

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

KOKI HOLDINGS AMERICA LTD.

Petitioner

v.

KYOCERA SENCO INDUSTRIAL TOOLS, INC.

Patent Owner.

PETITION FOR INTER PARTES REVIEW
U.S. PATENT NO. 11,845,167

Case No. IPR2025-00264

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Patent Trial and Appeal Board
U.S. Patent and Trademark Office
PO Box 1450
Alexandria, VA 22313-1450

TABLE OF CONTENTS

TABLE OF EXHIBITS	v
LISTING OF CHALLENGED CLAIMS.....	vii
I. INTRODUCTION	1
II. MANDATORY NOTICES	1
A. Real Parties-In-Interest.....	1
B. Related Matters.....	2
C. Counsel	3
D. Service Information	3
III. FEES	3
IV. REQUIREMENTS FOR IPR	3
A. Grounds for Standing	3
B. Challenge and Relief Requested	3
V. SUMMARY OF THE '167 PATENT	4
A. Brief Description	4
B. Summary of the Prosecution	5
VI. CLAIM CONSTRUCTION	6
VII. REASONABLE LIKELIHOOD OF UNPATENTABILITY	8
A. Ground 1: Claims 1-15 are Obvious based on Haley in view of Lai....	8
1. <i>Claim 1</i>	8
2. <i>Claim 2</i>	24
3. <i>Claim 3</i>	26

4.	<i>Claim 4</i>	28
5.	<i>Claim 5</i>	30
6.	<i>Claim 6</i>	31
7.	<i>Claim 7</i>	35
8.	<i>Claim 8</i>	35
9.	<i>Claim 9</i>	35
10.	<i>Claim 10</i>	35
11.	<i>Claim 11</i>	38
12.	<i>Claim 12</i>	38
13.	<i>Claim 13-14</i>	39
14.	<i>Claim 15</i>	39
B.	Ground 2: Claims 1-15 are Obvious based on Saari/Enstrom in view of Lai.....	40
1.	<i>Claim 1</i>	41
2.	<i>Claim 2</i>	51
3.	<i>Claim 3</i>	51
4.	<i>Claim 4</i>	54
5.	<i>Claim 5</i>	54
6.	<i>Claim 6</i>	55
7.	<i>Claim 7</i>	59
8.	<i>Claim 8</i>	59
9.	<i>Claim 9</i>	59
10.	<i>Claim 10</i>	60

11.	<i>Claim 11</i>	61
12.	<i>Claim 12</i>	61
13.	<i>Claim 13-14</i>	61
14.	<i>Claim 15</i>	62
C.	Ground 3: Claims 1-15 are Obvious based on Kondo	62
1.	<i>Claim 1</i>	62
2.	<i>Claim 2</i>	73
3.	<i>Claim 3</i>	74
4.	<i>Claim 4</i>	76
5.	<i>Claim 5</i>	77
6.	<i>Claim 6</i>	78
7.	<i>Claim 7</i>	81
8.	<i>Claim 8</i>	81
9.	<i>Claim 9</i>	82
10.	<i>Claim 10</i>	82
11.	<i>Claim 11</i>	84
12.	<i>Claim 12</i>	84
13.	<i>Claim 13-14</i>	84
14.	<i>Claim 15</i>	84
D.	Ground 4: Claims 1-15 are Obvious based on Pedicini	85
1.	<i>Claim 1</i>	85
2.	<i>Claim 2</i>	95
3.	<i>Claim 3</i>	97

4.	<i>Claim 4</i>	98
5.	<i>Claim 5</i>	99
6.	<i>Claim 6</i>	100
7.	<i>Claim 7</i>	104
8.	<i>Claim 8</i>	104
9.	<i>Claim 9</i>	105
10.	<i>Claim 10</i>	105
11.	<i>Claim 11</i>	107
12.	<i>Claim 12</i>	107
13.	<i>Claim 13-14</i>	107
14.	<i>Claim 15</i>	107
VIII.	CONCLUSION.....	108

TABLE OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 11,845,167 to Leimbach (“the ’007 patent”)
1002	Prosecution History of the ’167 patent
1003	Declaration of Dr. Glenn E. Vallee
1004	U.S. Patent No. 3,150,488 (“Haley”)
1005	U.S. Patent No. 5,503,319 (“Lai”)
1006	U.S. Patent No. 3,924,692 (“Saari”)
1007	U.S. Patent No. 3,913,685 (“Enstrom”)
1008	U.S. Patent No. 5,720,423 (“Kondo”)
1009	U.S. Patent Publication No. 2006/0180631 (“Pedicini”)
1010	U.S. Patent No. 4,834,278 (“Lin”)
1011	U.S. Publication No. 2006/0261127 (“Wolf”)
1012	U.S. Patent No. 3,636,707 (“Saari ’707”)
1013	U.S. Patent No. 4,953,774 (“Lai ’774”)
1014	U.S. Patent No. 860,536 (“Ellingham”)
1015	U.S. Pub. No. 2005/0217875 (“Forster”)

1016	U.S. Pub. No. 2008/0067213 (“Shima”)
1017	Senco 41 Nailer Operating Instructions

LISTING OF CHALLENGED CLAIMS

Claim 1	
[1.P]	1. A portable fastener driving tool, comprising:
[1.1]	a housing with a storage chamber that contains a pressurized gas that is always above atmospheric pressure;
[1.2]	a hollow cylinder that includes a movable piston;
[1.3]	a movable driver that is in communication with said piston at least during a drive stroke;
[1.4]	a lifter that is in communication with said driver at least during a return stroke;
[1.5]	a prime mover; and
[1.6]	a source of electrical energy that is removably attached to said housing;
[1.7]	said storage chamber being in fluidic communication with a first end of said hollow cylinder; and
[1.8]	said storage chamber including a removable top cap at a location proximal to said first end of said hollow cylinder;
[1.9]	wherein: said piston travels through said hollow cylinder between a higher pressure position and a lower pressure position; said piston has a rest position between operational cycles; and a location of said rest position is proximal to said higher pressure position; and
[1.10]	said pressurized gas is not vented to atmosphere after said drive stroke.
Claim 2	
[2]	2. The tool of claim 1, further comprising: said movable driver including at least one protrusion; and said lifter including at least one extension; wherein: said at least one extension of the lifter mechanically engages with said at least one protrusion of the driver during said return stroke.
Claim 3	
[3.1]	3. The tool of claim 2, further comprising: a guide body with a linear passageway for said driver;

[3.2]	wherein: said lifter moves in a rotational motion and causes said driver to move in a linear motion along said linear passageway.
Claim 4	
[4]	4. The tool of claim 2, wherein: said cylinder and piston act as a gas spring during said drive stroke, and said lifter does not mechanically engage said driver during said drive stroke.
Claim 5	
[5]	5. The tool of claim 1, wherein the piston is positioned inside the top cover when the piston is at or near the first end of the hollow cylinder.
Claim 6	
[6.P]	6. A portable fastener driving tool, comprising:
[6.1]	a housing with a main storage chamber that contains a pressurized gas;
[6.2]	a hollow cylinder that includes a movable piston, wherein:
[6.3]	(a) a first end of the hollow cylinder is always in fluidic communication with said main storage chamber, and
[6.4]	(b) said pressurized gas is not exhausted to atmosphere after a drive stroke;
[6.5]	a driver that is in communication with said piston at least during a drive stroke;
[6.6]	a lifter that is in communication with said driver at least during a return stroke;
[6.7]	a guide body with a linear passageway for said driver;
[6.8]	a handle portion;
[6.9]	a motor that provides motive power for said lifter;
[6.10]	a removable battery pack that provides energy for said motor; and
[6.11]	a removable magazine that holds a plurality of fasteners;
[6.12]	wherein: said removable battery pack is attached proximal to said handle portion; and

[6.13]	said removable magazine is attached proximal to an exit end of said guide body, wherein said magazine extends past said removable battery pack.
Claim 7	
[7.1]	7. The tool of claim 6, further comprising: said movable driver including at least one protrusion; and said lifter including at least one extension; wherein, during said return stroke: (a) said at least one extension of the lifter mechanically engages with said at least one protrusion of the driver, and
[7.2]	(b) said lifter moves in a rotational motion and causes said driver to move in a linear motion along said linear passageway.
Claim 8	
[8]	8. The tool of claim 7, wherein: said cylinder and piston act as a gas spring during said drive stroke, and said lifter does not engage said driver during said drive stroke.
Claim 9	
[9]	9. The tool of claim 6, wherein: a bottommost surface of said magazine is farther from a centerline of said exit end of the guide body than is a bottommost surface of said battery pack.
Claim 10	
[10.P]	10. A portable fastener driving tool, comprising:
[10.1]	(a) a housing with a storage chamber that contains a pressurized gas;
[10.2]	(b) a hollow cylinder that includes a movable piston, wherein said storage chamber is in fluidic communication with said hollow cylinder;
[10.3]	(c) a movable driver that is in communication with said piston at least during a drive stroke;
[10.4]	(d) a lifter that is in communication with said driver at least during a return stroke;
[10.5]	(e) a guide body that is located proximal to said hollow cylinder, and having a linear passageway for said driver, and having an exit end that is located distal from said hollow cylinder;

[10.6]	(f) a removable battery pack that is located at a rear portion of said tool; and
[10.7]	(g) a safety contact element proximal to said exit end, said safety contact element being disposed at a front portion of the tool, above said guide body.
Claim 11	
[11]	11. The tool of claim 10, further comprising: an electric motor that derives energy from said battery pack, which provides motive power for said lifter.
Claim 12	
[12]	12. The tool of claim 11, wherein: said safety contact element prevents said drive stroke from occurring unless said safety contact element is pressed against a solid surface.
Claim 13	
[13.1]	13. The tool of claim 11, further comprising: (a) said movable driver including at least one protrusion; and (b) said lifter including at least one extension; (c) wherein, during said return stroke: (i) said at least one extension of the lifter mechanically engages with said at least one protrusion of the driver, and
[13.2]	(ii) said lifter moves in a rotational motion and causes said driver to move in a linear motion along said linear passageway.
Claim 14	
[14]	14. The tool of claim 11, wherein: said cylinder and piston act as a gas spring during said drive stroke, and said lifter does not engage said driver during said drive stroke.
Claim 15	
[15]	15. The tool of claim 10, wherein: said safety contact element is located directly above said guide body, and extends from said front portion of the tool toward a rear portion of the tool, extending along at least a surface of the guide body that is on the opposite side of the tool from where said battery pack is located.

I. INTRODUCTION

Koki Holdings America Ltd. (“Petitioner”) petitions for Inter Partes Review (“IPR”) of claims 1-15 of U.S. Patent No. 11,845,167 (“the ’167 patent”). The ’167 patent describes “portable tools that drive staples, nails, or other linearly driven fasteners” and, more specifically, “a gas spring linear fastener driving tool, in which a cylinder filled with compressed gas is used to quickly force a piston through a driving stroke movement, while also driving a fastener into a workpiece.” Ex. 1001, 1:34-41.

The gas spring tool claimed in the ’167 patent is a result of conventional, off-the-shelf designs made possible by advancements in the unrelated field of light weight rechargeable lithium-ion batteries. The idea of a compressed gas nailer dates back to the 1960’s and 1970’s (as shown by the Haley and Saari patents) and the structure of the claimed “lifter member” was developed in the mid-1990’s (as shown by the Lai and Kondo patents). Grounds 1-2 are based on prior art combinations that were never substantively considered by the USPTO. Grounds 3-4 show how the claims are also unpatentable based on the prior art that was considered during original examination.

II. MANDATORY NOTICES

A. Real Parties-In-Interest

Koki Holdings America Ltd. and Koki Holdings Co., Ltd. are the real parties-in-interest.

B. Related Matters

The challenged patent has not been previously asserted. Related patents from the same patent family have been involved in litigation. On January 25, 2017, the patent owner filed a complaint in *Senco Brands, Inc. v. Hitachi Koki USA Ltd.*, S.D.OH. No. 1:17-cv-00061, asserting U.S. Patent Nos. 8,011,547, 8,267,296, 8,267,297, 8,286,722, 8,387,718, and 8,602,282 against Koki. That case was refiled on May 23, 2017 as D.DE. No. 1:17-cv-00598. On September 25, 2017, the patent owner requested a Section 337 investigation at the International Trade Commission (ITC) for those patents, which was instituted as *Certain Gas Spring Nailers and Components Thereof*, ITC Inv. No. 337-TA-1082. The district court case was stayed pending resolution of the ITC investigation. The ITC investigation led to cross-appeals: *Kyocera Senco Indus. Tools Inc. v. ITC*, C.A.F.C. No. 20-1046 and *Koki Holdings America Ltd. v. ITC*, C.A.F.C. No. 20-2050. The Federal Circuit affirmed the ITC's finding of no violation on January 21, 2022 for four of the patents and reversed the ITC's finding of a violation for a fifth patent (one patent was withdrawn). On remand, the ITC terminated the investigation at the patent owner's request.

The '167 patent is in the same patent family as U.S. Patent Nos. 9,676,088, 10,478,954, 11,034,007, and 11,241,776 for which Petitioner is concurrently petitioning for IPR.

C. Counsel

Petitioner provides the following designation of counsel:

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D. Service Information

Please address all correspondence to the lead counsel's address above.

Petitioner also consents to electronic service by email at Koki_IPR@mwe.com.

III. FEES

Petitioner authorizes the Office to charge Deposit Account No. 50-0417 for the petition fee set in 37 C.F.R. §42.15(a) and for any other required fees.

IV. REQUIREMENTS FOR IPR

A. Grounds for Standing

Petitioner certifies that the '167 patent is available for IPR and that Petitioner is not barred or estopped from requesting IPR.

B. Challenge and Relief Requested

Petitioner requests IPR of claims 1-15 of the '167 patent on the grounds listed below. This Petition is supported by the declaration of Dr. Glenn Vallee. Ex. 1003, Vallee.

Ground	Claims	Basis for Rejection
1	1-15	Obvious based on U.S. Patent No. 3,150,488 (“Haley”) in view of U.S. Patent No. 5,503,319 (“Lai”)
2	1-15	Obvious based on U.S. Patent Nos. 3,924,692 (“Saari”) and 3,913,685 (“Enstrom”) in view of U.S. Patent No. 5,503,319 (“Lai”)
3	1-15	Obvious based on U.S. Patent No. 5,720,423 (“Kondo”)
4	1-15	Obvious based on U.S. Patent Publication No. 2006/0180631 (“Pedicini”)

Haley issued in 1964. Saari and Enstrom issued in 1975. Lai issued in 1996. Kondo issued in 1998. Pedicini was published on August 17, 2006. All qualify as prior art because they were patented or published over a year before the earliest possible priority date, which is the filing of a provisional application on October 5, 2007. Kondo and Pedicini are discussed in the specification of the ’167 patent and identified as “Related Art.”

V. SUMMARY OF THE ’167 PATENT

A. Brief Description

The ’167 patent is directed to “a gas spring linear fastener driving tool, in which a cylinder filled with compressed gas is used to quickly force a piston through a driving stroke movement, while also driving a fastener into a workpiece.” ’167 patent, 1:37-41. In an embodiment illustrated below, a driver member 490 (orange) is attached to a piston 458 (green) and lifted by a lifter member 400 (bright yellow)

against compressed gas in a hollow cylinder 492 (light yellow) and a main storage chamber 454 (blue). '167 patent, Figs. 20-21, 21:57-22:22. The driver member is then released and the compressed gas pushes on the piston and driver member to drive a nail (red) into a workpiece. *Id.*

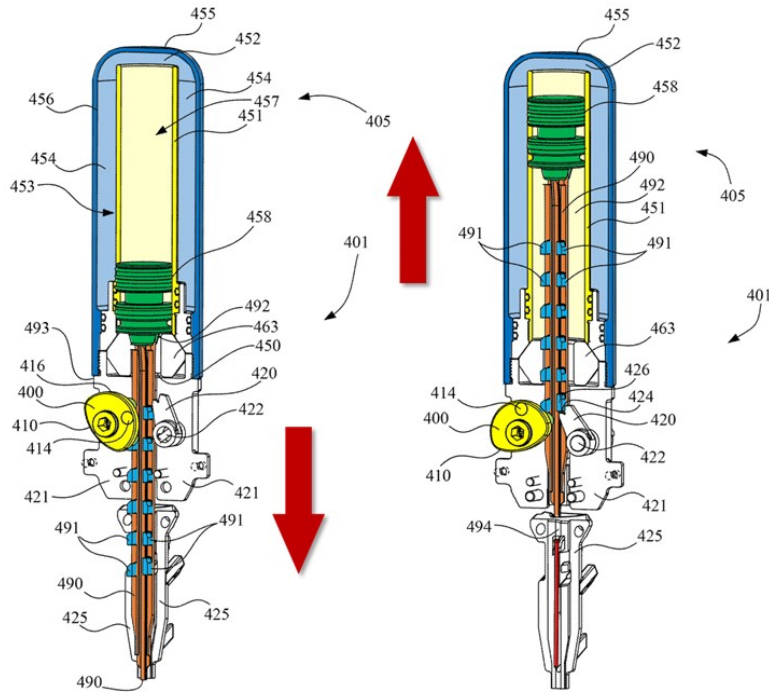


Fig. 20

Fig. 21

B. Summary of the Prosecution

The '167 patent issued from a continuation application filed on January 10, 2022, was granted on December 19, 2023, and claims priority through five applications to a provisional application filed on October 5, 2007.

On February 22, 2023, the Examiner rejected claims 5-8 as indefinite, rejected claims 1-4 as anticipated by Sollberger, and found claims 9-14 to be allowable. On

May 22, 2023, the Patent Owner amended claims 1 and 5. The Examiner issued a Notice of Allowance on August 9, 2023.

VI. CLAIM CONSTRUCTION¹

The Federal Circuit held that the term “lifter member” in the related patents is a means-plus-function term subject to §112(f). Petitioner submits that the term “lifter” in the claims of the ’167 patent is likewise a means-plus-function term, because the ’167 patent claims also lack any “recital of structure, material, or acts in support thereof” for the “lifter” element. 35 U.S.C. §112(f). The “lifter” of the independent claims only describes a function and is not accompanied by any structural recitations. ’167 patent, claims 1, 6, 10. Furthermore, the dependent claims cannot transform the means-plus-function “lifter” from the independent claims into a broader, *non*-means-plus-function term, because §112(d) requires that each of those dependent claims “shall be construed to incorporate by reference all the limitations of the claim to which it refers” and must “specify a further limitation.” 35 U.S.C. §112(d).

