Paper 14

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte JAMES D'ADDARIO and STEVEN T. MURRAY

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Appeal 2001-1527
Application 08/753,265[1]

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ON BRIEF

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Before: KIMLIN, DELMENDO, and NAGUMO, Administrative Patent Judges.

NAGUMO, Administrative Patent Judge.

Decision on appeal under 35 U.S.C. § 134

The appeal is from a decision of a primary examiner rejecting claims 1 through 5 and 17 through 19. Claims 6 through 16 have been withdrawn from consideration by the examiner as being drawn to a non-elected invention. (Paper No. 5 at 2.) We reverse.

[1] Application for patent filed November 22, 1996. According to Appellants, the real party in interest is Innovative Automation, Inc., of New York. (Brief at 3.)

A. **Findings of fact**

The record supports the following findings by at least a preponderance of the evidence.[2]

The invention

Appellants' invention relates to a method of forming a drum head membrane from a polymer sheet. (Specification at 1, l. 4.) More specifically, a polymer sheet is inserted into a mold; the sheet is then heated, and the center of the sheet is cooled so the periphery of the sheet is maintained at a higher temperature than the center section; the sheet is then formed into a drum head. (*Id.* at 3, ll. 19-26.) The center of the sheet comprises the battering surface and the peripheral collar forms a structure to which various tensioning devices may be attached to hold the battering surface at the desired degree of tension. (*Id.* at 2, ll. 20-24.) According to Appellants, their method provides easier tuning, particularly at lower pitches, compared to prior art drum heads. (*Id.* at 6, l. 29, to 7, l. 1.)

[2] To the extent these findings of fact discuss legal issues, they may be treated as conclusions of law.

The claims

Claims 1 and 17 are representative.

1. A process for producing a drumhead comprising:
a. inserting a polymer sheet in a mold having a peripheral section and a center section;
b. delivering heat to the polymer sheet;
c. cooling the mold only at the center section to maintain a temperature differential between the peripheral section and the center section wherein the temperature at the peripheral section is higher than the temperature at the center section; and
d. forming the polymer sheet into a drumhead battering surface comprised of a flat battering surface and a peripheral collar depending from the flat battering surface to form the drumhead.

17. A process for forming a drumhead comprising the steps of subjecting the center section of a polymer sheet to a temperature in the range of 90 degrees F to 130 degrees F and subjecting the periphery of said polymer sheet to a temperature in the range of 180 degrees F to 230 degrees F and imposing a force on the polymer sheet to form a flat central battering surface and a peripheral collar depending from the flat central battering surface.

The examiner's rejections

Rejection 1

The examiner has rejected claims 1–5 under 35 U.S.C. § 112, first paragraph, as lacking an adequate written description of the limitation "cooling the mold only at the center section."

Rejection 2

The examiner has rejected claims 1-5 and 17-19 as unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Donohoe[3] and either Bullock[4] or Medwed[5].

Rejection 3

The examiner has rejected 17-19 as unpatentable under 35 U.S.C. § 103(a) over the teachings of either Bullock or Medwed.

Donohoe

Donohoe relates to drum heads and processes for making them. (Donohoe at col. 1, ll. 8-9.) More specifically, Donohoe provides a method that "precisely positions and interlocks the periphery of a drum head membrane within an integral tensioning hoop." (*Id.* at col. 3, ll. 12-15.)

Donohoe also discloses that a drum head membrane may be made "from a circular disk that has an outer annular region thereof formed by the simultaneous application of heat and pressure (thermo-forming) into a curved transverse cross section." (Donohoe at col. 5, ll. 48-52.)

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[3] U.S. Patent No. 5,554,812, issued to David G. Donohoe on September 10, 1996, based on an application filed February 28, 1995.

[4] U.S. Patent No. 4,500,277, issued to Lance W. Bullock et al. on February 19, 1985.

[5] U.S. Patent 4,397,804, issued to Emmerich Medwed on August 9, 1983.

Bullock

Bullock relates to a method of thermoforming hollow articles in which a plug permits independent control of the wall cross-section or thickness by selective stretching and distribution of the material. (Bullock at col. 2, ll. 49–56.) Bullock accomplishes these goals by providing a plug having a thermal conductivity different from that of the remainder of the body of the mold. (*Id.* at col. 3, ll. 25–28.) In embodiments, the plug may be hollow, and may be provided with means to circulate pressurized air as a way to increase the transfer of heat from the plug. (*Id.* at col. 5, ll. 39–59, discussing Figure 4.)

