

**Internal distribution code:**

- (A)  Publication in OJ  
(B)  To Chairmen and Members  
(C)  To Chairmen  
(D)  No distribution

**D E C I S I O N**  
**of 17 June 2005**

**Case Number:** T 0226/01 - 3.3.7

**Application Number:** 94903098.5

**Publication Number:** 0676282

**IPC:** B32B 27/10

**Language of the proceedings:** EN

**Title of invention:**

Wrapping material, and method and apparatus for manufacturing the same

**Applicant:**

Tetra Laval Holdings & Finance SA

**Opponent:**

-

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

"Inventive step (yes) - problem and solution"

**Decisions cited:**

-

**Catchword:**

-



Case Number: T 0226/01 - 3.3.7

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.7  
of 17 June 2005

**Appellant:** Tetra Laval Holdings & Finance SA  
Avenue Général-Guisan 70, P.O. Box 430  
CH-1009 Pully (CH)

**Representative:** Müller, Hans-Jürgen, Dipl.-Ing.  
Müller, Schupfner  
Bavariaring 11  
D-80336 München (DE)

**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 25 July 2000  
refusing European application No. 94903098.5  
pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** R. E. Teschemacher  
**Members:** B. J. M. Struif  
B. L. ter Laan

## Summary of Facts and Submissions

I. European patent application 94 903 098.5, originating from international application PCT/JP93/01926, having a filing date of 28 December 1993, was translated in accordance with Article 158(2), 1st sent. EPC and published in accordance with Article 158(3) EPC as EP-A-0 676 282. The translated document comprises eighteen claims, wherein independent claims 1 and 10 read as follows:

"1. A packaging material having a laminate structure comprising a first layer formed on an outer surface which will be directed outwardly upon formation of a packaging container from the packaging material, a second layer formed on an inner surface which will be directed inwardly upon formation of the packaging container from the packaging material, and at least a substrate and a grease-proof paper layer formed between said first and second layers, wherein

(a) at least one of said first and second layers is formed from a polymer selected from the group consisting of polyolefins,

(b) said grease-proof paper layer has a TAPPI value in a range of 100 to 400 seconds, and

(c) said grease-proof paper layer includes a polymer layer formed on at least one of surfaces thereof by coating of a polymer."

"10. A process for producing a packaging material having a laminate structure comprising a first layer formed on an outer surface which will be directed outwardly upon formation of a packaging container from

the packaging material, a second layer formed on an inner surface which will be directed inwardly upon formation of the packaging container from the packaging material, and at least a substrate and a grease-proof paper layer formed between the first and second layers, said process comprising the steps of

(a) delivering a substrate and a grease-proof paper sheet,

(b) subjecting one of surfaces of said grease-proof paper sheet to a surface-activating treatment to activate the surface,

(c) coating a polymer onto the activated surface of said grease-proof paper sheet to form a polymer layer, and

(d) laminating said grease-proof paper sheet with said polymer layer formed thereon and said substrate onto each other."

II. The appeal lies from the decision of the examining division to refuse the application in suit on the basis of claim 1 filed with letter dated 14 June 2000 and claims 2 to 12 filed with letter dated 24 September 1999 (main request) and an auxiliary request on the basis of claim 1 filed at the oral proceeding before the examining division. Claim 1 of the main request read as follows:

"1. A packaging material having a laminate structure comprising a first layer (16) formed on an outer surface which will be directed outwardly upon formation of a packaging container from the packaging material, a second layer (37) formed on an inner surface which will be directed inwardly upon formation of the

packaging container from the packaging material, and at least a substrate (12) and a grease-proof paper layer (23) formed between said first and second layers (16, 37), wherein at least one of said first and second layers (16, 37) is formed from a polymer selected from the group consisting of polyolefins, **characterized in that**, an outer surface of said grease-proof paper layer (23) is subjected to a surface-activating treatment, and a polymer layer (36) is formed between said second layer (37) and said grease-proof paper layer (23)."

