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Whitmyer IP Group LLC 600 Summer Street 3rd Floor Stamford, CT 06901			KASTURE, DNYANESH G	
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* BERNHARD SPIEGL, MATTHIAS KORNFELD, and  
ANDREAS SCHLOFFER

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Appeal 2018-005296  
Application 14/508,652  
Technology Center 3700

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Before JOHN C. KERINS, WILLIAM A. CAPP, and  
BRANDON J. WARNER, *Administrative Patent Judges*.

WARNER, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>1</sup> appeals from the Examiner's decision to reject claims 6–17, which are all the pending claims. Appeal Br. 1, 2. We have jurisdiction over the appeal under 35 U.S.C. § 6(b). An oral hearing was held on January 16, 2020.

We REVERSE.

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<sup>1</sup> We use the word “Appellant” to refer to the “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Hoerbiger Kompressortechnik Holding GmbH. Appeal Br. 2.

### CLAIMED SUBJECT MATTER

Appellant's disclosed invention "relates to an adjusting device for an adjusting piston of a variable clearance space of a reciprocating compressor with a threaded spindle." *See, e.g.*, Spec., p. 1, ll. 3–4. Claim 11, reproduced below, is representative of the subject matter on appeal.

11. An adjusting device for moving an adjusting piston located in a variable clearance space of a piston compressor so as to regulate the capacity of the compressor, the adjusting device comprising:

a threaded spindle having external threads which have a thread height  $x$  and which are separated by a pitch  $z1$ ,

a threaded spindle nut which includes an outer nut carrier having internal threads with a thread height  $y$ , and an inner plastic nut having external threads engaged with the internal threads of the nut carrier and internal threads engaged with the external threads of the threaded spindle, the internal threads of the plastic nut being separated by the pitch  $z1$ , the plastic nut having a radial thickness  $d$  and wherein plastic material between outer and inner thread recesses therein has a thickness  $p$ , and

wherein the thread height  $x$  and the thread height  $y$  are each 50 to 80% of the radial thickness  $d$ , and the plastic thickness  $p$  is at least 15% of the thread pitch  $z1$ .

### EVIDENCE

The Examiner relies on the following evidence in rejecting the claims on appeal:

Kling	US 5,996,545	Dec. 7, 1999
Lautzenhiser	US 2009/0267040 A1	Oct. 29, 2009
McClendon	US 2011/0020144 A1	Jan. 27, 2011
Bidare	US 2012/0017756 A1	Jan. 26, 2012

Hartmann <sup>2</sup>	DE 872 701	Feb. 26, 1953
Neff <sup>3</sup>	DE 198 31 940 A1	Jan. 20, 2000

Oberg, Erik, et al., *Machinery's Handbook*, A Reference Book for the Mechanical Engineer, Designer, Manufacturing Engineer, Draftsman, Toolmaker, and Machinist, 29th Edition, Industrial Press, New York, 2012, pp. 1902–09 (“Machinery’s Handbook”)

### REJECTIONS

The following rejections are before us for review:

- I. Claims 6, 11–15, and 17 stand rejected under 35 U.S.C. § 103 as being unpatentable over McClendon, Neff, and Machinery’s Handbook. Final Act. 3–7.
- II. Claims 7 and 8 stand rejected under 35 U.S.C. § 103 as being unpatentable over McClendon, Neff, Machinery’s Handbook, and Kling. *Id.* at 7–8.
- III. Claims 7, 9, and 10 stand rejected under 35 U.S.C. § 103 as being unpatentable over McClendon, Neff, Machinery’s Handbook, and Lautzenhiser. *Id.* at 8–10.
- IV. Claim 16 stands rejected under 35 U.S.C. § 103 as being unpatentable over McClendon, Neff, Machinery’s Handbook, and Bidare. *Id.* at 10.
- V. Claim 11 stands rejected under 35 U.S.C. § 103 as being unpatentable over McClendon and Hartmann. *Id.* at 11–13.

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<sup>2</sup> We note that citations herein to Hartmann refer to the English language translation of this reference provided in the record.

<sup>3</sup> We note that citations herein to Neff refer to the English language translation of this reference provided in the record.

## ANALYSIS

Independent claim 11 recites, in relevant part, an adjusting device for moving an adjusting piston of a piston compressor, where the device includes “a threaded spindle having external threads which have a thread height  $x$  and which are separated by a pitch  $z1$ ,” and “a threaded spindle nut” that includes both “*an outer nut carrier* having internal threads with a thread height  $y$ ,” and “*an inner plastic nut* having external threads engaged with the internal threads of the nut carrier and internal threads engaged with the external threads of the threaded spindle,” where “the internal threads of the plastic nut [are] separated by the pitch  $z1$ , the plastic nut [has] a radial thickness  $d$  and wherein plastic material between outer and inner thread recesses therein has a thickness  $p$ ,” where “the thread height  $x$  and the thread height  $y$  are each 50 to 80% of the radial thickness  $d$ , and the plastic thickness  $p$  is at least 15% of the thread pitch  $z1$ .” Appeal Br. 18, Claims App. (emphasis added). All the claims include these structural limitations regarding the construction details of the inner plastic nut. According to Appellant, these details of the inner plastic nut make the recited spindle nut suitable for withstanding the high frequency pulsing loads seen in a reciprocating piston compressor, and provide the adjusting device with the ability to continuously adjust the clearance of the compressor. *See* Appeal Br. 5, 11–12; *see, e.g.*, Spec., p. 2, l. 30 – p. 3, l. 13, p. 5, l. 23 – p. 6, l. 27.

