NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

IN RE: RAYMOND CLARKE, LANDEC CORPORATION,
Appellants

2019-1698

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. 14/480,625.

Decided: March 26, 2020

JAMES S. MCDONALD, Walnut Creek, CA, for appellants.

FRANCES LYNCH, Office of the Solicitor, United States Patent and Trademark Office, Alexandria, VA, for appellee Andrei Iancu. Also represented by THOMAS W. KRAUSE, WILLIAM LAMARCA, MEREDITH HOPE SCHOENFELD.

Before O'MALLEY, MAYER, and WALLACH, *Circuit Judges*.

PER CURIAM.

Raymond Clarke and Landec Corporation (hereinafter "Clarke") appeal a decision of the Patent Trial and Appeal Board ("Board") affirming, in relevant part, the

unpatentability of proposed claims 1–8 and 10–15 in U.S. Patent Application No. 14/480,625 ("'625 application"). *See Ex parte Clarke*, 2018 Pat. App. LEXIS 8711 (P.T.A.B. Oct. 29, 2018). For the reasons discussed below, we *affirm* the Board's decision.

I. BACKGROUND

A. The '625 Application

The '625 application, filed on September 8, 2014, is directed to packaging for respiring biological material. The application explains that fruits—which are respiring biological material—consume oxygen and produce carbon dioxide at rates that depend on the age of the fruits. Many fruits are picked before they are ripe, transported under conditions that deter ripening, and then exposed to ethylene, a gaseous plant hormone, to promote rapid ripening of the fruit at a final destination. Packages designed to transport such fruits must, therefore, account for respiration, which impacts oxygen and ethylene levels inside a container, to ensure a desired atmosphere within the package.

The invention disclosed in the '625 application is useful for storing and ripening fruits that ripen "when exposed to ethylene or another [ethylene ripening agent]." J.A. 163. Such fruits include bananas, tomatoes, avocados, Bartlett pears, kiwis, melons, peppers, and mangos. These fruits are often picked when unripe and commercially ripened near a final point of sale via exposure to ethylene in a ripening room. The commercial ripening process can pose a problem, however, because produce is shipped in sealed bags that must be opened to allow ethylene exposure and because ripening can occur rapidly once fruits are exposed to ethylene.

The '625 application discloses a fruit ripening container that "mitigate[s] or overcome[s]" these problems by "provid[ing] a pathway for oxygen, carbon dioxide and

ethylene to enter or leave the container." J.A. 147. Specifically, it discloses containers that:

> include at least one atmosphere control member which provides a pathway for O_2 and CO_2, and which preferably comprises a gas-permeable membrane comprising
>
> (1) a microporous polymeric film, and
>
> (2) a polymeric coating on the microporous film.

J.A. 161. The atmosphere control member ("ACM") is "preferably a control member as described in one or more of U.S. Patent Nos. 6,013,293 [De Moor] and 6,376,032 and International Publication No. W000/04787 . . . . " *Id.* The specification discloses two types of control members, Type S and Type A, with differing oxygen permeabilities. The ACM is secured to a portion of the container, usually a bag, in which one or more round holes has been cut. J.A. 168. It may be secured on the interior or exterior of the bag. J.A. 169.

The '625 application's proposed claims are directed to a "sealed container," a "method of ripening fruit" in a sealed container, and a "method of storing and/or ripening a respiring biological material" in a sealed package. J.A. 277–80. Amended claim 1 is illustrative of the claims at issue on appeal:

> A sealed container which comprises
>
> (a) at least 4 kg of a respiring biological material, and
>
> (b) a packaging atmosphere around the respiring biological material, and
>
> (c) an atmosphere control member which
>
> (i) provides a pathway for oxygen, carbon dioxide and ethylene to

> enter or leave the packaging atmosphere, and
>
> (ii) consists of a membrane which comprises a microporous film and a polymeric coating on the microporous film, and which has an [oxygen permeability], at all temperatures between 20° and 25°C, of at least 50,000 ml/100 inch^2.atm.24hrs;
>
> the sealed container having (i) an oxygen permeability at 13°C per kilogram of the respiring biological material in the container (OP13/kg) of at least 700, and (ii) an ethylene permeability at 13°C per kilogram of the respiring biological material in the container (EtP13/kg) which is at least 2 times the OP13/kg, and
>
> the respiring biological material being a fruit selected from the group consisting of apples, apricots, avocados, blackberries, blueberries, cherimoyas, dates, figs, mangos, melons, peaches, papayas, pears, pineapples, peppers, persimmons, plums, cherries, grapes, lemons, oranges, tomatoes, raspberries, strawberries, nectarines, kiwis and tomatoes.