The parties agreed during the ITC investigation that “main storage chamber” means “a chamber that is distinct from the volume of the cylinder and contains part of the working air volume during operation.” A dispute later arose as to how to

¹ The constructions of these terms are only relevant to Ground 4, and is not necessary for Grounds 1–3, since they satisfy any conceivable constructions.

interpret the agreed-upon construction. Petitioner believed the terms “volume” and “cylinder” in the agreed construction respectively referred to the “displacement volume” and “hollow cylinder” expressly recited in the claims. In contrast, Patent Owner conceded that “cylinder” referred to the claimed “hollow cylinder,” but alleged that “volume” did not refer the claimed “displacement volume” and instead referred to the entire region enclosed by the “hollow cylinder,” including regions that are not part of the “displacement volume.” The ITC ultimately found in the Patent Owner’s favor. On appeal, the Federal Circuit did not conduct a *de novo* claim construction (as it did for “lifter member”), but instead only reviewed the ITC’s resolution of the parties’ dispute over the agreed-upon construction at the deferential clear error standard. *Kyocera Senco Indus. Tools Inc. v. ITC*, 22 F.4th 1369, 1381 (Fed. Cir. 2022).

Given the misunderstanding caused by the ambiguity in the prior agreed-upon construction—and given that the ITC’s claim construction is not binding here or in any other forum beyond the ITC—Koki proposes that “storage chamber” be construed with clarification to mean “a chamber that is distinct from the displacement volume of the hollow cylinder and contains part of the working air volume during operation.” The claims of the ’167 patent only recite one volume:

the “storage chamber.”² The only “volume” that the specification discusses for the “hollow cylinder” is its “displacement volume,” which is the portion of that cylinder “created by a stroke of said piston.” ’167 patent, 10:22-25. Certain dependent claims in related patents require the “storage chamber” to be outside the cylinder (see U.S. Patent No. 9,676,088 patent, claim 5), but there is nothing in the intrinsic record or any of the claims of the ’167 patent that prevents the “main storage chamber” from being in the hollow cylinder, so long as it is distinct from its separately-recited “displacement volume.” .

VII. REASONABLE LIKELIHOOD OF UNPATENTABILITY

A. Ground 1: Claims 1-15 are Obvious based on Haley in view of Lai

1. Claim 1

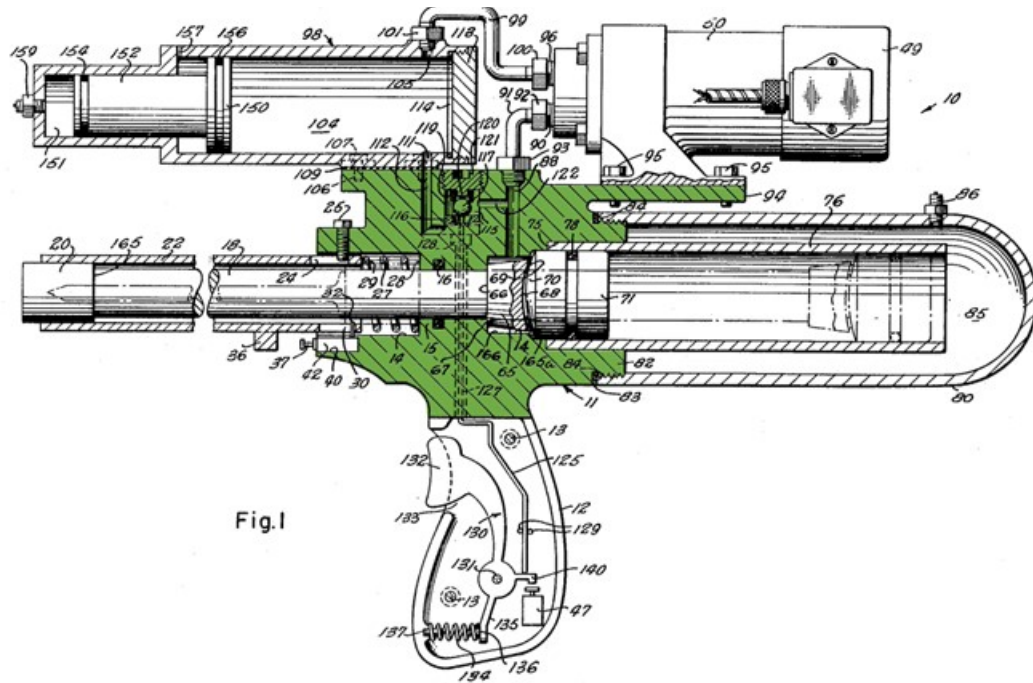
Element [1.P]

U.S. Patent No. 3,150,488 (“Haley”) discloses “[a] portable fastener driving tool.” Haley’s “invention relates to power devices and more particularly to a pressure fluid power device for operating hand tools.” Haley, 1:7-9.

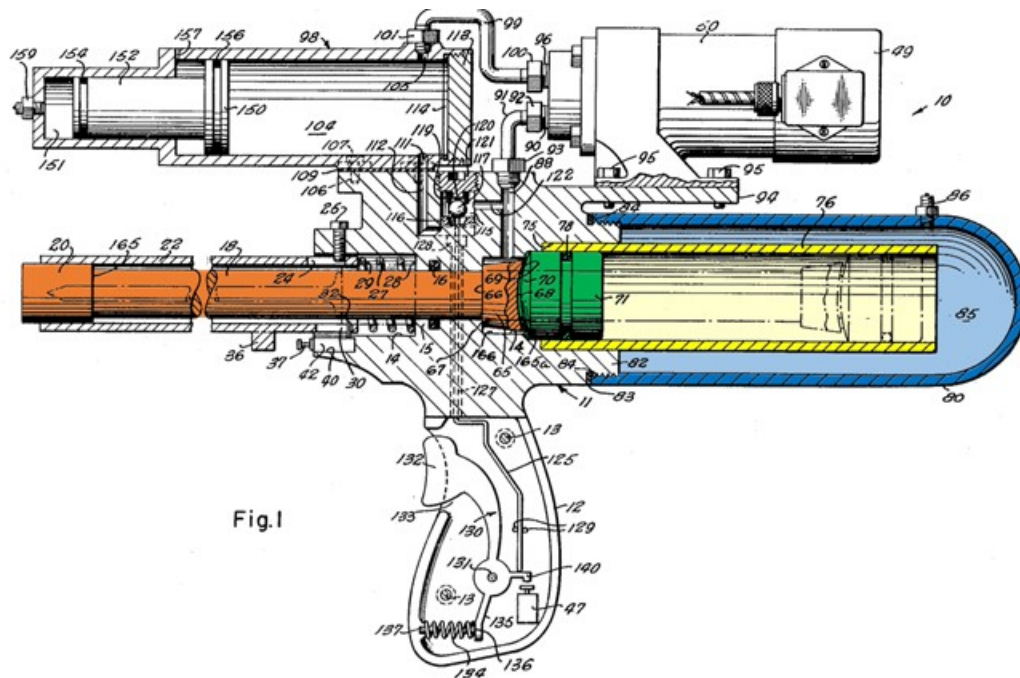
Element [1.1]

Haley discloses “a housing with a storage chamber that contains a pressurized gas that is always above atmospheric pressure.” Haley discloses “a housing” (“housing 40,” green). Haley, 2:47, Fig. 1.

² The “storage chamber” does not refer to a separate physical enclosure, but rather to a fixed volume of air. ’176 patent, 21:64–22:2.

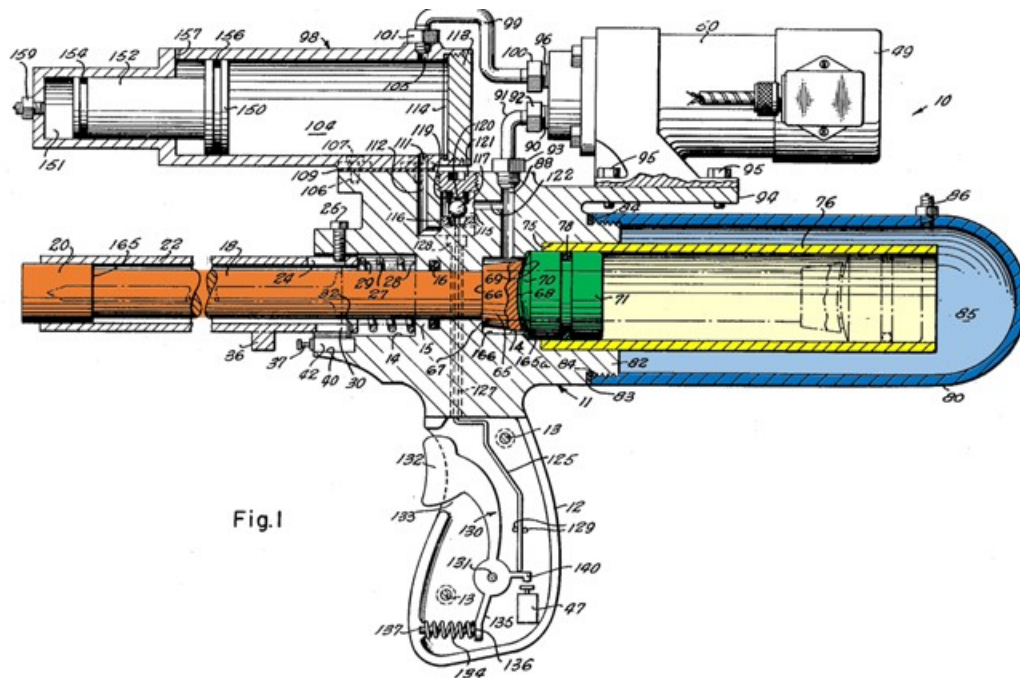


Haley refers to its storage chamber as “chamber 85” (blue) which is a chamber formed by “elongate accumulator shell 80.” Haley, Fig. 1; 3:40-54. Haley’s storage chamber “contains a pressurized gas that is always above atmospheric pressure.” Haley states that “the gas introduced into the gas chamber 85 may be initially of a relatively large value, say 1,000 pounds per square inch.” Haley, 7:1-13. During operation, the movement of the accumulator piston upward causes the gas pressure in chamber 85 to increase up to a higher value, such as 2,000 psi. Haley, 7:6-10. Both values are above atmospheric pressure (14.7 psi). Vallee, ¶52.



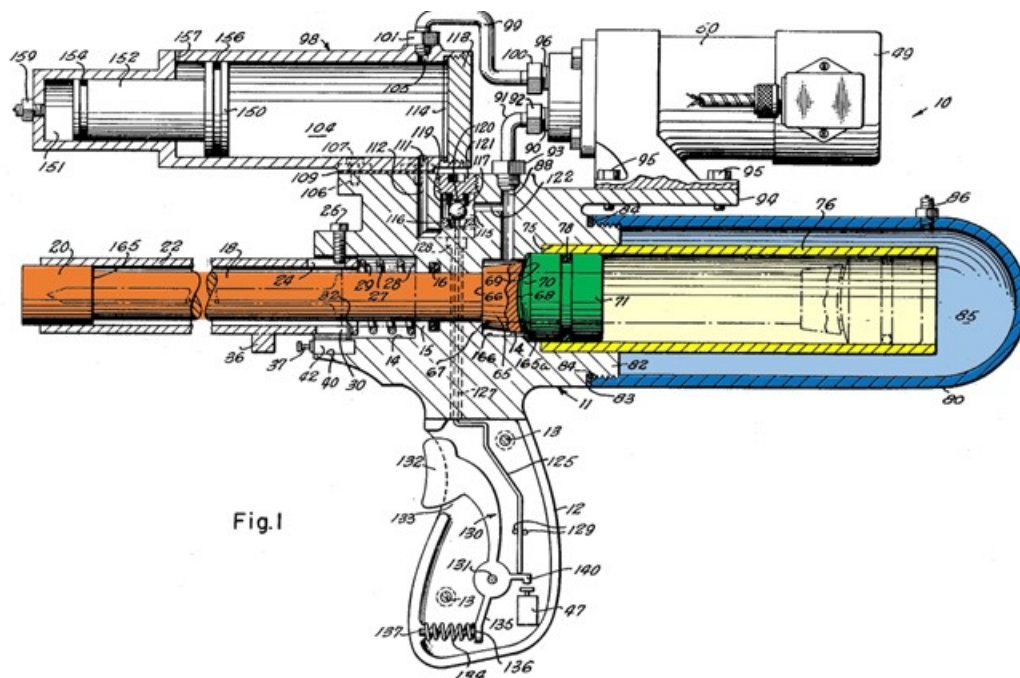
Element [1.2]

Haley discloses “a hollow cylinder that includes a movable piston.” Haley refers to its hollow cylinder (yellow) as “extension cylinder 76,” refers to the piston (green) within that hollow cylinder as “accumulator piston 71,” and says that the piston is “moveable within the cylinder extension.” Haley, 3:33-39, Figs. 1, 3-4.



Element [1.3]

Haley discloses “a movable driver that is in communication with said piston at least during a drive stroke.” Haley’s “movable driver” (“drive piston 18” and its “hammerhead 20,” orange) is in communication with its piston (“accumulator piston 71,” green) during a drive stroke. Haley, 2:20-23, 5:51-70, 5:74-6:7, Fig. 1, 3-4.

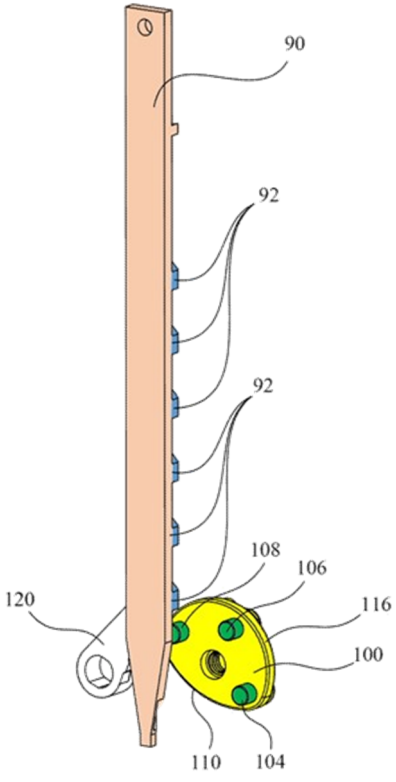
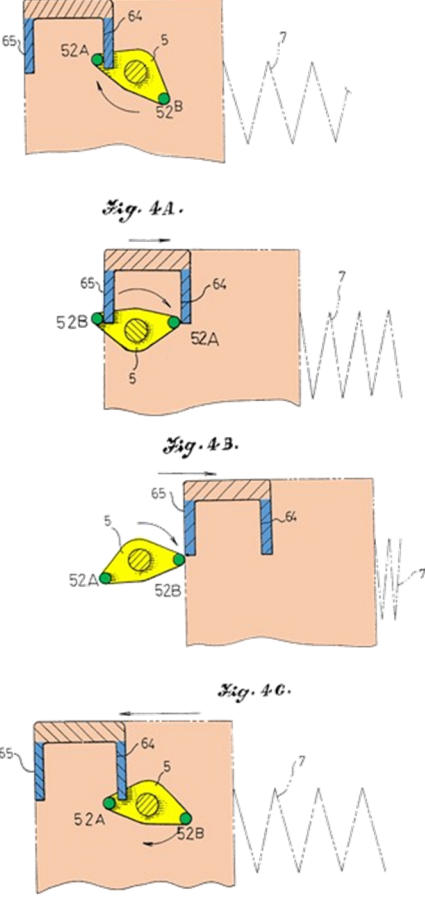


Element [1.4]

Haley discloses a hydraulic lifting mechanism and thus does not have “a lifter that is in communication with said driver at least during a return stroke.” However, as explained by Dr. Vallee, it would have been obvious—at the filing of the ’167 patent—to replace Haley’s hydraulic lifter with the claimed “lifter,” and to modify Haley’s driver to have a protrusion so that it can be mechanically engaged by that lifter to move it through its return stroke, as disclosed by U.S. Patent No. 5,503,319 (“Lai”). Vallee, ¶55.

Lai discloses an electrically-powered, mechanical lifting mechanism with a structure that is essentially identical to the “lifter member” disclosed in the ’167 patent. Compare ’167 patent, Fig. 12 with Lai, Figs. 3-4. The “lifter” of the ’167 patent includes a rotatable cam lifter 100 (yellow, below left), with pin 104, 106, and

108 (green) on its face surface that engage protrusions 92 (blue) on the driver member 90 (orange). '167 patent, 9:36-52, 16:39-53, Fig. 12. The '167 patent also discloses two-pin variants: lifter members 465 and 480 in Figs. 31 and 33. '167 patent, 32:21-36, 32:54-33:2. Lai discloses a rotatable cam 5 (yellow, below right), with pins 52A and 52B (green) on its face surface that engage two protrusions 64 and 65 (blue) from a U-shaped member 61 on the driver member 6 ("hammer," orange). Lai, 1:62-63, 2:14-25, Figs. 4A-D. Lai's lifter member is moved by a prime mover ("motor 3"). Lai, 2:14-16, Fig. 2.

'167 Patent Lifter	Lai Lifter Member
 Fig. 12	 <i>Fig. 4A.</i> <i>Fig. 4B.</i> <i>Fig. 4C.</i> <i>Fig. 4D.</i>

Lai is directed to an “electric stapling gun.” Lai, 1:1-2. However, the claims of the ’167 patent recite methods for controlling “a portable power tool,” which the ’167 patent describes more particularly as “portable tools that drive staples, nails, or other linearly driven fasteners.” ’167 patent, 1:34-36. A person of ordinary skill in the art (“POSITA”) would consider staplers to be a subcategory of nailers. Vallee, ¶57. For example, U.S. Patent No. 4,834,278 (“Lin,” Ex. 1010) is titled “Structure of DC Motorized Nailing Machine” and discloses a preferred embodiment that drives staples. Ex. 1010. Thus, Lin is directly relevant prior art for the ’167 patent.³ As Dr. Vallee explains, developments in portable nailers would tend to appear first in the context of portable staplers such as Lin and Lai due to the lower power needed to drive staples as compared to nails, and these improvements would later be applied generally to portable nail guns, notwithstanding their larger power drain requirements, as battery technology continued to improve. Vallee, ¶58. While Lin and Lai use metal springs rather than compressed gas springs, Dr. Vallee explains that a POSITA would consider metal springs and compressed gas springs to be interchangeable depending on the use case. Vallee, ¶58. This is reflected by various prior art references—for example, the Saari patent discloses an embodiment “which

³ Even if the ’167 patent claims did not include staplers, Lin is still at least analogous art because it is directly pertinent to the problem of needing a compact lifting mechanism that can be powered by a portable battery. Vallee, ¶57.

utilizes a compressible gas, such as air or the like, as the spring means” (Saari, 4:1-3) and U.S. Publication No. 2006/0261127 (“Wolf,” Ex. 1011) likewise discloses an embodiment where “the compression spring element 42 is formed as a gas spring (Wolf, ¶[0048]). The ’167 patent itself reflects this interchangeability with an embodiment where the compressed gas spring is exchanged for “a mechanical spring 496, which could be a fast-acting coil spring.” ’167 patent, 29:3-8. Thus, a POSITA would look to Lai’s portable stapler design for improvements to incorporate into nailers such as Haley’s nail gun and would have done so by the filing of the ’167 patent as battery technologies had continued to progress following Lai’s issuance in 1996. Vallee, ¶58.