Claim 1 of the auxiliary request differed from claim 1 of the main request in that the characterizing part was replaced by the following version:

"an outer surface of said grease-proof paper layer (23) is subjected to a surface activating treatment, prior to the application of layers, and a second polymer layer (36) is extruded from an extruding die device (55) onto the inner surface of said grease-proof paper layer (23), thereby being incorporated into the grease-proof paper layer (23) and providing an enhanced gas barrier property".

That decision was based on the following documents:

- D1: WO-A-92/01558
- D2: EP-A-0 313 356
- D3: GB-A-1 080 649
- D4: WO-A-91/15410

III. The decision can be summarized as follows:

- (a) The examining division raised neither formal objections nor objections regarding novelty.
  
- (b) As to inventive step, D1 was considered to represent the closest state of the art. D1 disclosed a laminate for a container comprising an LDPE layer, a paper board layer, a polyethylene layer, an aluminium-metallized grease-proof paper and an LDPE layer and was used as a packaging material of the type defined in the preamble of claim 1 of the main and auxiliary requests. The additional layer (36) between the grease-proof paper layer (23) and the layer (37) could be made up of the same material as layer (37) so that layer (37) did not define a distinguishing feature from the prior art laminate. The surface-activating treatment of the grease-proof paper layer (23) was obvious from D1.

Claim 1 of the auxiliary request differed from claim 1 of the main request in that the polymer layer (36) was formed by extrusion and incorporated into the grease-proof paper layer to provide enhanced gas barrier properties. However, at the priority date, extrusion coating was a conventional procedure to form layers onto a base layer and the enhanced gas barrier property was the inevitable result of such a process step. Thus, also the auxiliary request was regarded as *prima facie* obvious.

Furthermore, there was no evidence on file that the characterizing features of the requests provided an effect going beyond what the person skilled in the art would have expected. The incorporation of a polymer in the grease-proof paper layer (23) might enhance the gas barrier properties of that layer; however this did not ensure improved overall gas barrier properties of the packaging material as a whole, for which protection was sought. Consequently, none of the requests involved an inventive step.

- IV. On 5 September 2000 the applicant (appellant) filed a notice of appeal against the above decision, paying the appeal fee on the same date. The statement setting out the grounds of appeal was submitted on 27 November 2000.
  
- V. Oral proceedings were held on 4 November 2004. During the oral proceedings the appellant submitted three sets of claims (new main request and two new auxiliary requests) replacing the previous requests on file. During the discussion, claim 1 of auxiliary request I was amended several times.
  
- VI. As announced at the oral proceedings, the proceedings were continued in writing. The applicant was invited to file a complete set of claims on the basis of claim 1 of auxiliary request I as discussed during the oral proceedings, in particular with a claim 6 adapted to the amendments of claim 1, and claim 9 being deleted.

VII. By letter dated 10 December 2004, the appellant filed an amended set of claims 1 to 4 (main request) and withdrew the main request filed during the oral proceedings on 4 November 2004.

VIII. On 20 April 2005, in reply to a further communication of the board, the appellant submitted a set of claims 1 to 4 as the final main request. Claims 1 and 3 read as follows:

"1. A packaging material having a laminate structure comprising a first layer (16) formed on an outer surface which will be directed outwardly upon formation of a packaging container from the packaging material, a second layer (37) formed on an inner surface which will be directed inwardly upon formation of the packaging container from the packaging material, at least a substrate (12) and a grease-proof paper layer (23) formed between said first and second layers (16, 37), said first layer (16) is being formed on said substrate (12), and at least one of said first and second layer (16, 37) is formed from a polymer selected from the group consisting of polyolefins, and a first polymer layer (24) interposed between said substrate (12) and said grease-proof paper layer (23), wherein

- (a) both surfaces of said grease-proof paper layer (23) are subjected to a surface-activating corona or thermal treatment prior to the application of layers (24, 36),
- (b) a second polymer layer (36) is extruded onto the inner surface of said grease-proof paper layer (23), thereby being incorporated into the grease-proof paper layer (23) and providing an enhanced



- gas barrier property of said grease-proof paper layer (23), wherein said second polymer layer (36) is formed from an adhesive polymer,
- (c) said grease-proof paper layer (23) has a TAPPI value in a range of 100 to 400 seconds, and
  - (d) said second layer (37) is formed from a polymer and coated onto the second polymer layer (36) in the form of a film."

"3. A process for producing a packaging material having a laminate structure comprising a first layer (16) formed on an outer surface which will be directed outwardly upon formation of a packaging container from the packaging material, a second layer (37) formed on an inner surface which will be directed inwardly upon formation of the packaging container from the packaging material, and at least a substrate (12) and a grease-proof paper layer (23) formed between the first and second layers (16, 37), said first layer (16) is being formed on said substrate (12), and at least one of said first and second layers (16, 37) is formed from a polymer selected from the group consisting of polyolefins, said process comprising the steps of

- delivering a substrate (12) and a grease-proof paper sheet (23),
- interposing a first polymer layer (24) between said substrate (12) and said grease-proof paper sheet (23),
- subjecting both surfaces of said grease-proof paper sheet (23) to a surface-activating corona or thermal treatment to activate said surfaces prior to the application of layers (24, 36),
- extruding a second polymer layer (36) onto the inner surface of said grease-proof paper sheet (23), thereby

incorporating said second polymer layer (36) into said grease-proof paper sheet (23) and providing an enhanced gas barrier property of said grease-proof paper sheet (23), wherein said grease-proof paper sheet (23) has a TAPPI value in a range of 100 to 400 seconds and said second polymer layer (36) is formed from an adhesive polymer,

- coating said second layer (37), which is formed from a polymer, onto the inner surface of said second polymer layer (36) in the form of a film, and

- laminating said grease-proof paper sheet (23) with said second polymer layer (36) and said second layer (37) formed thereon and said substrate (12) with said first polymer layer (24) onto each other."

IX. The appellant argued in substance as follows:

D1 was considered to be the closest state of the art. It disclosed packaging materials including aluminium layers, which could be used for food, such as liquid products, like milk. Although an aluminium layer provided excellent gas barrier properties, containers formed from such packaging material had to be folded three times which could result in leaking. Amended claim 1 differed from D1 by four features a) to d) as claimed. One of said features was the presence of an additional adhesive polymer layer (36) which was incorporated into the grease-proof paper layer (23) and provided an enhanced barrier property. According to another key feature, said second layer (37) was coated onto the second polymer (36) in the form of a film. Thus, two distinct polymer layers (36, 37) were formed on the inner side of the container so that a borderline between the two layers was formed. The final coating

step (d) prevented the odour of the second polymer layer (36), which was extruded at a high temperature from being transferred to the content of the packaging container. The two objects of enhanced barrier property and the odour problem were related to each other.

D1 did not address the odour problem, nor did it give a hint to combine a surface activating treatment with incorporating a polymer into said grease-proof paper in order to enhance the barrier property. Although D4 disclosed the incorporation of polymer layers into a grease-proof paper to enhance gas barrier properties, it did not address the odour problem and provided no suggestion in a direction as claimed. Thus, the claimed features were not made obvious from the cited prior art documents even when considered in combination. Hence, the claimed subject-matter involved an inventive step.

- X. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of a set of claims 1 to 4 (sole request) filed with letter dated 20 April 2005.

### **Reasons for the Decision**

1. The appeal is admissible.

#### *Amendments*

2. The amendments are based on the translation filed in accordance with Article 158(2), 1st sent. EPC:

Amended claim 1 is based on claims 1 to 4 in connection with the second embodiment illustrated in Figure 2 and further disclosed on page 15, last paragraph to page 19, last paragraph. The preamble of present claim 1 until the term "wherein" is based on claim 1; the features a) to d) are disclosed as follows:

- feature a): page 17, second full paragraph and last two lines in connection with claims 2 to 4 and page 18, last five lines,
- feature b): page 19, second and third full paragraph in connection with page 15, last paragraph,
- feature c): claim 1, feature b),
- feature d): page 15, last paragraph.

2.1 Amended claim 3 is based on claims 1, 10 to 12 and has been adapted to the amendments of claim 1. Subclaims 2 and 4 are based on claim 6.

2.2 Consequently, the amendments meet the requirements of Article 123(2) EPC.

2.3 The examining division did not raise an objection of lack of clarity. Since the packaging material compared to the version of the decision under appeal has been further specified and since the board does not see any clarity objections arising from said amendments, the claimed subject-matter meets the requirements of Article 84 EPC.

### *Novelty*

3. An objection of lack of novelty was not raised by the examining division. The board sees no reason to take a

different view, as will also become apparent from the discussion of the cited documents relevant for inventive step below.

*Inventive step*

*Problem and solution*

4. The patent in suit concerns a packaging material and a method for manufacturing the same. Such a packaging material is known from D1, which the appellant and the examining division regarded as the closest prior art document. The Board has no reason to deviate from that approach.
- 4.1 D1 aims at providing a laminate including layers having a relatively good barrier to O<sub>2</sub> migration compared to polyethylene (D1, page 2, lines 20 to 34). To that end it proposes a laminate comprising first and second layers (2,7) which serve to stiffen the laminate, and a third layer (5) intermediate the first and second layers and by way of which the first and second layers (2,7) are tied together, the second layer (7) serving also as a relatively good barrier to migration, characterized in that the third layer (5) also serves as a relatively good barrier to O<sub>2</sub> migration compared to polyethylene (claim 1).
- 4.1.1 The third layer (5) comprises a polymer, in particular EVOH (ethylene/vinylalcohol copolymer) or PA (polyamide) (claims 2 and 3). The polymer (5) can be extruded or co-extruded onto said second layer (7) (claim 4). The second layer (7) may comprise surface-coated polymer or grease-proof paper (claim 5). Said surface-coated

polymer (7) may have its coated surface (8) directed towards said first layer (2) (claim 7). The laminate may further comprise a relatively good moisture barrier and heat-sealing layer (9) disposed to that side of said second layer (7) facing away from said third layer (5) (claim 8).

4.1.2 According to the description (page 9, lines 12 to 24), the layer arrangement may be as follows, progressing inwards:

(a) a moisture-barrier and heat-sealing layer 1 (10 to 30 g/m<sup>2</sup> LDPE) (low density polyethylene)

(b) a paperboard stiffening layer 2 (150 to 400 g/m<sup>2</sup> board)

(c) O<sub>2</sub> barrier polymer 3, such as EVOH or polyamide (3 microns to 15 microns, preferably 3 microns to 7 microns); for example in the form "thin tie layer (4)/EVOH or PA (5)/thin tie layer (6)",

(d) M-PET (metallized polyethylene terephthalate), G-PET (glass-coated polyethylene terephthalate), M-OPP metallized oriented polypropylene), G-OPP 7 (glass-coated oriented polypropylene) (6 microns to 25 microns, preferably 9 microns to 14 microns) with its coated surface 8 directed outwards, or greaseproof paper (25 to 100 g/m<sup>2</sup>)

(e) a moisture-barrier and heat-sealing layer 9 (10 to 70 g/m<sup>2</sup> LDPE).

The surfaces of the various layers may be treated, for example flame- or corona-discharge-treated, to enhance adhesion or sealability (page 9, lines 25 to 27).

In another preferred laminate, aluminium-metallized material, such as aluminium-metallized grease-proof paper can be used (page 10, lines 20 and 21).

