

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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REPUBLIC TOBACCO, L.P.,  
Petitioner,

v.

FAN BAO,  
Patent Owner.

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Case IPR2015-00072  
Patent 8,261,752 B2

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Before LORA M. GREEN, KEN B. BARRETT, and  
JENNIFER MEYER CHAGNON, *Administrative Patent Judges*.

CHAGNON, *Administrative Patent Judge*.

FINAL WRITTEN DECISION  
*Inter Partes* Review  
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

We have jurisdiction to hear this *inter partes* review under 35 U.S.C. § 6(c). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed herein, we determine that Petitioner has shown by a preponderance of the evidence that claims 2–24 of

U.S. Patent No. 8,261,752 B2 (Ex. 1001, “the ’752 patent”) are unpatentable. Further, claims 1 and 25 of the ’752 patent will be canceled.<sup>1</sup>

*A. Procedural History*

Republic Tobacco, L.P. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) seeking *inter partes* review of claims 1–25 (“the challenged claims”) of the ’752 patent. Petitioner included a Declaration of Dr. Steven R. Schmid (Ex. 1009) to support its positions. Fan Bao (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”).

Pursuant to 35 U.S.C. § 314(a), on May 1, 2015, we instituted an *inter partes* review of the challenged claims to determine if claims 1–6, 9–13, 16–20, and 25 are unpatentable under 35 U.S.C. § 103 as obvious over Chen;<sup>2</sup> if claims 7, 8, 14, 15, and 21–24 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Chen and Kastner;<sup>3</sup> and if claim 1 is unpatentable under 35 U.S.C. § 103 as obvious over the combination of Kastner and Moser.<sup>4</sup> Paper 7 (“Inst. Dec.”).

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<sup>1</sup> Patent Owner expressly requested cancelation of claims 1 and 25 of the ’752 patent. PO Resp. 9; *see also* Tr. 19:7–19 (Patent Owner’s counsel conceding the unpatentability of claims 1 and 25). Although Patent Owner did not file a Motion to Amend or statutory disclaimer, we construe Patent Owner’s statements regarding claims 1 and 25 as an abandonment of the contest as to these claims and, thus, as a request for entry of adverse judgment with respect to claims 1 and 25. *See* 37 C.F.R. § 42.73(b). Accordingly, claims 1 and 25 will be canceled.

<sup>2</sup> CN 201138314Y, published Oct. 22, 2008 (Ex. 1006). Ex. 1006 includes both a certified English translation, and the original publication in Chinese. All citations to Ex. 1006 are to the English translation portion of the document, and refer to the page numbers added by Petitioner at the bottom right-hand corner of each page.

<sup>3</sup> U.S. Patent No. 5,088,506, issued Feb. 18, 1992 (Ex. 1005).

<sup>4</sup> U.S. Patent Appl. No. 2006/0096604, published May 11, 2006 (Ex. 1004).

Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 13, “PO Resp.”), along with a Declaration of Fan Bao (Ex. 2001) to support its positions. Petitioner filed a Reply (Paper 21, “Reply”) to the Patent Owner Response, along with a Rebuttal Declaration of Dr. Schmid (Ex. 1017). An oral hearing was held on January 21, 2016. A transcript of the hearing is included in the record. Paper 29 (“Tr.”).

*B. Related Proceedings*

The parties indicate that the ’752 patent has been asserted against Petitioner in *Fan Bao v. Republic Tobacco, L.P.*, No. 2:14-cv-03655 (C.D. Cal.). Pet. 1; Paper 4, 2. In its initial mandatory notices, Patent Owner also identified two pending U.S. patent applications that claim priority to the application that issued as the ’752 patent: U.S. Patent Application number 13/507,774<sup>5</sup> and U.S. Patent Application number 14/224,036.<sup>6</sup> Paper 4, 2.

*C. The ’752 Patent*

The ’752 patent, titled “Crank Type Automatic Cigarette Tube Injector,” relates to an automatic cigarette tube injector, for injecting tobacco into hollow cigarette tubes, thereby forming cigarettes. Ex. 1001, 2:26–57. Embodiments of the ’752 patent also have “a compact size for enhancing the portability of the cigarette tube injector.” *Id.* at 1:17–18.

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<sup>5</sup> The ’774 application has been abandoned for failure to respond to an office action.

<sup>6</sup> The ’036 application is pending, awaiting examination.

Figures 2 and 5 of the '752 patent are reproduced below.

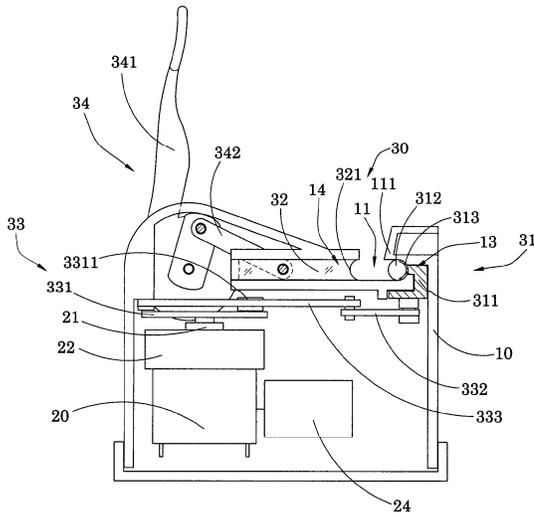


FIG. 2

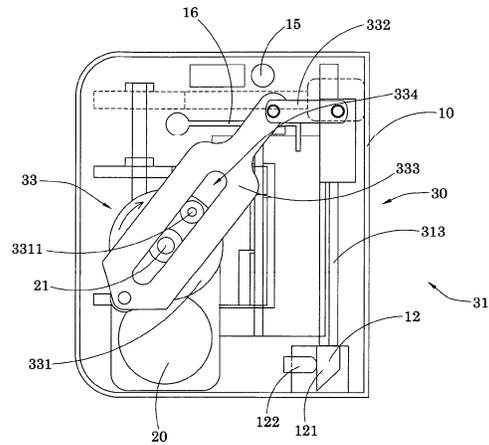


FIG. 5

Figures 2 and 5 of the '752 patent are sectional views of a cigarette tube injector, according to a preferred embodiment. *Id.* at 3:14–17, 3:25–27. Tobacco leaves are placed in tobacco cavity 11. *Id.* at 3:49–50. Arc-shaped feeding member 32 pushes the tobacco leaves toward arc-shaped retention member 313 (i.e., in a compression direction). *Id.* at 5:40–43. When feeding member 32 couples with retention member 313, the tobacco leaves form a tobacco cylinder with a uniform compactness within tubular chamber 35 (shown in Fig. 3). *Id.* at 5:40–43, 6:4–7.