A POSITA at the filing of the ’167 patent would have been motivated to replace Haley’s hydraulic lifting mechanism with Lai’s lifter member. A motivation to combine “may be found explicitly or implicitly in market forces; design incentives; the ‘interrelated teachings of multiple patents’; ‘any need or problem known in the field of endeavor at the time of invention and addressed by the patent’; and the background knowledge, creativity, and common sense of the person of ordinary skill.” *Plantronics, Inc. v. Aliph, Inc.*, 724 F.3d 1343, 1354 (Fed. Cir. 2013). As explained by Dr. Vallee, Haley’s hydraulic lifting mechanism was a known problem, because it was bulky and subject to the risk of hydraulic fluid leaking into the compressed gas chambers. Vallee, ¶59. In fact, this problem was

explicitly discussed less than a decade later in U.S. Patent No. 3,636,707 (Ex. 1012), which explained that “[t]he Haley devices are cumbersome, too heavy for prolonged use by an operator and subject to comingling of the noncompressible fluid with the compressible fluid or gas resulting in malfunctioning of the devices as well as having too long a time cycle between operative strokes thereof.” Ex. 1012 [Saari’707], 1:12-16. Dr. Vallee explains that these problems stemmed solely from Haley’s hydraulic lifting mechanism. Vallee, ¶60. Dr. Vallee further explains that a complete solution to Haley’s identified problem was not feasible at the time of Saari ’707 and that the improvement offered by Saari ’707 could only address the cumbersomeness factor by moving the hydraulic pump off the tool. Vallee, ¶60; Ex. 1012 [Saari’707], 5:20-28. Not long after that, the same inventor (Saari) disclosed another powered nailer in U.S. Patent No. 3,924,692 (“Saari,” Ex. 1006) that eliminated the hydraulic lifting mechanism and replaced it with an electrically-powered mechanical lifter. *See* Saari. That trend to electrically-powered mechanical lifting mechanisms is also reflected by Lin, which denigrates both “pneumatic power operated and motorized stapling machines” because they are “not portable and the utility of which are within the confines of the area where power source is available.” Lin, 1:27-30. Lin’s proposed solution involved “a nailing machine to make use of battery power to drive a DC motor so as to turn round gear set, ball screws and gear wheel, letting spring and guide block start nailing.” Lin, 1:56-58.

Lai further refines the battery-powered mechanical lifter of Lin. Lai expressly discusses its benefits in efficiency, power, and compactness over the prior art (such as Lin, which is prior art of record in Lai). Lai identifies an “ideal” electric stapling gun as being “energy saving, strong in hitting force and compact in size” and explains that its disclosed lifter member with two pins that engage two protrusions of the U-shaped member 61 leads to “1.8 times the compression of the prior art,” “provide the same hitting effect with less power consumption,” and be “smaller in size thereby increasing flexibility.” Lai, 1:9-10. 2:26-45.

Dr. Vallee explains that a POSITA would have solved Haley’s problem by incorporating Lai’s lifter member. Vallee, ¶62. Lai was a known solution to Haley’s problem of being bulky (solved by Lai’s use of a compact mechanical lifter member rather than a bulky hydraulic lifting mechanism, as well as Lai’s improved design for its specific mechanical lifter member) and Haley’s problem of being subject to the risk of hydraulic fluid leaking (solved by Lai’s use of a mechanical lifter member rather than a hydraulic lifting mechanism). Dr. Vallee explains that a POSITA would have been able to implement Lai’s lifter member in Haley with predictable results. Vallee, ¶62. Lai teaches adding a “U-shaped member 61” with protrusions to the driver blade (as a modification to prior art such as Lin, which has a driver blade without protrusions) that can be engaged by pins 52A and 52B of Lai’s lifter member. Lai, 2:4-7. Similarly, a POSITA would have understood that by adding

protrusions to Haley's driver blade it could be lifted by Lai's lifter member to achieve the same results predicted by Lai. Vallee, ¶62.

Dr. Vallee also explains that there was an additional, independent motivation to replace Haley's hydraulic lifting mechanism with Lai's lifter member because market forces and design needs favoring a portable, battery-powered nailer. Vallee, ¶63; Lin, 1:6-31 (discussing state of the art in 1989); Kondo, 1:9-44 (same for 1998); Pedicini, ¶¶[0003]-[0019] (same for 2006). Artisans repeatedly noted over the years that corded power nailers (with a pneumatic air hose, an electrical power cable, or both) were not ideal because of their lack of portability. Vallee, ¶63; Lin, 1:21-26; Kondo, 1:9-29; Pedicini, ¶[0005]. But the commercially-available portable power nailers were either combustion nailers (requiring costly fuel and emitting fumes) or electrical flywheel nailers (with low power output). Vallee, ¶63; Pedicini, ¶¶[0006]-[0007]. The obvious solution presented by the prior art was to take the compressed gas spring design first conceived by Haley and make it portable by implementing the battery-powered lifter member of Lai. Vallee, ¶64. The only missing piece for that solution was a reasonably-priced portable battery pack that could provide the power needed to make these off-the-shelf designs commercially feasible. *Id.* Battery technologies continued to advance, largely driven by smartphones and electric vehicles in the early 2000s, such that by the filing of the '167 patent, it was obvious to obtain a portable, battery-powered nailer by combining Haley's

compressed gas nailer design with Lai's battery-powered lifter member. *Id.* That is, the compressed gas nailer claimed by the '167 patent was not unlocked by any innovation in the field of powered nailers, but rather was an obvious combination of old, off-the-shelf designs motivated by the need for a battery-powered nailer and the availability of suitable portable batteries. *Id.*; see *Plantronics*, 724 F.3d at 1354.

Element [1.5]

The combination of Haley and Lai discloses “a prime mover.” Lai's lifter is moved by a prime mover (“motor 3”). Lai, 2:14-16, Fig. 2.

Element [1.6]

The combination of Haley and Lai discloses “a source of electrical energy that is removably attached to said housing.” Lai's motor is powered by a source of energy (Lai's battery 2), which is removably attached to the housing as reflected by Fig. 1 showing battery 2 (purple) attached and Fig. 2 showing battery 2 detached and showing an internal attachment clip (orange). Lai, Figs. 1-2; 1:25-35, 1:44-54, 1:60-62, 2:2; Vallee, ¶66.

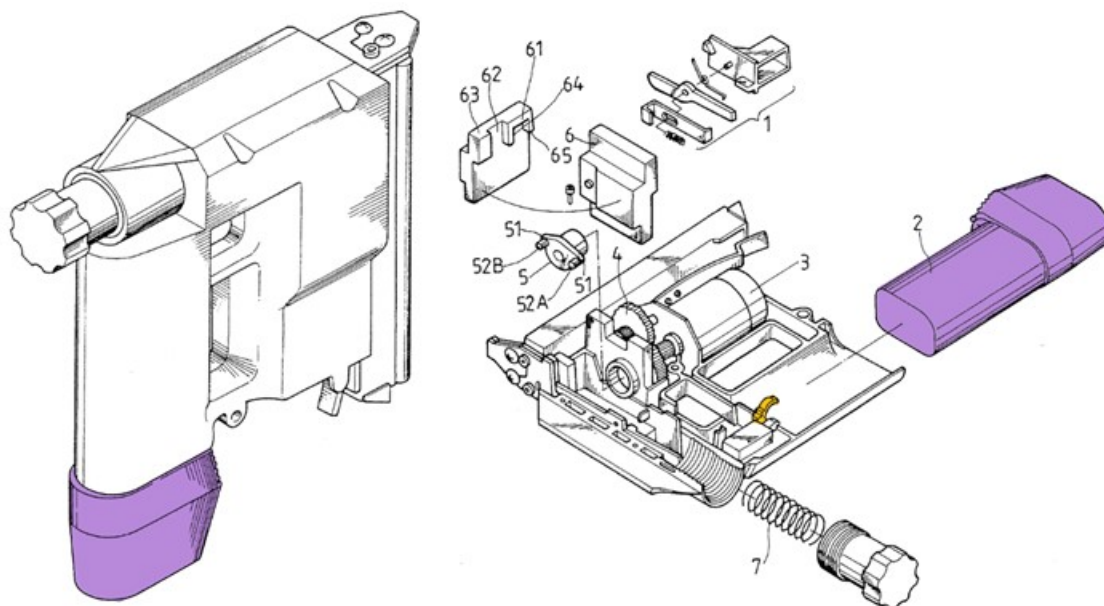
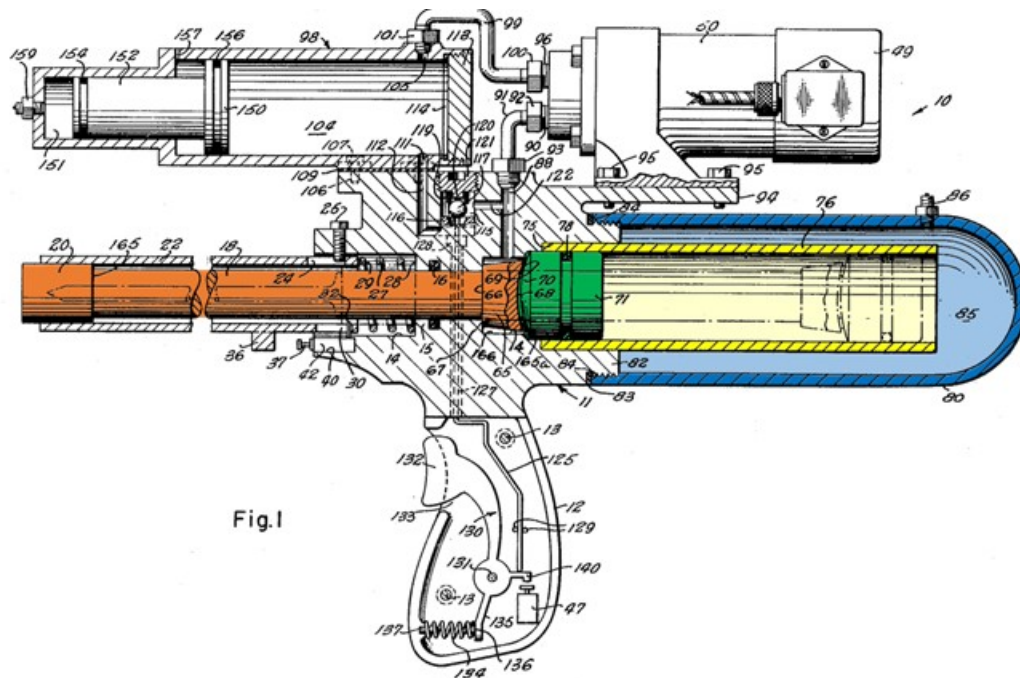


Fig. 1.

F I G. 2

Element [1.7]

Haley discloses “said storage chamber being in fluidic communication with a first end of said hollow cylinder.” Haley’s main storage chamber 85 (blue) is in fluidic communication with the first end of hollow cylinder 76 (yellow), which is shown in Figure 1, where the first end of cylinder 76 (right) is open to chamber 85.



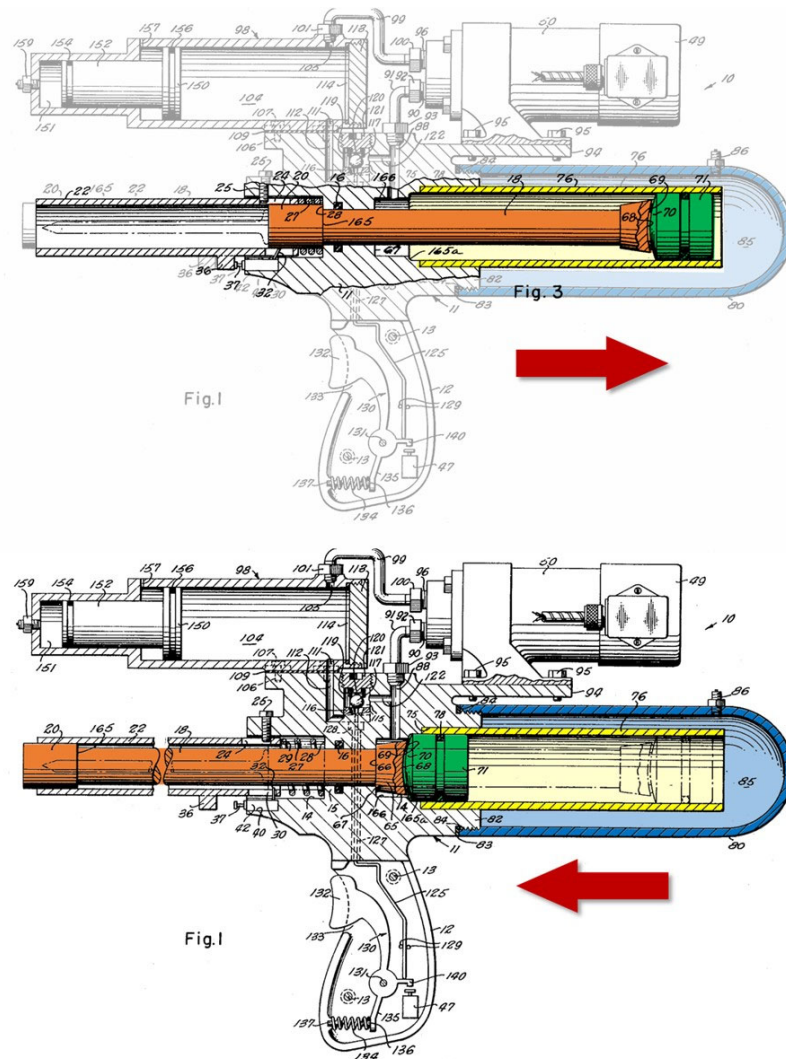
Element [1.8]

Haley discloses “said storage chamber including a removable top cap at a location proximal to said first end of said hollow cylinder.” Haley’s “elongate accumulator shell 83” (blue) is a removable top cap “threaded on the rearward extension 82 of the body” proximal to the first end (right in Fig. 1) of the hollow cylinder 76. Haley, 3:40-45, Fig. 1; Vallee, ¶68.

Element [1.9]

Haley discloses “wherein: said piston travels through said hollow cylinder between a higher pressure position and a lower pressure position; said piston has a rest position between operational cycles; and a location of said rest position is proximal to said higher pressure position.”

Haley's piston ("accumulator piston 71," green) travels through the hollow cylinder ("extension cylinder 76," yellow) between a higher pressure position (the rightward position shown in Fig. 3, which Haley says can be 2,000 psi) and a lower pressure position (leftward position shown in Fig. 1, which Haley says can be 1,000 psi). Haley, Figs. 1, 3, 7:4-10; Vallee, ¶70.



Haley discloses two rest positions: the lower position following a drive stroke shown in Fig. 1, which Haley refers to as the “normal at rest” position (Haley, 5:22-

23), and the higher position following a return stroke shown in Fig. 3, which is at or near what Haley refers to as the “fully retracted or cocked position” (Haley, 6:13-14). Vallee, ¶71. Haley expressly discloses that the tool will rest at or near the higher position (after the return stroke)—if the guide barrel “has not been moved inwardly . . . movement of the drive piston and the accumulator piston will stop.” Haley, 5:70-74, Fig. 3; Vallee, ¶71. The piston and driver will rest in that position until “the forward end of the guide barrel is then pressed against the work piece or structure into which the nail is to be driven,” at which point “the motor 49 is once again connected to the input circuit 52.” Haley, 5:74-6:7; Vallee, ¶71.

Element [1.10]

Haley discloses “said pressurized gas is not vented to atmosphere after said drive stroke.” While Haley’s main storage chamber has a “valve 86,” that valve is only a connection point by which compressed gas may be introduced from an external gas supply to initially charge the chamber 85 to then be re-used for a plurality of said operating cycles. Haley, Fig. 1 and 3:45-47; Vallee, ¶72. Haley discloses a sealing means 83 for its elongate accumulator shell 80 (which contains the storage chamber, “chamber 85”) to “effect a fluid tight seal,” which prevents the pressurized gas from being vented to the atmosphere and allows it to instead be re-used. Haley, 3:40-45, Fig. 1; Vallee, ¶72.

2. *Claim 2*

Haley and Lai disclose “said movable driver including at least one protrusion; and said lifter including at least one extension; wherein: said at least one extension of the lifter mechanically engages with said at least one protrusion of the driver during said return stroke.”

In this combination, the driver would have protrusions mechanically engaged by extensions of the lifter. Lai’s lifter includes extensions protruding from its surface (pins 52A and 52B, green) that fit between the spaced-apart protrusions of the driver (blue). Lai, Figs. 3-4, 2:13-21; Vallee, ¶74.

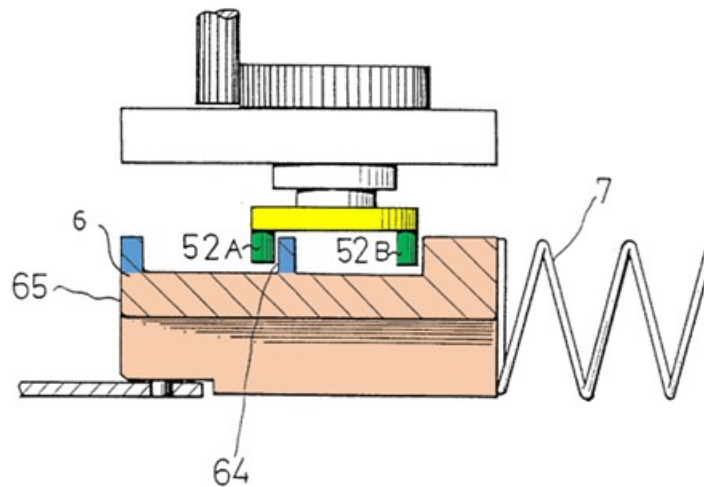


Fig. 3.

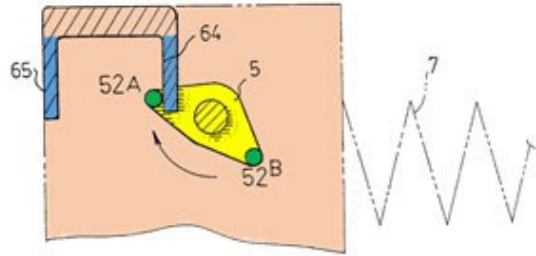


Fig. 4A.

