UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID R. KERLUKE, RICHARD GALLOWAY, and
MARSHALL R. CLELAND

Appeal 2008-5312
Application 10/896,962
Technology Center 1700

Decided: December 23, 2008

Before LINDA M. GAUDETTE, MICHAEL P. COLAIANNI, 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 rejection of claims 11-23.[1] (Examiner's Answer entered January 24, 2008, hereinafter "Ans."). We have jurisdiction pursuant to 35 U.S.C. § 6(b) (2002).

The Appeal was heard on December 10, 2008.

We AFFIRM.

THE INVENTION

Appellants' claimed invention is directed to a method for curing one or more coatings on an object made from a sheet material that is curved, bent, or folded into a three dimensional structure. The method includes coating the object with at least one electron beam or X-ray curable coating and moving the object one or more times through one or more medium to high power, medium to high energy electron beams or X-ray fields. (Spec. 7, ll. 10-19; 10, l. 18 – 14, l. 5). The electron beam or X-ray field is capable of penetrating through multiple layers of the sheet material to cure areas of coating outside the line of sight of the beam or field. (Spec. 8, ll. 5-7; 13, ll. 15-27).

Claims 11 and 21, reproduced below, are representative of the subject matter on appeal.

> 11. The method of claim 21 where the object is an automotive body, the coating is X-ray curable and the automotive body is moved one or more times through one or more X-ray fields generated by striking a metal target with a medium to high power, medium to high energy electron beam.

[1] Claims 1-10 and 24-26 have been withdrawn from consideration. (Amended Appeal Brief filed February 21, 2007, hereinafter "Br.," 3).

> 21. A method for curing one or more coatings on an object made from a sheet material that is curved, bent or folded into a three dimensional structure comprising: (i) coating the object with at least one electron beam or X-ray curable coating; and (ii) moving the object one or more times through one or more medium to high power (at least lkW), medium to high energy (at least 1 MeV) electron beams or X-ray fields, where at least one electron beam and/or X-ray field is capable of penetrating through multiple layers of said sheet material to cure areas of coating outside the line of sight of said beam or field.

THE REJECTION

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

Cullity, "Elements of X-Ray Diffraction," Chapter 1, pp. 1-28		1956
Ansdell, "Automotive Paints," p. 416, Fig. 10.3		1999
Horibe	US 6,231,984	May 15, 2001

The Examiner rejected claims 11-23 under 35 U.S.C. § 103(a) (2002) as being unpatentable over Horibe in view of Ansdell and Cullity. The Examiner found that Horibe does not expressly teach that: (i) the objects are moved through the X-ray field; (ii) the X-ray field is medium to high power and medium to high energy; (iii) the X-ray field is capable of penetrating through multiple layers to cure areas of coating outside the line of sight of the X-ray field; and (iv) the X-rays are generated by striking a metal target with a medium to high power, medium to high energy electron beam. (Ans. 4 and 5). The Examiner found that Ansdell teaches that automobile bodies are moved through an automated coating line. (Ans. 4). The Examiner concluded that it would have been obvious to modify Horibe's process to perform the coating and curing on an automated coating line to successfully

coat and cure the body part. (Ans. 4). The Examiner found that Cullity teaches that X-rays penetrate objects including pieces of metal where the intensity of an X-ray decreases proportionally to the distance traveled through a substance. (Ans. 4 and 5). The Examiner found that Cullity suggests that the higher the power and energy of the X-ray, the farther it will penetrate the object. (Ans. 4). The Examiner found that claim 21 defines power and energy using only lower limits. (Ans. 4). The Examiner concluded that it would have been obvious to modify the process of Horibe to utilize X-rays of the highest practicable power and energy in order to achieve maximum penetration through the entire thickness of the coated film. (Ans. 5). The Examiner also found that Cullity teaches that X-rays are produced when high speed electrons collide with a metal target. (Ans. 4 and 5). The Examiner concluded that it would have been obvious to modify Horibe's process to generate X-rays by striking a target with a high energy electron beam. (Ans. 5).

