THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SPX Corporation

Appeal No. 98-0058
Reexamination Control No. 90/004,082[1]

ON BRIEF

Before STAAB, McQUADE, and NASE, Administrative Patent Judges.

NASE, Administrative Patent Judge.

[1] Reexamination for U.S. Patent No. 5,285,647 issued February 15, 1994, based on Application No. 08/027,425, filed March 8, 1993. Request for reexamination filed December 21, 1995.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1, 2-15/1, 2-15/21, 16 and 21. Claims 2-15/22, 17-20 and 22-25 have been allowed.[2]

We AFFIRM-IN-PART.

[2] Based on the amendment after final rejection (paper No. 9, filed January 22, 1997) to claim 21, the rejection of claims 2-20/21 and 21 under 35 U.S.C. § 305 was withdrawn by the examiner.

BACKGROUND

The appellant's invention relates to a refrigerant handling system. Claims 1, 3, 6, 12 and 21 are representative of the subject matter on appeal and a copy of those claims, as they appear in the appendix to the appellant's brief, is attached to this decision.

The prior art references of record relied upon by the examiner as evidence of obviousness under 35 U.S.C. § 103 are:

Gray	4,445,366	May 1, 1984
Manz	4,939,905	July 10, 1990
Major et al. (Major)	5,078,756	Jan. 7, 1992
Manz et al. (Manz)	5,158,747	Oct. 27, 1992
Manz	5,181,391	Jan. 26, 1993
Daily	5,189,889	March 2, 1993

Claims 1, 7/1, 8/1 and 10/1 stand rejected under 35 U.S.C. § 103 as being unpatentable over Daily in view of Gray.

Claims 2/1, 4/1 and 5/1 stand rejected under 35 U.S.C. § 103 as being unpatentable over Daily in view of Gray as applied to claim 1 above, and further in view of Manz (905).

Claim 3/1 stands rejected under 35 U.S.C. § 103 as being unpatentable over Daily in view of Gray and Manz (905) as applied to claim 2/1 above, and further in view of Major.

Claim 6/1 stands rejected under 35 U.S.C. § 103 as being unpatentable over Daily in view of Gray and Manz (905) as applied to claim 2/1 above, and further in view of Manz (747).

Claim 9/1 stands rejected under 35 U.S.C. § 103 as being unpatentable over Daily in view of Gray as applied to claim 1 above, and further in view of Major.

Claims 11-15/1 stand rejected under 35 U.S.C. § 103 as being unpatentable over Daily in view of Gray as applied to claim 1 above, and further in view of Manz (391).

Claims 21, 2/21, 4/21, 5/21, 7/21, 8/21 and 10/21 stand rejected under 35 U.S.C. § 103 as being unpatentable over Daily in view of Manz (905).

Claim 16 stands rejected under 35 U.S.C. § 103 as being unpatentable over Daily in view of Manz (905) as applied to claim 21 above, and further in view of Gray.

Claims 3/21 and 9/21 stand rejected under 35 U.S.C. § 103 as being unpatentable over Daily in view of Manz (905) as applied to claim 21 above, and further in view of Major.

Claim 6/21 stands rejected under 35 U.S.C. § 103 as being unpatentable over Daily in view of Manz (905) as applied to claim 21 above, and further in view of Manz (747).

Claims 11-15/21 stand rejected under 35 U.S.C. § 103 as being unpatentable over Daily in view of Manz (905) as applied to claim 21 above, and further in view of Manz (391).

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellant regarding the § 103 rejections, we make reference to the final rejection (Paper No. 8, mailed November 19, 1996) and the examiner's answer (Paper No. 13, mailed May 14, 1997) for the examiner's complete reasoning in support of the rejections, and to the appellant's brief (Paper No. 12, filed March 17, 1997) and reply brief (Paper No. 14, filed June 20, 1997) for the appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by the appellant and the examiner. As a consequence of our review, we make the determinations which follow.

Claims 1, 7/1, 8/1 and 10/1

We will not sustain the rejection of claims 1, 7/1, 8/1 and 10/1 under 35 U.S.C. § 103 as being unpatentable over Daily in view of Gray.[3]

Claim 1 requires "means for automatically determining quantity of air within the vessel from said first and second signals and displaying said air quantity to an operator."

