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EXAMINER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TIRE SERVICE EQUIPMENT MFG. CO, INC.
Patent Owner.

Appeal 2016-002427
Reexamination Control No. 90/013,203
Patent US 6,179,033
Technology Center 3900

Before JAMES T. MOORE, MICHAEL L. HOELTER, and
JENNIFER L. McKEOWN, *Administrative Patent Judges*.

MOORE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appeal 2016-002427
Reexamination Control 90/013,203
Patent 6,179,033

I. SUMMARY

A. *Background*

This proceeding arose from a request for *ex parte* reexamination of US Patent 6,179,033, which is entitled “METHODS AND APPARATUS FOR SEATING TUBELESS TIRES” (issued to Norman P. Demers on January 30, 2001 from U.S. Application No. 09/303,698, filed May 3, 1999) (“the ’033 Patent”). The real party in interest of the ’033 Patent is stated to be the Patent Owner, Tire Service Equipment Manufacturing Co. Inc. App. Br. 2 (also referred to as Appellant herein). The request for reexamination, assigned Reexamination Control No. 90/013,203 (“Request”), was filed April 9, 2014 and granted a filing date of April 28, 2014. The Request was filed by Gaither Tool Co. (“Requester”).

We are informed that there was ongoing litigation in the United States District Court for the District of Minnesota, in a civil action styled *Tire Service Equipment Mfg. Co. Inc. v. Gaither Tool Co.*, filed November 1, 2013, Docket No. 13-CV-2996. We are informed that a judgment was reached in that case on January 27, 2016. Notice of Concurrent Proceedings, January 28, 2016. An inspection of the District of Minnesota’s case docket reveals that a contempt motion remains pending in that civil action.

We have jurisdiction under 35 U.S.C. §§ 134 and 306. We review the appealed rejections for error based upon the issues identified by Appellant, and in light of the arguments and evidence produced thereon. *See Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) (citing *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992)).

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We have as briefing available to us in this appeal the Appeal Brief filed September 14, 2015 (with various corrections later filed) “App. Br.”, Examiner’s Answer filed October 28, 2015 (“Ans.”), and Reply Brief filed December 28, 2015 “Reply Br.” We have carefully considered all the briefing.

Oral argument was conducted in this appeal on May 4, 2016. Being an ex-parte reexamination request, only the Patent Owner was present during that argument. A transcript of the oral argument was filed in the record May 26, 2016 (“Tr.”).

For the reasons discussed hereinafter, we affirm-in-part the rejections of record, but because our reasoning substantially departs from the thrust of the initial rejections, hereby designate those grounds affirmed as new grounds of rejection pursuant to 37 C.F.R. ¶ 41.50 (b).

B. The Invention and Claims

The invention of the ’033 Patent is directed to a method and apparatus for bead seating a tubeless tire onto a rim. To accomplish the seating of the bead, air stored in a portable tank is released as a single pneumatic pulse having an “extremely fast” rise time. ’033 Patent, Abstract.

A charging reservoir having a fill/quick-release port, an inlet and an outlet is described. A piston divides the charging reservoir into a control section containing the fill/quick-release port and an outlet section containing the inlet and the outlet. The portable tank is connected to the inlet of the outlet section. *Id.*

Air that is introduced into the fill/quick-release port fills the control section of the charging reservoir. The piston allows air to leak slowly past the piston and fill the outlet section of the charging reservoir and the portable tank that is connected to the inlet. The pressure differential across the piston keeps the piston tightly against the outlet, holding the pressurized air in the outlet section and the portable tank. *Id.*

Once the pressurized air in the quick-release section is released, the pressure differential is reversed and the piston is propelled away from the outlet, thereby explosively releasing the air from outlet section and the connected portable tank as a single pneumatic pulse. The pneumatic pulse is directed between the rim of the wheel and the bead of the tire by a nozzle to seat the bead of the tire. *Id.*

Figure 1 of the '033 Patent illustrates the valving apparatus.

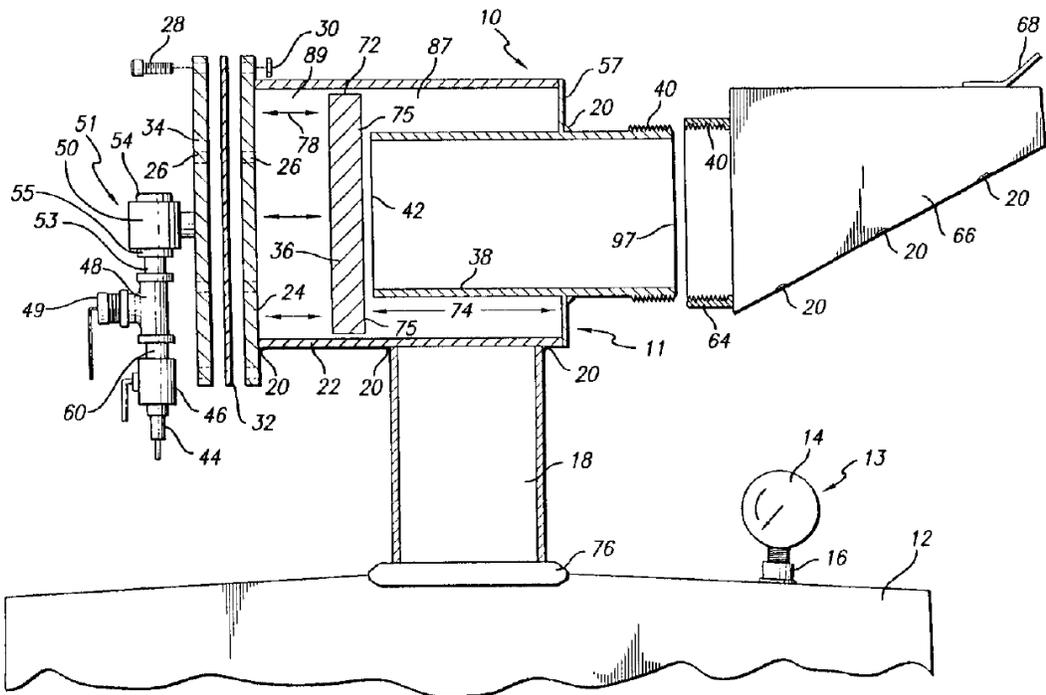


Figure 1 is a cross sectional view of
the tire mounting apparatus of the '033 Patent