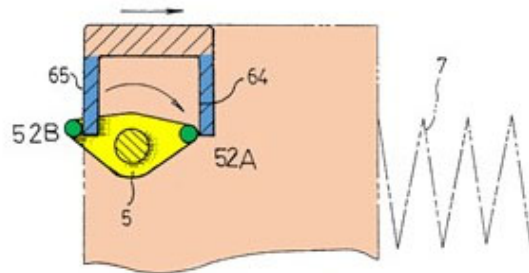


Fig. 4B.

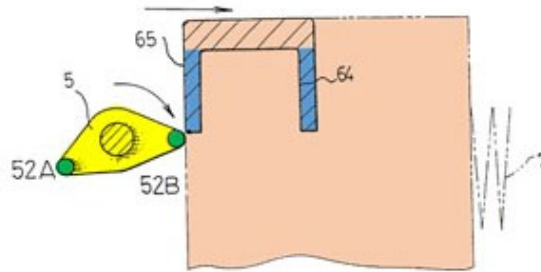


Fig. 4C.

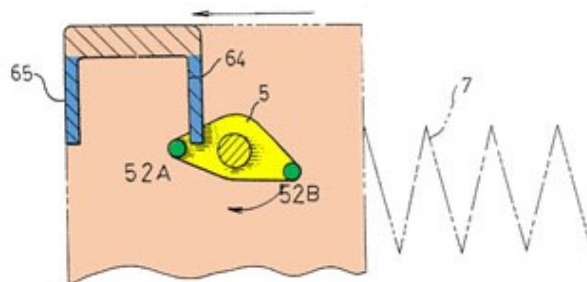


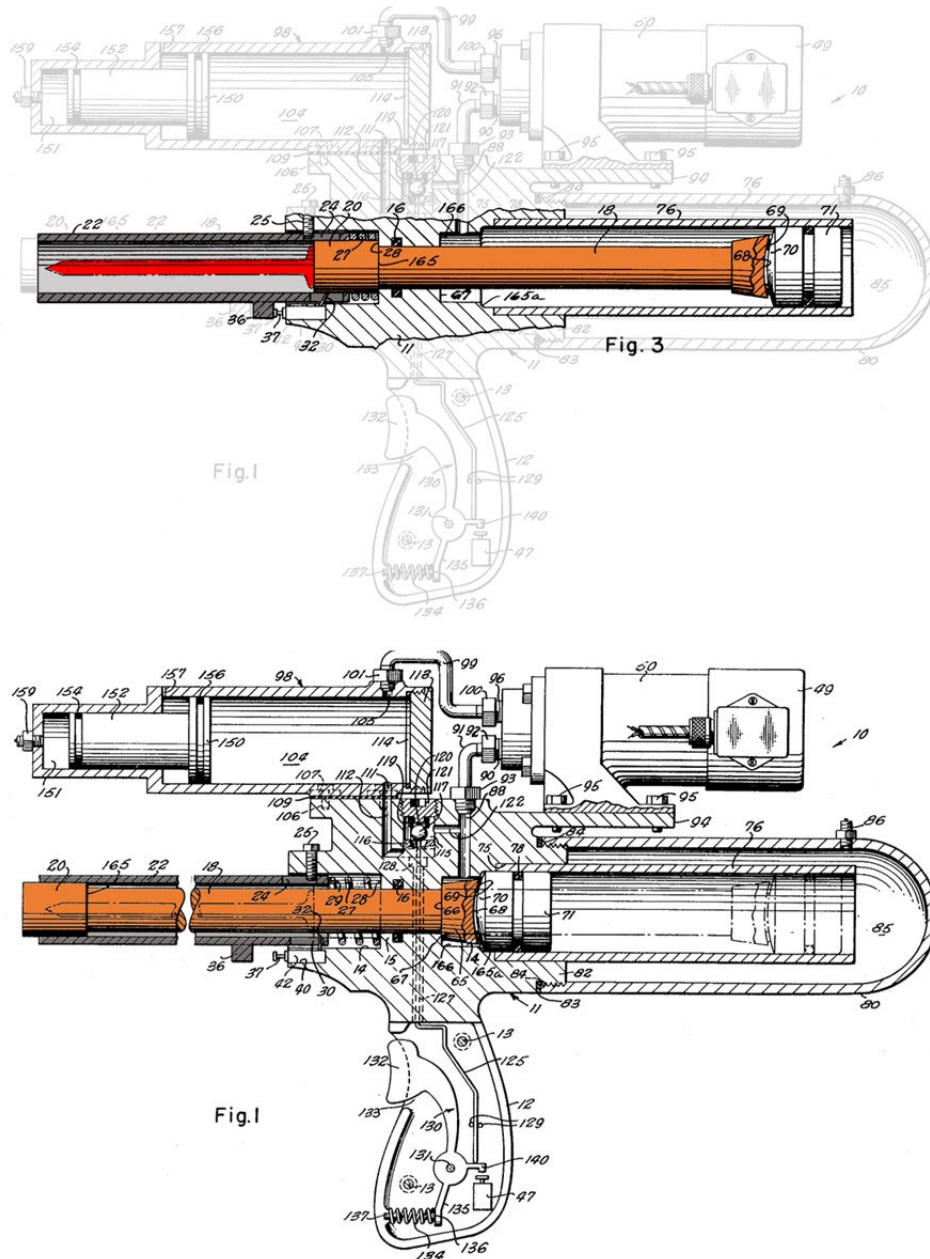
Fig. 4D.

3. Claim 3

Element [3.1]

Haley discloses “a guide body with a linear passageway for said driver.”

Haley discloses a guide body (“guide barrel 22,” grey) with a linear passageway for the driver (orange). Haley, 2:23-27, Figs. 1, 3.



Element [3.2]

Haley and Lai disclose “wherein: said lifter moves in a rotational motion and causes said driver to move in a linear motion along said linear passageway.”

Lai’s lifter is a rotatable component that is rotated in the clockwise direction (curved arrows) such that its extensions (green) engage the protrusions on the driver (blue) to cause the driver (orange) to move in a linear direction (straight arrows) within the driver track of the guide body toward the ready position. Lai, Figs. 4A-D, 1:62-63, 2:14-25; Vallee, ¶77.

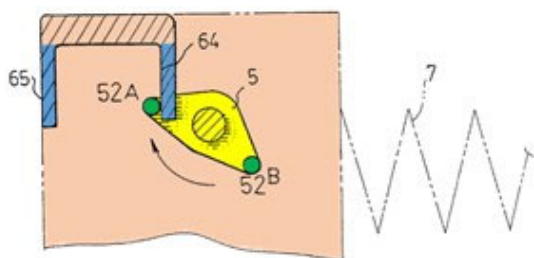


Fig. 4A.

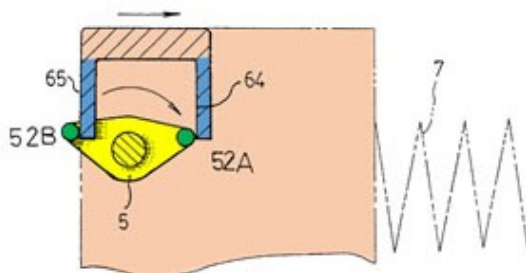


Fig. 4B.

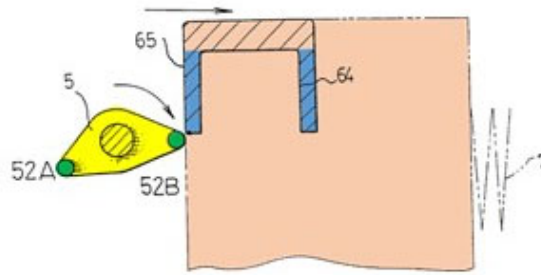


Fig. 4C.

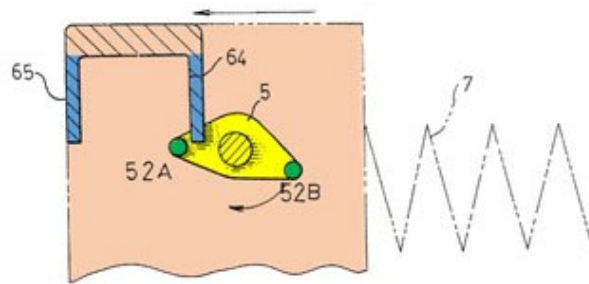


Fig. 4D.

4. Claim 4

Haley and Lai disclose “wherein: said cylinder and piston act as a gas spring during said drive stroke, and said lifter does not mechanically engage said driver during said drive stroke.”

In Haley, the pressurized gas of the storage chamber (“chamber 85”) and the cylinder (“extension cylinder 76”) act on the piston (“accumulator piston 71”) to form a gas spring for driving a nail during a drive stroke. Haley, Fig. 1; 5:74-6:26; 6:48-7:13. When the accumulator piston 71 is moved upward in the cylinder extension 76, the compressed gas in the chamber increases from 1,000 psi to 2,000 psi—because the pressurized gas from the displacement volume of the cylinder (yellow) is pushed by the piston upward into in the cylinder and into the main storage

IPR2025-00264



In Lai, the lifter (cam 5) does not mechanically engage (“is separated from”) the driver (with “U-shaped member 61” as its protrusions) during the drive stroke, which will then “move the hammer 6 towards the left 25 (see FIG. 4D).” Lai, 2:22-25, Figs. 4C-D.

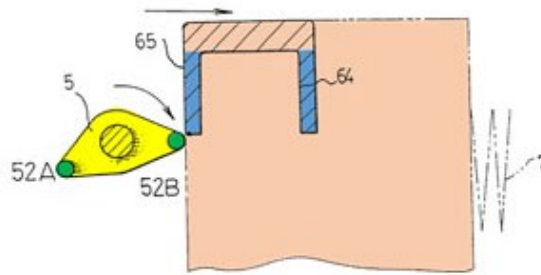


Fig. 4C.

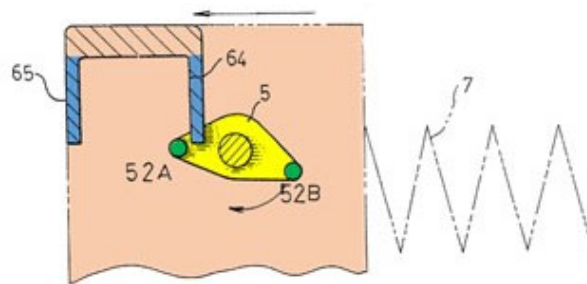


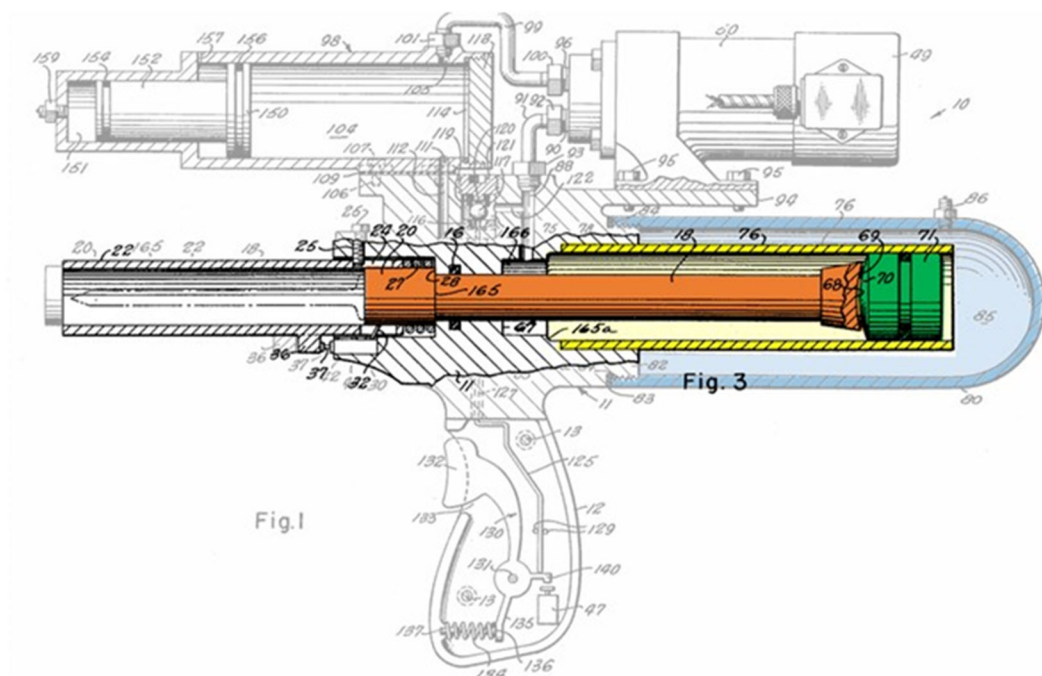
Fig. 4D.

5. Claim 5

Haley discloses “wherein the piston is positioned inside the top cover when the piston is at or near the first end of the hollow cylinder.” In Haley, the piston (“accumulator piston 71,” green) is positioned inside the top cover/cap⁴ (“chamber

⁴ The “top cover” lacks an antecedent but is assumed to refer to the “top cap.”

85”) when it is near the first end (right) of the cylinder (“extension cylinder 76,” yellow). Haley, Figs. 1, 3.



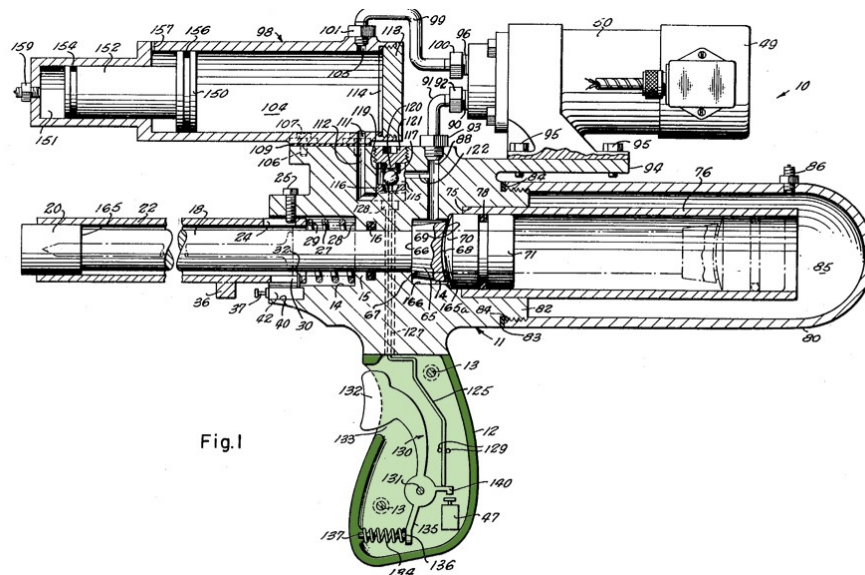
6. Claim 6

Elements [6.P]-[6.7]

Elements [6.P]-[6.7] are substantially identical to Elements [1.P], [1.1]-[1.2], [1.7], [1.10], [1.3]-[1.4], and [3.1], respectively, and are met as described above.

Element [6.8]

Haley discloses “a handle portion.” Haley discloses a “hollow handle 12” (green). Haley, 4:29-37, Fig. 1.



Element [6.9]

Element [6.9] recites “a motor that provides motive power for said lifter” and is met for the reasons described above for Element [1.5], which recites “a prime mover.”

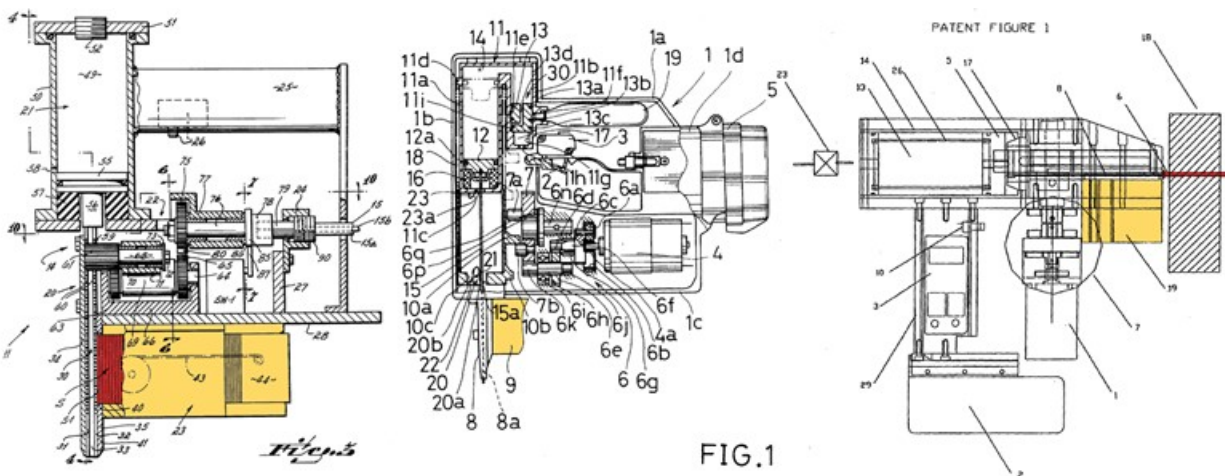
Element [6.10]

Element [6.10] recites “a removable battery pack that provides energy for said motor” and is met for the reasons described above for Element [1.6], which recites “a source of electrical energy that is removably attached to said housing.”

Element [6.11]

Haley does not explicitly disclose “a removable magazine that holds a plurality of fasteners,” but it would have been obvious at the filing of the ’167 patent to include a magazine that provides nails below the driver such that they are pushed out the exit of the driver track during a drive stroke.

