

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LIN-MIN TAU, YUNWA WILSON CHEUNG, CHARLES F.
DIEHL, and LONNIE G. HAZLITT

Appeal 2008-2965
Application 10/429,651
Technology Center 1700

Decided: June 18, 2008

Before ROMULO H. DELMENDO, LINDA M. GAUDETTE, and
JEFFREY B. ROBERTSON, *Administrative Patent Judges*.

ROBERTSON, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) (2002) from the Examiner’s final rejection of pending claims 20 and 21.¹ (Examiner’s Answer entered July 19, 2007, hereinafter “Ans.”). We have jurisdiction pursuant to 35 U.S.C. § 6(b) (2002).

Claims 20 and 21 are rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Huff (5,747,592).

We REVERSE.

Appellants’ claimed invention is directed to a thermoplastic olefin composition comprising at least about 40 percent by weight of (a) a propylene-alpha olefin copolymer, (b) at least about 20 percent by weight of a polypropylene, and (c) at least about 10 percent by weight of an ethylene-alpha olefin elastomer. (Spec. 3). The propylene-alpha olefin copolymer (a) forms a continuous phase and has the following characteristics: 60 percent by weight units derived from propylene; at least 5 percent by weight units derived from alpha olefin; a molecular weight distribution less than about 3.5; a broad composition distribution; a heat of fusion less than about 40 Joules/gram; and optionally a glass transition temperature less than about -10°C. (Spec. 3, 7, 8, 10, 12, and 15). The polypropylene (b) has about 93 percent by weight units derived from propylene, a heat of fusion greater than the propylene-alpha olefin copolymer, and a melting point of at least about 120°C. (Spec. 3 and 28). Appellants state that the claimed blend provides an improved flexible thermoplastic olefin blend having an excellent balance of physical properties. (Spec. 2 and 8).

¹ Claims 1-19 and 22-26 have been cancelled. (Amended Appeal Brief filed March 22, 2007, hereinafter “App. Br.,” 5).

Claim 20, the only independent claim on appeal, recites:

20. A thermoplastic olefin composition, comprising:

(a) at least about 40 percent by weight of a propylene-alpha olefin copolymer based on the total weight of polymers in the composition, the propylene-alpha olefin copolymer forming a continuous phase of the composition and the propylene-alpha olefin copolymer having:

(1) at least about 60 percent by weight units derived from propylene;

(2) at least about 5 percent by weight units derived from an alpha olefin;

(3) a molecular weight distribution less than about 3.5;

(4) a broad composition distribution;

(5) a heat of fusion of less than about 40 Joules/gram; and

(6) optionally, a glass transition temperature (T_{gp}) less than about -10°C;

(b) at least about 20 percent by weight of a polypropylene based on the total weight of polymers in the composition, the polypropylene having:

(1) at least about 93 percent by weight units derived from propylene;

(2) a heat of fusion greater than the heat of fusion exhibited by the propylene-alpha olefin copolymer; and

(3) a melting point T_{max}, of at least about 120°C; and

(c) at least about 10 percent by weight of an ethylene-alpha olefin elastomer based on the total weight of polymers in the composition.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Huff 5,747,592 May 5, 1998

At issue is the rejection of claims 20 and 21 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Huff. The Examiner found that Huff discloses a polypropylene and an elastomer, such as ethylene-propylene (EP) rubber, which meet the requirements of components (a) and (b) as claimed. (Ans. 4). The Examiner stated that although the composition comprises three polymers, propylene-alpha olefin copolymer (a) and polypropylene (b) can be substantially identical as claimed. (Ans. 4). The Examiner then stated that because the polypropylene copolymer disclosed in Huff is substantially identical to propylene-alpha olefin copolymer (a) and polypropylene (b), the claimed properties are inherent to the polypropylene copolymer disclosed in Huff. (Ans. 5).

Appellants contend that the first component and the second component cannot be the same because propylene-alpha olefin copolymer (a) and polypropylene (b) have different properties. (App. Br. 10). Appellants point to the limitation that the heat of fusion of polypropylene (b) must be greater than the heat of fusion exhibited by propylene-alpha olefin copolymer (a). (App. Br. 10). Appellants argue that Huff does not teach or suggest that the polypropylene disclosed therein has a heat of fusion less than 40 Joules/gram. (App. Br. 11).