Independent claim 13, reproduced below, is illustrative of the
appealed claims:

13. A method for seating a bead of a tubeless tire on a rim comprising
the steps of:

a) providing a control volume, an outlet volume with an outlet and a
storage volume, said volumes being dimensioned to contain air at a
predetermined pressure and having an airflow passageway communicating
between them subject to control by the air pressure within said control
volume;

b) filling the control volume with pressurized air which causes the
outlet of said outlet volume to be closed and which causes said outlet
volume and said storage volume to be simultaneously filled until said
control, outlet, and storage volumes are at the substantially the same
predetermined pressure;

c) selectively rapidly releasing the air pressure within said control
volume which correspondingly causes the outlet of said outlet volume to be
opened which defines a discharge area;

d) automatically and substantially instantaneously releasing said
storage volume into said outlet volume in response to the release of the air
pressure within said control volume to provide essentially a single
pneumatic pulse of air into the discharge area and out through the outlet of
said outlet volume;

e) orientating the single pneumatic pulse such that said single
pneumatic pulse is directed between the rim and bead of the tubeless tire;
wherein the bead of the tire is seated on the rim.

App. Br. 37.

C. The Adopted Rejections Appealed by Patent Owner¹

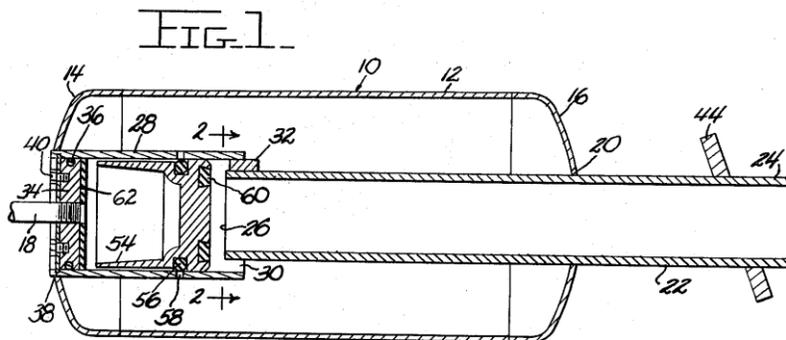
Claims 13-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Matson, U.S. Patent 3,788,527 (“Matson ’527) and Demers, U.S. Patent 5,456,302 (“Demers ’302). Ans. 2.

Claim 17 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Matson ’527, Demers ’302, and Wadensten U.S. Patent 5,143,256 (“Wadensten”). Ans. 6.

II. DISCUSSION

A. The Rejection of Claims 13-20 under 35 U.S.C. § 103(a) as being unpatentable over Matson ’527 and Demers ’302

The Examiner found that Matson ’527 describes a method for discharging a pulse of pressurized air. Matson ’527 Figure 1 is reproduced below.



¹ The original request sought reexamination of the six claims, 13-18, of the ‘033 patent on more than 160 separate grounds. Req. 3-14 (listing each proposed rejection). Claims 19-20 were added during the reexamination proceeding.

The Final Rejection found Matson '527's description to include the steps of:

a) providing a control volume within the cylinder 28 to the left of the piston 54, an outlet volume at 30 with an outlet 22 and a storage volume 10, said volumes being dimensioned to contain air at a predetermined pressure and having an airflow passageway communicating between them subject to control by the air pressure within said control volume. Ans. 2, citing Matson '527 Figure 1.

b) filling the control volume with pressurized air which causes the outlet of said outlet volume to be closed and which causes said outlet volume and said storage volume to be simultaneously filled until said control, outlet, and storage volumes are at the substantially the same predetermined pressure. Ans. 2–3, citing Matson '527 2:30–43.

c) selectively rapidly releasing the air pressure within said control volume by opening the valve 46 which correspondingly causes the outlet of said outlet volume to be opened which defines a discharge area. Ans. 3.

d) automatically and substantially instantaneously releasing said storage volume into said outlet volume in response to the release of the air pressure within said control volume to provide essentially a single pneumatic pulse of air into the discharge area and out through the outlet of said outlet volume. Ans. 3, citing Matson '527 2:43–50.

e) orientating the single pneumatic pulse such that said single pneumatic pulse is directed at an angle via the seating flange 44. *Id.*

The Examiner also found that the sole difference between the claimed method and the description in Matson '527 was the use of a tubeless tire.

Ans. 3.

The Examiner found that Demers '302 describes a method and apparatus for bead seating a tubeless tire onto a rim comprising the use of pressurized air supplied through an air inlet assembly 22 to inflate both reservoir 11 (through inlet 32) and charging reservoir 24 (through inlet 134).

Ans. 3, see also Demers '302 2:33–67.

The Examiner additionally found that Demers '302 describes a pressure differential valve 30 that provides for a predetermined pressure difference between the reservoir 11 and the charging reservoir 24 with the pressure within the charging reservoir 24 being at least slightly greater than reservoir 11. Ans. 3.

Moreover, the Examiner also found that Demers '302 describes a rubber diaphragm 48 in the charging reservoir 24 that expands as air is introduced into the charging reservoir 24 via inlet 134. This expansion causes piston 106 in the charging reservoir 24 to releasably seal against the outlet 122 of the reservoir 11, allowing the reservoir to be charged.