J.A. 277. Amended independent claim 12, a method claim, mirrors claim 1 and adds the additional limitation of "placing the sealed container in an atmosphere containing ethylene." J.A. 278–79.

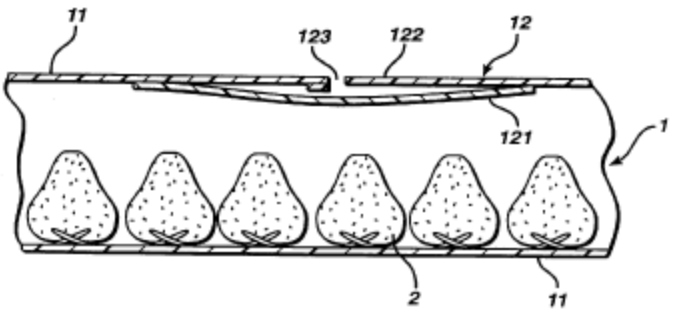
B. Prior Art

The Board relied on six prior art references in the portions of its analysis that Clarke challenges on appeal. We describe each in turn.

De Moor. U.S. Patent No. 6,013,293 ("De Moor"), titled "Packing Respiring Biological Materials with Atmosphere Control Member," issued on January 11, 2000. J.A. 95. De Moor explains that respiring biological materials consume oxygen and produce carbon dioxide such that they should be stored in a container that is sufficiently permeable to those gases. J.A. 99. According to De Moor, prior art packaging was inadequate because polymeric films alone do not have adequate oxygen and carbon dioxide transmission rates. *Id.*

De Moor teaches a container made up of a relatively oxygen and carbon dioxide impermeable barrier and an ACM that is relatively permeable. *Id.* One example of the De Moor invention is depicted in Figure 2:

FIG. 2



J.A. 97. De Moor's ACM 12 "comprises a gas-permeable membrane 121 and an apertured cover member 122" that covers an aperture 123 cut into the bag. J.A. 102. De Moor discloses an oxygen permeability of the gas permeable member of at least 50,000 cc/100 inch^2.atm.24hr at all temperatures between 20^o and 25^{o}C. J.A. 101.

Schreiber. U.S. Patent No. 5,332,088 ("Schreiber"), titled "Fruit Display Box with Hand Holes," issued July 26, 1994. J.A. 84. Schreiber discloses a shipping container

packed with 40 pounds (about 18 kilograms) of bananas. J.A. 86.

Curtis. U.S. Patent No. 6,085,930 ("Curtis"), titled "Controlled Atmosphere Package," issued July 11, 2000. J.A. 105. Curtis teaches using a gas permeable membrane to control gas concentrations within fruit packaging. J.A. 113. Curtis further teaches, "the rate at which a specific gas permeates through a membrane is proportional to the difference between the concentrations of that specific gas on both sides of the permeable membrane." J.A. 112.

Nakata. U.S. Patent No. 6,348,271 ("Nakata"), titled "Film Having Gas Permeability," issued on February 19, 2002. J.A. 119. Nakata, like Curtis, teaches permeable films with varying permeabilities to oxygen and ethylene. J.A. 127–28, tbl.1. Nakata Example 4 discloses an ethylene to oxygen permeability ratio of greater than 2:1. *Id.* The Example 4 film was ranked as keeping lettuce, spinach, and bean sprouts in "good" condition during tests of five to seven days. J.A. 128–29, tbls.2–4.

Herdeman. U.S. Patent No. 5,460,841 ("Herdeman"), titled "Process for Ripening Bananas and Other Produce," issued on October 24, 1995. J.A. 87. Herdeman discloses ripening produce, such as bananas, while the produce is stored in large containers that are also used for shipping. J.A. 90. Herdeman Figure 1 shows such a ripening container 20, packed with product filled boxes 17, that is

capable of receiving controlled atmosphere gas, including ethylene, through an input port 45:

