

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SEBASTIEN BEAUFILS
and CLAIRE CALERO

Appeal 2007-3193
Application 10/312,804
Technology Center 1700

Decided: November 28, 2007

Before CHARLES F. WARREN, THOMAS A. WALTZ, and
CATHERINE Q. TIMM, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 10, 11, 14, and 18-23. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

I. BACKGROUND

The invention relates to an insulation product. The product varies in properties across its thickness. Claims 10, 11, and 23 are illustrative of the subject matter on appeal:

10. Thermal and/or acoustic insulation product based on mineral wool formed by internal centrifuging using plural fiberizing members in series on a production line, where at least one fiberizing parameter of two successive fiberizing members in the production line are set differently, wherein said product exhibits, through its thickness, variations in at least one of its characteristics including variations in the size of the fibres of the mineral wool or in the chemical composition of said mineral wool, and wherein the fibres of the mineral wool have a lower micronaire value or a smaller diameter and/or a greater length on a surface layer of at least one of the faces of said product as compared to fibres at a core of said product.

11. Thermal and/or acoustic insulation product based on mineral wool formed by internal centrifuging using plural fiberizing members in series on a production line, where at least one fiberizing parameter of two successive fiberizing members in the production line are set differently, wherein said product exhibits, through its thickness, variations in its capacity to react or resist fire.

23. An insulation product comprising:

mineral wool formed by internal centrifuging using plural fiberizing members in series on a production line, where at least one fiberizing parameter of two successive fiberizing members in the production line are set differently,

wherein said product exhibits, through its thickness, variations in hydrophobic properties.

The grounds of rejection to be reviewed on appeal are:

1. The rejection of claims 10, 11, 18, 19, and 21-23 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Kissell et al. (US 4,115,498 issued Sep. 19, 1978);
2. The rejection of claims 14 and 20 under 35 U.S.C. § 103(a) as unpatentable over Kissell (US 4,115,498 issued Sep. 19, 1978) in view of Lee et al. (US 5,895,804 issued Apr. 20, 1999); and
3. The rejection of claim 23 under 35 U.S.C. § 103(a) as unpatentable over Kissell (US 4,115,498 issued Sep. 19, 1978) in view of Mahnke et al. (US 4,190,547 issued Feb. 26, 1980).

II. DISCUSSION

A. Ground 1: The Rejection over Kissell Alone

The Examiner rejects claims 10, 11, 18, 19, and 21-23 as anticipated by or obvious over Kissell. Appellants contend that Kissell does not teach or suggest the insulation product of claim 10, the product of claim 11 (representing the group of claims 11, 18, 19, 21, and 22), or the product of claim 23.

1. Claim 10

With regard to claim 10, Appellants contend that the Examiner has improperly interpreted column 18, lines 3-38 of Kissell. According to Appellants, Kissell does not teach or disclose a product in which “the fibres of the mineral wool have . . . a smaller diameter . . . on a surface layer of at least one of the faces of said product as compared to the fibres at a core of said product.” (Br. 5-8; Reply Br. 2-6; quoting Claim 10).

Both the Examiner and the Appellants agree that Kissell describes an embodiment in which three layers of insulation, each with fibers of varying diameter, are shaped into a finished product of cylindrical shape as shown in Figure 29. Both the Examiner and the Appellants further agree that, as depicted in Figure 29, the finished product has a layer 3' with small diameter fibers, a layer 2' having medium diameter fibers, and a layer 1' having large diameter fibers (Answer 8-9; Reply Br. 4, ll. 11-14), and that the finished product is shaped from the blanket 5' depicted in Figures 27 and 28.

The issues that arise from the contentions of Appellants and the Examiner are: (1) Does a structure described by Kissell meet the requirements of claim 10 such that claim 10 is anticipated; or (2) Does Kissell provide evidence that, even if there is a difference in product structure, the claimed product would have been obvious to one of ordinary skill in the art at the time of the invention?