Medwed

Medwed relates to a method of forming containers from a thermoplastic sheet. (Medwed at col. 1, ll. 6–8.) According to Medwed, the thermoplastic sheet is heated to its plastic (i.e., deformable) state, clamped at the periphery of the plastic region, and then shaped by a molding die. (*Id.* at ll. 60–65.) Referring to figures 2 through 6, the center of the molding die is recessed so that the central portion **21** does not contact the sheet material during the molding operation. (*Id.* at col. 3, ll. 7–11.) Cooling air is directed against the sheet material opposite the central portion **21** via ducts **23** through **26** that are

adjacent to the peripheral portions of the die, adjacent to the corner and edge portions. (*Id.* at col. 2, ll. 1–5.) The cooling air escapes via a venting bore **29** in the center of the central portion. (*Id.* at col. 3, ll. 61–67.) According to Medwed, the temperature and pressure of the supplied air are adjusted so the corners will have the same wall thickness as the wall portions of the containers. (*Id.* at col. 4, ll. 13–17.)

The examiner's rationale

Rejection 1:

In support of the rejection for lack of an adequate written description of the claimed subject matter, the examiner states that "[n]o apparent basis, either specific or inherent, has been provided in the original disclosure for excluding heating or cooling in other areas of the mold." (Answer at 3.)

Rejection 2:

In support of the obviousness rejection, the examiner finds that Donohoe teaches providing a drumhead membrane having a circular disk-shaped flat battering section and a peripheral section; a thermoforming process (citing Donohoe at col. 5, ll. 48–54) in which heat and positive pressure (*id.* at col. 5, ll. 48–54) are applied to a thin sheet of synthetic polymer (*id.*

at col. 4, l. 64, to col. 5, l. 2). (Answer at 4.) The examiner states that Donohoe does not teach: (a) the use of a mold; (b) a mold having peripheral and center sections; (c) cooling (only) the center section of the mold; and (d) the temperature of the peripheral section being higher than the temperature of the central section. (*Id.*)

To remedy these deficiencies, the examiner relies on the teachings of either Bullock or Medwed. According to the examiner, both references teach a thermoforming process in which a mold is cooled in the central section. (Answer at 5.) The examiner reasons that it would have been obvious to use the methods taught by Bullock or Medwed in the process taught by Donohoe to produce a drumhead in a cost-effective, efficient manner that would enhance the accuracy of the forming process. (Answer at 6.) The examiner argues that the peripheral temperature would be inherently higher in such processes than the cooled center section. (*Id.*)

With regard to claims 17-19, the examiner maintains that Donohoe teaches all the limitations but the recited temperatures of the peripheral and center sections. (Answer at 11.) Such temperatures, according to the examiner, would have been a matter of choice, obtainable by routine experimentation. (*Id.*) In

support of the routine optimization theory, the examiner asserts that the specified temperature and pressure ranges (recited in claim 19) are well known for molding polyester sheets. (*Id.*)

Rejection 3

The examiner argues that both Bullock and Medwed teach processes meeting all the limitations recited in claims 17–19 but for the temperature ranges (claim 17) and the range of pressures (claim 19.) (Answer at 13–14.) As in **Rejection 2**, the examiner asserts that the selection of such temperatures and pressures would have been a matter of routine optimization. (*Id.*)

Appellants' argument

The Appellants' traverse of the examiner's rejections is set out in full in their Brief.

B. Discussion

Rejection 1

Whether the specification provides an adequate written description of the subject matter claimed is a question of fact: "one skilled in the art, reading the original disclosure, must immediately discern the limitation at issue in the claims." *Purdue Pharma L.P. v. Faulding Inc.*, 230 F.3d 1320, 1323, 56 USPQ2d 1481, 1483 (Fed. Cir. 2000)(citation omitted). With

regard to **Rejection 1**, we find, as the Appellants urge (Brief at 9), that the specification discloses:

> Temperature sensors in the form of thermocouples 24 are strategically positioned around the periphery of the male mold member 4 to regulate the temperature of the mold in the area of the serpentine passage 18 serving to cool the central area of the mold 2. [Specification at 5, ll. 3-8.]