In the final rejection, the examiner determined (p. 3) that

> [i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Daily such that it included use of means for indicating the amount of air in a system to an operator as a function [sic, of] pressure difference of [sic] in view of the teachings of Gray '366.

The appellant argues (brief, pp. 7-10) that claim 1 is not suggested by Daily and Gray since neither Daily nor Gray

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[3] The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. See In re Young, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991) and In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

discloses means for displaying air quantity to an operator. We agree. Gray discloses[4] that in typical prior art refrigeration system, both the vapor temperature and the total vapor pressure are displayed on a number of gauges. After manual inspection of the gauges, a worker or mechanic can refer to a text or chart to determine the partial pressure of the refrigerant vapor. The difference, if any, between this determined partial pressure of the refrigerant vapor and the measured total vapor pressure of the refrigeration system indicates the presence and the amount of noncondensible gases in the refrigeration system. While Gray may have suggested the addition of temperature and pressure gauges to the refrigeration system of Daily, it is our opinion that the combined teachings of the applied prior art would not have suggested to modify Daily's device to display air quantity to an operator.

Claims 2-6/1, 9/1 and 11-15/1

[4] See column 1, lines 13-49, of Gray.

We will not sustain the rejections of claims 2-6/1, 9/1 and 11-15/1 under 35 U.S.C. § 103.

Based on the examiner's rationales in applying the additional references to Manz (905), Manz (747), Major and Manz (391), it is clear to us that the deficiency noted above relative to the combined teachings of Daily and Gray is not overcome.

Claim 21

We will sustain the rejection of claim 21 under 35 U.S.C. § 103 as being unpatentable over Daily in view of Manz (905).

Independent claim 21 recites a refrigerant handling system that includes apparatus for determining the quantity of air captured within a closed vessel for storing refrigerant. The apparatus for determining the quantity of air captured within the closed vessel comprises, inter alia, a first sensing means for providing a first electrical signal as a function of air/refrigerant vapor pressure within the vessel, a second sensing means for providing a second electrical

signal as a function of air/refrigerant vapor temperature within the vessel, and a microprocessor-based control means having prestored therein electronic indicia including a look-up table that relates refrigerant saturation pressure to temperature for at least one type of refrigerant. The microprocessor-based control means includes, inter alia, means for receiving the first and second signals, means responsive to the second signal for obtaining from the look-up table a corresponding refrigerant saturation pressure value, means responsive to the first signal for comparing the corresponding refrigerant saturation pressure value to the first signal indicative of air/refrigerant vapor pressure within the vessel, and means for indicating quantity of air within the vessel as a function of a difference between air/refrigerant vapor pressure indicated by the first signal and the corresponding refrigerant saturation pressure value obtained from the look-up table at the temperature indicated by the second signal.

Daily discloses[5] a container 14 enclosing a refrigerant. Microprocessor 56 is operatively connected to a pressure and temperature sensor 58 and a pressure sensor 60. The microprocessor 56 contains a program which describes the pressure-temperature relationship of the enclosed refrigerant. Whenever microprocessor 56 senses a pressure which is at least about 3 p.s.i. greater than the ideal saturated pressure of the enclosed refrigerant at that temperature, it then concludes that noncondensable impurities are present. If and when these impurities are present, they tend to rise to the top of container 14. When the microprocessor 56 senses the presence of such impurities, it activates a solenoid 62 and opens vent 64 to allow noncondensable gas to vent to the atmosphere. Vent 64 is opened for a relatively short period of time to allow a limited amount of gas to escape. The process may repeated at varying intervals until and unless the microprocessor senses that the pressure of the mixture is less than about 3 p.s.i. greater than the desired pressure.

[5] See Figure 7 and column 6, lines 42-64, of Daily.