Appellants additionally argue that Huff does not teach a propylene-alpha olefin copolymer having a combination of a narrow molecular weight distribution and a broad composition distribution. (App. Br. 10). Appellants contend that the portion of Huff cited by the Examiner does not refer to polypropylenes, but ethylene-based plastomers. (App. Br. 11).

The Examiner contends that components (a) and (b) can be miscible with each other to form a single component. (Ans. 5). The Examiner argues that the resulting properties of the single component are unknown, because the initial individual properties of components (a) and (b) are lost during the preparation process. (Ans. 6). The Examiner argues that the claim is a product-by-process claim, such that the patentability of the claim is determined by the product and not the process used to make the product, i.e. mixing individual components (a), (b), and (c). (Ans. 8 and 9). The Examiner analogizes combining components (a) and (b) to mixing two portions of water at two different temperatures where the result is water at one temperature. (Ans. 8).

Appellants contend that it is impossible for components (a) and (b) to be compositionally identical because they have recited different properties. (Reply Brief filed Sep. 18, 2007, hereinafter “Reply Br.,” 2). In addition, Appellants argue that their composition is not defined by the properties of the composition, but by the components from which the composition is made. (Reply Br. 2). Appellants argue that the compositions of Huff must have different properties than the claimed composition because it is made from different components. (Reply Br. 2). Last, Appellants dispute the Examiner’s water analogy because the molecules of water in both components of water are compositionally the same, whereas the composition

and properties of components (a) and (b) are different in size, structure, and aggregates of molecules. (Reply Br. 3). Appellants argue that the polymer blend formed with two components of polymer yields a blend with different properties from its component parts. (Reply Br. 3).

ISSUE

Based on the contentions of the Examiner and Appellants, the issue presented is: Have Appellants shown error in the Examiner's determination that the thermoplastic olefin composition disclosed in Huff is substantially identical to Appellants' claimed composition?

We answer this question in the affirmative.

FINDINGS OF FACT

The record supports the following Findings of Fact (FF) by a preponderance of the evidence.

1. Appellants' Specification states:

The flexible thermoplastic polyolefin blend of the invention comprises at least 40 percent by weight of a propylene-alpha olefin copolymer, preferably from 40 percent by weight to 80 percent by weight based on the total weight of the polymer present in the blend. The blend further comprises at least 20 percent by weight of a polypropylene, preferably at least 30 percent by weight based on the total weight of the polymer present in the blend. (Spec. 7, ll. 5-11).

2. Appellants' Specification states:

If a propylene-ethylene copolymer makes up the propylene-alpha olefin copolymer component of the blend, then a random propylene copolymer incorporating units derived from ethylene

preferably is utilized to increase the compatibility between the propylene-ethylene copolymer component and the polypropylene component of the blend. Increasing the compatibility will provide a blend exhibiting better physical properties, as discussed earlier. The polypropylene copolymer, preferably has from 0.5 to 6 percent by weight units derived from an alpha olefin, with the alpha-olefin preferably matching the alpha-olefin comprising the propylene-alpha olefin copolymer component of the blend. For example, if a propylene-ethylene copolymer makes up the propylene-alpha olefin copolymer of the blend, then the polypropylene component preferably is a polypropylene copolymer having from 0.5 to 6 percent by weight units derived from ethylene, more preferably it is a random propylene copolymer having from 0.5 to 6 percent by weight units derived from ethylene. (Spec. 29, ll. 12-24).

3. Huff states:

In a preferred embodiment, the TPO of the present invention includes in the range of about 2-40 wt % plastomer, more preferably 3-20 wt %, yet more preferably 4-15 wt % and most preferably 5-12 wt %. For the purposes of this application, the term "plastomer" shall mean ethylene based copolymers having a density in the range of about 0.86-0.915 gm/cm³. (Col. 4, ll. 32-35).

4. Huff states:

The preferred plastomers for use in the present invention have a CDBI of at least 45%, preferably at least 50% more preferably at least 60% and most preferably above 70%. They have a MWD of below 4.0, preferably in the range of 1.7-3.5, more preferably in the range of 1.8-3.0 and most preferably in the range of 1.9-2.8. They have a density in the range of 0.865-0.92 g/cm³; preferably in the range of 0.87-0.91 g/cm³, more preferably in the range of 0.88-0.905 g/cm³, and most preferably in the range of 0.880-0.900 g/cm³. The preferred comonomers are non-cyclic mono-olefins such as butene-1,

pentene-1, hexene-1, octene-1 and 4 methyl-pentene-1. However, cyclic mono-olefins and both linear and cyclic dienes can also be used. It will be desirable in some applications to use ethylene, alpha-olefin, [and] diene terpolymers. This is advantageous in that it provides the plastomer with residual unsaturation to allow a functionalization reaction or cross-linking in the rubber phase of the finished product. (Col. 5, ll. 4-21).