We answer both questions in the affirmative.

A preponderance of evidence supports the following Findings of Fact (FF):

1. According to Appellants' Specification, the invention may apply to products of a range of geometrical shapes including annular cylinders as well as parallelepipedal shapes (Specification 3:15-36).
2. The Specification uses the word "external" in describing a felt of approximately parallelepipedal shape that has two main external faces (Specification 3:37-39).
3. In describing a product intended to be rolled, Appellants' Specification states that the "external surface" of the insulation product is "the side that is visible once the roll has been formed."

4. Claim 10 does not include the word “external” before “faces.”
5. In geometry, a face is defined as “any of the bounding surfaces of a solid figure.” (“face.” *Dictionary.com Unabridged (v 1.1)*. Random House, Inc. accessed: November 09, 2007).
6. The Specification does not define the word “core.”
7. The Specification refers to a “core” which is a portion of the product between two surface layers. The Specification refers to felt having on at least one of its external surfaces, a “surface layer” having different characteristics/properties from those of the product in the “core” (Specification 4:12-16).
8. Kissell describes combining three layers of insulation from insulation rolls 1’, 2’, and 3’ to form a blanket of insulation 5’ (Kissell, col. 17, ll. 49-52; Figs 27-28). This blanket 5’ is formed into a cylindrical finished product with layers corresponding to the insulation rolls 1’, 2’, and 3’ (Figure 29).
9. The cylindrical product of Kissell has an external face on the outside surface of layer 1’ and an interior face on the interior surface of layer 3’ (Kissell, Figure 29).
10. Kissell discloses that the three layers of insulation can vary in fiber diameter such that the thermal properties vary along the cross section of the wall of the insulation (Kissell, col. 18, ll. 3-7). According to Kissell: “Usually the fiber diameter would be varied so that the larger diameter fibers would be on the exterior and the smaller diameter fibers on the interior of the finished product.” (Kissell, col. 18, ll. 7-10). In other words, layer 1’ has large diameter fibers, layer 2’ has medium diameter fibers, and layer 3’ has small diameter fibers

(Kissell, col. 17, l. 49 to col. 18, l. 10 and Fig. 29; *see also* Reply Br. 4, ll. 12-14; Answer 8-9).

11. The fibers have a smaller diameter on an internal surface layer of a face (layer 3') of the product (finished product of Figure 29) as compared to fibers at a core (layer 2') of the product.
12. Rolls 1', 2', and 3' of Figure 27 correspond to the layers 1', 2', and 3' of the finished product of Figure 29 (Kissell, col. 17, ll. 49-61).
13. In the embodiment of varying fiber dimensions expressly disclosed by Kissell at column 18, lines 7-10, the intermediate blanket 5' shown in Figure 27 has a layer of large diameter fibers supplied from roll 1', medium diameter fibers from roll 2', and small diameter fibers from roll 3'.

“[A]s an initial matter, the PTO applies to the verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant's specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997). Absent claim language carrying a narrow meaning, we only limit the claim based on the specification when those sources expressly disclaim the broader definition. *In re Bigio*, 381 F.3d 1320, 1324-25 (Fed. Cir. 2004).

As a second step, the PTO must compare the construed claim to the prior art. Where a prior art reference teaches each and every limitation, either explicitly or inherently, the claim is anticipated. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). Where there are differences between what is encompassed by the claim and what is disclosed in the prior art reference

“[s]ection 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 said subject matter pertains.’” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S. Ct. at 1734 (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”).

Starting with the question of claim interpretation, we determine that the claim encompasses products in annular or cylindrical form such as that of Kissell’s Figure 29, as well as parallelepiped shaped products such as the blanket 5’ depicted in Kissell’s Figures 27 and 28 (FF 1 and Claim 10). The blanket is a “product” of the rolls 1’, 2’, and 3’. The claim does not exclude such an intermediate product.