Tobacco feeder 31 includes driving member 311, which is supported by sliding compartment 13 and is slidable perpendicular to the compression direction (i.e., in an injection direction). *Id.* at 4:30–46. Retention member 313 is coupled to driving member 311, and front pusher wall 312 of driving member 311 pushes the tobacco cylinder into a cigarette paper tube that is disposed at feeding opening 12. *Id.* at 3:66–4:9, 4:47–56, 5:59–64. The inner wall of retention member 313 retains the tobacco leaves within tobacco

cavity 40 and enters into the cigarette paper tube with the tobacco leaves. *Id.* at 4:56–5:4.

Driving member 311 is connected to reciprocating unit 33, which transmits a rotational power of output shaft 21 to a sliding movement of driving member 311. Ex. 1001, 5:9–14. Reciprocating unit 33 includes transmission wheel 331 coaxially coupled with output shaft 21 of electric motor 20, eccentric shaft 3311 on the edge of transmission wheel 331, transmission arm 333 including transmitting slot 334 slidably coupled with eccentric shaft 3311, and connecting arm 332 rotatably connected to both driving member 331 and transmission arm 333. *Id.* at 5:14–30. When transmission wheel 331 is driven to rotate by motor 20, via output shaft 21, eccentric shaft 3311 drives transmission arm 333 to swing reciprocatingly through transmitting slot 334. *Id.* at 5:30–34. In this way, transmission arm 333 drives driving member 311 in a linear fashion, along the injection direction, causing tobacco feeder 31 to inject the tobacco cylinder into the cigarette tube. *Id.* at 5:34–39, 6:30–51.

*D. Illustrative Claims*

Claims 2–24 remain at issue in this trial. Each of claims 3–24 depends, directly or indirectly, from claim 2, which itself depends from claim 1. Claims 1 and 2 of the '752 patent, reproduced below, are illustrative of the challenged claims:

1. An automatic cigarette tube injector for injecting tobacco leaves into a hollow cigarette paper tube, comprising:

a housing having a tobacco cavity for said tobacco leaves disposing thereat, and a feeding opening for said cigarette paper tube alignedly supporting thereat, wherein a longitudinal length of said housing is lesser than two cigarette lengths of said cigarette paper tube;

an electric motor, having an output shaft, received in said housing; and

a cigarette filling arrangement, which is driven by said electric motor via said output shaft for automatically feeding said tobacco leaves to said cigarette paper tube through said feeding opening of said housing, wherein said cigarette filling arrangement comprises:

a tobacco feeder, which is a feeding crank, longitudinally supported in said housing and driven by said output shaft at a longitudinal direction which is an injection direction;

a retention member for retaining said tobacco leaves from said tobacco cavity;

a feeding member slidably supported in said housing along a direction perpendicularly to said injection direction, wherein said tobacco feeder is able to be slid to couple with said retention member to form a tubular chamber for holding said tobacco leaves therein such that said tobacco feeder is able to be driven to push towards said feeding opening of said housing for feeding said tobacco leaves into said cigarette paper tube; and

a reciprocating unit for transmitting a rotational power of said output shaft to a sliding movement of said tobacco feeder, wherein said tobacco feeder is linearly moved at said longitudinal direction out of said feeding opening for feeding said tobacco leaves into said cigarette paper tube and is longitudinally received in said housing to minimize said longitudinal length of said housing which is lesser than two cigarette lengths of said cigarette paper tube.

Ex. 1001, 7:66–8:36.

2. The automatic cigarette tube injector, as recited in claim 1, wherein said tobacco feeder comprises

a driving member, having a front pusher wall, being reciprocatingly driven by said output shaft of said electric motor to slide at said housing between a first position and a second position along said injection

direction through said feeding opening of said housing,  
and

an arc-shaped retention member frontwardly  
extended from said front pusher wall of said driving  
member for retaining said tobacco leaves at an inner wall  
of said retention member from said tobacco cavity;

wherein said feeding member is an arc-shaped feeding  
member slidably supported in said housing along said direction  
perpendicularly to said injection direction,

wherein said feeding member is slid to couple with said  
retention member at said first position to form said tubular  
chamber within said inner wall of said retention member and an  
inner wall of said feeding member for holding said tobacco  
leaves within said tubular chamber, such that when said driving  
member is driven to slide at said second position, said front  
pusher wall of said driving member is driven to push towards  
said feeding opening of said housing for feeding said tobacco  
leaves into said cigarette paper tube.

*Id.* at 8:37–58 (paragraphing added).

## II. ANALYSIS

### A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1275–79 (Fed. Cir. 2015), *cert. granted sub nom. Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 890 (2016). Under the broadest reasonable construction standard, claim terms generally are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). The claims, however, ““should always be read in light of the specification and teachings

in the underlying patent,” and “[e]ven under the broadest reasonable interpretation, the Board’s construction ‘cannot be divorced from the specification and the record evidence.’” *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015) (citations omitted).

No issue in this Decision requires explicit construction of any claim term. *See, e.g., Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed ‘to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). Accordingly, for purposes of this Decision, we do not provide explicit construction for any claim terms.

*B. Obviousness in View of Chen, Alone or in Combination with Kastner*

Due to the entry of adverse judgment against claims 1 and 25, the only grounds remaining in this trial are whether claims 2–6, 9–13, and 16–20 are unpatentable under 35 U.S.C. § 103 as obvious over Chen and whether claims 7, 8, 14, 15, and 21–24 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Chen and Kastner. We have reviewed the entire record before us, including the parties’ contentions and supporting evidence presented during this trial. For the reasons explained below, we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 2–24 are unpatentable. We begin with a discussion of the cited references, and then turn to a discussion of the parties’ contentions and supporting evidence.