In rejecting the claims, the Examiner relies on McClendon for disclosing the general conditions of a linear screw drive, but acknowledges that McClendon does not include an inner plastic nut as recited. Final Act. 4, 11. For Rejection I, the Examiner turns to Neff and Machinery’s Handbook for teaching a plastic coating on the nut and the specific relative

dimensions recited, characterizing selection of these construction details as “performing routine design practice in determining the Pitch using the Preferred Basic sizes chart on [p]age 1909 of [Machinery’s] Handbook. Final Act. 5; *see id.* at 4–6. Similarly, for Rejection V, the Examiner relies on Hartmann for teaching a plastic nut in a linear screw drive and appears to dismiss any criticality of the specific relative dimensions recited as either being sufficiently close to those of Hartmann (and asserting that there would be no change in function), or being optimizable result-effective variables (and stating without evidence that “ratios involving these variables” would likewise be result-effective and optimizable). *Id.* at 12–13. For all the rejections, the only basis given to modify the screw drive of McClendon with an inner plastic nut as recited is simply “for the purpose of smoother operation” of the screw drive. *Id.* at 4–5 (citing Neff, p. 2), 12.

Appellant persuasively argues, however, that the rejections do not provide an adequately supported reason why a person of ordinary skill in the art would have modified McClendon’s screw drive to include an inner plastic nut having the construction details recited, suggesting instead that such a modification is the result of improper hindsight reconstruction. *See* Appeal Br. 12–14, 15; Reply Br. 2–5. For example, Appellant explains that the stated basis of “smoother operation” is misplaced because this benefit (pulled from Neff) is disclosed in the context of a lifting device, where its power screw drive would be subject to different types of forces than the adjusting device for a reciprocating piston compressor as claimed (or the device of McClendon). *See* Appeal Br. 13; *but see* Ans. 7 (essentially disregarding the differences in the forces seen by the distinct devices). In other words, we agree with Appellant that the Examiner’s stated basis for the

combinations of teachings used in the rejections appears to have been gleaned from Appellant's own disclosure, rather than originating from any facts provided or suggested by the prior art, and thus is the result of improper hindsight reconstruction.<sup>4</sup>

Rejections based on obviousness must rest on a factual basis; in making such a rejection, the Examiner has the initial burden of supplying the requisite factual basis and may not, because of doubts that the invention is patentable, resort to speculation, unfounded assumptions, or hindsight reconstruction to supply deficiencies in the factual basis. *See In re Warner*, 379 F.2d 1011, 1017 (CCPA 1967). Here, absent improper hindsight reconstruction, we do not see a sufficiently articulated explanation, based on an objective rational underpinning, as to why one of ordinary skill in the art would have been led to modify the screw drive of McClendon with an inner plastic nut having the structural details recited. No adequate reason for such modification is otherwise evident from the record.

The Examiner's reliance on the remaining cited references is for teaching other claimed features, but not in any way that would cure the fundamental deficiency in the base combinations with regard to modifying the screw drive of McClendon with an inner plastic nut including the construction details recited. *See* Final Act. 7–10.

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<sup>4</sup> Further, we agree with Appellant that a report submitted in the record (providing evidence of unexpected results by using an inner plastic nut with the specific dimensions recited compared with other alternatives) has not been adequately addressed substantively by the Examiner. *See* Appeal Br. 11–12; Reply Br. 3–4; *see also* Ans. 6 (noting that the report has been “considered,” but not addressing the “surprising” strength and durability benefits demonstrated by using a thinner plastic nut compared to using a thicker plastic nut).

Accordingly, based on the record before us, the Examiner's conclusion of obviousness stated in the rejections is premised on an insufficient reason to combine the teachings relied upon. Thus, we do not sustain the rejections of claims 6–17 under 35 U.S.C. § 103.

### DECISION

We REVERSE the Examiner's rejections of claims 6–17.

### CONCLUSION

In summary:

<b>Claim(s) Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
6, 11–15, 17	103	McClendon, Neff, Machinery's Handbook		6, 11–15, 17
7, 8	103	McClendon, Neff, Machinery's Handbook, Kling		7, 8
7, 9, 10	103	McClendon, Neff, Machinery's Handbook, Lautzenhiser		7, 9, 10
16	103	McClendon, Neff, Machinery's Handbook, Bidare		16
11	103	McClendon, Hartmann		11
<b>Overall Outcome</b>				6–17

REVERSED