Manz (905) discloses[6] coupling a temperature sensor 100 to the input refrigerant line at the inlet side of compressor 22 between evaporator 30 and oil separator 42. Likewise, a pressure sensor 102 is coupled to the refrigerant line between evaporator 30 and oil separator 42. Each of the sensors 100, 102 feeds an associated electronic signal to control electronics 96a indicative of refrigerant temperature or pressure. Control electronics 96a, which preferably is microprocessor-based, includes internal facility, such as a look-up table or the like schematically illustrated in Figure 2 for determining refrigerant type from the pressure and temperature saturation characteristics of the refrigerant being drawn into compressor 22, and for automatically operating solenoid valves 50a, 52a, 54a accordingly.

[6] See Figure 2 and column 4, line 67, to column 5, line 17, of Manz (905).

In the final rejection, the examiner determined (p. 4) that

> [i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Daily such that it used a look-up table in order to store the pressure and temperature relationship of refrigerants in view of the teachings of Manz '905.

Implicit in this rejection is the examiner's view that the above noted modification of Daily would result in an apparatus which corresponds to the apparatus recited in claim 21 in all respects.

The appellant argues (brief, pp. 10-12 and reply brief, pp. 3-4) that there is no suggestion to incorporate the look-up table of Manz (905) into the system of Daily. We do not agree. The suggestion to incorporate the look-up table of Manz (905) into the system of Daily comes from the combined teachings of Daily and Manz (905). In that regard, we note that Daily specifically teaches (column 6, lines 47-49) that "the microprocessor 56 contains a program which describes the pressure-temperature relationship of the refrigerant." From Daily's description of the operation of the microprocessor 56

(column 6, lines 42-64), it would have been apparent to one of ordinary skill in this art that (1) the temperature read by sensor 58 causes the program to determine the ideal saturated pressure of the enclosed refrigerant at that temperature, (2) the microprocessor 56 compares the sensed pressure to the determined ideal saturated pressure of the enclosed refrigerant at the sensed temperature, and (3) whenever the sensed pressure is at least about 3 p.s.i. greater than the determined ideal saturated pressure of the enclosed refrigerant at the sensed temperature, the microprocessor 56 activates solenoid 62 to open vent 64 to allow noncondensable gas to vent to the atmosphere. The teaching of Manz (905) discloses that it was known in this art at the time the invention was made to include a look-up table setting forth the pressure and temperature saturation characteristics of known refrigerants in control electronics, which were preferably microprocessor-based. In applying the above-noted test for obviousness, we reach the conclusion that it would have been obvious to one of ordinary skill in the art at the time of the appellant's invention to have utilized a look-up table as taught by Manz (905) in the program used by Daily to

determine the ideal saturated pressure of the enclosed refrigerant at the sensed temperature.

Claims 2/21, 4/21, 5/21, 7-11/21, 15/21 and 16/21

Claims 2/21, 4/21, 5/21, 7-11/21, 15/21 and 16/21 which depend from claim 21 have not been separately argued by the appellant. Accordingly, we have determined that these claims must be treated as falling with their respective independent claim. See In re Nielson, 816 F.2d 1567, 1572, 2 USPQ2d 1525, 1528 (Fed. Cir. 1987) and 37 CFR §§ 1.192(c)(7) and 1.192(c)(8)(iv). Thus, it follows that the examiner's rejections of claims 2/21, 4/21, 5/21, 7-11/21, 15/21 and 16/21 under
35 U.S.C. § 103 are also sustained.

Claim 3/21

We will not sustain the rejection of claim 3/21 under 35 U.S.C. § 103 as being unpatentable over Daily in view of Manz (905) and Major.

Claim 3/21 requires "means responsive to an operator for providing a third electrical signal to said control means indicative of said apparent refrigerant type."

In the final rejection, the examiner determined (p. 5) that

> [i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Daily such that it included means responsive to an operator to input the particular type of refrigerant type in order to provide the proper vent pressure in view of the teachings of Major.