1. Overview of Chen

Chen is a Chinese utility model application titled “Portable Electric Filtered Cigarette Tube Filling Machine,” and discloses a machine that fills cigarettes with shredded tobacco. Ex. 1006, 1. In particular, Chen describes several benefits of the device disclosed therein, including “more uniform shredded tobacco distribution” and “suitable degree of shredded tobacco compactness.” *Id.* at 4.

Figure 2 of Chen is reproduced below.

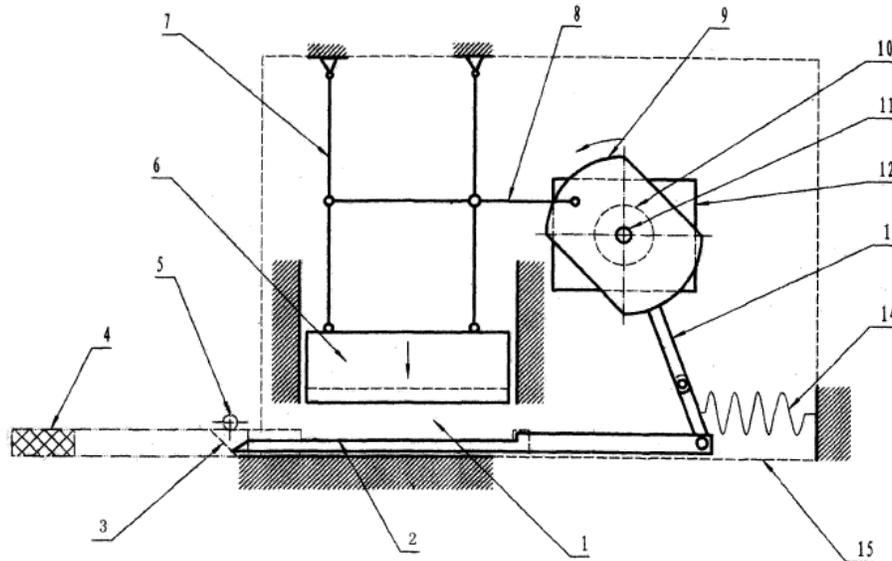


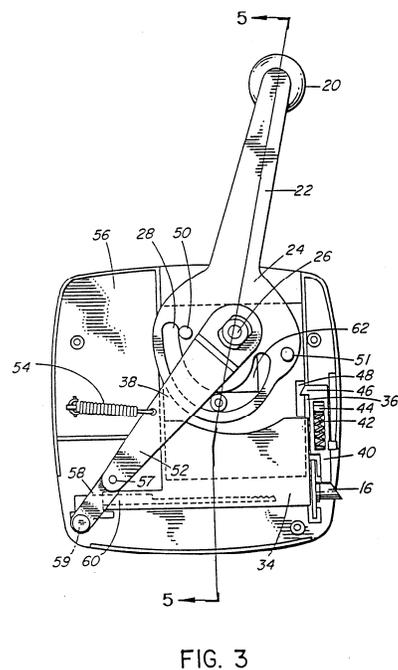
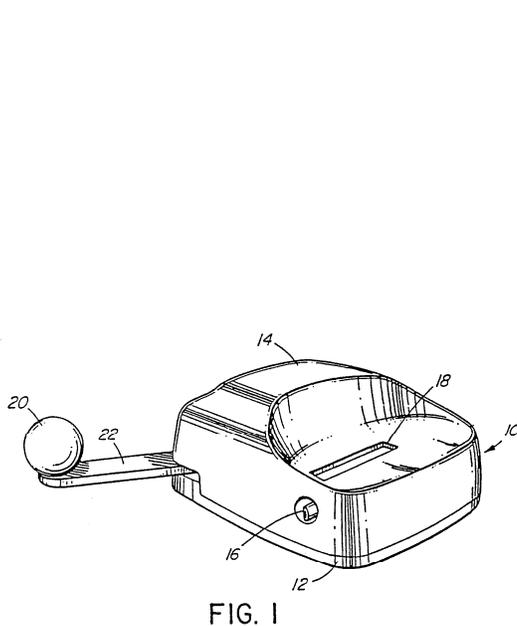
Figure 2 of Chen is a “schematic diagram illustrating the shredded tobacco pressing process” of the utility model. Ex. 1006, 4. As seen in Figure 2, the machine includes housing 15, tongue-shaped pusher 3 having a cigarette forming slot 2, cigarette tube clamp 5 connected to housing 15, and pressing block 6. *Id.* The machine also includes motor 10, having actuation shaft 11 and decelerator 12, and crank wheel 9 disposed on actuation shaft 11. *Id.* Crank wheel 9 is connected to connection bar 8 and rocking bar 13. *Id.*

In operation, cigarette tube 4 is clamped at the front of cigarette forming slot 2, and shredded tobacco is placed in tobacco storage trough 1.

*Id.* at 5. Crank wheel 9 is driven by motor 10, decelerator 12, and actuation shaft 11, to rotate counterclockwise, causing pressing block 6 to move downward, pressing the tobacco in tobacco storage trough 1 into cigarette forming slot 2, where the tobacco forms a cylindrical shape. *Id.* Crank wheel 9 is then driven to rotate clockwise, causing pressing block 6 to stop temporarily, at which time rocking bar 13 moves forward along the axial direction of cigarette forming slot 2, thus causing tongue-shaped pusher 3 to push the tobacco into the cigarette tube. *Id.* at 5, Fig. 3. After the tobacco is in the cigarette tube, the pressing block 6 and tongue-shaped pusher 3 then return to their original positions, and the tobacco remains within the cigarette tube. *Id.* at 5.

## 2. Overview of Kastner

Kastner relates to “portable manually operable cigarette making machines.” Ex. 1005, Abstract. Figures 1 and 3 of Kastner are reproduced below.



Figures 1 and 3 of Kastner show an external and a bottom-view internal appearance, respectively, of an embodiment of the cigarette making machine of Kastner. *Id.* at 4:63–68. As can be seen in the figures, machine 10 includes base plate 12, casing 14, cigarette tube nipple 16, tobacco slot 18, handle 20, and handle drive 22. *Id.* at 5:15–18. Rotating handle drive 22 urges compactor 32 toward spoon 60, thereby compacting the tobacco. *Id.* at 5:25–29. Further rotation of handle drive 22 moves tobacco plunger and spoon 60 toward and through cigarette tube nipple 16, ejecting the tobacco into cigarette tube. *Id.* at 5:39–47.