We regard this disclosure, by itself or in conjunction with Figure 4, which it describes, as sufficient evidence supporting recitation of the limitation that the mold is to be cooled "only" at the center section. The examiner's failure to come forward with any evidence in support of the rejection, showing that this passage is somehow inadequate, is fatal, and we reverse.

Rejection 2

The initial burden is on the examiner to establish a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992) ("The examiner . . . bears the initial burden . . . of presenting a prima facie case of unpatentability."). "Although a reference need not expressly teach that the disclosure contained therein should be combined with another, the showing of combinability, in whatever form, must nevertheless be 'clear and particular.'" *Winner International Royalty Corp. v. Wang*, 202 F.3d 1340, 1348-49,

53 USPQ2d 1580, 1586-87 (Fed. Cir. 2000) (citations and footnote omitted).

With regard to claims 1 through 5, we have found that Donohoe teaches that the outer annular region of a drum head membranes may be formed by applying heat and pressure to the membrane. Specifically, Donohoe states that "drum head membrane **11** is made from a circular disk that has an outer annular region thereof formed by the simultaneous application of heat and pressure (thermo-forming) into a curved transverse cross section." (Donohoe at col. 5, ll. 48-52.) We do not find in this statement any teaching that the drum head membrane as a whole is thermoformed. Moreover, the examiner has not directed our attention to such a teaching in the art relied on as evidence of obviousness. Although we disagree with the examiner's statement that Donohoe does not teach the use of a mold, we agree with the examiner that Donohoe does not teach a mold having peripheral and center sections. The mold used to thermoform the outer annular section of Donohoe's drum head membranes might itself have an annular cross section: it need not also mold the center section of the membrane, and hence there need not be a section of the mold that is reasonably characterized as the "center section." Accordingly, we find that substantial evidence

does not support the combination of the teachings of Donohoe with those of Bullock or Medweg, which relate to molds having center and peripheral sections. Furthermore, while we agree with the examiner that Bullock and Medweg teach cooling the center sections of molds, we do not find a reason, suggestion, or teaching in Donohoe that would invite one of ordinary skill in the art to apply their teachings to the disclosure of forming the annular section of the drum head membrane. While this may be a consequence of the incidental nature of Donohoe's teachings regarding the molding of drum head membranes (Donohoe is primarily concerned with teaching how to integrally bond a preformed drum head membrane to a tensioning ring), we may not substitute speculation for fact-finding. The rejection of claims 1-5 is reversed.

With regard to the examiner's rejection of claims 17-19, the examiner has relied on the theory that the selection of temperatures and pressures would have been matters of choice that would have "obviously been determined . . . through routine optimization." (Answer at 11.) The examiner asserts that the temperature and pressure ranges recited in the claims are known in molding processes involving polyester sheets, and that the application of parameters within known ranges to the molding

process outlined by Donohoe would have been obvious. (*Id.* at 11-12.) However, the examiner has not directed our attention to any factual basis in the prior art of record supporting these determinations. As our reviewing court has repeatedly emphasized, "[t]he Board's findings must extend to all material facts and must be documented on the record, lest the 'haze of so-called expertise' acquire insulation from accountability. 'Common knowledge and common sense,' even if assumed to derive from the agency's expertise, do not substitute for authority when the law requires authority." *In re Lee*, 277 F.3d 1338, 1344-45, 61 USPQ2d 1430, 1435 (Fed. Cir. 2002). Even granting, arguendo, the premise that polyester sheet molding temperatures are recognized to be between 90°F and 230°F, and that both Medwed and Bullock provide a reason to cool the center of a sheet, we find no reason in these references or in the general knowledge appealed to by the examiner to select the range of 90 to 130°F for the center, and 180 to 230°F for the periphery. For this reason, we are constrained to reverse the rejection of claims 17-19.

Rejection 3

As explained in our reversal of **Rejection 2**, neither Bullock or Medweg provides any teachings that would direct one of

ordinary skill in the art to select the temperature ranges recited for the central and peripheral sections of the mold. Accordingly, we reverse this rejection as well.

C. Decision

Upon consideration of the appeal, and solely for the reasons given, rejections 1-3 are reversed.

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

REVERSED

EDWARD C. KIMLIN Administrative Patent Judge	)
ROMULO H. DELMENDO Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
MARK NAGUMO Administrative Patent Judge	)

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