The appellant argues (brief, pp. 12-13 and reply brief, p. 4) that claim 3/21 is not suggested by Major since Major discloses inputting a pressure differential threshold, not apparent refrigerant type. We agree. Major discloses[7] that a microprocessor 60 may be arranged to automatically operate valves 13 and 54 in accordance with signals received from pressure sensor 56 and liquid sensor 58 instead of causing an operator prompt to be displayed on display 62. In Major's preferred embodiment, the predetermined pressure at which

[7] See Figure 1 and column 6, lines 13-27, of Major.

purging of "noncompressible" gases or drawing off of liquid refrigerant will be initiated is set by means of an input device such as keyboard 64 so that an appropriate pressure may be selected at which to vent or drain the vessel 50 dependent upon the particular type of refrigerant which is being purified and recovered. While Major would have suggested modifying Daily's system to include the use of an input device, such as a keyboard, to input to Daily's microprocessor 56 the predetermined pressure difference (i.e., the input device would be able to alter Daily's standard of 3 p.s.i. difference) at which purging of the noncondensable gas will be initiated, it is our view that the combined teachings of the applied prior art would not have suggested utilizing an input device for providing an electrical signal indicative of the apparent refrigerant type.

Claim 6/21

We will not sustain the rejection of claim 6/21 under 35 U.S.C. § 103 as being unpatentable over Daily in view of Manz (905) and Manz (747).

Claim 6/21 requires "means responsive to said first and second signals and to said indication of apparent refrigerant type for indicating either incorrect refrigerant type or mixed refrigerant types as a function of said indicia."

In the final rejection, the examiner determined (p. 5) that

> [i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Daily such that it included a display of the type of refrigerant or refrigerant blend in order to determine incorrect refrigerant type in view of the teachings of Manz '747.

The appellant argues (brief, p. 14 and reply brief, pp. 4-5) that claim 6/21 is not suggested by Manz (747) since Manz (747) is not disclosed as operating in conjunction with an input of apparent refrigerant type. We agree. Manz (747) discloses[8] that a sensor 22 provides electrical signals to sensor electronics 24 that vary as a function of the refrigerant vapor within a container 12. The electronics 24 drive a display 26 that indicates to an operator the type of

[8] See Figures 1 and 3 and column 3, lines 11-18, of Manz (747).

refrigerant vapor within the container 12. While Manz (747) would have suggested modifying Daily's system to determine and display refrigerant type, it is our view that the combined teachings of the applied prior art would not have suggested means responsive to the indication of apparent refrigerant type and the pressure and temperature signals for indicating either incorrect refrigerant type or mixed refrigerant types.

Claim 12/21

We will sustain the rejection of claim 12/21 under 35 U.S.C. § 103 as being unpatentable over Daily in view of Manz (905) and Manz (391).

Claim 12/21 requires at least one of the first and second sensing means be disposed in a connector adapted for releasable coupling to at least one port that opens to an upper portion of the container.

In the final rejection, the examiner determined (p. 6) that

> [i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Daily such that it included a vessel with multiple ports and sensing means for detecting temperature and pressure in the connectors to those ports in view of the teachings of Manz '391.

The appellant argues (brief, p. 15 and reply brief, pp. 5-6) that claim 12/21 is not suggested by Manz (391) since Manz (391) sensors are not disposed "in" a connector adapted for releasable coupling to one of the container's ports.

While the appellant's argument is correct that Manz (391) does not suggest a sensor disposed in a releasable connector, we, nevertheless, reach the conclusion that it would have been obvious to one of ordinary skill in the art at the time of the appellant's invention to dispose Daily's sensor 60 in a connector adapted for releasable coupling to a port that opens to the upper portion of the container 14. An artisan must be presumed to know something about the art apart from what the reference discloses (see In re Jacoby, 309 F.2d 513, 516, 135

USPQ 317, 319 (CCPA 1962)) and the conclusion of obviousness may be made from "common knowledge and common sense" of the person of ordinary skill in the art (see In re Bozek, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969)). Moreover, skill is presumed on the part of those practicing in the art (see In re Sovish, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985)) and in evaluating a reference it is proper to take into account not only the specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (see In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968)). Thus, in this case, it is our opinion that it would have been obvious to one of ordinary skill in the art at the time of the appellant's invention to releasably couple Dailey's connector (i.e., the line/conduit between sensor 60 and container 14) to the upper port of container 14 from the sensor 60 since the use of a releasable coupling would have been apparent due to the common knowledge and common sense of the person of ordinary skill in the art.