### 3. Analysis

Petitioner argues that Chen, alone or in combination with Kastner, teaches or suggests all limitations of claims 2–24. Pet. 36–42, 51–60. Patent Owner argues that Petitioner’s declarant, Dr. Schmid, is not qualified to testify as to the knowledge of one of ordinary skill in the art (PO Resp. 11–18), that Chen and Brown<sup>7</sup> do not qualify as prior art (*id.* at 18–31), and that the cited references do not teach or suggest all features of claims 2, 5, 11, and 18 (*id.* at 31–43). We address each of these issues in turn.

#### *a. Dr. Schmid’s Qualifications to Testify as to the Knowledge of One of Ordinary Skill in the Art*

Patent Owner asserts that Dr. Schmid is not a person of ordinary skill in the art, and his testimony, thus, is irrelevant and should be entitled no

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<sup>7</sup> HENRY T. BROWN, FIVE HUNDRED AND SEVEN MECHANICAL MOVEMENTS 42–43 (18th ed. 1896) (Ex. 1010; Ex. 1020). In our Institution Decision, we relied on Brown not as an express part of the instituted grounds, but instead as evidence of the knowledge of one of ordinary skill in the art. Inst. Dec. 6.

weight.<sup>8</sup> PO Resp. 1–2, 11–18. Patent Owner’s argument is based, in part, on its definition of a person of ordinary skill—namely, a person with “at least 4 years’ experience in the design of consumer products, including at least 2 years in the design and operation of cigarette making devices.” *Id.* at 13 (citing Ex. 2001 ¶ 16). Patent Owner asserts that “merely being a skilled engineer is not enough to qualify as one of ordinary skill in the art of the ’752 patent, unless that person has sufficient experience in cigarette making devices specifically.” *Id.* at 14 (citing Ex. 2001 ¶ 17).

Patent Owner points to “several specific and unique issues” that must be addressed by a design for cigarette making devices, including that they are intended to be operated by unskilled consumers, they are used with “delicate and easily torn or crushed paper cigarette tubes,” they must make a cigarette that burns in a reliable and desirable manner, and they are often used by older people and must be operated easily without significant manual force. *Id.* (citing Ex. 2001 ¶ 17). Patent Owner asserts that, absent specific experience in cigarette making devices, a skilled engineer would be unaware of and fail to take into account these issues. *Id.* (citing Ex. 2001 ¶ 17). Patent Owner asserts that Dr. Schmid does not have any experience in the design and operation of cigarette making devices. *Id.* at 14–16 (citing Ex. 2002 (Schmid Deposition Transcript), 46:11–23, 82:21–84:4, 85:17–24,

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<sup>8</sup> To the extent Patent Owner argues that Dr. Schmid’s testimony should be excluded entirely (*see, e.g.*, PO Resp. 12–13), we agree with Petitioner (Reply 6) that Patent Owner should have objected to the evidence within ten business days of institution of trial, in accordance with 37 C.F.R. § 42.64(b)(1), and subsequently filed a Motion to Exclude in accordance with 37 C.F.R. § 42.64(c) to preserve any such objection. We, thus, only consider Patent Owner’s arguments regarding the weight to be given to Dr. Schmid’s testimony.

96:11–13, 103:4–16, 104:3–11, 105:2–7, 139:1–21, 148:18–149:22). Thus, according to Patent Owner, Dr. Schmid is not, nor can he testify to the knowledge of, a person of ordinary skill in the art of cigarette making devices.

Petitioner, on the other hand, argues that a person of ordinary skill in the art would have a Bachelor’s degree in mechanical engineering or equivalent engineering design experience, as well as “familiarity with machines to achieve consolidation through compression of loose materials like tobacco to fill hollow tubes and other receptacles and experience in designing machines to achieve consolidation through compression.” Pet. 27–28 (citing Ex. 1009 ¶ 10). While we agree with Patent Owner that one of skill in the art will have some familiarity or experience in the design of consumer products, we are not persuaded by Patent Owner’s assertion that the relevant art should be defined so narrowly as to specifically require experience in designing cigarette making devices. Patent Owner presents no evidence beyond the uncorroborated testimony of its declarant (who also happens to be the inventor of the ’752 patent) that the design of cigarette making devices is particularly specialized and beyond the skill of a mechanical engineer. Thus, we disagree with Patent Owner and decline to insert any specific experience or specialized knowledge of cigarette making devices into the definition of one of ordinary skill in the art of the ’752 patent.

Patent Owner further argues that Dr. Schmid “himself readily *admits* (as he must) that he is *not* a person of ordinary skill in the art.” PO Resp. 12 (citing Ex. 2002, 176:16–18). Dr. Schmid is an experienced mechanical engineer and a long-time professor of engineering. Ex. 1009 ¶¶ 3–8;

Ex. 1017 ¶¶ 2–8; Ex. 1012 (Dr. Schmid’s Curriculum Vitae). Additionally, beyond the portion of Dr. Schmid’s deposition testimony cited by Patent Owner regarding his status as one of ordinary skill, Dr. Schmid further testified, “I have an exceptional background in identifying what an undergraduate or a bachelor’s degree holder in mechanical engineering is capable of doing and understands. So I understand what is a person of ordinary skill in this art.” Ex. 2002, 176:9–14; *see* Reply 8–10; Ex. 1009 ¶ 9; Ex. 1017 ¶¶ 5–8.

Patent Owner argues that “the Federal Circuit [has] excluded the testimony of [an] expert on the issues of patent invalidity and non-infringement because he lacked any relevant technical training in the field of the invention.” PO Resp. 12 (citing *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1361 (Fed. Cir. 2008)). In *Sundance*, however, the expert whose testimony was excluded was a patent attorney with only one year of experience as an engineer. *Sundance*, 550 F.3d at 1361. Based on the evidence presented, we are not persuaded that Dr. Schmid similarly is lacking in relevant training. Rather, we are persuaded, based on the facts in this record, that Dr. Schmid is qualified to testify as to the knowledge of a person of ordinary skill in the art of the ’752 patent.