Appellants contend that Horibe teaches heat curing as the only way to cure the outside line of sight portions of the substrate and as a result, Horibe does not suggest omitting this heating step. (Br. 6 and 7). Appellants argue that Horibe does not recognize curing the outside the line of sight portions of the coating as a problem. (Br. 10). Appellants contend that Cullity does not teach or suggest the use of X-rays for curing applications. (Br. 7 and 8). Appellants contend that Horibe identifies certain body parts of an automobile, but does not teach an automotive body as required in claim 11. (Br. 11). Appellants argue that Ansdell teaches movement of the body or part from one discrete stage to the next and not movement during one particular stage. (Br. 8 and 9). Appellants argue that Horibe does not teach

or suggest that X-ray fields are generated by striking a metal target with an electron beam and that Horibe fails to teach what power and energy requirements would be necessary to irradiate the outside the line of sight portions of the object. (Br. 11 and 12).

ISSUE

Have Appellants shown that the Examiner erred in determining that the claimed method would have been obvious over Horibe in view of Cullity and Ansdell?

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence.

1. Horibe describes a method for curing a coating film having one or more coatings by actinic radiation and heating. (Col. 1, ll. 4-11 and 43-52).
2. Horibe teaches that the substrates coated are "not particularly limited" and that the invention is particularly useful for coating automobile body panels. (Col. 1, l. 66 - col. 2, l. 7).
3. Horibe discloses that X-rays and electron beams may be used as the actinic ray. (Col. 8, ll. 22-24).
4. Horibe discloses that "it is difficult to uniformly irradiate the actinic ray through the whole intermediate coating surface according to the shape of the substrate." (Col. 8, ll. 36-39).
5. Horibe discloses that as a result of insufficient irradiation, "curing by crosslinking by heating is necessary." (Col. 8, ll. 49-60).

6. Cullity discloses that X-rays are known to pass through "quite thick pieces of metal, and other 'opaque' objects." (P. 1).

7. Cullity discloses that "the fractional decrease in intensity *I* of an x-ray beam as it passes through any homogenous substance is proportional to the distance traversed." (p. 10).

8. Cullity discloses that "x-rays are produced whenever high-speed electrons collide with a metal target." (p. 17).

9. Ansdell discloses that an automobile is moved through different stages when coated. (Fig. 10.3).

10. Appellants' Specification states:

> In the mid 1990's, Ion Beam Applications, S.A. (IBA) introduced a family of revolutionary medium to high power, medium to high energy electron beam accelerators.
> (Spec. 3, ll. 29-30).

11. Appellants' Specification defines "automotive body" as

> the main portion of a car, truck, bus, motorcycle, or any other automotive transportation vehicle, including at least the frame or shell, but optionally including other parts such as doors, hood, trunk, axles, etc.
> (Spec. 7, ll. 20-23).

12. Appellants' Specification states:

> In one embodiment, the car body is rotated at a fixed angle (*e.g.* 45º) as it passes through the treatment zone, in order to improve the dose uniformity. One pass through two beams with this body orientation should be sufficient. Alternatively, two passes at half the total dose per pass (*i.e.* twice the conveyor speed) could be applied to opposite rotations of the body to obtain a more uniform dose distribution. *Two passes are routinely done at many electron beam facilities today*.
> (Spec. 15, ll. 8-13) (emphasis added).

PRINCIPLES OF LAW

Determining whether a reference is non-analogous art is a two-fold inquiry. First, we must decide if the reference is within the field of the inventor's endeavor; if it is not, we proceed to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved. *See In re GPAC Inc*., 57 F.3d 1573, 1577 (Fed. Cir. 1995); *In re Wood*, 599 F.2d 1032, 1036 (CCPA 1979). "A reference is reasonably pertinent if, even though it may be in a different field of endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992).