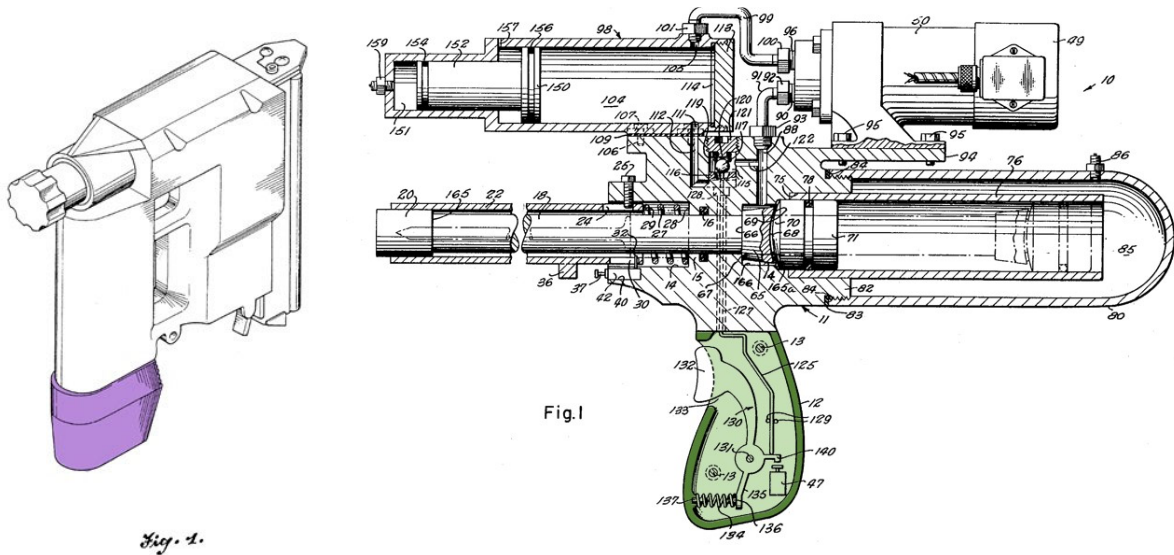
Removable magazines that feed fasteners (such as nails) below the driver to be pushed out the exit during a drive stroke had become a ubiquitous component of powered nailers by the time of the '167 patent, which customers would have expected and required to be included. Vallee, ¶87. All three prior art references expressly discussed in the specification of the '167 patent (1:58-2:9) included such a magazine. See U.S. Patent No. 4,215,808 (“Sollberger”), Fig. 3 (“magazine 23,” below left), 5:65-6:5; Kondo, Fig. 1 (“nail magazine 9,” below middle), 5:15-23; Pedicini, Fig. 1 (“fastener feeder (19),” below right), ¶[0077]. It was therefore obvious for a POSITA to include such a magazine due to market forces and design incentives. Vallee, ¶87.



Element [6.12]

The combination of Haley and Lai discloses “wherein: said removable battery pack is attached proximal to said handle portion.” Lai’s removable battery 2 (purple) is attached at the bottom of the tool, which when combined with Haley would be

proximal to Haley's handle 12 (green). Lai, Fig. 1 (below left); Haley, Fig. 1 (below right); Vallee, ¶88.



Element [6.13]

It was obvious that “said removable magazine is attached proximal to an exit end of said guide body, wherein said magazine extends past said removable battery pack.” The removable magazine added by the POSITA would need to be attached proximal to an exit end of said guide body to feed fasteners below the driver. Vallee, ¶¶90-91. Dr. Vallee further explains that the magazine would obviously extend below the removable battery pack in designs with high capacity magazines, since increasing the magazine size will extend it outward from the tool at a greater pace than increasing the battery, because the magazine holds nails linearly whereas the battery holds charge based on volume. Vallee, ¶¶90-91.

7. Claim 7

Elements [7.1]-[7.2] are substantially identical to Claim 2 and Element [3.2], respectively, and are met as described above.

8. Claim 8

Claim 8 is substantially identical to Claim 4 and is met as described above.

9. Claim 9

It was obvious that “wherein: a bottommost surface of said magazine is farther from a centerline of said exit end of the guide body than a bottommost surface of said battery pack.” As Dr. Vallee explains above for Element [6.13], designs with high capacity magazines will obviously have a magazine that extends further downward below the tool than the battery pack, and thus the magazine’s bottommost surface will be farther away from the centerline than the battery’s bottommost surface. Vallee, ¶¶94-95.

10. Claim 10

Elements [10.P]-[10.4]

Elements [10.P]-[10.4] are substantially identical to Elements [6.P], [6.1], [6.2]-[6.3], [6.5], and [6.6], respectively, and are met as described above.

Element [10.5]

Element [10.5] recites “a guide body . . . having a linear passageway for said driver,” which is substantially identical to Element [6.7], and further recites that the guide body is “located proximal to said hollow cylinder” and “having an exit end

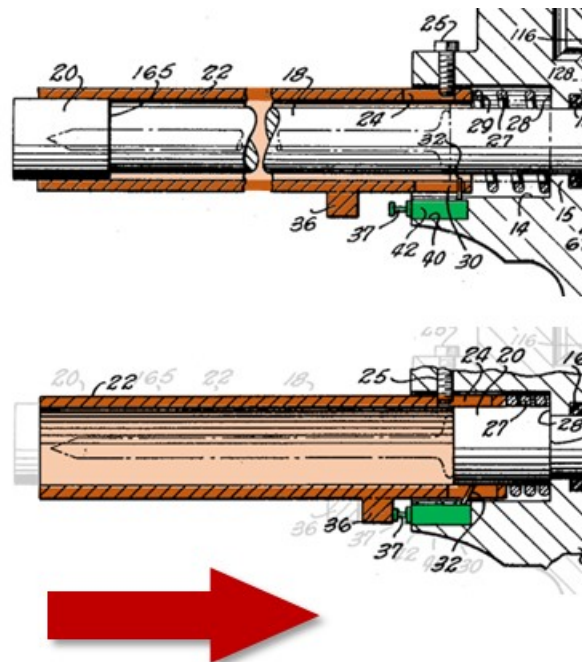
that is located distal from said hollow cylinder.” Element [10.5] is met for the reasons discussed above for Element [6.7].

Element [10.6]

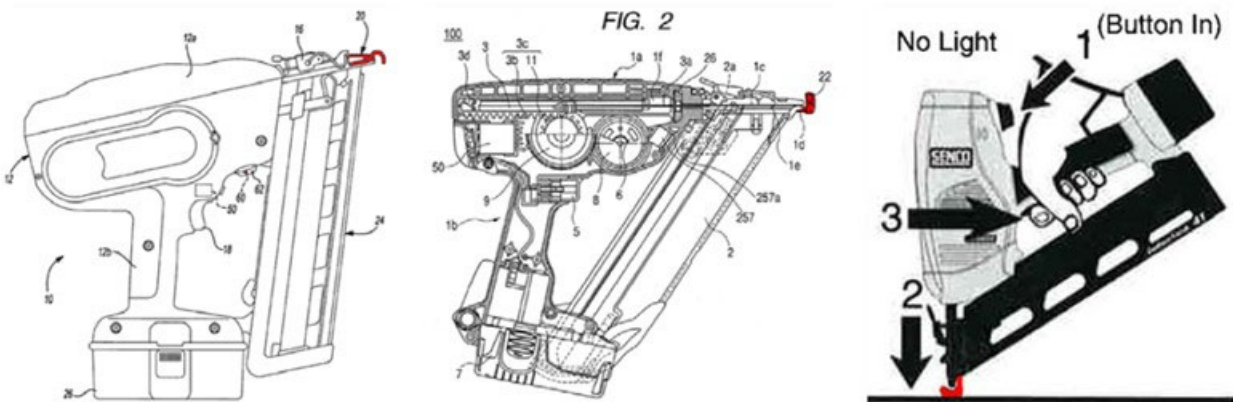
Element [10.6] recites “a removable battery pack,” which is identical to Element [6.10], and further recites that it “is located at a rear portion of said tool.” Element [10.6] is met for the reasons discussed above for Element [6.10].

Element [10.7]

Haley discloses “a safety contact element proximal to said exit end, said safety contact element being disposed at a front portion of the tool, above said guide body.” Haley discloses a “guide barrel 22” with a “lug 36” that engages “operator arm 37” to allow operation of the tool. Haley, Figs. 1-4 and 5:74-6:12; Vallee, ¶100.



Haley's safety contact is at a front portion of the tool but is integrated into the guide body, but Dr. Vallee explains that this is a mere matter of design choice and it would have been obvious to have the safety contact be a separate element above the guide body, particularly in the combination in Lai, which eliminates Haley's bulky lifting mechanism taking up space above the guide body. Vallee, ¶101. Also, a POSITA would be motivated to incorporate such a safety contact element into Haley based on design choice and market forces, because that was the conventional design taught by numerous prior art references, including U.S. Pub. No. 2005/0217875 (Ex. 1015, "Forster"), U.S. Pub. No. 2008/0067213 (Ex. 1016, "Shima"), and the Senco 41 Nailer Operating Instructions (Ex. 1017, "Senco"). Forster, ¶[0024], ¶[0028] ("contract trip 20"), Fig. 1 (below left); Shima, ¶[0054] ("push lever switch 22"), Fig. 2 (below middle); Senco, 13-14 ("workpiece contact element," below right); Vallee, ¶101.



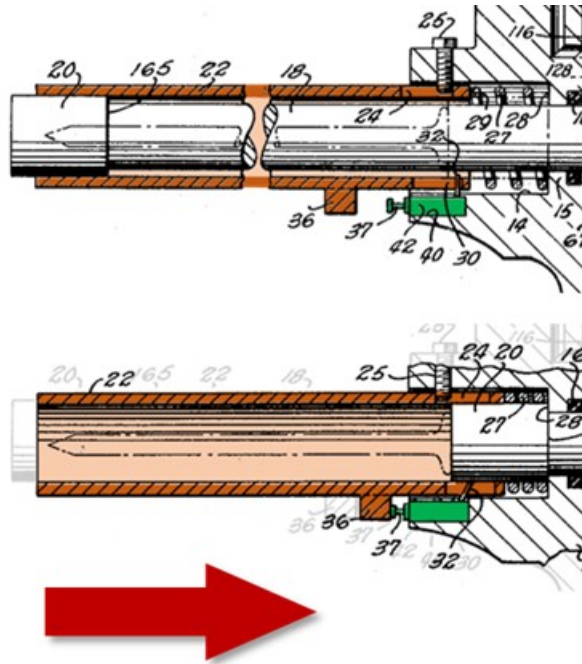
11. Claim 11

Claim 11 recites “an electric motor that derives energy from said battery pack, which provides motive power for said lifter” and is met for the reasons discussed above for Element [6.9].

12. Claim 12

Haley discloses “wherein: said safety contact element prevents said drive stroke from occurring unless said safety contact element is pressed against a solid surface.”

Haley states that “[w]hen the forward end of the guide barrel is then pressed against the work piece . . . the lug 36 engages the operating rod 37 of the normally open switch 38 and closes the switch so that the motor 49 is once again connected to the input circuit 52.” Haley, 5:74-6:7. This action is shown by Figures 1 and 3, below. Haley’s safety contact element thus prevents the drive stroke from occurring by not closing the circuit that powers the motor until the safety is pressed against the workpiece. Vallee, ¶103.



13. *Claim 13-14*

Claims 13-14 are identical to Claims 7-8, respectively, and are met as described above.

14. *Claim 15*

Haley discloses “wherein: said safety contact element is located directly above said guide body and extends from said front portion of the tool toward a rear portion of the tool, extending along at least a surface of the guide body that is on the opposite side of the tool from where said battery pack is located.”

As explained above for Element [10.7], Dr. Vallee explains that it would have been an obvious design choice to have the safety contact be a separate element above the guide body, particularly in the combination in Lai, which eliminates Haley’s bulky lifting mechanism taking up space above the guide body. Vallee, ¶106. In this

obvious design, the safety contact element would be located directly above the guide body, extend from the front of the tool toward the rear of the tool along the top surface of the guide body, and be on the opposite side of the tool from the battery pack located on the bottom. *Id.*

B. Ground 2: Claims 1-15 are Obvious based on Saari/Enstrom in view of Lai

U.S. Patent Nos. 3,924,692 (“Saari”) and 3,913,685 (“Enstrom”) are closely related patents that were filed on the same day and given sequential application numbers, assigned to the same company, have identical titles and terminology, and contain overlapping specifications and figures. Exs. 1006[Saari], 1007[Enstrom]. Because of the close relationship between Saari and Enstrom, a POSITA would look to their collective teachings together and would have combined them as a matter of course. Vallee, ¶46. To the extent there are aspects described in only one of Enstrom or Saari, a POSITA would understand that is simply due to their separate focuses on different inventive aspects of the tool (warranting the separate patents for different inventors). Vallee, ¶46. For example, Saari describes the switching means for controlling the fastener driving tool (Saari, 1:48-57, 3:19-68, Figs. 7-9), whereas Enstrom describes the lifting mechanism and compressed gas chamber for that tool (Enstrom, 2:35-3:19, Figs. 6-7). Accordingly, a POSITA would combine the two teachings to achieve the complete tool worked on by Enstrom and Saari. Vallee, ¶¶45-47. Saari and Enstrom are treated as such below.

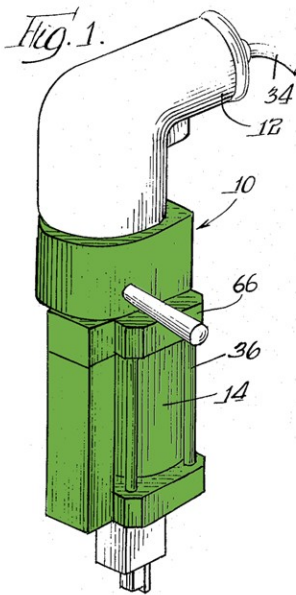
1. Claim 1

Element [1.P]

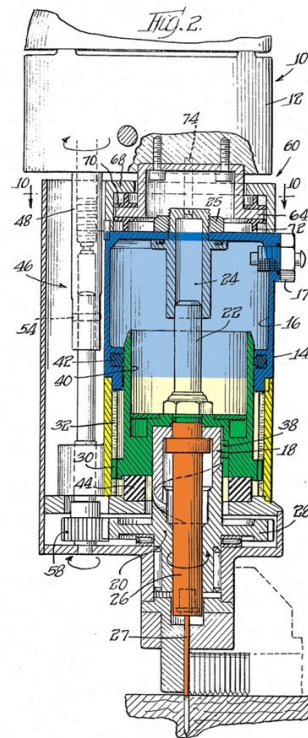
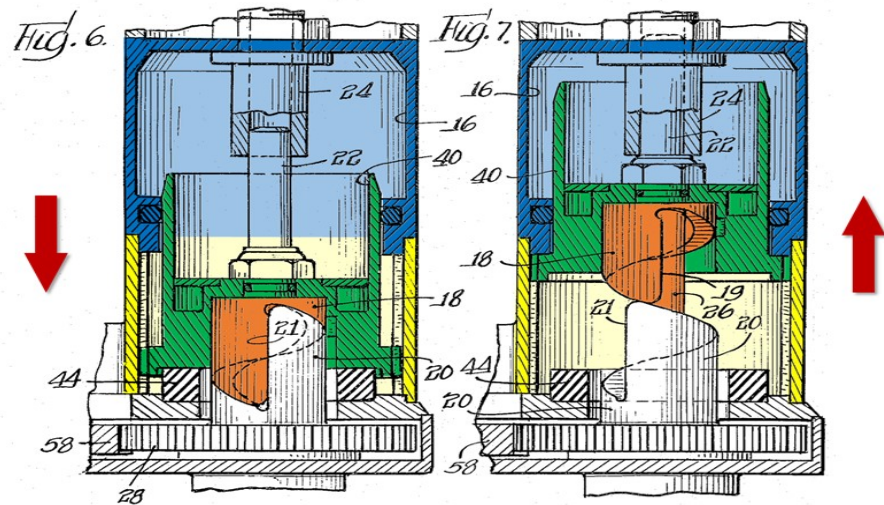
Saari/Enstrom discloses “[a] portable fastener driving tool.” Saari/Enstrom disclose a “driving tool” with a spring (including a compressed gas spring) to “provide the actual driving force to seat the fastener.” Saari, 1:27-33; Enstrom, 1:27-32.

Element [1.1]

Saari/Enstrom discloses “a housing with a storage chamber that contains a pressurized gas that is always above atmospheric pressure.” Saari/Enstrom’s housing is shown below in green. Enstrom, Fig. 1; *see also* Saari, Fig. 1.



Saari/Enstrom’s storage chamber (“chamber 16,” blue) is distinct from the cylinder (yellow). Enstrom, 2:35-39, Figs. 2 and 6-7; *see also* Saari, 4:1-9, Fig. 10.

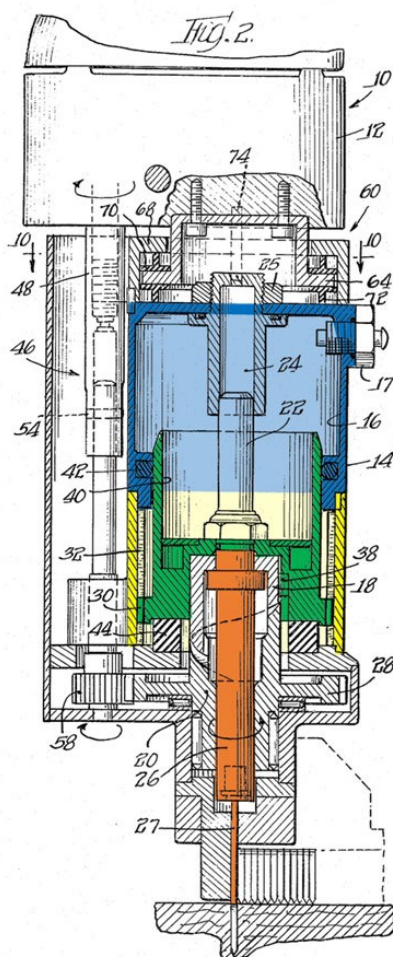
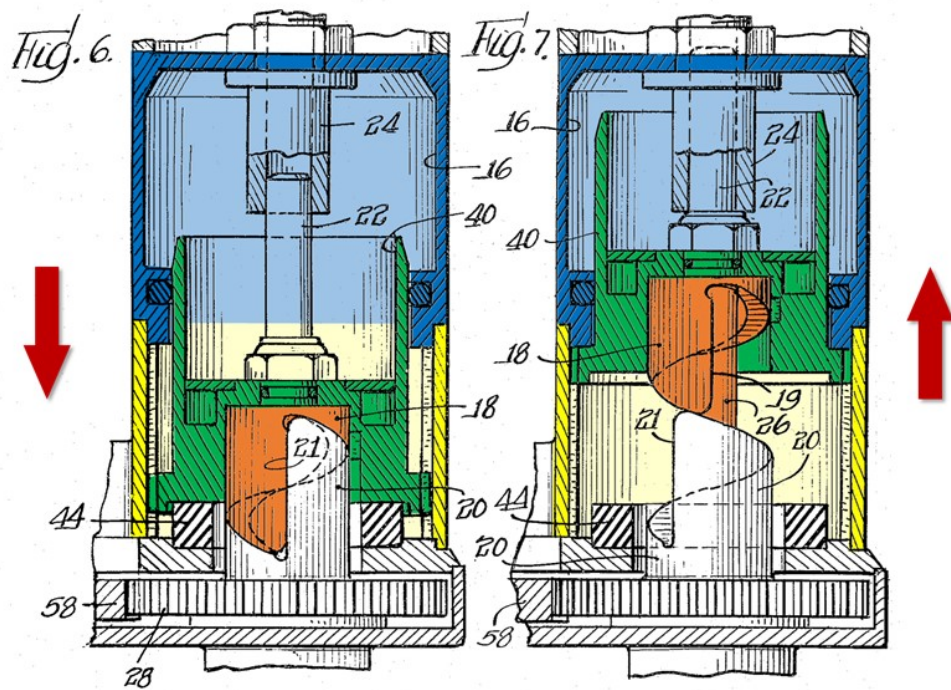


Saari/Enstrom's storage chamber contains a pressurized gas that is always above atmospheric pressure. Saari states that "valve 86 is provided for selectively charging the chamber with the appropriate compressible gas," which "will thus allow the compressibility of the spring to be conveniently varied." Saari, 4:11-14, Fig. 10;

see also Enstrom, Fig. 2. Saari also states that “[t]he gas chamber is sealed by suitable seal means 84 between the inner walls of the housing 14a and the outer side walls of the piston 80.” Saari 4:6-9, Fig. 10; *see also* Enstrom, 2:52-55, Figs. 1 and 6-7. A POSITA would understand the disclosure of a sealed storage chamber and a valve for “selectively charging the chamber” means that the chamber is always above atmospheric pressure, since a charging valve would have no use if the chamber were allowed to reach atmospheric pressure. Vallee, ¶112. Nor would a POSITA misinterpret the valve in Saari/Enstrom as a connection point for a pneumatic hose to attached and supply gas throughout operation (as opposed to only an initial charge), since Saari/Enstrom explicitly denigrate pneumatic devices that “require[] convenient sources of compressors and air hoses which makes a tool undesirable for the various remote locations required on a construction site.” Saari, 1:9-15; Enstrom, 1:7-13.

Element [1.2]

Saari/Enstrom discloses “a hollow cylinder that includes a movable piston.” Saari/Enstrom’s hollow cylinder (yellow) contains a piston (“cup-like piston 40”) movable within the cylinder along “key and spline devices 30 and 32.” Enstrom, 2:52-60, Figs. 2, 6-7; Saari, 4:1-9, Fig. 10.



Element [1.3]

Saari/Enstrom discloses “a movable driver that is in communication with said piston at least during a drive stroke.” Saari/Enstrom’s movable driver (“upper cam 18 and associated ram 26,” orange) is in communication with its piston (“cup-like piston 40,” green) during the drive stroke. Enstrom, 2:55-59, Figs. 2, 6-7; *see also* Saari, 2:51-54, Figs. 1-2.

Element [1.4]

Saari/Enstrom in combination with Lai discloses “a lifter that is in communication with said driver at least during a return stroke.”

Saari/Entrom discloses a lifting mechanism with “a pair of coacting helicoidal cams 18 and 20,” where the “[t]he lower cam 20 will be rotatably mounted within the housing and serves as the driving cam. Enstrom, 2:32-39, Figs. 1 and 6-7. Saari/Entrom’s lifting structure (“cam 20”) moves the driver member (“upper cam 19 and associated ram 26”) away from an exit end of the fastener driving mechanism (“a purely axial rearwardly motion”). Enstrom, 2:55-59, Figs. 6-7; *see also* Saari, 2:51-54, Figs. 1-2.

As explained by Dr. Vallee, it was obvious—at the filing of the ’167 patent—to replace Saari/Enstrom’s helicoidal lifting mechanism with the claimed “lifter,” which is disclosed by Lai as explained above in relation to the combination of Haley with Lai. Vallee, ¶¶117-119.

A POSITA at the filing of the '167 patent would have been motivated to replace Saari/Enstrom's helicoidal lifting mechanism with Lai's lifter member, and would have known how to do so. As explained by Dr. Vallee, Saari/Enstrom's lifting mechanism had a known problem in that it was designed to be used in a corded tool with access to AC power from an electrical outlet. Vallee, ¶117; Enstrom, Fig. 1 (power cord 34). As explained above in relation the combination of Haley with Lai, at the filing of the '167 patent, market forces and design needs favored a portable, battery-powered nailer. Vallee, ¶117. Artisans repeatedly noted over the years that corded power nailers (with a pneumatic air hose, an electrical power cable, or both) were not ideal because of their lack of portability. Vallee, ¶117; Lin, 1:21-26; Kondo, 1:9-29; Pedicini, ¶[0005]. Moreover, a person of skill in the art would have known how to replace the coacting helical cams of Saari/Enstrom with a straight member having a rectangular cross section which would allow a straight forward addition of Lai's protrusions to this straight member. Vallee, ¶ 119.

Lai discloses a battery-powered nailer (*see* §VII.A.1) and expressly touts one of its benefits as being electrical efficiency. Specifically, Lai identifies an "ideal" electric stapling gun as being "energy saving" and explains that its disclosed lifter member can "provide the same hitting effect with less power consumption." Lai, 1:9-10. 2:34-42. Accordingly, a POSITA would have replaced Saari/Enstrom's

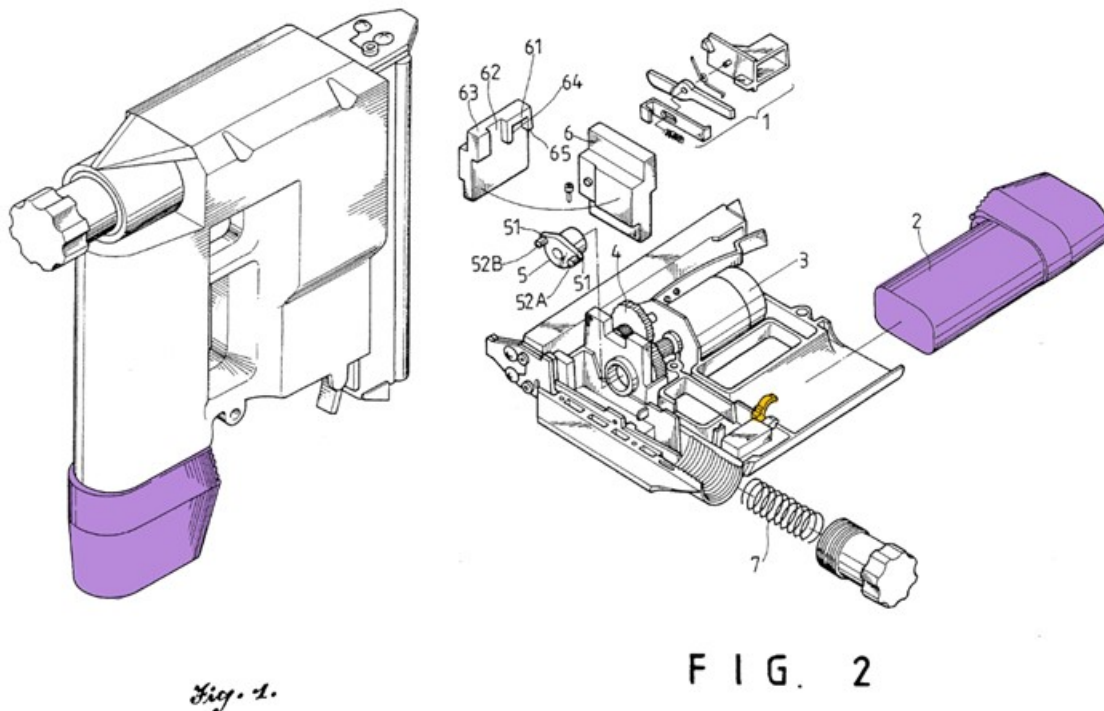
helicoidal lifting mechanism with Lai's lifter member to eliminate the electrical power cable and achieve a portable, battery-powered nailer. Vallee, ¶118.

Element [1.5]

The combination of Saari/Enstrom and Lai discloses "a prime mover." Lai's lifter is moved by a prime mover ("motor 3"). Lai, 2:14-16, Fig. 2.

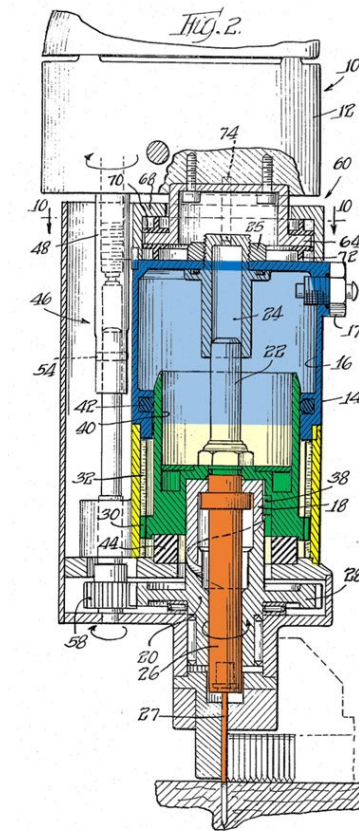
Element [1.6]

The combination of Saari/Enstrom and Lai discloses "a source of electrical energy that is removably attached to said housing." Lai's motor is powered by a removable battery (Lai's battery 2, purple). Lai, Figs. 1-2, 1:25-35, 1:44-54, 1:60-62, 2:2; Vallee, ¶121.



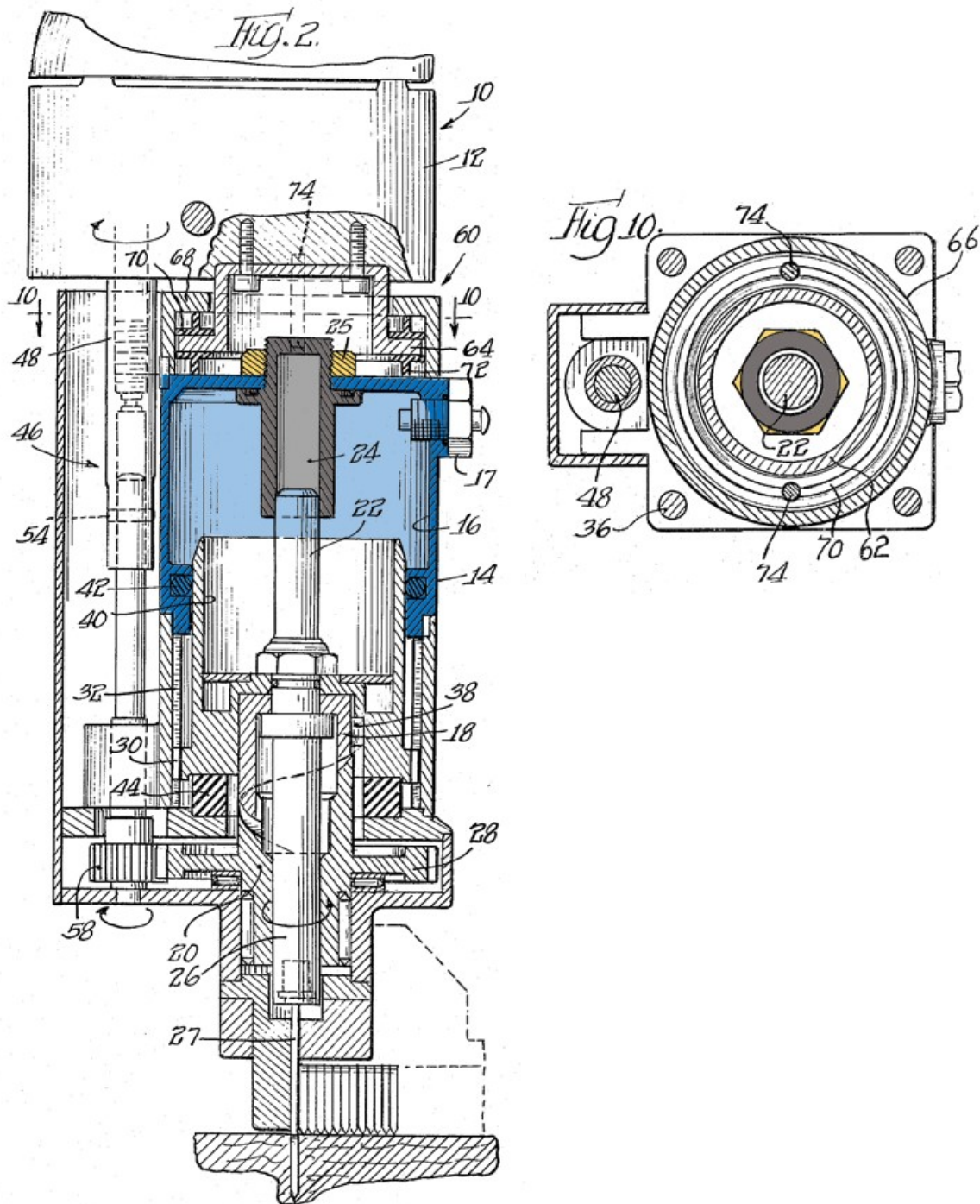
Element [1.7]

Saari/Enstrom discloses “said storage chamber being in fluidic communication with a first end of said hollow cylinder.” Saari/Enstrom’s storage chamber 16 is in fluidic communication with the first end of the hollow cylinder (yellow). Enstrom, 2:35-39, Fig. 2.



Element [1.8]

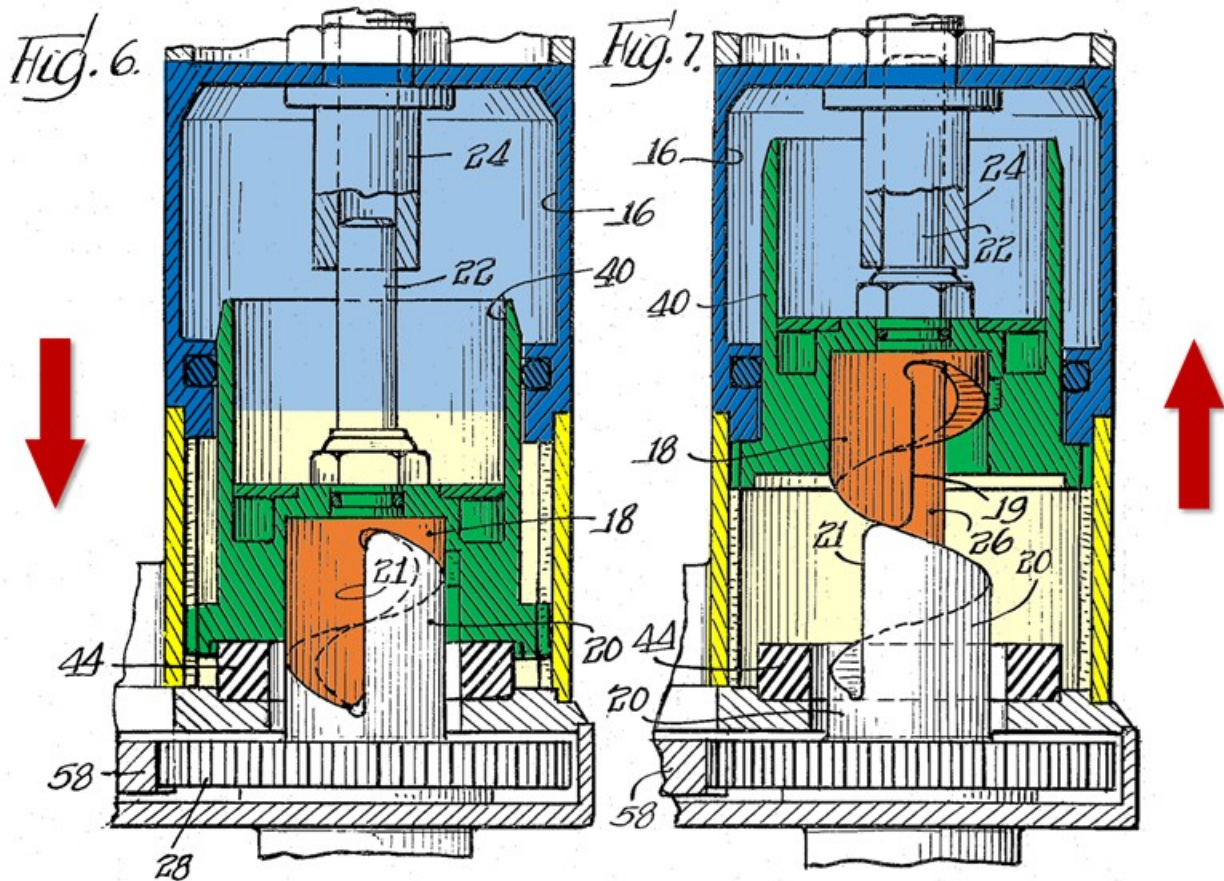
Saari/Enstrom discloses “said storage chamber including a removable top cap at a location proximal to said first end of said hollow cylinder.” Saari/Enstrom’s storage chamber (blue) has a top cap (sleeve 24, grey), which is removably attached by a nut 25 (yellow). Enstrom, Figs. 2, 10; Vallee, ¶123.



Element [1.9]

Saari/Enstrom discloses “wherein: said piston travels through said hollow cylinder between a higher pressure position and a lower pressure position; said

piston has a rest position between operational cycles; and a location of said rest position is proximal to said higher pressure position.” Saari/Enstrom’s piston 40 (green) travels through the hollow cylinder (yellow) between a higher pressure position (Fig. 7, right) and a lower pressure position (Fig. 6, left). Enstrom, Figs. 6-7; Vallee, ¶124.



Element [1.10]

Saari/Enstrom discloses “said pressurized gas is not vented to atmosphere after said drive stroke.” As Dr. Vallee explains, a POSITA would understand that the pressurized gas is not vented to atmosphere after the drive stroke, since a

charging valve would have no use if the chamber were vented to reach atmospheric pressure. Vallee, ¶125.