*b. Whether Chen Qualifies as Prior Art*

Patent Owner argues that Petitioner “completely omits any discussion about the operability of . . . Chen, for its intended purpose, which is required for Chen to qualify as prior art.” PO Resp. 2; *see id.* at 18–23. In particular, Patent Owner asserts that the device of Chen is inoperable to make a cigarette, because “after compressing the tobacco, the pressing block of Chen does not maintain the tobacco in a compressed state while it is injected

into the empty cigarette paper tube.” *Id.* at 19–20 (citing Ex. 1006, Figs. 2, 3). According to Patent Owner, the tobacco, thus, would expand before it could be injected into the paper tube. *Id.* at 20–22 (citing Ex. 2001 ¶¶ 49–50; Ex. 2002, 156:23–157:3, 158:17–23). Patent Owner further asserts that, because one of ordinary skill would not have reason to expect that Chen could successfully make a cigarette, such a person of ordinary skill would not have considered Chen in an obviousness analysis of the ’752 patent claims. *Id.* at 22–23.

The express disclosure of Chen, however, contradicts Patent Owner’s argument and evidence about Chen’s alleged inoperability. Chen describes the operation of its cigarette filling machine, stating that after pressing block 6 moves downward to press the shredded tobacco into forming slot 2 to form a cylindrical shape, “shredded tobacco pressing block (6) *stops temporarily . . .*, at which time the rocking bar (13) at the rear end of the tongue-shaped pusher (3) moves forwards . . . to push the cylindrical shredded tobacco into the filtered cigarette tube, *after which* the shredded tobacco pressing block (6) and the tongue-shaped pusher (3) return to their respective initial positions.” Ex. 1006, 5 (emphases added); *see* Reply 14–15; Ex. 1017 ¶¶ 27–31. Further, Chen describes its device as having several benefits, including “more uniform shredded tobacco distribution” and “suitable degree of shredded tobacco compactness.” Ex. 1006, 4; *see* Reply 14–15; Ex. 1017 ¶¶ 27–31. As noted by Mr. Bao, if the device of Chen did not maintain the tobacco in a compressed state while it is injected into the empty cigarette paper tube, these stated benefits would not be possible. *See, e.g.*, Ex. 2001 ¶ 51.

Petitioner describes this operation of Chen in its Petition (Pet. 23–24) and, in response to Patent Owner’s arguments that Chen is inoperable to form cigarettes, provides additional discussion and testimony supporting its position in the Reply (Reply 14–16; Ex. 1017 ¶¶ 27–31, 33–37). Based on the evidence presented in this proceeding, we are not persuaded that one of skill in the art would have “immediately recognized that Chen was inoperable to make cigarettes, and would have consequently discarded or otherwise not considered Chen” (PO Resp. 21–22 (citing Ex. 2001 ¶¶ 45–52)), as asserted by Patent Owner. Accordingly, Chen properly is available as prior art in this proceeding.

*c. Whether Brown Qualifies as Prior Art*

As previously noted, our Institution Decision relies on Brown as evidence of the knowledge of one of ordinary skill in the art. Inst. Dec. 6. Patent Owner argues that Petitioner has not proven Brown is a printed publication and also that Brown is not analogous art. PO Resp. 23–31.

Regarding whether Brown is a printed publication, Patent Owner argues that the 1896 date printed on Brown is hearsay and cannot be used to establish dissemination or public availability. *Id.* at 24. As noted by Petitioner, however, “Brown, including the printed date of 1896, falls within the exception to the rule against hearsay under Federal Rule of Evidence 803(16).”<sup>9</sup> Reply 7. Further, Petitioner provides evidence regarding the

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<sup>9</sup> Patent Owner did not object to the authenticity of Brown. *See* 37 C.F.R. § 42.64(b)(1). Patent Owner only now argues that the date printed thereon is hearsay as to Brown’s publication date. PO Resp. 24.

dissemination and public availability of Brown,<sup>10</sup> prior to the filing of the earliest application to which the '752 patent claims priority (i.e., March 11, 2009 (Ex. 1001, [60])). *See* Ex. 1017 ¶ 53 (Dr. Schmid attesting that he purchased Brown from Amazon, and has relied on it since at least 2003); Ex. 1018 (Dr. Schmid's Amazon receipt); Ex. 1019 (Library of Congress letter regarding Brown). Based on the evidence of record, we are persuaded that Brown is a printed publication available as prior art to the '752 patent.

Regarding whether Brown is analogous art, Patent Owner argues that Brown is not in the field of personal cigarette making devices, but is instead a general engineering reference catalog. PO Resp. 27. Patent Owner also argues that Brown is not "reasonably pertinent" to the problem faced by the inventor, i.e., "how to reduce the size of the device housing to below two cigarette lengths." *Id.* (citing Ex. 2001 ¶¶ 19–34). We disagree with Patent Owner's characterization of the problem faced by the inventor. As discussed above, we are not persuaded that the relevant art is limited to cigarette making devices specifically. The problem of identifying an appropriate design, including selecting a reciprocating unit for transmitting rotational power to linear movement, to fit within desired size constraints is not unique to cigarette making devices. Further, we are persuaded that one of ordinary skill in the art would have been aware of general engineering

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<sup>10</sup> Patent Owner objected to this evidence arguing it was untimely-filed supplemental evidence (Paper 24), but did not file a Motion to Exclude. In any event, because Patent Owner did not object to Brown under our rules (which would have provided Petitioner with an opportunity to serve supplemental evidence), but for the first time raised the issue of the publication status of Brown in its Patent Owner Response, we determine Petitioner properly submitted this evidence with its Reply brief in response to Patent Owner's arguments.

principles, such as the various “mechanical movements” disclosed in Brown, and would have looked to such a general resource in designing cigarette making devices, as well as many other types of mechanical-based consumer goods. Reply 23–24; Ex. 1020 (back cover of Brown, identifying it as “[a] basic source book for anyone interested in . . . ideas for design and construction”). Accordingly, Patent Owner’s argument that Brown is not analogous art is unpersuasive.