PRINCIPLES OF LAW

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. Inc. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 827 (1987). Analysis of whether a claim is patentable over the prior art under 35 U.S.C. § 102 begins with a determination of the scope of the claim. We determine the scope of the claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). Claims will be given their plain meaning unless their plain meaning is inconsistent with the specification. *In re Zletz*, 893 F.2d 319, 321 (Fed. Cir. 1989). The properly interpreted claim must then be compared with the prior art.

“Section 103 forbids issuance of a patent when the ‘differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the

subject matter pertains.’’ *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1734 (2007).

ANALYSIS

After consideration of both the Examiner's and Appellants' contentions, we agree with Appellants that Huff does not teach or suggest all of the limitations of the claimed thermoplastic olefin composition. Specifically, claim 20 recites the limitation that propylene-alpha olefin copolymer (a), (1) has a heat of fusion of less than about 40 Joules/gram, and polypropylene (b), (2) has a heat of fusion greater than the heat of fusion exhibited by the propylene-alpha olefin copolymer. The plain meaning of limitation (b)(2) is that the heat of fusion of polypropylene (b) must be greater than the propylene-alpha olefin (a). Thus, in order to satisfy this limitation, propylene-alpha olefin copolymer (a) and polypropylene (b) must be different. An interpretation that propylene-alpha olefin copolymer (a) and polypropylene (b) are the same would be inconsistent with the specification, which indicates that these polymers are different. (FF 1 and 2). Therefore, we agree with Appellants that propylene-alpha olefin copolymer (a) and polypropylene (b) cannot be the same polymer.

The Examiner's position that Huff anticipates copolymer (a) and polypropylene (b) is based in part on the molecular weight distribution and composition distribution disclosed in Huff in column 5, lines 4-21. (Ans. 4; *see* FF 3 and 4). The Examiner relies on this portion of Huff's disclosure to support the finding that the polypropylene copolymer of Huff is substantially identical to the polypropylene copolymer as claimed. (Ans. 4). However, we agree with Appellants that this portion of Huff refers to the plastomer

component, which is ethylene based, and not the polypropylene component. (FF 3 and 4). The properties of Huff's plastomer component, a different component of the composition, are not relevant to Huff's polypropylene component.

Appellants also contend that Huff does not disclose the heat of fusion, molecular weight distribution, and broad composition distribution properties of the polypropylene. (App. Br. 10 and 11). Indeed, as discussed above, Huff fails to disclose these properties of the *polypropylene* component. Therefore, in addition to the requirement that copolymer (a) and polypropylene (b) must be different, we agree with Appellants that the polypropylene disclosed in Huff is not the same or substantially the same polypropylene as claimed. Further, in light of the above discussion, there is no evidence or reason to conclude that a miscible component with unknown properties is necessarily or inherently formed from copolymer (a) and polypropylene (b) such that the claimed components (a) and (b) read on the polypropylene disclosed in Huff.

Regarding the Examiner's analogy that the combination of copolymer (a) and polypropylene (b) is similar to combining water at two different temperatures, we agree with Appellants that this analogy is not on point. Water present at two different temperatures is still water. In contrast, copolymer (a) and polypropylene (b) have different properties (and necessarily different structures), as illustrated by the different heat of fusion for these components. As discussed above, Huff does not disclose many of the required characteristics of propylene-alpha olefin copolymer (a) and polypropylene (b) as claimed to support a finding of anticipation. Thus, the combination of (a) and (b) "yield[s] a polymer blend different from its

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component parts not only in temperature, but also in other properties as well.” (Reply Br. 3). For the above reasons, Huff fails to disclose all limitations of the present claims.

Last, the Examiner has not provided any other rationale as to how the claimed elements not disclosed in Huff would have been obvious to one of ordinary skill in the art. Therefore, we agree with Appellants that the claims are not obvious over Huff.

CONCLUSION

For the foregoing reasons, Appellants have shown reversible error on the part of the Examiner.

ORDER

The decision of the Examiner rejecting claims 20 and 21 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Huff is reversed.

REVERSED

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