The Examiner further found that upon operation of a push button 28 the quick-release valve 40 releases a small amount of air from portion 130 of charging reservoir 24 through the air inlet assembly 22, lowering the pressure within portion 130 of the charging reservoir 24. The quick release valve 40 substantially instantaneously releases the charge of air within the charging reservoir 24. The release is accomplished by releasing the piston 106 from against the outlet 122 of the reservoir 11, permitting the charge of

air within reservoir 11 to exit opening 122 and into portion 132 of the charging reservoir 24 and out the nozzle 51 through the inlet 122 as substantially a single pulse of air. The pulse of air is used to seat the bead of a tire onto the rim. Ans. 3–4.

The Examiner then concluded that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the method of Matson '527 to seat a tubeless tire, such as taught by Demers '302, as a “mere matter of intended use.” *Id.* at 4.

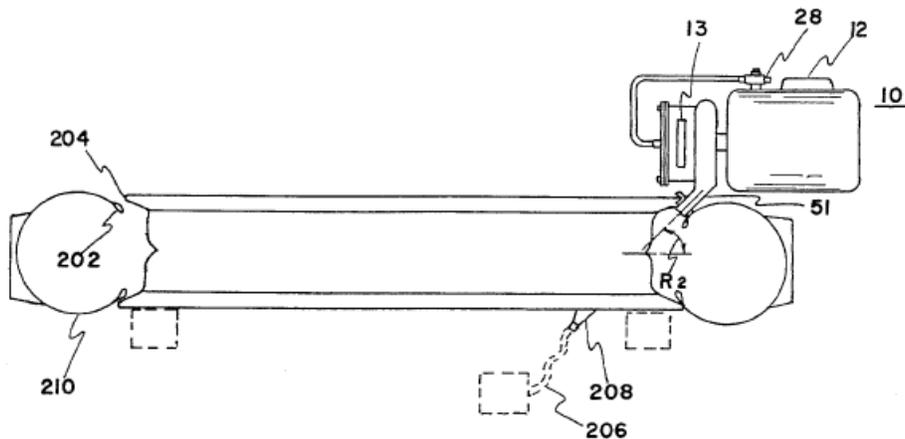
The Appellant advances several reasons for error in the Examiner’s conclusion that the combination of references renders the instant claim obvious. Among the reasons, that the step of seating a tubeless tire is not merely a statement of intended use for the method. Next, that the art of record is not pertinent. Further, that the combination of art does not show a number of elements of the claim. Finally, that the evidence of secondary considerations indicates the claims are not obvious. *Id.* 10–11. We address these contentions below.

The Appellant argues that the Examiner has not established a *prima facie* case of obviousness as to claim 13. App. Br. 9. According to the Appellant, Matson '527 is permanently mounted to the side of a silo wall and is used to release air into granular material until it breaks loose and flows again. *Id.* Demers '302 is said to be a cumbersome and expensive device for mounting a tubeless tire, using a piston. *Id.* at 10. The Appellant is of the view that the Examiner cannot disregard the step of seating a tubeless tire as a mere statement of intended use, and that the art applied is not pertinent to the problem being solved. *Id.*

The Intended Use Issue

The Appellant is correct when it states that the claim language is not merely a statement of intended use. Claim 13 is a method claim and the “statement of use” in mounting a tire is a claimed step of the claimed method. More specifically, claim 13 contains a step “e” which recites the step of “orientating the single pneumatic pulse such that said single pneumatic pulse is directed between the rim and bead of the tubeless tire; wherein the bead of the tire is seated on the rim.” ’033 Patent 11:30–33. This element as a consequence requires the presence of both a rim and a tire, and “orientating” the pulse there between.

However, the rejection in question relies not upon a single reference, but the combination of two references. Demers ’302 describes the tire-related elements of step “e.” Figure 5 of Demers ’302 is reproduced below:



Demers ’302 Figure 5 is a cross-sectional view of a tubeless tire bead seater.

As described in Demers ’302 - “Nozzle 51 is placed between bead 202 of tire 210 and rim 204.” Demers ’302 5:57–58. “To successfully seat bead

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202 onto rim 204, an operator merely must push button 28 and tire 210 will be substantially instantly seated regardless of the type, size, or manufacturer of truck tire.” *Id.* 5:66–6:2. This is accomplished by allowing the charge of air to exit the inflation reservoir through the nozzle as substantially a single pulse of air. *Id.* 5:17–20.

Thus, despite the Appellant’s assertion that the rejection itself has “disregarded” the step of seating a tubeless tire, the cited art of record, when viewed as a whole and not singly, directly addresses that limitation. The question, more properly focused, is whether one of ordinary skill in the art would combine these two references in the manner the rejection has done.

The Analogous Art Issue

It is well established that art is analogous if it is “is from the same field of endeavor, regardless of the problem addressed” *In re Clay*, 966 F.2d 656, 658-9 (Fed. Cir. 1992) or “reasonably pertinent to the particular problem with which the inventor is involved,” *In re Paulsen*, 30 F.3d 1475, 1481-1482 (Fed. Cir. 1994). Further, a “reference is reasonably pertinent if, even though it may be in a different field from that of the inventor’s 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.” *Clay*, 966 F.2d at 659.

The Appellant asserts that the applied art is not pertinent. Specifically, Appellant states that “non-pertinent prior art cannot be magically converted to pertinent prior art merely by combining it with other prior art to establish an ‘intended use.’” App. Br. 10.

The Final Rejection asserts that both the patent under appeal and Matson '527 relate to the quick release of a portable charged air cylinder to create a pulse of air. Fin. Rej. 7. The Final Rejection then equates the fields of endeavor of Matson '527 and the instant patent. *Id.* While this is not technically incorrect if the field of endeavor is considered to be fluid dynamics (*i.e.* the delivery of air pulses), we find a somewhat narrower definition of the field of endeavor than that found in the final rejection – specifically, the seating of a beadless tire on a rim. App. Br. 14. *See also* O'Keefe Declaration, ¶ 18.