*d. Whether Chen Teaches or Suggests All Limitations of Claim 2*

Claim 2 depends from claim 1, and, thus, includes all limitations thereof. We first discuss Petitioner’s contentions as to how Chen teaches or suggests each of the elements of claims 1 and 2. We then turn to Patent Owner’s opposition presented in its Response.

*Petitioner’s Contentions*

Claim 1 recites an “automatic cigarette tube injector for injecting tobacco leaves into a hollow cigarette paper tube.” Ex. 1001, 7:66–67. As noted above, Chen is a Chinese utility model application titled “Portable Electric Filtered Cigarette Tube Filling Machine,” and discloses a machine that fills cigarettes with shredded tobacco. Ex. 1006, 1.

Petitioner relies on housing 15, tobacco storage trough 1, feed opening and tube support at cigarette tube clamp 5, and motor 10 with actuation shaft 11 of Chen as teaching the claimed housing, tobacco cavity, feeding opening, and electric motor with an output shaft, respectively. Pet. 36–37, 40 (citing Ex. 1006, 1, 4–5, Fig. 2; Ex. 1009 ¶¶ 49–50, 53, 61). Petitioner further relies on tongue-shaped pusher 3, cigarette forming slot 2, pressing block 6, and rocking bar 13 in combination with actuation shaft 11 of Chen

as teaching the claimed tobacco feeder, retention member, feeding member, and reciprocating unit of the claimed cigarette filling arrangement, respectively. Pet. 38–41 (citing Ex. 1006, 4–5, Fig. 2; Ex. 1009 ¶¶ 55–58, 61).

With respect to the claim 1 requirement that the “cigarette filling arrangement . . . is driven by said electric motor via said output shaft for automatically feeding said tobacco leaves to said cigarette paper tube through said feeding opening of said housing,” Petitioner points to Chen’s crank wheel 9 and rocking bar 13, which are driven by motor 10, to cause tobacco to be fed into cigarette tube 4 through the feed opening at cigarette tube clamp 5. Pet. 38, 40 (citing Ex. 1006, 4–5, Fig. 2; Ex. 1009 ¶ 54).

In Chen, crank wheel 9 is driven to rotate by motor 10 and actuation shaft 11, causing rocking bar 13 to move tongue-shaped pusher 3 “forward[] along the axial direction of the cigarette forming slot (2) to push the cylindrical shredded tobacco into the filtered cigarette tube.” Ex. 1006, 5, Figs. 2, 3. Petitioner relies on these features as teaching that the tobacco feeder is “driven by said output shaft at a longitudinal direction which is an injection direction” and “is linearly moved at said longitudinal direction out of said feeding opening for feeding said tobacco leaves into said cigarette paper tube,” as claimed. Pet. 38, 40–41 (citing Ex. 1006, 4–5, Fig. 2; Ex. 1009 ¶¶ 55, 59, 61). As also can be seen in Figure 2 of Chen, Petitioner contends that tongue-shaped pusher 3 is “longitudinally supported in said housing” and “longitudinally received in said housing,” as claimed. Ex. 1006, Fig. 2; Ex. 1009 ¶¶ 55, 60, 61.

The pressing block 6 of Chen moves perpendicularly to the injection direction “to press the shredded tobacco in the shredded tobacco storage

trough (1) into the cigarette forming slot (2) where the shredded tobacco forms a cylindrical shape” that is then injected into cigarette tube 4, which Petitioner asserts teaches that the feeding member is “s[li]dably supported in said housing along a direction perpendicularly to said injection direction, wherein said tobacco feeder is able to be slid to couple with said retention member to form a tubular chamber for holding said tobacco leaves therein such that said tobacco feeder is able to be driven to push towards said feeding opening of said housing for feeding said tobacco leaves into said cigarette paper tube,” as claimed. Ex. 1006, 5, Fig. 2 (see downward arrow on pressing block 6); Pet. 38–39, 41 (citing Ex. 1006, 4–5, Fig. 2; Ex. 1009 ¶¶ 57, 61). Petitioner also relies on Dr. Schmid’s testimony that, because “the shredded tobacco is formed into a cylinder, the pressing block and pusher must form a tubular chamber to accomplish this.” Pet. 38–39 (citing Ex. 1009 ¶ 57).

Rocking bar 13 of Chen, connected to crank wheel 9 and tongue-shaped pusher 3, converts the rotation of actuation shaft 11 to a sliding movement of tongue-shaped pusher 3, which Petitioner asserts teaches that the reciprocating unit “transmit[s] a rotational power of said output shaft to a sliding movement of said tobacco feeder,” as claimed. *Id.* at 39, 41 (citing Ex. 1006, 4–5, Fig. 2; Ex. 1009 ¶¶ 58, 61).

Claim 1 further recites that the “longitudinal length of said housing is lesser than two cigarette lengths of said cigarette paper tube” and “said tobacco feeder . . . is longitudinally received in said housing to minimize said longitudinal length of said housing which is lesser than two cigarette lengths of said cigarette paper tube.” Ex. 1001, 8:4–5, 8:30–36. Petitioner asserts that the “recitation of relative dimensions in the [’752 patent] claims

cannot render them patentably distinct from prior art devices like Chen, [because] the Chen machine performs in the same fashion whatever its length.” Pet. 37 (citing *Gardner v. TEC Sys., Inc.*, 725 F.2d 1338, 1349 (Fed. Cir. 1984); MPEP § 2144.04 IV; Ex. 1009 ¶ 51). Petitioner further asserts that it would have been obvious to modify the device of Chen in order to make the housing smaller. Pet. 37.

In particular, Petitioner relies on Dr. Schmid’s testimony that “the Chen figures, which are schematic diagrams, show a substantial amount of dead space to the right of crank wheel (9) which would be eliminated by one of ordinary skill in the art as a routine matter,” that “[i]n such an obvious modification, the person of ordinary skill would reposition the schematically depicted restoring spring (14), again as a routine matter,” and that “Chen also includes additional dead space in the housing on either side of pressing block (6) which also could be removed as a routine matter.” *Id.* (citing Ex. 1009 ¶ 52). Petitioner also relies on Dr. Schmid’s testimony that the device of Chen “performs in the same fashion whatever its length.” *Id.* (citing Ex. 1009 ¶ 51).