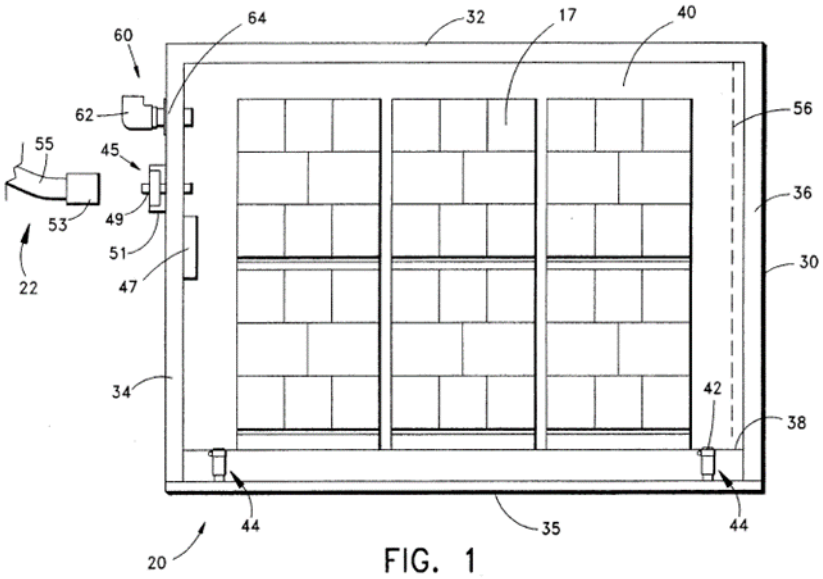


FIG. 1

J.A. 88, 90–91.

Sisler. U.S. Patent No. 5,518,988 ("Sisler"), titled "Method of Counteracting an Ethylene Response in Plants," issued on May 21, 1996. J.A. 73. Sisler teaches that ethylene ripens fruits and vegetables. J.A. 79.

C. The Board's Decisions

Decision on Appeal. Before the Board, Clarke appealed six of the examiner's grounds for rejection of the claims of the '625 application:

A. The rejection of claims 1–4, 6, and 8 as obvious over De Moor in view of Schreiber, Curtis, and Nakata;

B. The rejection of claims 5, 10–12, and 14 as obvious over De Moor, Schreiber, Curtis, Herdeman, Nakata, and Sisler;

C. The rejection of claim 7 as obvious over De Moor, Schreiber, Curtis, Nakata, and Sisler;

D. The rejection of claim 13 as obvious over De Moor, Schreiber, Curtis, Herdeman, Nakata, and Sisler;

E. The rejection of claim 15 as obvious over De Moor, Schreiber, Curtis, Herdeman, Nakata, Reilly, and Sisler; and

F. The rejection of claims 16 and 18–21 as obvious over De Moor, Schreiber, Curtis, Herdeman, Nakata, Sisler, and Orman.

J.A. 4–5. The Board considered grounds A–E, related to claims 1–8 and 10–15, together, and separately considered ground F, related to claims 16 and 18–21. The Board reversed the examiner as to ground F. J.A. 14. Accordingly, Clarke's appeal does not address independent claim 16 and dependent claims 18–21. Clarke also does not separately appeal grounds C–E (concerning dependent claims 7, 13, and 15), relying instead on establishing the patentability of the independent claims to show the patentability of the dependent claims that the Board rejected under those combinations.

First, relevant to claims 1–8 and 10–15, the Board found that De Moor teaches an ACM within the scope of the claims. J.A. 6. Clarke argued to the Board that De Moor does not teach the claims' ACM because De Moor's ACM includes a "cover member." *Id.* Clarke argued that the "consists of a membrane which comprises" language of the claims, describing the ACM, meant that the extra structure in De Moor put De Moor's ACM outside the scope of the claims. *Id.* The Board found, however, that there is no real difference between the proposed claims and De Moor's structure. The Board explained that De Moor's cover member "can be an integral part of the barrier sections surrounding the control member . . . . This structure

is no different than what Appellant describes in the Specification as his invention, i.e., a gas permeable membrane control member secured over one or more holes in a bag." *Id.* Thus, the Board found, "[a]ny difference resides merely in the language De Moor uses to describe the structure rather than in the structure itself." *Id.*

Next, as to claim 1, the Board considered whether the examiner erred in finding that a skilled artisan would have selected a membrane with the oxygen and ethylene permeabilities recited in claim 1 for use with De Moor's container and whether De Moor discloses the 4 kg limitation. J.A. 7–9. The Board found no error in the examiner's analysis. It explained that De Moor, Curtis, and Nakata are "concerned with packaging that will inhibit the spoilage of respiring fruits and vegetables during transport and storage" and "teach using gas permeable membranes to control the concentrations of various gases within the package." J.A. 7. De Moor expressly discloses a conventional-sized container for packaging fruits and discloses a gas permeable membrane with oxygen permeability that meets the claimed range. J.A. 8. The Board further found that Clarke and Nakata show that one of skill in the art would have been motivated to optimize De Moor's membrane to achieve the claimed permeability values. J.A. 8–9. The Board also found that Schreiber teaches a conventional sized shipment container carrying 18 kg of fruit. J.A. 9. Thus, the Board found the examiner's rejection was supported by a preponderance of the evidence. *Id.*