Refocusing the analysis thusly, it is evident that Demers '302 is within the field of endeavor and analogous. Demers '302, Title. Demers describes the substantially instantaneous release of air from a charging reservoir using a quick release valve in a handheld unit. *Id.*, Abstract. The next logical question, then, is whether one of ordinary skill in the art would turn to other valve systems for the delivery of a pulse of air in seating tubeless tires, such as the system of Matson '527.

The structural and functional similarities of the quick release valves of Matson '527 and Demers '302 far outweigh the different end use to which Matson is put – *i.e.* welded to a grain silo to dislodge material using a pulse of air releasing a “large volume of air into a large space.” App. Br. 14. We reproduce the valves of Demers '302 and Matson '527 side by side below. Demers '302 utilizes an expandable diaphragm 48 to close the valve in the direction of arrow “A” while Matson '527 utilizes a one-piece piston in the direction of Arrow 2.

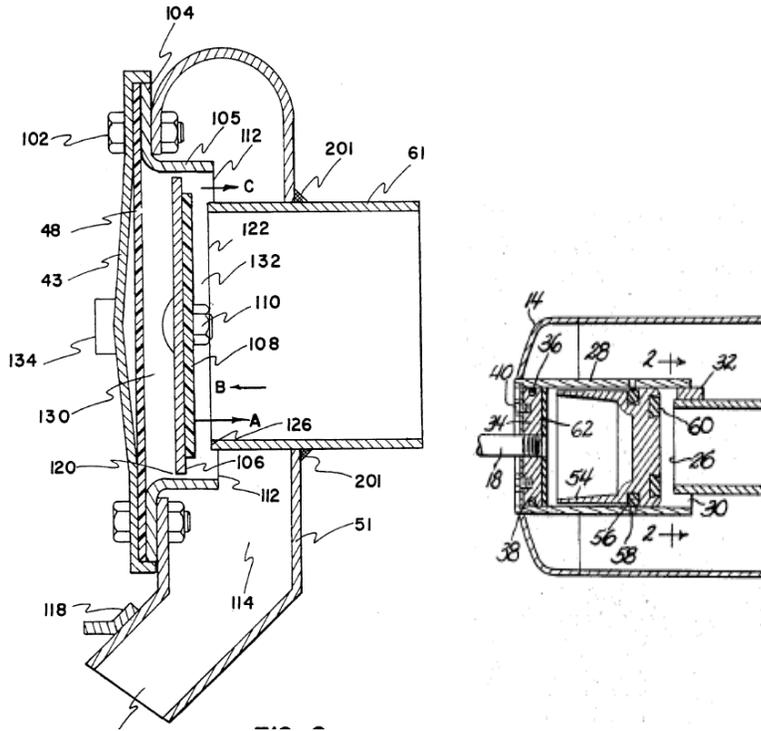


Figure 5 of Demers '302 and Partial Figure 1 of Matson '527 above are cross-sectional illustrations of quick release valves

The Appellant urges that the problem being addressed by the '033 patent is “safely, easily and inexpensively seating a bead of a tubeless tire onto a rim, in particular when trying to change a tire on the road.” *Id.* Matson '527 is said to be, *inter alia*, not portable, not safely hand operated due to the weight and forces involved, permanently connected to a compressor, classified in different classes/subclasses, and actuated by a remote control. *Id.* Appellant further urges that one of ordinary skill in the art would not have looked to “large, heavy, permanently installed, non-portable, remotely controlled devices, with dangerous kickback that are used

for the purposes of accelerating the flow of bulk granular materials as they are being dispensed from hoppers, bins, silos, etc.” App. Br. 16.

We think these asserted differences do not detract from the finding that quick release valves generally were known for tire seating apparatuses, as evidenced by Demers ’302. The claims themselves contain no size, weight, portability, or similar limitations. Matson ’527 is a somewhat different valve, but nonetheless very similar in operation to that used in Demers ’302, and used for substantially the same purpose, i.e., the instantaneous release of a reservoir of stored compressed air. Given that one of ordinary skill in the art in this field would be aware of the Demers ’302 apparatus, we find that the apparatus of Matson ’527 would logically commend itself to their attention.

As a consequence, although we have carefully considered the Appellant’s contentions otherwise, we conclude Matson ’527 and Demers ’302 are analogous art.

The Combination of References

From the outset, we observe that the question to be resolved under 35 U.S.C. § 103 depends on what the prior art teaches or suggests as a whole and whether what the prior art teaches or suggests would have rendered what is claimed unpatentable. *In re Albrecht*, 579 F.2d 92, 94 (CCPA 1978); *In re Bush*, 296 F.2d 491, 496 (CCPA 1961).

The Final Rejection structured the rejection as taking the method of Matson ’527 and utilizing it to seat a tubeless tire on a rim, as a mere matter of intended use. Ans. 3-4. The Appellant has challenged that rejection as unfounded in evidence, focusing on Matson ’527 and the description of

Matson '527 as being unrelated to the seating of tires, and there being no evidence to support a modification of Matson '527. App. Br. 11. Appellant urges that even were Demers '302 the primary reference, the claims would not have been obvious. App. Br. 16.

On the surface, the Appellant's position as regards the intended use appears to have some merit. When the rejection is presented as whether one would modify Matson '527 to seat a tire, we question whether one of ordinary skill in the art would start by looking at a silo agitator which facilitates dispensing bulk materials and then choose to modify the agitator for use in a method to seat a tubeless tire.