Focusing first on the cylindrical insulation product of Kissell’s Figure 29, we find that claim 10, when read as broadly as is reasonable and consistent with the Specification, is broad enough to encompass the Kissell product.

Claim 10 encompasses insulation products with a surface layer on *any* face of the product with smaller diameter fibers than *any* core of the product (FF 3-6). Kissell has two faces, an external face facing outwardly from layer

1', and an internal face facing inwardly from layer 3' (FF 9). Layer 2' is between the two surface layers and, therefore, meets the requirements of "a core of said product" (FF 6-7). Layer 3', as acknowledged by Appellants, has smaller diameter fibers than layer 2' (FF 10; *see also* FF 8-10 and Reply Br. 4, ll. 12-14). It follows that Kissell expressly describes an insulation product "wherein the fibres of the mineral wool have a . . . smaller diameter . . . on a surface layer of at least one of the faces [(Kissell's layer 3' shown in Figure 29)] of said product as compared to fibers at a core [(layer 2' shown in Figure 29)] of said product" as required by claim 10 (FF 11). Therefore, Kissell expressly teaches an insulation product having the structure required by the claim.

Appellants point out that Kissell discloses the product as having a "softer core" of insulation and argues that layer 3' would be considered this "core." (Reply Br. 4). But the fact that Kissell uses the word "core" to describe layer 3' does not overcome the fact that Kissell expressly teaches placing the smaller fibers in layer 3' such that the resulting product structure is the same structure recited in claim 10. *See Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 772 (Fed. Cir. 1983) ("The law of anticipation does not require that the reference 'teach' what the subject patent teaches. Assuming that a reference is properly 'prior art,' it is only necessary that the claims under attack, as construed by the court, 'read on' something disclosed in the reference, i.e., all limitations of the claim are found in the reference, or 'fully met' by it.").

Turning to the blanket layer 5' of Kissell, we also find that this intermediate product has a structure meeting the requirements of claim 10. In order to obtain the cylindrical product shown in Figure 29, it is necessary

to create blanket 5' with layers corresponding to the layers of the final product. That corresponding blanket is shown in Figures 27 and 28 (FF 8) with rolls 1', 2', and 3' corresponding to the layers 1', 2', and 3' shown in Figure 29 (FF 12). It follows that the blanket 5' has an upper surface layer from roll 3' having small diameter fibers, a core layer from roll 2' with medium diameter fibers, and a bottom surface layer from roll 1' with large diameter fibers (FF 13). This structure also meets the requirements of claim 10.

We also note that Kissell describes more than just the one specific embodiment discussed above. Kissell describes more broadly that the three layers can vary in fiber diameter and binder content and then introduces the specific embodiment discussed above with the word “[u]sually” (FF 10). One of ordinary skill in the art would understand that other variations were possible. The purpose of varying the fiber diameter is to vary the thermal properties along the cross section of the wall of the insulation (FF 10). Those of ordinary skill in the art would have recognized that the thermal properties could be varied by forming layer 1' with smaller diameter fibers, layer 2' with medium diameter fibers, and layer 3' with the large diameter fibers with predictable results on insulation value. “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR*, 127 S. Ct. at 1739.

We determine that: (1) The structures of Figures 27 and 29 described by Kissell meet the requirements of claim 10 such that claim 10 is anticipated; and that (2) Kissell provides evidence that, even if there is a difference in product structure, the claimed product would have been

obvious to one of ordinary skill in the art at the time of the invention based on the broader disclosure of the reference.

Appellants have not overcome the rejection of claim 10 over Kissell.

2. Claims 11, 18, 19, 21, and 22

The issue arising from the contentions of Appellants and the Examiner with regard to the rejection of claims 11, 18, 19, 21, and 22 over Kissell is: Does Kissell anticipate or render obvious an insulation product exhibiting, through its thickness, variations in its capacity to react or resist fire as required by claim 11?

We answer this question in the affirmative.