As to claim 12, addressing ground B, the Board found that Herdeman discloses the use of ethylene to rapidly ripen fruits in a combination shipping and ripening container. J.A. 10. The Board further found that Herdeman discloses ripening the fruit while the fruit was in boxes. *Id.* The Board explained,

> [a]lthough Herdeman does not specify the structure of the boxes in which the fruit is stored, a

> preponderance of the evidence indicates that using sealed containers having gas permeable membranes was known in the art to store fruit and vegetables after picking. This is clear from the teachings of both De Moor and Herdeman, which provide evidence of the conventional methods used in picking, storing, shipping, and ripening of respiring fruit. The fruit is often picked when green, cooled, and packaged in sealed polymeric containers.

J.A. 11.

Decision on Rehearing. Clarke requested rehearing of the Board's decision as to claims 1–8 and 10–15. J.A. 18. He challenged the Board's rationale and conclusions as to De Moor's ACM, the prior art's disclosure that ethylene and oxygen permeabilities were known result-effective variables in the art, and placing a sealed container in a Herdeman-type environment. J.A. 19. The Board denied the rehearing request. *Id.*

First, the Board reiterated its view that there is no meaningful distinction between the claims and De Moor's ACM. J.A. 20–21. It explained that claim 1, a comprising claim, does not exclude the presence of a bag in addition to the ACM. The "consists of" language of the ACM limitation does not, the Board explained, change that understanding. J.A. 20.

Second, the Board rejected Clarke's argument that its analysis focused on the permeability of the membrane alone to find overall container permeability limitations disclosed. J.A. 22. Instead, the Board explained, its decision that the prior art teaches that a person of ordinary skill would find optimal permeabilities was based on teachings from multiple references that use permeable membranes to achieve certain concentration of various gases in the entire package. *Id.* The Board explained,

> the references as a whole evince that the relationships between the gas concentrations and ripening/spoilage rates were known in the art and that those of ordinary skill in the art understood how to control the gas concentrations in containers through the use of a membrane as well as by controlling the mix of gases in the environment outside the container to obtain a desired result, i.e., a desired rate of ripening or of spoilage prevention.

J.A. 23–24. The Board cited *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990), for the proposition that, once it is shown that the prior art provides guidance on optimal ranges, the burden shifts to the applicant to show that the claimed range achieved unexpected results. Thus, because "both oxygen permeability and ethylene permeability were known to have an effect," the Board explained that the burden was on Clarke to establish that the result of the claimed invention was unexpected—a burden he failed to carry. J.A. 24.

Third, the Board rejected Clarke's argument that it had equated Herdeman's shipping container to De Moor's ripening container. J.A. 25. The Board explained that Herdeman's shipping container is like a ripening room into which a container, such as the one described in De Moor, might be placed. *Id.*

Clarke appeals. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(4)(A).

II. ANALYSIS

"Whether an invention would have been obvious to one of ordinary skill in the art is a legal determination based on underlying findings of fact." *In re Mouttet*, 686 F.3d 1322, 1330 (Fed. Cir. 2012). "The foundational facts for the prima facie case of obviousness are: (1) the scope and content of the prior art; (2) the difference between the prior art and the claimed invention; and (3) the level of ordinary

skill in the art." *In re Mayne*, 104 F.3d 1339, 1341 (Fed. Cir. 1997). Whether a person of ordinary skill in the art would have had a motivation to combine prior art references is a question of fact. *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). The Patent Office bears the burden of establishing the prima facie facts of obviousness. *Mayne*, 104 F.3d at 1341. If the Patent Office carries its burden, it falls to the applicant to rebut the Patent Office's showing. *Id.*

We review the Board's factual findings for substantial evidence and its ultimate determination of obviousness without deference. *Gartside*, 203 F.3d at 1315–16. "Substantial evidence is more than a mere scintilla. It means such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938).