On the other hand, we observe that when one of ordinary skill in the art looks at both references together as a whole (regardless of which is denominated primary or secondary), the evidence supports a finding that one of ordinary skill in the art would be motivated to take the diaphragm-actuated valve and apparatus of Demers '302 used in a method of seating a tubeless tire on a rim, and improve it with the supposedly cheap, simple, easy to maintain one-moving-part piston valve of Matson '527. Matson '527 1:22–34. The elastomeric seals of Matson '527 are said to mitigate rebound shock. *Id.* 2:28–30. Maintenance is said to be simple. *Id.* 2:55–57. It also appears to be the substitution of equivalents.

This combination, when made for these additional reasons, results in a rationale for putting the claimed method steps together in the manner as outlined in the Final Rejection, at pages 2–3 for Matson '527 (steps a-e (without the tire)). Demers '302 describes that the substantially

instantaneous pulse is directed between the rim and bead of the tubeless tire, and specifically illustrates it in Figure 1. *Id.*, 4.

Seating a bead of a tubeless tire on a rim

Appellant notes that claim 13 recites a method of seating a bead of a tubeless tire on a rim and that a single pneumatic pulse is directed between the rim and bead of the tubeless tire; wherein the bead of the tire is seated on the rim. App. Br. 11. Appellant urges that the only justification the Final Rejection provided for its conclusion of obviousness is that utilizing the method of Matson '527 to seat a tubeless tire is a mere matter of intended use. *Id.*

We agree with the Appellant that the Final Rejection is inartfully phrased. The claim elements recited in claim 13 relating to a tire and a rim are not a mere intended use. We are therefore not satisfied with the rejection's conclusory statement that the claim element is a "mere matter of intended use." However, when the art is considered as a whole, we disagree with Appellant that a conclusion of obviousness should not be reached on these facts. The inclusion of Demers '302 indicates that the rejection is also premised upon the knowledge of one of ordinary skill in the art that an instantaneous pulse of air was known to be utilized to seat a tubeless tire upon the rim of a wheel. Fin. Rej. 4.

The Appellant urges there was nothing in "Matson '527 [which] would have motivated one of ordinary skill in the art to modify Demers '302 and the Final Rejection does not assert there is." App. Br. 18.

The Appellant is correct that the Final Rejection does not discuss a line of reasoning including modifying Demers '302 with Matson '527's apparatus, relying instead upon the "statement of use." However, based upon the evidence of record, we observe that Matson '527 describes a valve and apparatus capable of delivering a pulse of air, and that valve appears to be capable of use in the method of Demers '302. The Matson valve and apparatus is an equivalent substitute for the valve and apparatus of Demers '302. The valve and apparatus can also provide the benefits described in Matson '527 and enumerated above when used in a tire-seating apparatus. We therefore find there was, at the time of Appellant's invention, also motivation to modify Demers '302.

Orientating the single pneumatic pulse

According to the Appellant, the plain and ordinary meaning of orientating is a verb "establishing an alignment and direction of the single pneumatic pulse." App. Br. 18. We agree that this initial interpretation is reasonable. However, without citation to any persuasive evidence, the Appellant goes on to assert that orientating also "requires that the seating device be portable and preferably hand operable." *Id.* Appellant then asserts that Matson '527 is not portable and the combination would not be made. *Id.*, 19–20.

We disagree that this "orienting" language requires the method to be carried out on a portable or hand-operated device. It is well established that limitations are not to be read into the claims from the specification. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). While it might be desirable that the apparatus is portable, or hand operated, or an embodiment

of the invention, the broadest reasonable interpretation of the claims is not so limited.

In any event, Demers '302 describes orientating a pulse using a hand-held device. Accordingly, we are unpersuaded by this argument of the Appellant.

Instantaneously releasing said storage volume ... to provide essentially a single pneumatic pulse of air

The Appellant urges that this phrase “must be construed in light of the specification and requires that the substantially instantaneous release is of such a nature as to seat a tire bead against a rim.” App. Br. 20. According to the Appellant, the meaning of claim 13 is therefore very different to one of ordinary skill in the art from the disclosed operation of Matson. App Br. 21.

Appellant relies upon the testimony of Mr. Okeefe, a licensed professional engineer. Okeefe Decl. ¶1. In Mr. Okeefe’s opinion, the commercial embodiment of the Matson ‘527 device is large, stationary, and has dangerous kickback. *Id.* ¶ 32, 33. It has no handles and is welded into place. *Id.* ¶ 34, 35. Mr. Okeefe states that the Matson ‘527 patent would not be considered by one of ordinary skill in the art for mounting tires onto rims. *Id.* ¶ 38.

We think Mr. Okeefe has an initially valid point. As discussed above, in a vacuum, it is hard to see why one of ordinary skill in the art would look at Matson ‘527 and think about mounting tubeless tires onto a rim. However, this argument is ineffective when one considers the cited art as a whole and the actual limitations of claim 13.

One of ordinary skill in the art would fairly consider Demers '302 as describing the delivery of a pneumatic pulse of air to seat a tire using a portable unit. Once this description is considered by the skilled artisan, alternative apparatuses for delivering the pulse of air fall within the ambit of references which would commend themselves to the attention of one looking to improve upon tubeless tire seating devices.

The Appellant also raises numerous objections to the stated combination including those based on size, location on a silo in multiples, portability, safety, and alleged inefficacy for seating a tire. App. Br. 21–22. Claim 13 does not specify portability or efficacy for any particular size of tire. As noted above, we decline to import unrecited limitations into the claim. The fact that Matson's tanks are of a different size, do not permit air leaks, and are used in multiples when mounted on silos, does not detract from the plain teachings to improve the valve and apparatus. *Cf.* Okeefe Decl. ¶¶ 39–43.