Claims 13/21 and 14/21

Claims 13/21 and 14/21 which depend from claim 12/21 have not been separately argued by the appellant. Accordingly, we have determined that these claims must be treated as falling with their respective independent claim. See In re Nielson, 816 F.2d 1567, 1572, 2 USPQ2d 1525, 1528 (Fed. Cir. 1987) and 37 CFR §§ 1.192(c)(7) and 1.192(c)(8)(iv). Thus, it follows that the examiner's rejection of claims 13/21 and 14/21 under 35 U.S.C.
§ 103 is also sustained.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1, 2-15/1, 3/21 and 6/21 under 35 U.S.C. § 103 is reversed; the decision of the examiner to reject claims 2/21, 4/21, 5/21, 7-15/21, 16 and 21 under 35 U.S.C. § 103 is affirmed.

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

AFFIRMED-IN-PART

LAWRENCE J. STAAB Administrative Patent Judge	)
JOHN P. McQUADE Administrative Patent Judge	) BOARD OF PATENT APPEALS AND INTERFERENCES
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APPENDIX

1. In a refrigerant handling system that includes a closed vessel for storing refrigerant, apparatus for determining quantity of air captured within said vessel with the refrigerant comprising:

first sensing means operatively coupled to said vessel for providing a first electrical signal as a function of air/refrigerant vapor pressure within said vessel,

second sensing means operatively coupled to said vessel for providing a second electrical signal as a function of air/refrigerant vapor temperature within said vessel, and

microprocessor-based control means having stored therein electronic indicia that relates saturation pressure to temperature for at least one type of refrigerant, and means for receiving said first and second signals and responsive to said indicia for indicating quantity of air within said vessel as a function of a difference between pressure indicated by said first signal and said saturation pressure indicia at the temperature indicated by said second signal,

said means for indicating air quantity including means for automatically determining quantity of air within the vessel from said first and second signals and displaying said air quantity to an operator.

3. The apparatus set forth in claim 2 wherein said means for indicating apparent refrigerant type to said control

means comprises means responsive to an operator for providing a third electrical signal to said control means indicative of said
apparent refrigerant type, said control means comprising means responsive to said third signal for selecting, from among said plurality of indicia, electronic indicia associated with the refrigerant type indicated by said third signal.

6. The apparatus set forth in claim 2 wherein said microprocessor-based control means further includes means responsive to said first and second signals and to said indication of apparent refrigerant type for indicating either incorrect refrigerant type or mixed refrigerant types
as a function of said indicia.

12. The apparatus set forth in claim 11 wherein at least one of said first and second sensing means is disposed in a connector adapted for releasable coupling to at least one port that opens to an upper portion of the container.

21. In a refrigerant handling system that includes a closed vessel for storing refrigerant, apparatus for determining quantity of air captured within said vessel with the refrigerant comprising:

first sensing means operatively coupled to said vessel for providing a first electrical signal as a function of air/refrigerant vapor pressure within said vessel,

second sensing means operatively coupled to said vessel for providing a second electrical signal as a function of air/refrigerant vapor temperature within said vessel, and

microprocessor-based control means having prestored therein electronic indicia including a look-up table that relates refrigerant saturation pressure to temperature for at least one type of refrigerant, means for receiving said first and second signals, means responsive to said second signal for obtaining from said look-up table indicia a corresponding refrigerant saturation pressure value, means responsive to said first signal for comparing said corresponding refrigerant saturation pressure value to said first signal indicative of air/refrigerant vapor pressure within said vessel, and means for indicating quantity of air within said vessel as a function of a difference between air/refrigerant vapor pressure indicated by said first signal and said corresponding refrigerant saturation pressure value obtained from said look-up table indicia at the temperature indicated by said second signal.

APPEAL NO. 98-0058 - JUDGE NASE
Reexamination Control No. 90/004,082

APJ NASE

APJ McQUADE

APJ STAAB

DECISION: **AFFIRMED-IN-PART**

Prepared By: Delores A. Lowe

DRAFT TYPED: 26 Jan 98

FINAL TYPED: