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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* VICTOR KIRILICHIN, DAVID P. TURECHEK, and BRIAN P. KRIEGER

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Appeal 2020-003395
Application 16/027,992
Technology Center 3700

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Before JENNIFER D. BAHR, MICHAEL J. FITZPATRICK, and WILLIAM A. CAPP, *Administrative Patent Judges*.

CAPP, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant[1] seeks our review under 35 U.S.C. § 134(a) of the non-final rejection of claims 1–13 as unpatentable under 35 U.S.C. § 103 over Rothstein (US 4,646,816, iss. Mar. 3, 1987) and Lee (US 5,160,226, iss. Nov. 3, 1992). We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.[2]

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[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies Engineered Inserts & Systems, Inc. as the real party in interest. Appeal Br. 2.

[2] This case came before the Board for regularly scheduled telephonic oral hearing on August 18, 2020.

## THE INVENTION

Appellant's invention is a plug that seals a hole. Spec. ¶ 1. Claim 1, reproduced below with the critical claim limitation at issue italicized, is illustrative of the subject matter on appeal.

> 1. An insert for sealing a hole having a first diameter comprising:
>
> a core having a height and a tapered outer wall;
>
> a threaded hole located in a first end of said core, a depth of said threaded hole less than the height;
>
> a cylindrical metallic sleeve having a through hole defining an inner diameter of the cylindrical metallic sleeve wherein said cylindrical metallic sleeve is in contact with and surrounds at least part of said core;
>
> said cylindrical metallic sleeve having a first end and a second end;
>
> a maximum outer diameter of said cylindrical metallic sleeve is equal to or less than the first diameter;
>
> a second end of said core having an outer diameter larger than the inner diameter of the cylindrical metallic sleeve;
>
> the first end of said core having a first end diameter dimensioned such that prior to retraction of said core into said cylindrical metallic sleeve and *prior to engagement of said threaded hole with a male threaded device*, said first end of said core is retained and in press fit contact at said second end of said cylindrical metallic sleeve such that the core extends from the first end of said core to the second end of said core in a direction away from both the first and second ends of said cylindrical metallic sleeve.

## OPINION

*Claims 1–5*

Appellant argues claim 1, but raises no separate argument as to claims 2–5. Appeal Br. 5–25. We treat claim 1 as representative and claims 2–5 will stand or fall therewith. *See* 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner finds that Rothstein explicitly discloses the invention as claimed except that the core and sleeve do not engage in a press fit manner until after the threaded device is engaged and, therefore, not "prior to" engagement of the threaded device. Non-Final Act. 4–6. The Examiner relies on Lee as press fitting plug components without first engaging a threaded device and concludes that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to press fit Rothstein's core and sleeve prior to placing them in the hole. *Id.* at 6–7. According to the Examiner, a person of ordinary skill in the art would have done this to pre-assemble the plug components to avoid mismatching of parts. *Id.*

Appellant essentially argues just two points: (1) Rothstein and Lee are not combinable because Lee's hole and insert are tapered; and (2) the Examiner gives insufficient reason to modify the location and accessibility of Lee's components. Appeal Br. 5–25. The primary thrust of Appellant's position is that, in Rothstein's device, the core (plug 48) is disposed on the distal end of the device and tapers inward from the distal end to the proximal end and is drawn into the interior of sleeve 46 to radially expand the device to fill the hole, whereas in contrast, Lee's sleeve (plug body 14) is disposed on the distal ("inner") end of the device and Lee's plug (frusto-conical pin 12) is forced into the sleeve from the proximal end of the device or, in other words, from proximate the surface opening of the hole to be plugged. *Id.* As we understand the argument, this poses difficulty for disposing a threaded hole near a first end of the core for threadably mating with a male threaded device. *Id.*

In response, the Examiner reiterates that the only thing missing from Rothstein is an explicit teaching that the core and sleeve are press fit "prior to" engagement with a threaded device. Ans. 4. The Examiner merely relies on Lee for the explicit disclosure of pre-assembling by press fitting the core and sleeve prior to deployment in an opening. *Id.*

Appellant's Reply Brief, although lengthy, lacks persuasiveness. *See generally* Reply Br. We deem it unnecessary to discuss Appellant's lengthy arguments in detail as the issues presented in this case are simple, straightforward, and lead to a clear outcome. In essence, Appellant raises a classic "bodily incorporation" argument, namely that relative juxtaposition of core and sleeve components of Rothstein and Lee prevent the bodily incorporation of Lee into Rothstein. However, "[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...." *In re Keller*, 642 F.2d 413, 425 (CCPA 1981); *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012) ("a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements").

Rothstein discloses a plug for sealing defective heat exchanger tubes. Rothstein Abstract. In the Figure 5–8 embodiment, Rothstein discloses plugging apparatus 45 comprised of plug 48, sleeve 46, and threaded stem 49. *Id.* col. 8, ll. 32–38, Figs. 5–8. Plug portion 48 corresponds to Appellant's core. *Id.* col. 8, ll. 36–37, Fig 5. Sleeve member 46 corresponds to Appellant's sleeve. *Id.* The external surface of sleeve 46 is cylindrical from shoulder 50 at its proximal end to its distal end. *Id.* col. 8, ll. 39–40, Fig. 5. Sleeve 46 has a partially tapered internal surface. *Id.* col. 8,

ll. 41–45. Stem 49 corresponds to Appellant's threaded device. *Id.* The distal end of sleeve 46 fits over the tapered sides of plug 48. *Id.* col. 8, ll. 32–35, Figs. 5–8. Torque supplied to stem 49 draws sleeve 46 and plug 48 toward each other causing radial expansion of sleeve 46 so as to fill a hole and thereby seal a defective tube. *Id.* col. 9, ll. 34–44, Figs. 5–8. Such torque is communicated through square gripping end 51 on the proximal end of stem 49 using a wrench. *Id.* col. 9, ll. 28–44, Figs. 5–8. A second wrench acts on threaded nut 54 to supply a pulling force to deform sleeve 46. *Id.*

Thus, plug 48 is press fit (or friction fit) into sleeve 46. Figure 5 of Rothstein appears to suggest that stem 49 is threaded into plug 48 before plugging apparatus 45 is inserted into the hole to be plugged. *Id.* Fig. 5. However, a person of ordinary skill in the art would understand that the distal end of sleeve 46 could be press fit onto the proximal end of plug 48 before engaging stem 49. *Id.* Indeed, in our opinion, even a skill level considerably less than that of "ordinary" skill would have been more than sufficient to conceive and execute such a press fitting of the two components. This could be accomplished by something as simple as the tap of a hammer with the two components in axial, vertical alignment and resting on a work bench. Depending on the materials used, the thickness of the sleeve, and the axial forces applied, a person of ordinary skill in the art would recognize that a press fit could be obtained before sufficient radial expansion of sleeve 46 takes place so as inhibit insertion of plugging apparatus 45 into tube 19. *See id.* Fig. 6 (showing that sleeve 46 retains its cylindrical outer shape despite axial overlap of the distal end of sleeve 46 and the proximal end of plug 48). This is essentially identical to Appellant's

claim 1 embodiment that permits a tapered outer wall from top to bottom of core 3. Spec. ¶ 32, Claims App.

Regardless of whether the core or the sleeve element end of the device is inserted first into the hole to be plugged, we agree with the Examiner that Lee teaches friction fitting of a core into a sleeve. We also agree that Lee provides the requisite motivation to modify Rothstein as proposed in the rejection. Conceiving of and executing a pre-insertion friction fit of Rothstein's plug and sleeve requires no more than ordinary skill. The result of the modification is predictable and expected. *See KSR Int'l Co. v. Teleflex Inc*., 550 U.S. 398, 416 (2007) (explaining that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results).

Appellant's arguments regarding the "tapering" of Lee's components are unpersuasive. Rothstein, Lee, and Appellant's devices all rely on tapering to utilize the well-known principle of the mechanical wedge to radial expand a sleeve by insertion of a wedge shaped plug or core. Appellant applies tapering or the mechanical principle of the wedge by contouring the outer wall shape of the core. Spec. ¶ 32, Fig 1B. Rothstein applies tapering on the outer surface of plug 48 and the inner surface 46b of sleeve 45. Rothstein, col. 8, ll. 32–45, Figs 5–8. Lee applies tapering to socket 22 and inner pin 12. Lee, col. 5, l. 3 – col. 6, l. 10, Fig 2. While the locations of the tapering may vary from one device to another, a person of ordinary skill in the art would understand that the mechanical principles applied are the same.

Furthermore, although Appellant's Specification teaches that a friction fit occurs between a cylindrical section 7 of core 3 and void 10 of sleeve 5

(Spec. ¶ 33), the Specification also teaches that tapered section 2 may extend from the top of the core towards the bottom. *Id.* ¶ 32. Moreover, there is no requirement in claim 1 that any portion of the external wall of core 3 be cylindrical. Claims App. The only reasonable conclusion to be drawn from the record is that a friction fit may be accomplished between tapered wall 2 of Appellant's core 3 and the interior surface of void 10 of sleeve 5. Thus, we discern no patentable distinction between the physical structure of the respective core and sleeve components of Rothstein and Appellant's claim 1 embodiment.

Although we do not deem resolution of the following issue necessary to decide this case, there is an open question as to whether claim 1 actually requires the core to be press-fit into the sleeve before engagement with the threaded device. Claim 1 arguably just requires that the core and sleeve are "dimensioned such that" they are capable of being press fit prior to engagement of the threaded device. Claims App. Appellant appears to import what amounts to a process limitation into what is otherwise an apparatus claim so that the core, sleeve, and threaded device are assembled in a series of process steps that must be performed in a particular sequence. Appellant fails to persuade us that claim 1 necessarily must be interpreted as requiring assembly of the claimed insert in any particular sequence. Appellant similarly fails to persuade us that claim 1 must be construed such that "*retained and in press fit contact*" is a positively recited structural limitation as opposed to merely shedding light on what it means for the first diameter of the core being "*dimensioned such that* . . . (etc.)." In that regard, we are cognizant that the burden of precise claim drafting falls on Appellant. *In re Morris*, 127 F.3d 1048, 1056-57 (Fed. Cir. 1997).

Appellant's and Rothstein's devices appear to be equally capable of functioning regardless of whether press fitting is performed before or after engagement by the threaded device. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997) ("It is well settled that the recitation of a new intended use for an old product does not a make a claim to that old product patentable"). We reiterate, however, that the analysis set forth in this paragraph is not necessary to support our ultimate disposition of this case.

We have considered Appellant's arguments to the contrary which, although lengthy, are unpersuasive as they fail to account for the level of skill in the art. *See KSR*, 550 U.S. at 421 ("A person of ordinary skill is also a person of ordinary creativity, not an automaton"). A "wedge" is widely considered to be one of the earliest and simplest of machines. The plug devices of Appellant, Rothstein, and Lee merely use the well-known mechanical principles of the wedge in the context of a circumferential, directional application of force. The invention here amounts to little more than inserting a (tapered) round peg into a round hole. The mechanical principles that come into play are viewed as elementary to the skilled artisan.

We are not apprised of error and, therefore, sustain the rejection of claims 1–5.

*Claims 6–9*

Appellant argues independent claim 6, but does not separately argue claims 7–9 that depend therefrom. Claims App., Appeal Br. 25–26. Claim 6 is representative. 37 C.F.R. § 41.37(c)(1)(iv).

Claim 6 is substantially similar in scope to claim 1. Claims App. Appellant argues that the rejection "ignores" the fact that Lee's threaded hole would be inaccessible to threaded device due to the juxtaposition of

respective ends of frusto-conical pin 12 relative to the hole of plug body 14. Appeal Br. 25–26.

Appellant's argument mischaracterizes the Examiner's rejection with respect to the teachings of the references and how those teachings are combined to render the claims unpatentable. Our discussion with respect to claim 1 applies with equal force to claim 6. For the reasons expressed above with respect to claim 1, we sustain the Examiner's rejection of claims 6–9.

*Claims 10–13*

Appellant argues independent claim 10, but does not separately argue claims 11–13 that depend therefrom. Claims App., Appeal Br. 26. Claim 10 is representative. 37 C.F.R. § 41.37(c)(1)(iv).

Claim 10 is substantially similar in scope to claim 1. Claims App. Appellant raises the same arguments that we previously considered and found unpersuasive with respect to claims 1 and 6 and find equally unpersuasive here. Appeal Br. 26.

For the reasons expressed above with respect to claims 1 and 6, we sustain the Examiner's rejection of claims 10–13.

CONCLUSION

| Claims Rejected | § | References | Affirmed | Reversed |
|---|---|---|---|---|
| 1-13 | 103 | Rothstein, Lee | 1-13 | |

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