We also observe that one of ordinary skill in the art would understand how to size modifications and how to adapt the Demers '302 apparatus with the valve and apparatus of Matson '527. This adaptation would be well within the skill of a person of ordinary skill in the art – such person would have at least an associate degree in mechanics or mechanical engineering technology, or its equivalent, and at least two years of work experience in the field of mechanical design. Okeefe Decl. ¶ 16. We further observe that “[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference Rather, the test is what the combined teachings of the

references would have suggested to those of ordinary skill in the art.” *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

During oral argument, counsel for the Appellant attempted to demonstrate the difference in the bursts of air by making different noises. Tr. 8:23–9:5. While we appreciate counsel’s ingenuity, the real question is not whether a dull explosive sound in a silo is different from the crisp pop of a tire on a rim, but whether the valve and apparatus of Matson ’527 could be expected to issue an adequate pulse to mount a tire. Given that there are no size limitations on the tire, we find the evidence of this record sufficient to establish a valve such as Matson ’527 could be used to mount a tire.

Accordingly, we are unpersuaded by these arguments of the Appellant.

Secondary Considerations

The Appellant has urged that there is evidence of secondary considerations. During oral argument, it was asserted that Gaither Tool Co., the Requester, admitted infringement of claims 13 and 18, and paid a “substantial but confidential” sum in settlement. Tr. 4:15–16.

The allegedly infringing item was Gaither’s “Bead Bazooka” which has a movable piston gas valve. App. Br. 23. During prosecution of their own application, Gaither obtained declarations from witnesses asserting that the high speed air valve of the Bead Bazooka was largely responsible for the commercial success of the Bead Bazooka. App. Br. 24, citing Ex. B. According to the Appellant, the piston-based valve approach of claims 3 and 18 provides a significant improvement over the art at the time of the invention, and is evidence of nonobviousness. App. Br. 24.

The Examiner has determined that the high-speed valve discussion in the declarations does not correspond to the claimed invention, and that Demers has a high speed piston. Ans. 8. Accordingly, it may be safely presumed that the Examiner remained unpersuaded by the evidence of secondary considerations.

We, likewise, have difficulty establishing both the evidentiary value of the allegations of commercial success, and a nexus between the claims and the alleged commercial success. For example, we cannot determine whether the Bead Bazooka is in fact a commercial success when no data supporting its sales, its market share, the size of the relevant market, or any related information, is provided and its pertinence explained.

Mr. Farrell's declaration asks us to accept that the air valve allows for a smaller tank which provides a competitive advantage, and that this accounts for its commercial success. Farrell Decl. 2. Mr. Brahler's declaration is similar. Brahler Decl. 2. No sales data is provided, only the observation that the valve is faster and allows a smaller air tank, which is said to provide a competitive advantage. *Id.*

We do not doubt that a smaller tank and fast-acting valve provide an advantage for portable tire seating apparatuses. However, on balance, we observe that fast-acting valves were known in the field, and the piston-type valve of Matson '527 has several known advantages.

While we have carefully considered the evidence of secondary considerations and the Appellant's arguments concerning the art of record, we are of the view that claim 13 is obvious over the combination of Matson

'527 and Demers '302. We therefore affirm this rejection, but designate our affirmance as a new ground of rejection.

Claim 14

Claim 14 recites an additional element that “the outlet of said outlet volume and said outlet volume each have respectively a cross-sectional area with the cross-sectional area of outlet volume corresponding to the cross-sectional area of the outlet of said outlet volume.” '033 Patent, 11:34–12:2.

The Final Rejection has found that the volumes “correspond to each other” because the term “correspond” does not convey any specific ratio of sizes. Fin. Rej. 4. The Final Rejection, again, is not incorrect, but the term “correspond” conveys at least some form of relationship between the cross-sectional areas recited. The specification, when discussing prior art apparatuses, observed that a fan-shaped nozzle was dimensioned to “correspond” to the rim of the tire. '033 Patent 2:36-38. In discussing the instant invention, the specification states that the “cross-sectional area of the outlet of said nozzle corresponds to the inlet of said nozzle as well as the outlet of charging reservoir. When the pressurized air from said inflation tank is released, the air passes into the inlet of said nozzle and exits the outlet of said nozzle so that the airflow is directed between the bead of the tire and the rim, thereby seating the tire on the rim.” *Id.*, 3:67–4:6.

Appellant urges that we should interpret “corresponding” as being in associated in some form of a working relationship. App. Br. 25. We agree with that interpretation. Accordingly we find the term “correspond” to mean jointly sized so as to deliver the air pulse sufficient to mount the tire.

Appellant then urges that Matson '527's air passage means 30 has no operative relationship between its cross sectional areas. *Id.* Appellant urges that the preferred embodiment of the '033 patent "essentially relates to the airflow path between the outlet area and the discharge, defined by the piston stroke and diameter being no more restrictive [than] by thirty percent."

App. Br. 26.

We are not persuaded by this argument. Appellant seeks to import a relationship into this claim with a no more than 30% restriction in the cross-sectional area. We decline to import a preferred embodiment into the claim. Rather, we observe that Matson '527 appears capable of delivering a release "suddenly" (Abstract), using a "quick release" (1:17) that creates a "dull explosion" (1:20). Air is exhausted rapidly into the silo through the tube. *Id.*, 2:49. We find that this is sufficient description of a working relationship between the cross sectional areas. Contrary to the Appellant's assertion, we observe that Matson '527's cross sectional areas are "operatively" related to deliver a pulse. Accordingly, we affirm this rejection, although we designate it, too, as a new ground of rejection.

Claim 15

Claim 15 depends from claim 14 and recites the cross-sectional area of the outlet volume is at least 70% of the cross sectional area of the outlet of said outlet volume. '033 Patent, 12:3-5.

The final rejection found that the cross-sectional area of the outlet volume of Matson '527 is larger than the outlet, and accordingly describes an outlet volume cross sectional area of at least 70% of the outlet cross sectional area. Fin. Rej. 4.

