The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RALF SCHEIDECKER,
HORST REINHARD,
PETER SCHWIRBLIES,
HAL ARMSTRONG,
and HAL AITKEN

Appeal No. 2005-2005
Application 10/273,845[1]

HEARD: September 15, 2005

Before BARRETT, GROSS, and BARRY, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

[1] Application for patent filed October 21, 2002, entitled "Cable With An External Extruded Sheath And Method of Manufacturing Of The Cable," which claims the foreign filing priority benefit under 35 U.S.C. § 119 of European Patent Office (EPO) Application 01402742.9, filed October 22, 2001.

This is a decision on appeal under 35 U.S.C. § 134(a) from the final rejection of claims 1-25.

We reverse, but enter a new ground of rejection.

BACKGROUND

The invention relates to a cable that has a lower weight than conventional cables because the outer sheath which surrounds the core of the cable has the same thickness as conventional cables but is lighter due to the enclosed gas bubbles which result from expanding a layer of the material of the outer sheath; i.e., the sheath is made from an "expanded material."

Claim 1 is reproduced below.

> 1. A cable having a core, which is surrounded by an external extruded sheath, the core comprising at least one transmission element for the transmission of electrical current or telecommunication signals, characterized in that the sheath (M) comprises at least one flexible layer (2) of a conventional, expanded material, this material having a tensile strength between 10.0 MPa and 50.0 MPa.

THE REFERENCES

The examiner relies on the following references:

Leuchs	3,943,087	March 9, 1976
Dougherty et al. (Dougherty)	4,174,236	November 13, 1979
Kennedy et al. (Kennedy)	5,210,377	May 11, 1993
Hayashi Masayuki (Hayashi)	JP 09-035544	July 2, 1997

THE REJECTIONS

Claims 1, 2, 4, 5, 7, 9, 12, 16-18, 23, and 25 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Hayashi.

Claims 3, 6, 13, 19, and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayashi and Kennedy.

Claims 8, 21, 22, and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayashi and Dougherty.

Claims 10 and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayashi and Leuchs.

Claims 14 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayashi.

We refer to the final rejection (pages referred to as "FR__") and the examiner's answer for a statement of the examiner's rejection, and to the brief (pages referred to as "Br__") and reply brief (pages referred to as "RBr__") for a statement of appellants' arguments thereagainst.

OPINION

Anticipation

The examiner finds that the claimed "core" reads on the two insulated conductors 2 and 3 in Figs. 1 and 2 of Hayashi; the

claimed "external extruded sheath" reads on the PVC sheath 6 and foamed PVC interposition (filler) 7; the claimed "core comprising at least one transmission element for the transmission of electrical current or telecommunication signals" reads on the copper conductor 2; and the limitation "that the sheath (M) comprises at least one flexible layer (2) of a conventional, expanded material, this material having a tensile strength between 10.0 MPa and 50.0 MPa" reads on element 7 of a conventional expanded material (FR2).

Appellants argue that Hayashi "does not disclose an 'external extruded sheath' which comprises at least one flexible 'layer of expanded material' which has a 'tensile strength between 10.0 and 50.0 MPa' that 'surrounds' the core" (Br6). It is argued (Br6):

> Only the interstitial filler 7 is formed of expanded material and this filler 7 is not a portion of the external extruded sheath 6. This filler 7 is not a "layer" as recited in claim 1, nor does it "surround" the core. Rather, this filler 7 of JP '544 corresponds to the filler 7 of the present invention, which is illustrated at "7" in Figs. 3 and 4, for providing support to the core for the surrounding sheath. Rather than having a layer structure, it only fills the crevices between the insulated conductors. [Footnote omitted.]

Appellants further argue that the filler 7 does not have a tensile strength of 10 to 50 MPa, but "[r]ather, it has a bending

stress (which is comparable with tensile strength) of 2Ns (Newton) which corresponds to 2 MPa" (Br7).