In claim 2, the automatic cigarette tube injector of claim 1 is further defined. Claim 2 further defines the claimed tobacco feeder, reciting that it includes a “driving member, having a front pusher wall,” and an “arc-shaped retention member frontwardly extended from said front pusher wall of said driving member.” According to Petitioner, pusher 3 of Chen, which includes an unlabeled wall at its back edge, teaches the driving member with a front pusher wall. Pet. 52 (citing Ex. 1006, 4–5, Fig. 3; Ex. 1009 ¶ 87). Petitioner relies on the portion of pusher 3 extending forward of the

unlabeled wall as teaching the arc-shaped retention member. *Id.* (citing Ex. 1006, Figs. 2, 3; Ex. 1009 ¶ 87).

The driving member, as claimed, is “reciprocatingly driven by said output shaft of said electric motor to slide at said housing between a first position and a second position along said injection direction through said feeding opening of said housing.” As described by Petitioner, Chen teaches that pusher 3 is reciprocatingly driven by shaft 11 of motor 10 between first and second positions, shown in solid and broken lines in Figure 3, and that the pusher moves through a feeding opening of the housing. *Id.* (citing Ex. 1006, 4–5, Fig. 3; Ex. 1009 ¶ 87).

The arc-shaped retention member, as claimed, “retain[s] said tobacco leaves at an inner wall of said retention member from said tobacco cavity.” As described by Petitioner, Chen teaches that tobacco leaves in shredded tobacco storage trough 1 are retained at the inner wall of the retention member. *Id.* at 52–53 (citing Ex. 1006, Figs. 2, 3; Ex. 1009 ¶ 87).

Claim 2 further defines the claimed feeding member, reciting that the “feeding member is an arc-shaped feeding member slidably supported in said housing along said direction perpendicularly to said injection direction” and that the “feeding member is slid to couple with said retention member at said first position to form said tubular chamber within said inner wall of said retention member and an inner wall of said feeding member for holding said tobacco leaves within said tubular chamber.” As described by Petitioner, pressing block 6 of Chen, upon which Petitioner relies for teaching the claimed feeding member, must be arc-shaped because pressing block 6 and pusher 3 together form the tobacco into a cylindrical shape. *Id.* at 53 (citing Ex. 1006, 4, 5, Figs. 2, 3; Ex. 1009 ¶ 87). As discussed previously with

respect to claim 1, Chen also describes that pressing block 6 moves perpendicularly to the injection direction. *See* Ex. 1006, 5, Fig. 2 (downward arrow on pressing block 6); Pet. 53 (citing Ex. 1006, 4, 5, Figs. 2, 3; Ex. 1009 ¶ 87).

Finally, claim 2 recites that “when said driving member is driven to slide at said second position, said front pusher wall of said driving member is driven to push towards said feeding opening of said housing for feeding said tobacco leaves into said cigarette paper tube.” As seen in Figure 3 and the corresponding description of Chen, as pusher 3 moves forward in the longitudinal direction, the unlabeled wall at its back edge (i.e., the claimed front pusher wall), pushes the cylindrical shredded tobacco into cigarette tube 4. Ex. 1006, 5; *see* Pet. 24.

Patent Owner’s Contentions

Patent Owner argues that Chen does not teach or suggest a “front pusher wall of said driving member is driven to push towards said feeding opening of said housing for feeding said tobacco into said cigarette paper tube,” as recited in claim 2. PO Resp. 32–35. Patent Owner’s arguments in this regard are premised on the assertion that Chen is inoperable to form cigarettes, and, thus, the structure identified by Petitioner as teaching the claimed front pusher wall does not operate to “feed[] said tobacco into said cigarette paper tube,” as required by the claim. *Id.* at 33–35. However, as discussed above (*see* § II.B.3.b), we are not persuaded that Chen is, in fact, inoperable, but instead determine that Chen describes a device that one of skill in the art would understand functions to form cigarettes. Accordingly, we are not persuaded that Chen does not teach a front pusher wall that feeds tobacco into said cigarette paper tube.

Patent Owner also argues that Chen does not teach or suggest the device housing size is “lesser than two cigarette lengths of said cigarette paper tube,” as recited in claim 1, from which claim 2 depends. PO Resp. 35–37. We first note that Patent Owner has conceded the unpatentability of claim 1. Tr. 19:7–19; PO Resp. 9. However, we also are not persuaded by Patent Owner’s arguments that Chen does not teach or suggest this claim feature.

Patent Owner argues that “Republic’s proposed modification [to remove the dead space and reposition restoring spring 14 of Chen] simply does not work.” PO Resp. 36. Patent Owner asserts that “no matter how much ‘dead space’ is removed, the device of Chen still cannot overcome the minimum size threshold” problem described in the ’752 patent. *Id.* (citing Ex. 2001 ¶ 78). Patent Owner further argues that Petitioner does not explain how its modified version of Chen meets both critical claim features (i.e., maintaining compression and minimizing the housing to lesser than two cigarette paper tube lengths) at the same time. *Id.* at 37–39. Specifically, Patent Owner asserts that “Chen cannot remain functional while simultaneously providing the recited limitations of claim 2.” *Id.* at 38.

According to Patent Owner, if the housing of Chen is to be less than two cigarette lengths, the driving shaft of Chen must be shortened. *Id.* However, the unlabeled front wall still must travel the length of the chamber to drive the entire tobacco cylinder into the paper, causing the rightmost end of the drive shaft to travel into the chamber. *Id.* at 38–39. Patent Owner contends that in this situation, rocking bar 13 would run into presser block 6, preventing further movement of the pusher/drive shaft. *Id.* at 39.