2. Claim 2

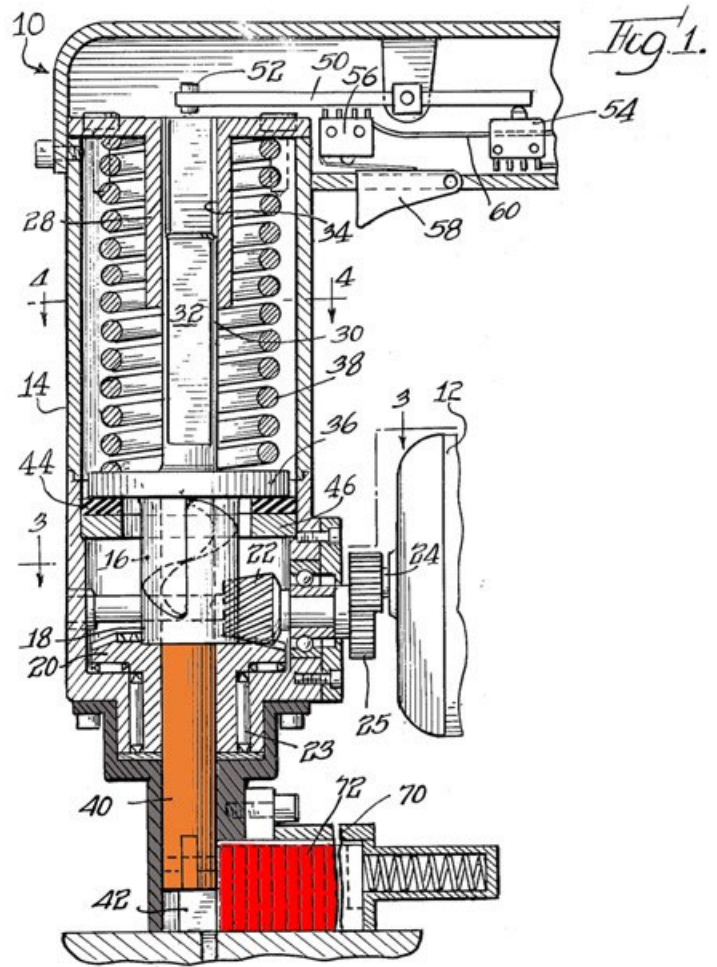
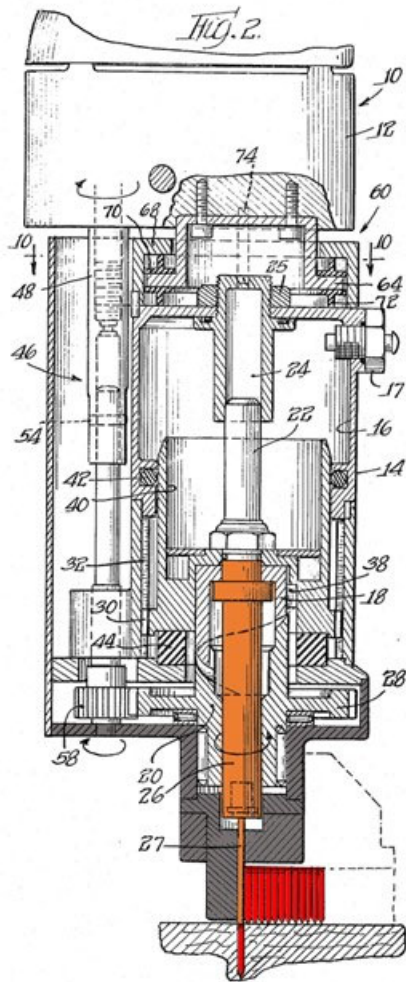
The combination of Saari/Enstrom and Lai discloses “said movable driver including at least one protrusion; and said lifter including at least one extension; wherein: said at least one extension of the lifter mechanically engages with said at least one protrusion of the driver during said return stroke.”

Lai teaches adding a “U-shaped member 61” with protrusions to a protrusion-less driver blade so that it can be mechanically engaged by the extensions (pins 52A and 52B) of Lai’s lifter member during the return stroke. Lai, 2:4-7. In the same way, POSITA would have understood that by adding protrusions to Saari/Enstrom’s driver blade it could be lifted by Lai’s lifter member and would have achieved the same results predicted by Lai. Vallee, ¶126.

3. Claim 3

Element [3.1]

Saari/Enstrom discloses “a guide body with a linear passageway for said driver.” Saari/Enstrom’s guide body (grey) has a linear passageway for the driver (26/40, orange below). Enstrom, Fig. 2 (below left); Saari, Fig. 1 (below right).



Element [3.2]

The combination of Saari/Enstrom and Lai discloses “wherein: said lifter moves in a rotational motion and causes said driver to move in a linear motion along said linear passageway.”

In that combination, the lifter taught by Lai is a rotatable cam 5 (yellow) that moves in rotational motion (curved arrows) to cause the driver (light orange) to move

in a linear motion (straight arrows) in the linear passageway of the guide body. Lai,
Figs. 4A-D, 1:62-63, 2:14-25.

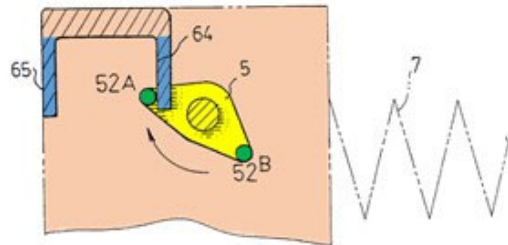


Fig. 4A.

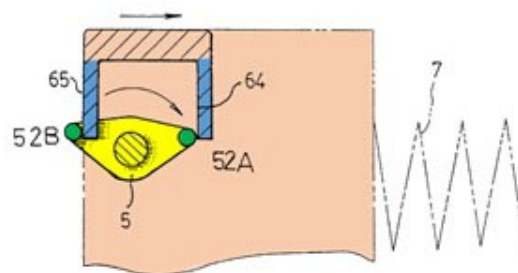


Fig. 4B.

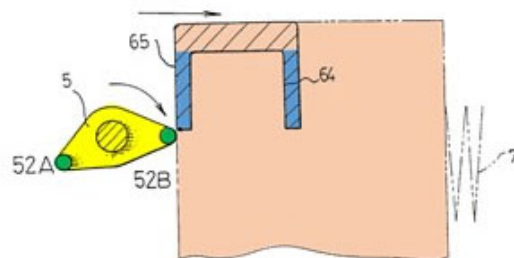


Fig. 4C.

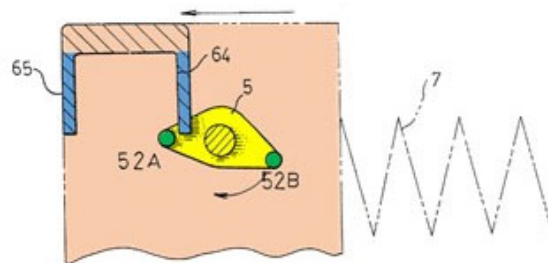
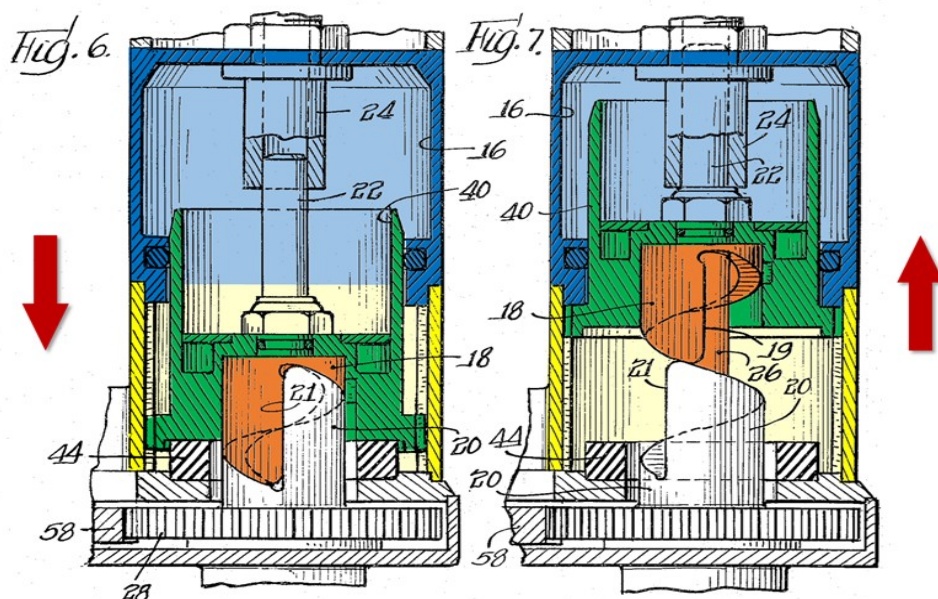


Fig. 4D.

4. Claim 4

Saari/Enstrom discloses “wherein: said cylinder and piston act as a gas spring during said drive stroke, and said lifter does not mechanically engage said driver during said drive stroke.” In Saari/Enstrom, the cylinder (yellow) and piston (“cup-like piston 40,” green) act as a gas spring during the drive stroke. When the cup-like piston 40 is raised, the gas in the displacement volume of the cylinder within the cup of piston (yellow) and the gas in chamber 16 (blue) are compressed, and the lifter then moves out of mechanical engagement with the driver for a drive stroke where the ram is then “driven downwardly under the bias of the compressed gas.” Vallee, ¶130; Enstrom, 2:45-46, Figs. 6-7; Saari, Fig. 10.

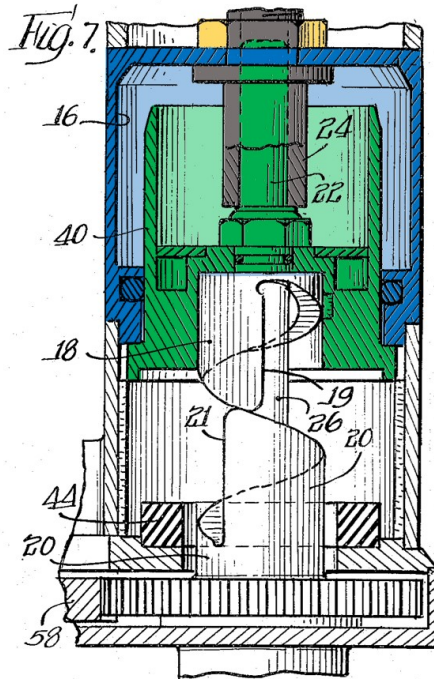


5. Claim 5

Saari/Enstrom discloses “wherein the piston is positioned inside the top cover when the piston is at or near the first end of the hollow cylinder.” Saari/Enstrom’s

piston 40 includes a guide shaft 22 (green) positioned inside the top cover (sleeve 24, grey) when the piston is at the first end (top) of hollow cylinder (yellow).

Enstrom, 2:48-54, Fig. 7; Vallee, ¶131.



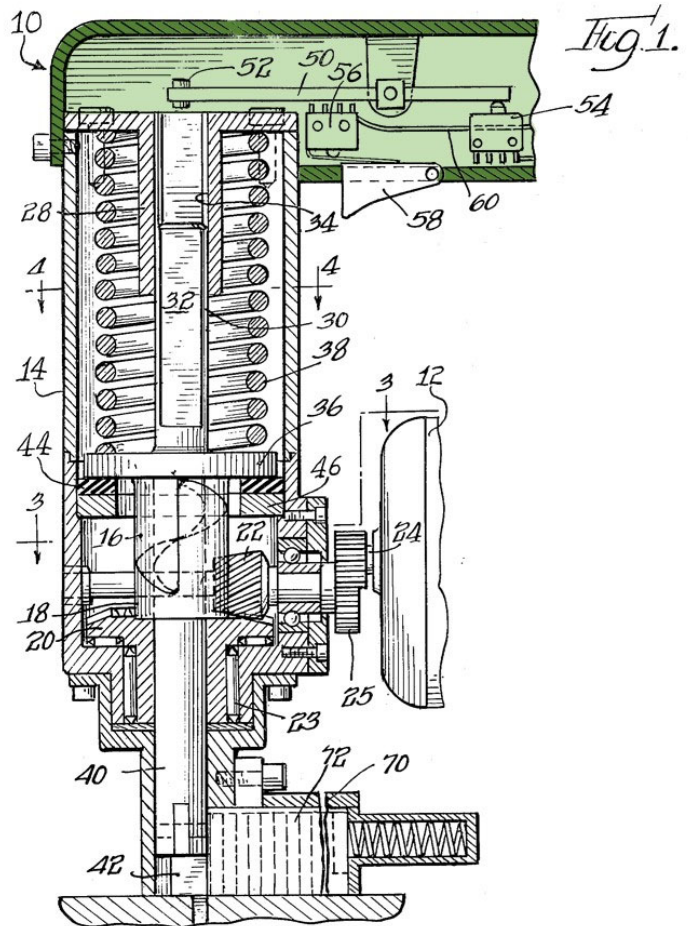
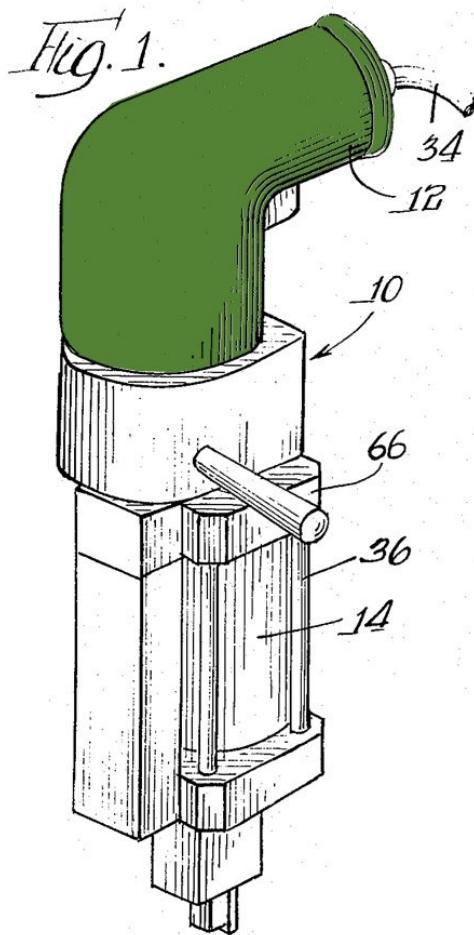
6. Claim 6

Elements [6.P]-[6.7]

Elements [6.P]-[6.7] are substantially identical to Elements [1.P], [1.1], [1.2], [1.7], [1.10], [1.3], [1.4], and [3.1], respectively, and are met as described above.

Element [6.8]

Saari/Enstrom discloses “a handle portion.” Saari/Enstrom’s handle portion is part of the electric motor housing 12. Enstrom, Fig. 1; Saari, Fig. 1.



Element [6.9]

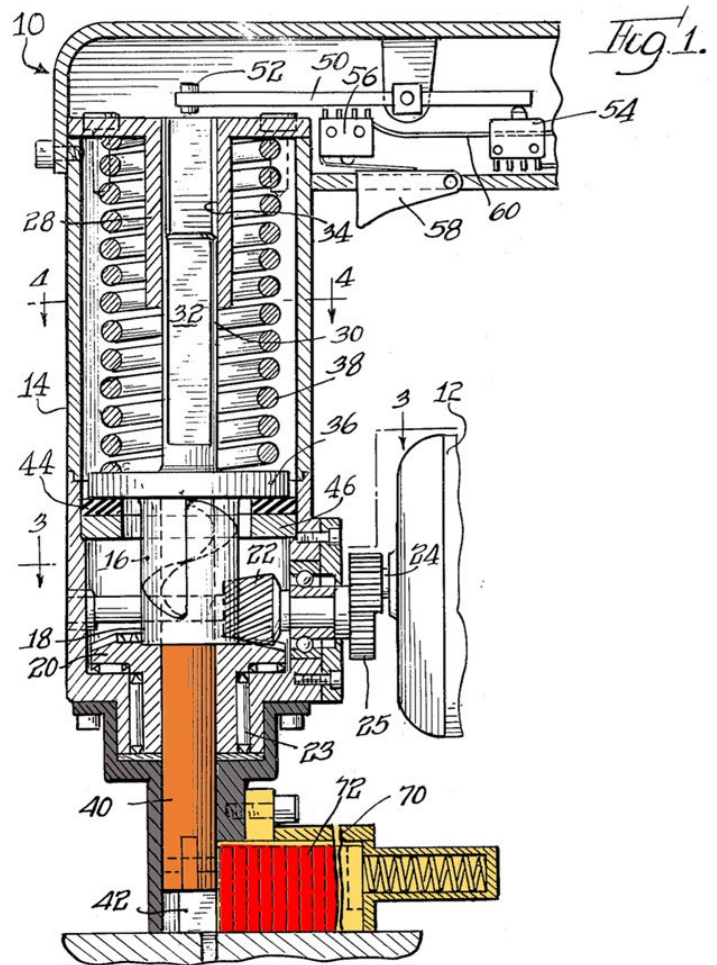
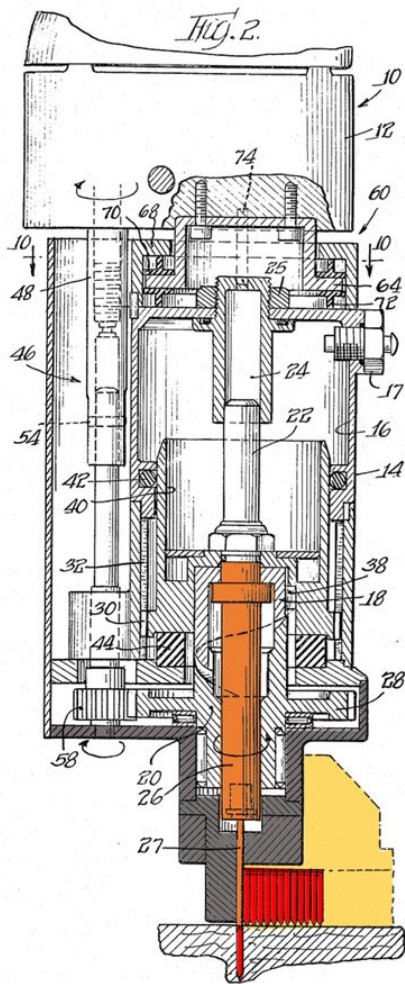
Element [6.9] recites “a motor that provides motive power for said lifter” and is met for the reasons described above for Element [1.5], which recites “a prime mover.”

Element [6.10]

Element [6.10] recites “a removable battery pack that provides energy for said motor” and is met for the reasons described above for Element [1.6], which recites “a source of electrical energy that is removably attached to said housing.”

Element [6.11]

Saari/Enstrom discloses “a removable magazine that holds a plurality of fasteners.” Saari/Enstrom’s magazine (70, light orange) contains a plurality of fasteners (“fastener member 72,” red). Saari, Fig. 1, 2:61-63; Enstrom, Fig. 2; Vallee, ¶136. Dr. Vallee explains that a POSITA would understand Saari/Enstrom’s magazine is removable based on their knowledge of nailers, as well as the how the magazine is illustrated in Enstrom (with a dashed-line outline) and Saari (with an unlabeled bolt allowing removal). Vallee, ¶136.



Element [6.12]

The combination of Saari/Enstrom and Lai discloses “wherein: said removable battery pack is attached proximal to said handle portion.” As explained by Dr. Vallee, it would have been obvious to locate Lai’s removable battery pack proximal to Saari/Enstrom’s handle portion, particularly since that is the location of Saari/Enstrom’s power cable (replaced by Lai’s battery) and because that location is conventional, as shown by Kondo and Pedicini.