The examiner finds that the core comprises two conductors and their insulation, which is supported by Hayashi which refers to the insulated conductors 2 and 3 as wire cores (EA12-13). The examiner finds that the statement that "the insulation of the wires within the core 1 of the cable in general and the filler 7 of the cable of FIGS. 3 and 4 can be made of expanded material" (spec. at page 6), indicates that appellants intend for the core 1 and the filler 7 to be separate entities (EA13). The examiner defines a "sheath" as "an enveloping structure or part" and finds that layers 6 and 7 of Hayashi clearly envelop the core comprising the two insulated conductors (EA15). The examiner finds that since the fillers 7 are made of expanded material, such as expanded PVC, and since appellants stated in the specification that expanded PVC has a tensile strength from 10 to 50 MPa, the fillers must meet that strength limitation (EA15).

Appellants note that the fundamental misunderstanding is the meaning of the "core" (RBr4). It is argued that while the examiner considers the core to only be the conductor, the core of a cable comprises all elements which are finally surrounded by a protecting sheath (RBr5). It is noted that the core is generally

designated as "1" in Figs. 1 and 2 where the design of the core depends upon the type of cable, and the core may include multiple insulated wires and filler 7 as in Figs. 3 and 5 (RBr4-5).

We agree with appellants that the core comprises all elements which are surrounded by the protecting sheath, which is consistent with Figs. 1-4. Thus, the filler 7 and the two insulated conductors in Hayashi are part of the core. The statement that "the insulation of the wires within the core 1 of the cable in general and the filler 7 of the cable of FIGS. 3 and 4 can be made of expanded material" (spec. at page 6) says that wires are within the core and does <u>not</u> indicate that the filler 7 is not part of the core. Only the interstitial filler 7 in Hayashi is formed of expanded material and this filler 7 is not a "layer" of the external extruded sheath 6. Thus, Hayashi does not disclose an "external extruded sheath" which comprises at least one flexible "layer of expanded material." For this reason, the rejection of claims 1 and 16, and dependent claims 2, 4, 5, 7, 9, 12, 17, 18, 23, and 25 is reversed.

As to the limitation of the expanded material sheath "having a tensile strength between 10.0 MPa and 50.0 MPa," the examiner finds that since the fillers 7 are made of expanded PVC, and since appellants stated in the specification that expanded PVC

has a tensile strength from 10 to 50 MPa, the fillers must meet that strength limitation (EA15).[2] There is no showing by the examiner that all expanded PVC has the same properties and, thus, the examiner may not properly rely on inherency. For this additional reason, the rejection of claims 1 and 16, and dependent claims 2, 4, 5, 7, 9, 12, 17, 18, 23, and 25 is reversed.

Obviousness

The examiner has not relied upon Kennedy, Dougherty, and Leuchs to overcome the deficiencies of Hayashi with respect to independent claims 1 and 16. Thus, the obviousness rejections of claims 3, 6, 8, 10, 11, 13-15, 19-22, and 24 are reversed.

New ground of rejection under 37 CFR § 41.50(b)

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[2] Appellants seem to acknowledge that the tensile strength of the filler 7 in Hayashi is about 2 MPa, which is less than the claimed 10 to 50 MPa; i.e., "[the filler 7] has a bending stress (which is comparable with tensile strength) of 2Ns (Newtons) which corresponds to 2 MPa" (Br7; RBr7). Actually, a Newton (N) is a measure of force while a pascal (Pa) is a measure of pressure, where: 1 Pa = 1 N/m^2. The prefix Mega is represented by symbol M, and stands for 1,000,000, so 1 MPa = 1 megapascal = 10^6 N/m^2 = 145 $pound/in^2$. Thus, assuming the units in Hayashi are N/m^2, 2 Ns = $2(10^{-6})$ MPa which is not close to 10 to 50 MPa.