The Appellant states that Matson '527 does not describe any relationship between the cross sectional areas. App. Br. 27. Appellant does not address the specific contrary finding made in the final rejection on this point. Accordingly, without persuasive argument or evidence to the contrary, we affirm the rejection of this claim.

Claim 16

Claim 16 depends from claim 14 and recites that “the discharge area is at least 70% of the cross-sectional area of the outlet of said outlet volume.” '033 Patent 12:6–8. The final rejection found that the discharge area of Matson '527 is larger than the outlet, and accordingly describes a discharge cross sectional area of at least 70% of the outlet cross sectional area. Fin. Rej. 4.

The Appellant asserts that the discharge area is defined by the stroke dimension of the piston, and is not a cross section of the discharge area. App. Br. 28. We understand the discharge area to be the area opened when the piston slides back during discharge, and it must be sufficient for airflow.

The resistance of the airflow path from the inflation tank 12 into end 42 must be very small compared to the resistance through the clearance 72. Therefore, piston 36 preferably must be permitted to slide far enough away from end 42 in control section 89 to provide a cross-sectional piston discharge area that is greater than or equal to cross-sectional area of end 42. The inventor has discovered that stroke dimension 78 should be preferably 1/2 to 1 inch. The minimum stroke dimension 78 that will provide a piston discharge area greater than the cross-sectional area of end 42 of the nipple 38 is easily calculated by dividing the radius of end 42 of nipple 38 squared divided by the diameter of end 42 of nipple 38. As before, if decreased performance is acceptable, then stroke dimension 78 can be reduced accord-

ingly but should be sufficiently long so that the air passage-way between piston 36 and end 42 is at least 70% of the cross-sectional open area of end 42.

'033 Patent 7:64–8:13.

The Appellant is correct that the discharge area in Matson '527 is not specifically identified by size and the Final Rejection's enumerated reasoning fails. However, the discovery of an optimum value of result effective variable in a known process is ordinarily within the skill of one of ordinary skill in the art. *See, e.g. In re Boesch*, 617 F.2d 272, 277, (CCPA 1980). Accordingly, while we reverse this rejection, we nonetheless conclude the claim is unpatentable, as one of ordinary skill in the art would be capable of determining workable or optimal sizing of the piston and pertinent openings to assure sufficient airflow. Because the rejection is reversed and our own reasoning substituted, this rejection is designated as a new ground of rejection.

Claim 17 – Matson '527 and Demers '302

Claim 17 depends from claim 13 and further recites that an “airflow passageway communicating between said control volume and said outlet volume permits air to flow only from said control volume to said outlet volume.” '033 Patent 12:9–12.

The Final Rejection found that Matson '527's O-ring 56 prevented communication between the outlet volume and the control volume. Fin. Rej. 4. Appellant observes that the air flow in Matson '527 is from the control volume through port 58 and not through a passageway between the control volume and the outlet volume. App. Br. 28. We agree. There is no direct

airflow passageway between only the control volume to the outlet volume permitting only one-way air flow. The O-ring gasket 58 covers ports 56 which communicate with the storage volume. We therefore reverse this rejection as it applies to claim 17.

Claim 17 – Matson '527, Demers '302, and Wadensten

The Examiner has found that Wadensten teaches the use of gas under pressure which is introduced via a fill/quick release port (directional control valve 88) in communication with a conduit and check valve 32. The check valve is in communication with a pressure tank 12, which simultaneously allows for filling of the first end portion of a quick release valve on one side of a piston 56 via apertures 80 in the first end portion of the quick release valve 14. The valve uses pressure in the first end of the quick release valve to keep the valve closed. Releasing the pressure in the first end portion of the quick release valve (by venting gas from the first end portion of the quick release valve through the fill/quick release port) results in a sudden drop in pressure in the first end portion of the quick release valve holding the valve closed, thereby opening the valve and discharging quickly the gas stored in the pressure tank. Fin Rej. 6, citing Wadensten 4:8–50.

The Final Rejection concludes that it would have been obvious to one of ordinary skill in the art to have used a check valve, with the method of Matson' 527 and Demers '302, in view of the teaching of Wadensten so as to insure a full discharge of air into the outlet. *Id.*

Appellant observes that the check valve of Wadensten permits one-way flow from the control area into the storage tank. Appellant asserts that it does not operate between the control volume and the outlet volume. App.

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Br. 29–30. Accordingly, no air flows from the control volume to the outlet volume. *Id.*

On balance, we think the Appellant has the better position based upon the evidence of record. While it may be obvious to add check valves in standard lines and ports, allowing the air to flow only unidirectionally around the piston from the control volume to the outlet volume as presently claimed is not described in Matson '527 or Demers '302.

Accordingly, we reverse this rejection.

Claim 18

Claim 18 is an independent claim, and recites as follows:

18. An apparatus for seating a bead of a tubeless tire on [a] rim comprising:

a charging reservoir having a port, an inlet and an outlet;
a storage tank connected to the inlet of said charging reservoir;
a control member moveably disposed within said charging reservoir wherein pressurized air introduced into said charging reservoir causes said control member to substantially close the outlet while filling the charging reservoir and the storage tank by air leaking past said control member until a predetermined pressure is reached;
and

wherein quickly releasing the pressure within at least a portion of said charging reservoir causes said control member to be substantially instantaneously propelled away from the outlet of said charging reservoir, thereby permitting the pressurized air stored in said inflation tank to be explosively released through the outlet of said charging reservoir as a substantially single pneumatic pulse which is used to seat the bead of the tire on the rim.

'033 Patent, 12:13–34.