In an obviousness rejection, the combination of references must be considered as a whole, rather than the specific teaching of each reference. *In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971); *In re Simon*, 461 F.2d 1387, 1390 (CCPA 1972).

The Court in *KSR* stated:

> The first error of the Court of Appeals in this case was to foreclose this reasoning by holding that courts and patent examiners should look only to the problem the patentee was trying to solve. The Court of Appeals failed to recognize that the problem motivating the patentee may be only one of many addressed by the patent's subject matter. The question is not whether the combination was obvious to the patentee but whether the combination was obvious to a person with ordinary skill in the art. Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.
> The second error of the Court of Appeals lay in its assumption that a person of ordinary skill attempting to solve a problem

> will be led only to those elements of prior art designed to solve the same problem.

KSR Int'l Co. v. Teleflex, Inc., 127 S. Ct. 1727, 1742 (2007) (Internal citations omitted).

ANALYSIS

Appellants' argument that Horibe does not recognize outside the line of sight curing as a problem in need of solution is unpersuasive. Horibe acknowledges that complete curing of a three-dimensional substrate through actinic radiation is a problem due to the shape of the substrate. (FF 4). The only reason that Horibe employs a heat-curing step is to cure those portions of the shaped substrate that are outside the line of sight of the actinic ray. (FF 5). Appellants take the position that if Horibe has defined curing the outside the line of sight portions of a substrate as a problem to be solved, it is solved through the use of heat curing. (Br. 10). However, Appellants have failed to consider that one of ordinary skill in the art is not limited to solving a problem in the same manner as the prior art. Since Horibe specifically teaches the use of X-rays for curing a substrate and Cullity teaches that X-rays penetrate through layers of metal, one of ordinary skill in the art would have had a reasonable expectation of success in applying well-known prior art X-ray techniques in curing the portions of the substrate that are out of the line of sight of the X-ray field. (*See* Ans. 5; FF 3, 6 and 7). Although Cullity does not expressly address curing though X-rays, Cullity would have commended itself to the inventor's attention due to the description of the properties and methods of generating X-rays described therein. Thus, Appellants' argument that Horibe does not teach how the X-

rays are generated does not consider what the prior art as a whole would have conveyed to one of ordinary skill in the art.

In addition, Appellants' argument that Horibe does not teach the power and energy requirement of the claims also fails to consider the rejection as a whole. Appellants have not shown error in the Examiner's determination that the highest practicable power and energy of X-rays would have been above the lower limits of power and energy presently claimed. (*See* Ans. 4 and 5). Indeed, Appellants' Specification states that medium to high power, medium to high energy electron beam accelerators, used to produce X-rays, have been known since the 1990's. (FF 10). Therefore, Appellants' argument is not persuasive.

Appellants have failed to show that moving an automobile body through an X-ray field would not have been obvious to one of ordinary skill in the art in view of Ansdell. The Examiner found that Ansdell shows that moving an automobile body through an automated coating line is known in the art. (Ans. 4). Appellants' Specification is consistent with the Examiner's finding. (FF 12). Thus, the claimed movement would have been readily obvious depending on the specific process requirements for a given coating and curing application.

Appellants have failed to show that Horibe does not suggest coating an entire automobile body as defined in the Specification and recited in claim 11. Horibe does not limit the substrates to portions of an automobile body and Ansdell demonstrates that automobile body substrates are known in the art. (*See* Ans. 8; FF 2 and 9). In addition, Appellants have not shown any unexpected advantages to coating the entire automobile substrate as

opposed to the individual panels. Therefore, Appellants' arguments are not persuasive.

CONCLUSION

Appellants failed to demonstrate that the Examiner erred in determining that the claimed method would have been obvious over Horibe in view of Cullity and Ansdell.

ORDER

We affirm the Examiner's decision rejecting claims 11-23 under 35 U.S.C. § 103(a) as being unpatentable over Horibe in view of Ansdell and Cullity.

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

AFFIRMED

PL initials:
sld

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