Claims 1 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 98/52197, PCT application published November 19, 1998 (copy attached). The specification describes WO 98/52197 on pages 1 to 2 as a power transmission cable with an outer coating of expanded polymer material and a flexural modulus of between 400 MPa and 1800 MPa. The material is expensive but its weight is lower compared to the not expanded version. It is stated (spec. at 1-2): "But for the purpose of impact protection the coating of expanded polymer material needs an adequate thickness and flexural modulus together with a great mass. Therefrom the weight of the sheath still is high. WO 98/52197 also mentions documents which describe cables for the transmission of signals with a layer of expanded insulating material. Such a material shall be usefull [sic] only for the increase of the transmission speed of the signals." The discussion that cables having sheaths of expanded material were known in WO 98/52197 raises questions of patentability that we feel are best addressed in the context of a rejection.

WO 98/52197 is concerned with impact protection and a relatively high flexural modulus, "measured before its expansion" (page 6, line 22), is necessary. The modulus before expansion is higher than 200 MPa (page 7, lines 25-26; page 16, lines 29-30)

and the polymer material has a degree of expansion from about 20% to about 3000% (page 7, lines 31-33), which is relevant to claim 3. The modulus of the polymer material decreases as the degree of expansion of the material increases (page 18, line 28, to page 19, line 12). WO 98/52197 provides a number of suitable materials (page 8, lines 5-32). The background in WO 98/52197 indicates that it was known to use an expanded material around a conductor to increase the transmission speed of the electrical signals and to provide a film of nonexpanded polymer over an insulating expanded polymer surrounding the conductor (pages 3-4), which is relevant to claim 5. WO 98/52197 teaches that the sheath is produced by extrusion and the material can be expanded by chemical or gas "expanders" (e.g., page 22, line 32, to page 23, line 12), which is relevant to claims 2, 3, 17, and 20.

The difference between WO 98/52197 and the subject matter of claims 1 and 16 is that WO 98/52197 teaches a flexural modulus (tensile strength) <u>before expansion</u> of at least 200 MPa, whereas the claims recite that the <u>expanded</u> material has a tensile strength of between 10.0 and 50.0 MPa. The modulus of 200 MPa is chosen so the expanded material will have a suitable impact strength. The present invention is not concerned with impact strength, but with reducing weight and amount of sheathing

material (spec. at 3). One of ordinary skill in the art would have appreciated that the flexural modulus of the material is a result effective variable depending on the usage and determining the optimum values of result effective variables is ordinarily within the skill of the art. See In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In this case, one skilled in the art would have known to select a material with a lower flexural modulus if impact resistance was not needed, such as for coating of wires to resist modest compression loads as in the background of WO 98/52197 (pages 3-6). Moreover, it is not clear how far different the material is in WO 98/52197 because if the flexural modulus before expansion E_1 is 200 MPa and the material is expanded 100%, so that the expanded density ρ_2 is one-half the nonexpanded density ρ_1, the modulus after expansion $E_2 = E_1(\rho_2/\rho_1)^2 = 200(.5)^2 = 50$ MPa (equation at bottom of page 18). Thus, the limitation of a "tensile strength between 10.0 MPa and 50.0 MPa" seems prima facie obvious.

We leave it to the examiner to address the merits of the dependent claims. Some of the relevant teachings have been noted above.

CONCLUSION

The rejections of claims 1-25 are reversed.

A new ground of rejection of claims 1 and 16 under 35 U.S.C. § 103(a) is entered pursuant to 37 CFR § 41.50(b).

This decision contains a new ground of rejection pursuant to 37 CFR § 41.50(b) (effective September 13, 2004). 37 CFR § 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review."

37 CFR § 41.50(b) also provides that the appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

> (1) Reopen prosecution. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .
>
> (2) Request rehearing. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1). See 37 CFR § 1.136(a)(1)(iv) (2004).

REVERSED - 37 CFR § 41.50(b)

LEE E. BARRETT Administrative Patent Judge	)	
ANITA PELLMAN GROSS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
LANCE LEONARD BARRY Administrative Patent Judge	)	

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