A. Substantial Evidence Supports the Board's Finding that De Moor Discloses the Claimed ACM

Clarke argues that De Moor's ACM falls outside the scope of claims 1 and 12 because of the claims' "consists of" limitation. Appellant's Br. 12–17. Specifically, he argues that De Moor describes its ACM as comprising "(1) a membrane comprising a microporous film and a polymeric coating on the microporous film and (2) an apertured cover member." *Id.* at 12. He contends that the apertured cover member is essential to De Moor's ACM and that removing it would change the principles of De Moor's operation. *Id.*

The Board disagreed with Clarke's characterization of De Moor. It is undisputed that De Moor discloses a gas permeable membrane, with the required oxygen permeability, that is secured over one or more holes in a bag. *See* J.A. 6. The only issue before the Board was the significance, if any, of the apertured cover member to the analysis. *Id.* The Board found the apertured cover member had no bearing on the analysis. It explained, "[a]ny difference [between De Moor and the claims] resides merely in the

language De Moor uses to describe the structure rather than in the structure itself." *Id.*

We find no error in the Board's analysis. While prior art elements must be arranged in the same manner as the claim, "the reference need not satisfy an *ipsissimis verbi*s test." *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009). Here, although De Moor contains structures in addition to those found in the proposed claims, substantial evidence supports a finding that each element of each of the claims is present in the prior art.

Accordingly, we see no error in the Board's analysis of De Moor's disclosure, and reject Clarke's contention that the "consists of" language of the claim somehow excludes De Moor's ACM as a matter of law.

B. Prosecution History Estoppel Does Not Apply During Prosecution

Clarke argues that the Board's analysis of De Moor is erroneous because he "disclaimed" De Moor's ACM during prosecution. Appellant's Br. 17–19; 26–27. He argues that the alleged "disclaimer" can be found in statements he made during prosecution to argue that his claims do not cover a De Moor-type ACM with an apertured cover member. Appellant's Br. 17–18 (citing prosecution history statements found at J.A. 231, 282, 314, 375). Clarke's argument fails, however, because the doctrine of prosecution history estoppel is inapplicable *during* prosecution. Instead, the doctrine is applicable only to *issued* patents and available only to patentees. *See Omega Eng'g, Inc, v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) ("[W]here the *patentee* has unequivocally disavowed a certain meaning to obtain his *patent*, the doctrine of prosecution disclaimer attaches and narrows the ordinary meaning of the claim congruent with the scope of the surrender." (emphases added)). To receive the benefit (or detriment) of a prosecution history disclaimer, an applicant must persuade an examiner that his claims are, as a matter of fact,

distinguishable from the prior art. Clarke has failed to do so in this case. We, therefore, find no legal error in the Board's analysis of the scope of the proposed claims.

C. The Prior Art Renders Obvious Placing a Sealed Container in an Atmosphere Containing Ethylene

Clarke argues that the Board erred in concluding that Herdeman discloses placing produce in a sealed container and exposing the sealed container to an atmosphere containing ethylene. Appellant's Br. 27–29. In support of this argument, he discusses Herdeman's specific disclosure at length. *Id.* As the government points out, however, Clarke's discussion ignores that the Board's obviousness determination was based on a combination of six references: De Moor, Schreiber, Curtis, Nakata, Herdeman, and Sisler. J.A. 10–11; *see also* Appellee's Br. 36–38. The Board relied on Herdeman only to establish that the prior art taught placing produce-filled containers in an atmosphere containing ethylene to facilitate ripening. *See* J.A. 10–11. The Board then reasoned that Herdeman does not discuss the structure of the containers and that a person of ordinary skill in the art would have understood that a De Moor-type container could be used along with Herdeman. J.A. 11. Thus, although Clarke is correct that Hardeman does not expressly disclose exposing *sealed* containers containing produce to ethylene, that was not the Board's rationale for finding obviousness. As such, Clarke has not identified any error in the Board's analysis.

We conclude that substantial evidence supports the Board's factual findings, and we hold that the Board correctly found claim 12 obvious in view of De Moor, Schreiber, Curtis, Nakata, Herdeman, and Sisler.

III. CONCLUSION

We have considered Clarke's additional arguments on the content of the prior art and motivation to combine, but find them unpersuasive. Substantial evidence supports

the Board's factual findings and the Board did not commit legal error in its analysis of the obviousness of claims 1–8 and 10–15 of the '625 application. We agree with the Board that, given the underlying facts, the proposed claims are obvious. We therefore *affirm*.

AFFIRMED

COSTS

No costs.