The Final Rejection found that Matson '527 described an apparatus for discharging a rapid pulse of air comprising:

“a charging reservoir at 28 having a port, an inlet at 46 and an outlet on tube 22 a storage tank 10 connected to the inlet of said charging reservoir;

a control member 54 moveably disposed within said charging reservoir wherein pressurized air introduced into said charging reservoir causes said control member 54 to substantially close the outlet while filling the charging reservoir and the storage tank by air leaking past said control member at port 58 until a predetermined pressure is reached; and

wherein quickly releasing the pressure within at least a portion of said charging reservoir causes said control member to be substantially instantaneously propelled away from the outlet of said charging reservoir, thereby permitting the pressurized air stored in said inflation tank to be explosively released through the outlet of said charging reservoir as a substantially single pneumatic pulse directed at an angle relative to flange 44.”

Fin. Rej. 4–5.

The Final Rejection observes that the claimed invention differs “only in the intended use” and that Demers ’302 teaches an apparatus for seating a tubeless tire with a pulse of air, concluding that it would have been obvious to one of ordinary skill in the art to have utilized the method of Matson ’527 to seat a tubeless tire, such as taught by Demers ’302, as a mere matter of intended use. *Id.*

As observed above, we disagree with the statement of intended use. However, for the reasons discussed above, we find that a person of ordinary skill in the art would have combined Demers ’302 and Matson ’527 as either a substitution of equivalents, or as motivated by the improvements described in Matson ’527’s valve, to arrive at the claimed invention as discussed element by element in the Final Rejection at pages 4–5.

The Appellant asserts that no air leaks past the piston in Matson '527 into the storage tank. App. Br. 30–31. According to the Appellant, the piston is sealed by an O-ring 56 which prevents any air leaking past the piston into the storage tank.

A more correct statement would have been to say that air does not leak past the entire piston into the storage tank *through aperture 30*. We observe that at least some air must leak past the left end of the piston during charging in order to fill the tank through aperture 58. The claim is broad enough to cover that leakage as well.²

Appellant also urges that Matson's "dull explosion" is not substantially instantaneous action. App. Br. 31. Given the similarity in the Matson '527 valve and the instant valve, we are not persuaded by this argument.

We therefore shall affirm this rejection. As the rationale has changed to improvement of the valve in the manner as discussed above for claim 13, we also denominate this rejection a new ground of rejection.

Claim 19

Claim 19 depends from claim 18, and recites that "the charge [sic – charging] reservoir includes a control area and an outlet area, wherein the control member is configured for the pressurized air to leak past the control member to the outlet area while filling the charging reservoir and the storage tank." App. Br. 38.

² Paragraph 72 of the Okeefe declaration admits that "[c]ompressed air leaks from the control volume partway past the piston 54."

The Final Rejection found that the air in Matson '527 leaks past the control area (on the left side of the piston 54) and around the outer circumference of the piston 54, through the port 58 and into the charging reservoir 10 and consequently the outlet volume 30, concluding that the pressurized air leaks past the control member to the outlet area while filling the charging reservoir of the storage tank. Fin. Rej. 5.

Appellant urges that the Final Rejection misidentifying the charging reservoir 28 and the storage tank 10 is sufficient to reverse the rejection. App. Br. 34. We disagree. Given the closely related terminology used by the Appellant in describing the invention, we are not surprised one term was incorrectly applied. Matson '527's charging reservoir 28 includes both the control volume 34 and outlet volume 30. Air fed into the charging reservoir leaks past piston 54 through port 58 into the storage tank.

Appellant also urges that no air leaks past the piston because of the O-ring 56 when piston is closed. App. Br. 34. As observed above, we find that position to be inaccurate. Accordingly, we affirm this rejection.

Claim 20

Claim 20 depends from claim 13, and further recites "causing said outlet volume and storage volume to be simultaneously filled by passing pressurized air past a piston to the outlet volume." App. Br. 39.

The Final Rejection found that as the outlet volume in Matson '527 is in communication with the storage volume it is simultaneously filled by passing air past the piston to the outlet volume via the reservoir. Fin. Rej. 5.

Appellant principally argues that Matson '527 and Demers '302 fail to show pressurized air moving past a piston to an outlet volume while filling a

charging reservoir. App. Br. 35. We disagree. Although Matson '527's piston appears to stop air from flowing directly into the outlet, the storage volume does appear to be connected in part to the outlet volume in aperture 30 of Figure 1, while in the charging state. As a consequence, we are not persuaded of error in this rejection.

Conclusion

The Appellant has shown error in the rejections of claim 17, and the rejections of claim 17 are hereby reversed.

The Appellant has demonstrated error in the rejection of claim 16, and the rejection of claim 16 is hereby reversed. We exercise our discretion to enter a new ground of rejection as to claim 16.

The Appellant has not demonstrated error in the rejection of claims 13, 14, 15, 18, 19, or 20. However, the supporting reasoning for the rejection has been modified sufficiently that we exercise our discretion to denominate the affirmance of the rejection of these claims as new grounds of rejection.

DECISION

The rejection of claims 13-20 under 35 U.S.C. § 103(a) as being unpatentable over Matson '527 and Demers '302 is affirmed-in-part.

The rejection of claim 17 under 35 U.S.C. § 103(a) as being unpatentable over Matson '527, Demers '302, and Wadensten is reversed.

V. TIME PERIOD FOR RESPONSE

It is ORDERED that since our rationale supplements the rationale of the Examiner, and we have relied on additional evidence, our affirmance is designated as a new rejection. 37 C.F.R. § 41.50(b).

FURTHER ORDERED that our decision is not a final agency action.

FURTHER ORDERED that within **two (2) months** from the date of our decision, appellant may further prosecute the application on appeal by exercising on of the two following options:

Option 1: Request reopening of prosecution by submitting an amendment or evidence or both. 37 C.F.R. § 41.50(b)(1).

Option 2: Request rehearing on the record presently before the Board. 37 C.F.R. § 41.50(b)(2).

FURTHER ORDERED that 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-IN-PART

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