- 4.2 In example 1, 230g/m<sup>2</sup> of Duplex board is flame-treated on both sides and extrusion coated on its outside with a layer of 14g/m<sup>2</sup> LDPE. The resulting laminate is flipped over, then the inside of the Duplex board is brought face-to-face with the outside of a layer of grease-proof paper (50g/m<sup>2</sup>) in a laminating station of an extrusion coating line and between them there is co-extruded a three-layer structure consisting of an outside layer of LDPE (20g/m<sup>2</sup>), an intermediate tie layer "BYNEL", (5g/m<sup>2</sup>), and an inside layer of EVOH (7g/m<sup>2</sup>). The resulting laminate then has a layer of LDPE (35g/m<sup>2</sup>) extrusion-coated onto its inside.

The laminates of D1 are used particularly when the contents of the carton would otherwise be deleteriously affected by migration of substances, for example O<sub>2</sub>, either inwards or outwards or by light. However, the foils of D1 have a number of disadvantages, for example they are relatively brittle and thus liable to break during feeding, scoring and folding. Moreover, owing to its rather smooth surface, it is relatively difficult to bond to LDPE or other polymers. Also, the further layer of LDPE allows significant O<sub>2</sub> penetration at the sealed seams and through defects, such as pinholes or cracks, in the foil (page 1, lines 15 to 29).

Although the laminates according to D1 have good barrier properties, odours may enter the packaging content from the packaging material itself. This may happen, since polymers in the molten state are applied to the grease-proof paper (compare D1, page 9, lines 4 to 8), by which a degradation of the polymer into

volatile sub-products can occur. Hence, the provision of enhanced barrier properties of the grease-proof paper by using polymer layers instead of Aluminium is directly connected to an odour problem.

4.2.1 In view of the above, the problem to be solved over D1 may therefore be seen in providing a packaging material having good gas barrier properties without using an aluminium foil, and without odour being transferred from the container packaging to the contents thereof in line with the application in suit (page 13, second paragraph in connection with page 19, last paragraph).

4.2.2 Since the outer layer 37 is applied in the form of a film at a much lower temperature than the polymer applied to the grease-proof paper by extrusion, it is plausible that the outer film layer 37 prevents that odour is emitted from the resulting packaging material.

4.3 In view of the above, the board comes to the conclusion that the above-defined problem has been effectively solved.

#### *Obviousness*

5. It remains to be decided whether the claimed subject-matter is obvious having regard to the documents on file.

5.1 D1 discloses that EVOH or PA can be applied as a monolayer or in co-extrusion with other plastic materials; it is preferably attached to at least the second layer by means of a tie layer. It is advantageous if the EVOH or PA is applied to the grease-proof paper in a molten state, since it thereby



fills the pores in the coated surface or the grease-proof paper surface and thus increases the combined O<sub>2</sub> barrier effect of those two layers (page 9, lines 2 to 8). Although from D1 the incorporation of polymers into the grease-proof paper to provide good barrier properties is known, D1 does not address any odour problem associated therewith. Hence, there is no hint to use a combination of an adhesive layer (36) and layer (37) in connection with a grease-proof paper having the claimed TAPPI value, which has been subjected on both sides to a surface activating treatment prior to the application of layers (24, 36) in order to solve the problem posed. Thus, the claimed subject-matter is not made obvious by D1 alone.

- 5.2 D2 discloses a laminate of a basic member and a polyolefin, for use for containers for food products, characterized in that the basic member of paperboard is provided with a gas barrier layer in the form of a layer of grease-proof paper which has low air permeability and a grease-resistance higher than approximately 900 sec. TAPPI, preferably in the range of approximately 1600 sec, this grease-proof paper being laminated to the paperboard by the aid of a polyolefin (such as polyethylene or polypropylene) or other adhesive and that the laminate is provided with external layers of polyethylene or like flexible polyolefin on both outer sides (claim 7). Thus, D2 leads the skilled person away from using a grease-proof paper having a low TAPPI value and from applying a combined layer structure, such as layers 36 and 37, to the grease-proof layer (23).

