preferably derived predominantly from dicyclopentadiene.

Example 1

This example illustrates a composition useful for packaging applications. A sample was prepared using a blend of

Response of July 21, 2000

the Applicants would like to direct the Examiner's attention to the Examples beginning at p. 21, and in particular to Table's III, IV and V exemplifying various adhesive compositions of the present invention

Response of Jan. 28, 2002

. Undoubtedly, the chemically different composition provided by the subject invention

Response of April 1, 2002

In contrast, in the subject invention, the claimed adhesive composition includes a thermoplastic base polymer selected from copolymer and terpolymers of ethylene, amorphous polyalphaolefins, homogeneous ethylene/a-olefin interpolymers, and mixtures thereof.

See, e.g., Reply at 6-8; Ex. 2004 at 132, 208, 242.

The Claims Do Not Require A Specific Function

- Fuller tries to confuse issues by focusing on alleged properties of "bondability" or "heat resistance."
- But none of the claims have any such requirement and are not limited to any specific application.

22. A hot melt adhesive composition comprising:

a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65° C.;

b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/α-olefin interpolymer, and mixtures thereof.

See, e.g., Resp. at 7-8, 31-32, 34-37; Reply at 12.

Fuller's Motion to Exclude Should Be Denied As An Improper Sur-Reply

- "A motion to exclude is [not] a substantive sur-reply." *Kyocera Corp. Motorola Mobility LLC v. Softview LLC*, 2014 WL 1382058, at *19 (PTAB Mar. 27, 2014).
  - Yet Fuller clearly tries to do just that arguing that Henkel failed "to meet its burden of proof."
  - Fuller alleges Henkel "only" relied on Ex. 1040 and Ex. 1041, but ignores the other references of record, including the '404 patent.
  - Fuller even presents a *new argument in its reply to Henkel's opposition*, arguing that Henkel identified the "hot melt adhesive" as an independent limitation.

See, e.g., Motion at 7; Opp. at 5-7; Reply to Opp. at 1.

Ex. 1040 and 1041 Were Properly Submitted

- Henkel submitted these exhibits simply to rebut arguments raised by Fuller in its reply:
  - Fuller alleged that the amount of wax in the Exxon composition (40%) was inconsistent with the '404 patent. (*See* Resp. at 35-36.)
  - Henkel could not have anticipated such an argument, particularly because the '404 patent actually *claims* hot melt adhesives with 40% wax.
  - Ex. 1040 and Ex. 1041 were cited, in conjunction with the '404 patent claims, to rebut Fuller's unsupported and surprising argument.

See, e.g., Opp. at 3-4.

Ex. 1040 and Ex. 1041 Are Not Being Applied to the Claims

- In denying a motion to exclude, the Board considered it important that the new reference was not being applied to the claims and that the grounds on which the Board instituted the claims did not change. *Kyocera*, 2014 WL 1382058, at *19.
  - Here, Ex. 1040 and Ex. 1041 are being used to rebut Fuller's surprising and unsupported arguments.
  - They are not being applied to the claims.
  - They do not change the grounds on which the Board instituted the claims.

See, e.g., Opp. at 3-4.

Fuller Uses Its Motion To Again Mischaracterize the Record

- Fuller argues that Ex. 1040 and Ex. 1041 are the "only" evidence Henkel has to rebut Fuller's contention that 40% wax in the Exxon composition is inconsistent with the '404 patent.
- Fuller is wrong. Henkel cited to the **'404 patent claims**.
- Ex. 1040 and Ex. 1041 were merely cited in a footnote to *further* support Henkel's position.

See, e.g., Motion at 7; Opp. at 6-7.