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Datasheet for the decision of 27 February 2025

Case Number: T 0870/23 - 3.3.05

Application Number: 17199961.8

Publication Number: 3348526

IPC: C03C17/36, B32B17/10, C23C14/06, C23C14/00

Language of the proceedings: EN

Title of invention:
COATED ARTICLE WITH SILICON NITRIDE INCLUSIVE LAYER ADJACENT GLASS

Patent Proprietor:
Guardian Europe S.à.r.l.
Guardian Glass, LLC

Opponent:
Pilkington Group Limited

Headword:
Coated Article/Guardian

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (no)

Decisions cited:

Catchword:

Europäisches Patentamt
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Beschwerdekammern

Boards of Appeal

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Case Number: T 0870/23 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 27 February 2025

Appellant: (Patent Proprietor 1)	Guardian Europe S.à.r.l. Atrium Business Park Extimus Building 19, rue du Puits Romain 8070 Bertrange (LU)
Appellant: (Patent Proprietor 2)	Guardian Glass, LLC 2300 Harmon Road Auburn Hills MI 48326 (US)
Representative:	Hoyng Rokh Monegier B.V. Rembrandt Tower, 30th Floor Amstelplein 1 1096 HA Amsterdam (NL)
Respondent: (Opponent)	Pilkington Group Limited Hall Lane Lathom Nr. Ormskirk Lancashire L40 5UF (GB)
Representative:	Marsh, Andrew James Pilkington Group Limited Intellectual Property European Technical Centre Hall Lane Lathom Ormskirk Lancashire L40 5UF (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 10 March 2023 revoking European patent No. 3348526 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	E. Bendl
Members:	G. Glod
	P. Guntz

Summary of Facts and Submissions

I. The appeal of the patent proprietor (appellant) lies from the opposition division's decision revoking European patent No. 3 348 526 B1.

II. The following documents are of relevance here.

D2: US 2003/0150711 A1
D3: US 2002/0064662 A1

III. Claim 1 of auxiliary request 11' (the sole request) reads as follows.

"*1. A coated article including a multi-layer coating supported by a glass substrate,*
the multi-layer coating comprising, from the glass substrate outwardly:
a layer comprising silicon rich silicon nitride located directly on and contacting the glass substrate, which layer is doped with Al, B, or stainless steel;
a layer comprising zinc oxide located directly on and contacting the layer comprising silicon rich silicon nitride;
a layer comprising silver located over and contacting the layer comprising zinc oxide;
a metal layer comprising NiCr or NiCrOx located over and contacting the layer comprising silver; and
at least one dielectric layer."

IV. The arguments of the appellant, where relevant to the present decision, can be summarised as follows.

The requirements of Article 56 EPC were met. The goal was to protect the silver layer during heat treatment.

D3 did not disclose the migration of sodium from glass. The benefit of a silicon-rich layer of silicon nitride was not disclosed in that respect. Since D3 already solved the problem of haze, there was no reason to change the layer of $NiCrO_x$ without the benefit of hindsight. Therefore, the skilled person would not turn to D2.

V. The respondent's (opponent's) arguments are reflected in the Reasons given below.

VI. At the end of the oral proceedings of 27 February 2025, the requests were as follows.

The appellant requested that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of auxiliary request 11' as submitted with its letter of 13 February 2025.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

Auxiliary request 11' (the sole request)

1. This request was accepted as a correction of previous auxiliary request 11 under Rule 139 EPC.

In this context, the questions concerning the admissibility of previous auxiliary request 11 and the reasons for accepting the correction under Rule 139 EPC can be left open since auxiliary request 11' is not in any case allowable for lack of inventive step (see below).

2. Article 56 EPC

The requirements of Article 56 EPC are not met for the following reasons.

2.1 The patent relates to windows, including glass substrates, with solar control coatings provided thereon (paragraph [0001] of the patent).

2.2 D3 is the starting point for the assessment of inventive step. It relates to heat treatable (low-E) coated articles, which are used, for example, in the context of vehicle windshields and insulating glass (IG) units (paragraph [0002]). Fig 6 discloses an embodiment comprising a glass substrate, a layer of silicon nitride deposited thereon, followed by a layer of $NiCrO_x$, a layer of Ag, another layer of $NiCrO_x$ and a dielectric layer of SnO_x. It is not explicitly disclosed that the layer of silicon nitride shown in Figure 6 is Si-rich and doped with Al, B or stainless steel. In addition, compared to claim 1 of auxiliary request 11', the layer adjacent to the silicon nitride is $NiCrO_x$ instead of zinc oxide.

2.3 The problem to be solved according to the patent is to provide a coated article having both high visible transmission and good solar/optical performance as reflected in high T_{vis}/R_s ratios (paragraphs [0007], [0009] and [0012] of the patent). The fact that a Si-rich silicon nitride inclusive layer is used contributes to this high T_{vis}/R_s value (see paragraph [0024], first sentence). Therefore, the appellant's formulation of the problem relating to the protection of the Ag-layer during heat treatment is only one specific factor within the overall goal of the patent.

2.4 It is proposed that the problem can be solved by a coated article according to claim 1, characterised in that the layer comprising silicon nitride is silicon rich, doped with Al, B or stainless steel, and directly contacts a layer comprising zinc oxide.

2.5 Although there are no comparative data present, the board accepts to the benefit of the appellant that the article claimed has a higher T_{vis}/R_s ratio than the article of Figure 6 of D3.

2.6 However, the solution to this problem is obvious in view of the following considerations.

D3 discloses that Si-rich silicon nitride has improved performance in reducing haze compared to silicon nitride (paragraph [0085]). The skilled person knows that haze negatively affects the optical performance of the coated article. Therefore, they will always try to reduce haze when trying to solve the posed problem. D3 provides a clear incentive to use Si-rich silicon nitride.

Furthermore, D3 discloses in paragraph [0074] that silicon nitride may be doped with aluminium and/or stainless steel when sputtering the silicon nitride layer. The patent does not associate the doping with Al, B or stainless steel with any other benefit. The skilled person will clearly learn from D3 that the doping is beneficial if sputtering is desired.

In addition, D2 teaches that using ZnO_x instead of $NiCrO_x$ for the lower contact layer, which is the layer underneath the Ag layer, enables visible transmission of the resulting coated article to be increased and

sheet resistance R_s and/or emissivity to be reduced, and overall enables solar performance to be improved (paragraph [0042] of D2). This teaching is independent of the dielectric layer chosen, which may also be silicon nitride (paragraph [0038]). Therefore, the skilled person trying to solve the problem posed will clearly learn from D2 that replacing $NiCrO_x$ with zinc oxide will be beneficial.

The appellant's argument that the skilled person had no reason to turn to D2 since haze was already reduced is not convincing. The skilled person trying to solve the problem posed will aim at obtaining the best result. D2 clearly teaches towards replacing $NiCrO_x$ with zinc oxide, and there is no reason why the skilled person would not implement that teaching in an effort to achieve a higher T_{vis}/R_s ratio.

Consequently, D3 and D2 teach towards the proposed solution.

2.7 Thus, claim 1 lacks an inventive step in view of D3 in combination with D2.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

C. Vodz E. Bendl

Decision electronically authenticated