5.3 D3 discloses a method of treating the surface of a substrate to improve the adherence of the surface to a subsequently applied extrusion coating of a polyolefin plastics material, the method comprising subjecting the surface to the action of a corona discharge at a voltage of 10,000 to 25,000 volts from an electrode spaced from 0.025 to 0.25 inch away from the surface, the substrate being advanced past the electrode at a speed of 200 to 600 feet per minute (claim 1). The ethylene coated substrates may be used as cartons for packaging food (page 1, line 28). Whilst D3 relates to improving the adherence of the layers, it does not address the odour problem associated with coating a plastic layer on a grease-proof paper. Thus, there is no hint to use a grease-proof paper having the specified TAPPI value within a specific laminate structure as claimed and to use that structure as innermost layers of a container.

5.4 D4 discloses a gastight packaging material for use as a packaging for aroma or gas emitting products, eg products which degenerate as a result of influence from the surrounding atmosphere, which material comprises a grease repellent layer of brown paper/grease-proof paper coated with a plastic layer of the polyolefin kind, such as polyethylene, and is laminated with a cellulose containing layer, wherein the cellulose containing layer is substantially a thin paper layer (claim 1). The grease-proof paper can be coated on both sides with a plastic material (claim 4). In order to achieve the best possible gas barrier effect the grease-proof paper should have low air permeability and it should be grease-proof to a degree which is higher than 90 s TAPPI, preferably in the order of 160 s, and

the plastic material, which is preferably a polyolefin, advantageously a polyethylene, is melted into the pores of the grease-proof paper from both sides at a temperature between 290 and 330 °C (plastic temperature; page 2, third paragraph).

5.4.1 In an especially advantageous embodiment of D4, this gas barrier layer is combined with a thin paper sheet on which various kinds of print may be applied to show which product is packaged, as well as to state a trade description of the product. Such a packaging material would be very inexpensive in production and it proved to provide a very good gas tightness, combined with all the advantages of a common thin packaging paper (page 2, last paragraph).

5.4.2 The exemplified packaging materials have very good aroma-tightness, and it was impossible to detect any smell of soap outside a packaged piece of soap. It is also useful for long time storage of tea (page 3, paragraph a)). D4 aims at a grease-proof paper which shows in itself sufficient strength and pliability to be used in a pliable packaging material without causing cracking or fissures which are open to let gas pass through (page 2, second paragraph). Although according to D4 a polyolefin is incorporated in the pores of the grease-proof paper at temperatures as high as 290 to 330 °C and although in D4 no smell of soap could be detected outside a packaged piece of soap, there is no mention of any problem concerning odour which may be transferred from the plastic applied while hot. Furthermore, the laminated paper layer in D4, which is applied on the outside of the container, is there for printing purposes and has therefore another function

than polymer layer (37) of the application in suit, which is directed inwardly upon formation of a packaging container to prevent the odour problem.

Consequently, the skilled person gets no hint from D4 to use a two-layer polymer structure as now being claimed.

5.5 Hence, there is no incentive in D4, nor in the other cited prior art to use the claimed steps a) to d) in combination in order to modify the teaching of D1 in a direction as claimed. Thus, the claimed packaging material is not made obvious by the cited prior art and involves an inventive step.

5.6 Since the same features as discussed above are present in the independent process claim 3, the arguments presented under points 5.1 to 5.5 above apply *mutatis mutandis*. Consequently, claim 3 is inventive as well.

**Order**

**For these reasons it is decided that:**

1. The decision under appeal is set aside.
  
2. The case is remitted to the department of first instance with the order to grant a patent on the basis of the set of claims 1 to 4 submitted with letter dated 20 April 2005 and a description yet to be adapted.

The Registrar:

The Chairman:

C. Eickhoff

R. Teschemacher