A preponderance of evidence supports the following additional Findings of Fact:

14. Kissell describes an insulation product with layers varying in fiber diameter and binder content (Kissell, col. 18, ll. 3-4).
15. In one embodiment, the insulation product has an exterior with a high binder content which upon curing produces a very thick hard skin and a softer interior with a low binder content (Kissell, col. 18, ll. 11-24). The interior may be binder-free (Kissell, col. 18, ll. 25-31).
16. The Specification does not define what “capacity to react or resist fire” means.
17. The only discussion of fire-related properties in the Specification is in the paragraph bridging pages 2 and 3 of the Specification. According to the Specification:

These variations [i.e., variations in at least one of its characteristics, especially in the geometry of the mineral wool fibres or in the chemical composition of the mineral wool,] may lead, within the thickness of the product, to variations in its

properties, most particularly in its mechanical properties and/or its thermal/acoustic insulation properties. They may also lead to improve its *reaction/resilience towards fire*, or confer superficially to the product hydrophobic properties or any kind of properties by modification or addition of one or more agents in a gluing step.

(Specification 2:30 to 3:5 (emphasis added)).

As a first matter, we determine that the claim, interpreted as broadly as is reasonable and consistent with the Specification, encompasses products that vary in any capacity to react *to fire* or resist fire. This interpretation is consistent with the Specification which refers to “reaction/resilience towards fire” (FF 17). The terminology encompasses any reaction to fire. There is no definition or other disclosure in the Specification excluding such a reading of the words of the claim (FF 16-17). Kissell discloses that variations in fiber diameter across the thickness of the insulation product result in varying thermal properties cross the wall thickness (FF 10). One way a material reacts to fire is by heating up, and a product such as Kissell’s that varies in its thermal insulation ability has “variations in its capacity to react to fire” as claimed.

Moreover, inherently, differences in composition such as in fiber diameter and binder concentration result in variations in capacity to react to or resist fire. Different materials react to fire in different ways. Every binder material has a specific ability to react to or resist fire. Glass fibers of a given diameter will also have a specific capacity to react to or resist fire different from that of fibers of another diameter. An area of the insulation with less binder will react to or resist fire differently than an area of insulation with more binder due to differences in mass and fire resistance.

An area with smaller diameter fibers will react differently to fire than areas of greater diameter due to mass differences. For instance, an area with smaller diameter fibers will melt or deform before an area with larger diameter fibers. This follows from basic heat transfer theory. An area with more fire resistant binder will be more fire resistant than areas with less of the binder and vice versa. In every case, a difference in fiber diameter or binder concentration results in a difference in capacity to react or resist fire. Kissell describes varying the fiber diameter and binder content along the thickness (FF 14 and 15). Therefore, it is reasonable to conclude that the capacity of Kissell's insulation to react to or resist fire varies through the thickness of the Kissell insulation product.

Where the Examiner has reason to believe that a claimed property may, in fact, be an inherent characteristic of the prior art product, an Examiner possesses the authority to require applicant to prove that the subject matter shown to be in the prior art does not in fact possess the property. *In re Best*, 562 F.2d 1252, 1254-55 (CCPA 1977). The burden shifted to Appellants to prove that, in fact, the claimed product is different from that of Kissell. Appellants have provided no objective proof or evidence that the claimed product differs from the product of the prior art.

We find that Kissell anticipates or renders obvious an insulation product exhibiting, through its thickness, variations in its capacity to react to or resist fire as required by claim 11.

Appellants have not overcome the rejection of claims 11, 18, 19, 21, and 22 over Kissell

3. *Claim 23*

The issue arising from the contentions of Appellants and the Examiner with respect to the rejection of claim 23 over Kissell is: Does Kissell anticipate or render obvious an insulation product that “exhibits, through its thickness, variations in hydrophobic properties?”

We answer this question in the affirmative.