We do not find this argument persuasive. Petitioner provides declaration testimony that “a person of ordinary skill in the art would recognize that the machine design taught by the[] schematic drawings [of Chen] could be implemented in many different ways.” Reply 15 (citing Ex. 1017 ¶¶ 33–37); *see* Ex. 1009 ¶ 52. According to Petitioner, the device of Chen “performs in the same fashion whatever its length.” Pet. 37 (citing Ex. 1009 ¶ 51); *see* Reply 15 (citing Ex. 1017 ¶¶ 38–43). Further, Dr. Schmid testifies that a person of ordinary skill “would have learned to design systems, components and processes to meet desired needs within realistic constraints (like size constraints), and to select proper springs, component sizes and structural arrangements to optimize desired mechanical motion.” Ex. 1017 ¶ 43; *see* Reply 20 (citing Ex. 1009 ¶ 10). We credit Dr. Schmid’s testimony in this regard. Given that the disclosure of Chen is schematic in form, we are persuaded that one of skill in the art would have been more than capable of appropriately rearranging the components in a way to make the device smaller, and would have been motivated to do so in order to make it more portable. *See* Ex. 1006, 3, 4; Ex. 1017 ¶¶ 38–43; Ex. 1009 ¶ 52.

### Conclusion

Given the evidence on this record, we determine Petitioner has shown, by a preponderance of the evidence, that Chen renders obvious claim 2.

*e. Whether Chen, Alone or in Combination with Kastner, Renders Obvious Claims 3–24*

Petitioner asserts that claims 3–6, 9–13, and 16–20 would have been obvious in view of Chen, and that claims 7, 8, 14, 15, and 21–24 would have been obvious in view of Chen and Kastner. Pet. 51–60. Except for claims 5,

11, and 18, Patent Owner does not substantively discuss these claims, apart from its discussion of claim 2 and the discussion of the admissibility of Petitioner's evidence generally, which we have addressed above.

*Obviousness in View of Chen*

For each of claims 3–6, 9–13, and 16–20, Petitioner provides arguments as to how each claim limitation is taught or suggested by Chen, and relies upon Dr. Schmid's testimony. Pet. 53–54, 56–60 (citing Ex. 1006, 4–5, Figs. 2, 3; Ex. 1009 ¶¶ 31, 88–96, 99–106; Ex. 1010, 42–43). We are persuaded that Petitioner has shown that Chen renders obvious claims 3, 4, 6, 9, 10, 12, 13, 16, 17, 19, and 20, and adopt Petitioner's reasoning as our own.

Each of claims 5, 11, and 18 recites a particular configuration of the reciprocating unit. Ex. 1001, 9:4–15, 9:54–65, 10:38–49. Petitioner asserts that this particular claimed design to “convert circular motion into linear motion by a crank-pin on a rotating disk working in the slot of a bell-crank” was known in the art since at least 1896. Pet. 54–56 (citing Ex. 1010, 42–43; Ex. 1009 ¶¶ 31, 93). Patent Owner argues that, without undue experimentation, one of skill in the art would not have chosen the particular claimed configuration for the claimed reciprocating unit because there are many, perhaps “infinite,” different ways of converting rotation to linear motion. PO Resp. 29–30.

We are persuaded, however, that these various ways of converting rotation to linear motion described in Brown are all well within basic knowledge of a mechanical engineer designing any product or device, including personal cigarette making devices. See Reply 23–24 (citing Ex. 1020). We are further persuaded that the “Brown design would be

recognized by one of ordinary skill in the art as an efficient and economical way to convert circular motion into linear motion, because it has been publicly available and widely used for this purpose since well before the earliest application for the '752 patent.” *Id.* at 23 (citing Ex. 1017 ¶ 57). We, thus, are persuaded that the use of such a design in the device of Chen would have been obvious to one of ordinary skill in the art. Pet. 55 (citing Ex. 1009 ¶¶ 93–94).

Accordingly, we are persuaded that Petitioner has shown, by a preponderance of the evidence, that Chen renders obvious claims 5, 11, and 18.

*Obviousness in View of Chen and Kastner*

For each of claims 7, 8, 14, 15, and 21–24, Petitioner provides arguments as to how each claim limitation is taught or suggested by the cited references, and relies upon Dr. Schmid’s testimony. Pet. 51, 57–60 (citing Ex. 1005, 5:18–31, Fig. 5; Ex. 1006, 4–5, Fig. 2; Ex. 1009 ¶¶ 97–100, 103–106). Each of claims 7, 14, and 21 recites a “manual actuator for actuating said feeding member being shifted within said tobacco cavity” and specific details thereof. Ex. 1001, 9:24–35, 10:11–21, 10:63–11:6. Each of claims 8, 15, and 22–24 depends from one of claims 7, 14, and 21.

The cigarette filling machine of Kastner includes handle 20 and handle drive 22, which when rotated manually cause compactor 32 to slide within tobacco slot 18 to couple with spoon 60, meeting the language of claims 7, 14, and 21. Ex. 1005, 5:18–30, Fig. 5. Petitioner also provides evidence that Chen and Kastner both relate to portable cigarette filling machines. *See* Pet. 23–25; Ex. 1005; Ex. 1006. We are persuaded that it would have been well within the ability of a person of ordinary skill in the

art to incorporate the manual feeding member actuator of Kastner's cigarette filling machine into the cigarette filling machine of Chen. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 420–21 (2007) (A person with ordinary skill in the art is “a person of ordinary creativity, not an automaton,” and “in many cases . . . will be able to fit the teachings of multiple patents together like pieces of a puzzle.”).

Thus, we are persuaded that Petitioner has shown that the combination of Chen and Kastner renders obvious claims 7, 14, and 21. We also are persuaded that Petitioner has shown that the cited combination renders obvious claims 8, 15, and 22–24, and adopt Petitioner's reasoning as our own.

### Conclusion

Given the evidence on this record, we determine Petitioner has shown, by a preponderance of the evidence, that Chen renders obvious claims 3–6, 9–13, and 16–20, and that the combination of Chen and Kastner renders obvious claims 7, 8, 14, 15, and 21–24.

### III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 2–6, 9–13, and 16–20 are unpatentable under 35 U.S.C. § 103 as obvious over Chen, and that claims 7, 8, 14, 15, and 21–24 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Chen and Kastner.

IV. ORDER

Accordingly, it is

ORDERED that adverse judgment is entered against Patent Owner with respect to claims 1 and 25 of U.S. Patent No. 8,261,752 B2, and, thus, claims 1 and 25 will be *anceled*;

FURTHER ORDERED that claims 2–24 of U.S. Patent No. 8,261,752 B2 are held *unpatentable*; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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