As pointed out by Appellants, one of the definitions of “hydrophobic” means “shedding” water (Reply Br. 8). Kissell describes an insulation product in which some parts will shed water better than others. For instance, Kissell describes an embodiment in which the insulation has a very thick hard skin (high binder content) and a softer interior (low binder content) (FF 15). It is reasonable to conclude that the skin would shed water more readily than the more fibrous low binder interior. Moreover, the binder and mineral wool fiber would have inherent differences in hydrophobic properties due to their chemical differences. Therefore, any variation in relative concentration between the binder and fiber necessarily results in a difference in hydrophobic properties within the product.

We find that Kissell anticipates or renders obvious an insulation product exhibiting, through its thickness, variations in hydrophobic properties as required by claim 23.

Appellants have not overcome the rejection of claim 23 over Kissell.

Ground 2: The Rejection over Kissell and Lee

Appellants present no new issue with respect to the rejection of claims 14 and 20 over Kissell in view of Lee (Br. 12-13). Appellants have not shown a reversible error with regard to this rejection. We, therefore, sustain the rejection.

Ground 3: The Rejection over Kissell and Mahnke

The Examiner rejects claim 23 as obvious over Kissell in view of Mahnke on the basis that it would have been obvious to one of ordinary skill in the art to use the hydrophobic binder of Mahnke as the binder of Kissell's insulation having a variation of binder across the product thickness (Answer 7-8). As framed by Appellants, the issue is: Would it have been obvious to one of ordinary skill in the art to use the binder of Mahnke in varying amounts along the thickness of the product of Kissell? (Br. 14). This is a correct statement of the issue and we adopt it.

We answer the question in the affirmative.

A preponderance of the evidence of record supports the following additional Findings of Fact (FF):

18. Mahnke describes a binder added to an insulation product to confer hydrophobic properties to the insulation (Mahnke, col. 1, ll. 31-37). The object is to reduce the amount of water absorbed by the insulation (Mahnke, col. 1, ll. 23-30).
19. Mahnke applies the binder uniformly across the thickness of the insulation (Mahnke, col. 4, ll. 16-19).
20. Kissell describes varying the binder content across the thickness to obtain a product with a tough, hard and abuse resistant outer skin and a softer core of insulation with good insulating properties (Kissell, col. 18, ll. 22-24).

While Mahnke does not specifically disclose varying the binder concentration across the thickness of the insulation product (FF 19), such is described by Kissell (FF 20). Kissell teaches that varying the binder content will provide a hard outer skin and a core of insulation with good insulating properties (FF 20). One of ordinary skill in the art would recognize that

using a hydrophobic binder in the product of Kissell would result in an insulating product with a hard hydrophobic skin, but a core of insulation with good insulating properties. This follows from the teaching of the references.

We cannot agree with Appellants that varying the binder content is directly contrary to Mahnke in such a way as to amount to a teaching away. The benefit is readily apparent: The high binder outer skin of Kissell is skin; it completely surrounds the inner layers of insulation. This skin would offer the needed protection from water, and yet the interior would retain a higher level of insulating properties due to the lower level of binder there. *See KSR*, 127 S. Ct. at 1740 (stating that “if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill”); and *KSR*, 127 S. Ct. at 1741 (“the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.”).

We determine that it would have been obvious to one of ordinary skill in the art to use the binder of Mahnke in varying amounts along the thickness of the product of Kissell as required by claim 23.

Appellants have not overcome the rejection of claim 23 as obvious over Kissell in view of Mahnke.

III. CONCLUSION

We sustain the rejection of claims 10, 11, 18, 19, and 21-23 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Kissell; the rejection of claims 14 and 20 under 35 U.S.C. § 103(a) as unpatentable over Kissell in view of Lee; and the rejection of claim 23 under 35 U.S.C. § 103(a) as unpatentable over Kissell in view of Mahnke.

IV. DECISION

The decision of the Examiner is affirmed.

V. TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

tc/lc

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