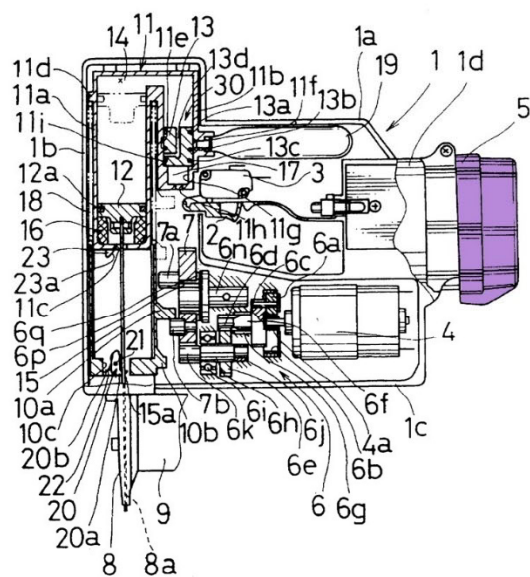
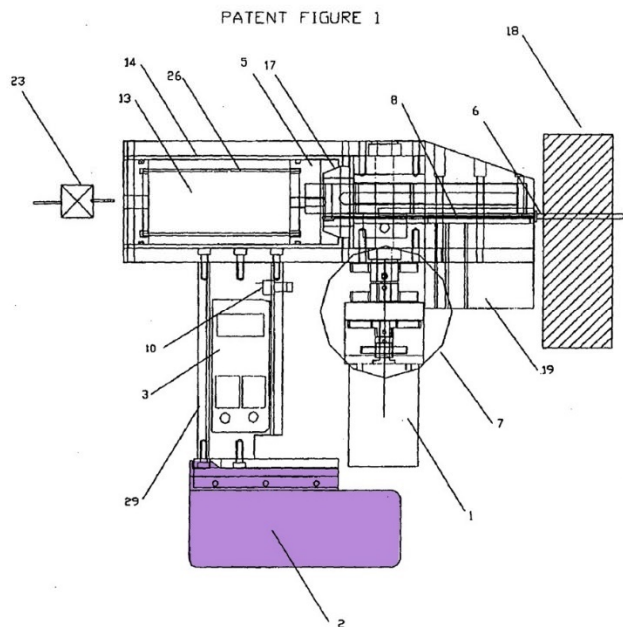


FIG.1



Element [6.13]

Saari/Enstrom discloses “said removable magazine is attached proximal to an exit end of said guide body, wherein said magazine extends past said removable battery pack.”

Saari/Enstrom's magazine (70, light orange) is attached proximal to an exit end of the guide body (grey) as shown above for Element [6.11]. Saari, Fig. 1, 2:61-63; Enstrom, Fig. 2.

Dr. Vallee explains that Saari/Enstrom's magazine would obviously extend past the removable battery pack in designs with high capacity magazines, since increasing the magazine size will extend it outward from the tool at a greater pace than increasing the battery, because the magazine holds nails linearly whereas the battery holds charge based on volume. Vallee, ¶¶140-141.

7. Claim 7

Elements [7.1]-[7.2] are substantially identical to Claim 2 and Element [3.2], respectively, and are met as described above.

8. Claim 8

Claim 8 is substantially identical to Claim 4 and is met as described above.

9. Claim 9

Saari/Enstrom discloses "wherein: a bottommost surface of said magazine is farther from a centerline of said exit end of the guide body than is a bottommost surface of said battery pack." As explained above for Element [6.13], Dr. Vallee explains that designs with high capacity magazines will obviously have a magazine that extends further outward from the tool than the battery pack, and thus the magazine's bottommost surface will be farther away from the centerline than the battery's bottommost surface. Vallee, ¶144.

10. Claim 10

Elements [10.P]-[10.4]

Elements [10.P]-[10.4] are substantially identical to Elements [6.P], [6.1], [6.2]-[6.3], [6.5], and [6.6], respectively, and are met as described above.

Element [10.5]

Element [10.5] recites “a guide body . . . having a linear passageway for said driver,” which is substantially identical to Element [6.7], and further recites that the guide body is “located proximal to said hollow cylinder” and “having an exit end that is located distal from said hollow cylinder.” Element [10.5] is met for the reasons discussed above for Element [6.7].

Element [10.6]

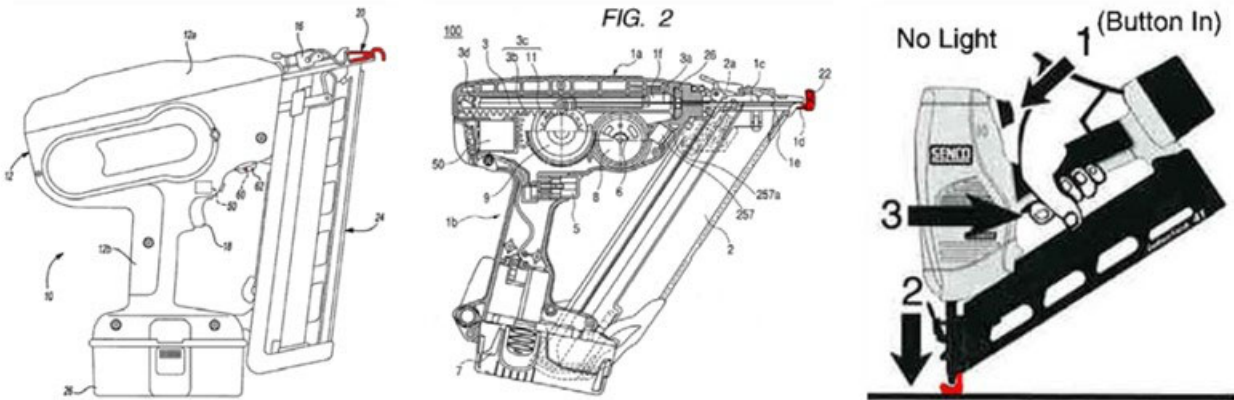
Element [10.6] recites “a removable battery pack,” which is identical to Element [6.10], and further recites that it “is located at a rear portion of said tool.” Element [10.6] is met for the reasons discussed above for Element [6.10].

Element [10.7]

Saari/Enstrom is silent about a safety contact, but it would have been obvious to a POSITA to have “a safety contact element proximal to said exit end, said safety contact element being disposed at a front portion of the tool, above said guide body.”

Dr. Vallee explains that a POSITA would be motivated to incorporate such a safety contact element into Saari/Enstrom based on design choice and market forces, because that was the conventional design taught by numerous prior art references,

including Forster, Shima, and Senco. Forster, ¶[0024], ¶[0028], Fig. 1 (below left); Shima, ¶[0054], Fig. 2 (below middle); Senco, 13-14 (below right); Vallee, ¶149.



11. Claim 11

Claim 11 recites “an electric motor that derives energy from said battery pack, which provides motive power for said lifter” and is met for the reasons discussed above for Element [6.9].

12. Claim 12

Saari/Enstrom discloses “wherein: said safety contact element prevents said drive stroke from occurring unless said safety contact element is pressed against a solid surface.” The conventional safety contact element taught by numerous prior art references (Forster, Shima, Senco) prevents said drive stroke from occurring unless said safety contact element is pressed against a solid surface. Vallee, ¶151.

13. Claim 13-14

Claims 13 and 14 are identical to Claims 7 and 8, respectively, and are met as described above.

14. Claim 15

Saari/Enstrom discloses “wherein: said safety contact element is located directly above said guide body and extends from said front portion of the tool toward a rear portion of the tool, extending along at least a surface of the guide body that is on the opposite side of the tool from where said battery pack is located.” The conventional safety contact element taught by numerous prior art references (Forster, Shima, Senco) is located directly above the guide body, extends from the front of the tool toward the rear, and extends along a surface of the guide body opposite the battery. Vallee, ¶153.

C. Ground 3: Claims 1-15 are Obvious based on Kondo

1. Claim 1

Element [1.P]

U.S. Patent No. 5,720,423 (“Kondo”) discloses “[a] portable fastener driving tool.” Kondo “provide[s] a fastener driving tool which is operable to drive fasteners,” Kondo, 1:48-49.

Element [1.1]

Kondo discloses “a housing with a storage chamber that contains a pressurized gas that is always above atmospheric pressure.” Kondo’s housing (“housing 1”) is shown below in green. Kondo, 2:50-53, Fig. 1.

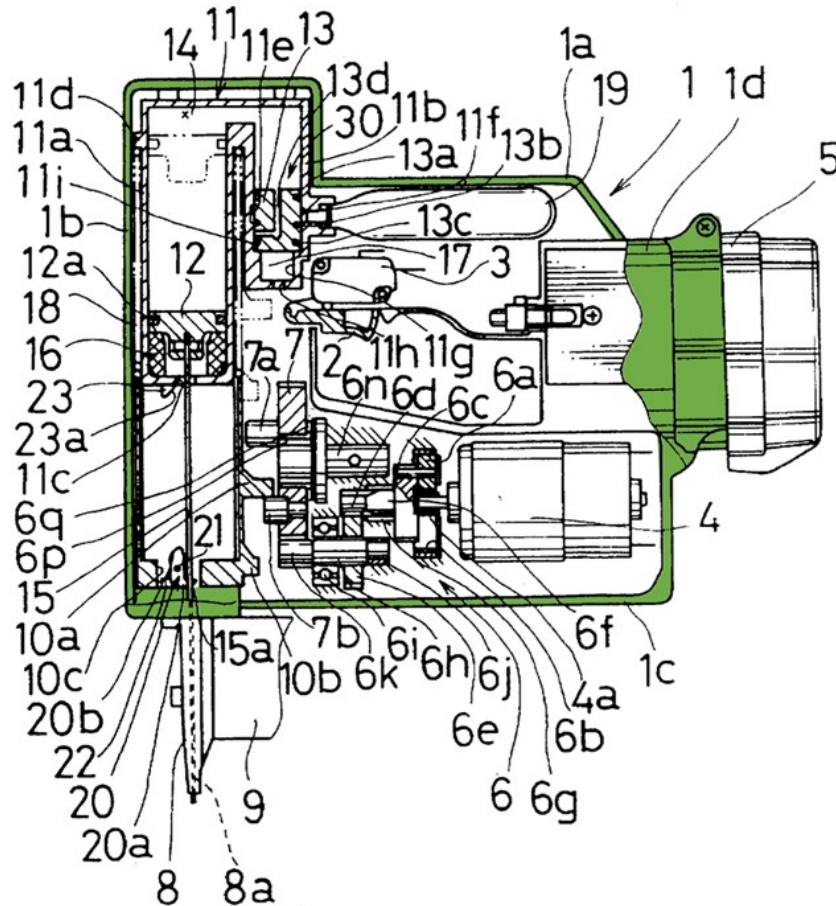


FIG.1

Kondo's storage chamber ("air chamber 14" of "auxiliary cylinder portion 11b," blue) is distinct from the cylinder ("cylindrical main body 11a")—while Kondo generally refers to a "cylinder 11," it also distinctly references "cylindrical main body 11a" and "auxiliary cylinder portion 11b" of cylinder 11. Kondo, 4:35-40, Figs. 1 and 2. Dr. Vallee explains that a POSITA would consider Kondo's cylinder (the "cylindrical main body 11a," yellow above) to be distinct from the portion of the "air chamber 14" above and beside it, because that portion of the

chamber is surrounded by a structure with a different arrangement, radius, and alignment than the “cylindrical main body 11a.” Vallee, ¶156; Kondo, Figs 1-2.

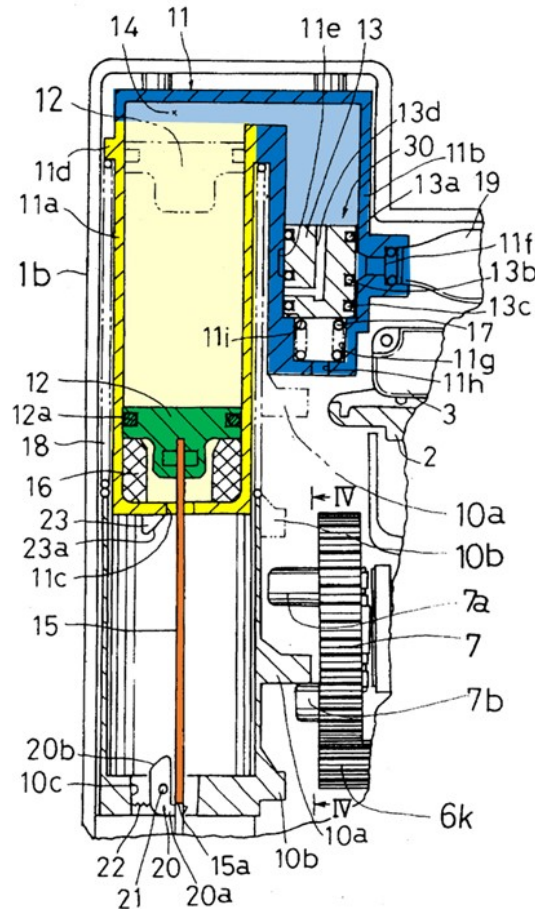


FIG.2

Kondo's storage chamber is charged with a pressurized gas that is always above atmospheric pressure. Dr. Vallee explains that the design of the "auxiliary piston 13" shows that Kondo's storage chamber is charged with a pressurized gas. Vallee, ¶157. Because the "compression coil spring 17" and atmospheric pressure (through "communication hole 11h) are collectively acting upon the bottom of "auxiliary piston 13" (Kondo, 6:31-39) and because Kondo's "air replenishing tank

19” is meant to be used only after “the use of the nailer for a long time” (Kondo, 7:63-67), Kondo’s pressure must remain, during all portions of the operating cycle, above the combined pressures of atmospheric pressure plus the pressure of “compression coil spring 17,” which by definition will be higher than atmospheric pressure alone. Vallee, ¶157.

Element [1.2]

Kondo discloses “a hollow cylinder that includes a movable piston.” Kondo’s hollow cylinder (“cylindrical main body 11a,” yellow) contains a movable piston (“drive piston 12,” green) that is “disposed within the main body 11a of the cylinder 11,” and “is moved vertically within the main body 11a of the cylinder 11.” Kondo, 4:45-46, 5:9-11, Figs. 1-2.

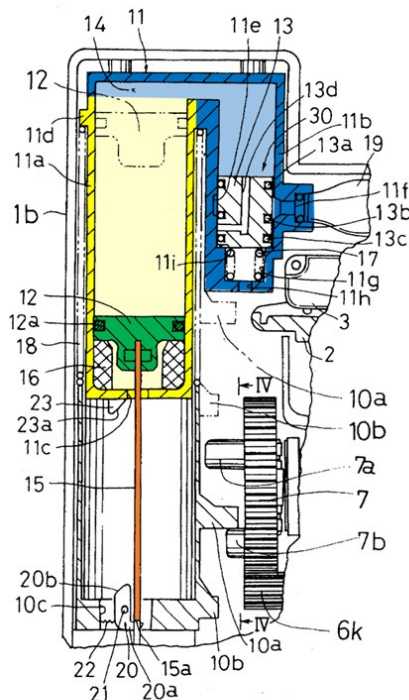


FIG. 2

Element [1.3]

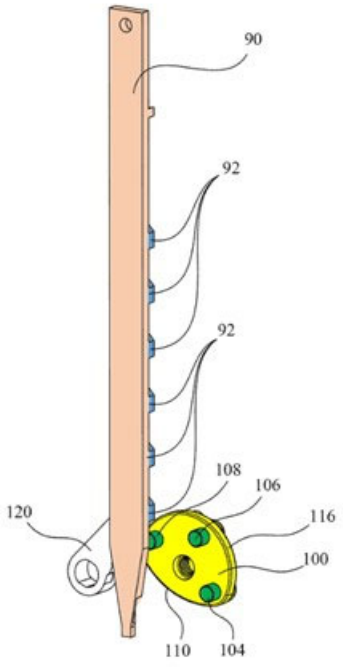
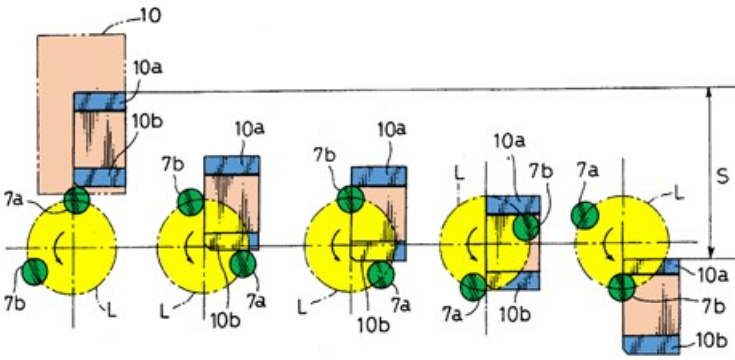
Kondo discloses “a movable driver that is in communication with said piston at least during a drive stroke.” Kondo’s movable driver (“driver 15,” orange) is in communication with its piston (“piston 12,” green) during a drive stroke. Kondo, 4:66-67, Figs. 1-2.

Element [1.4]

Kondo discloses “a lifter that is in communication with said driver at least during a return stroke.”

Kondo discloses an electrically-powered, mechanical lifting mechanism with a structure that is nearly identical (with only insignificant differences) to that of the “lifter” disclosed by the ’167 patent. *Compare* ’167 patent, Fig. 12 with Kondo, Figs. 1-4. The “lifter” of the ’167 patent includes a rotatable cam lifter 100 (yellow below left), with pin 104, 106, and 108 (green) on its face surface that engage protrusions 92 (blue) on the driver member 90 (orange). ’167 patent, 9:36-52, 16:39-53, Fig. 12. The ’167 patent also discloses two-pin variants: lifter members 465 and 480 in Figs. 31 and 33. ’167 patent, 32:21-36, 32:54-33:2. Kondo discloses a rotatable drive gear 7 (yellow below right), with crank pins 7a and 7b (green) on its face surface that engage two protrusions 10a and 10b (blue) on an intermediate

member 10 (orange) that contains the driver member (“driver 15”). Kondo, 3:1-4:32, Figs. 1-4.⁵

'167 Patent Lifter Member	Kondo Lifter Member
 Fig. 12	 FIG. 4(E) FIG. 4(D) FIG. 4(C) FIG. 4(B) FIG. 4(A)

Kondo differs slightly from the '167 patent in that the pins of the lifter member (crank pins 7a and 7b) engage protrusions on an intermediate member (protrusions 10a and 10b on an intermediate member 10) rather than protrusions on the driver blade itself. Dr. Vallee explains that a POSITA would consider this difference to be insignificant, because Kondo’s actual lifting structure is still the same as that of the

⁵ Figs. 4A–E are illustrated in right-to-left order rather than left-to-right.

“lifter” in the ’167 patent and the intermediate member simply channels the lifting force from that lifter member to the driver blade 15. Vallee, ¶162.

Element [1.5]

Kondo discloses “a prime mover.” Kondo’s lifter member is moved by a prime mover (“motor 4”). Kondo, 3:1-10, Fig. 2.

Element [1.6]

Kondo discloses “a source of electrical energy that is removably attached to said housing.” Kondo discloses a “battery 5 as a power source for driving the motor 4,” which “can be removed from the battery housing portion 1d for charging purposes” such that “it is not necessary to be connected to an external power source by means of a cord.” Kondo, 2:63-65; 7:51-55, Fig. 1.

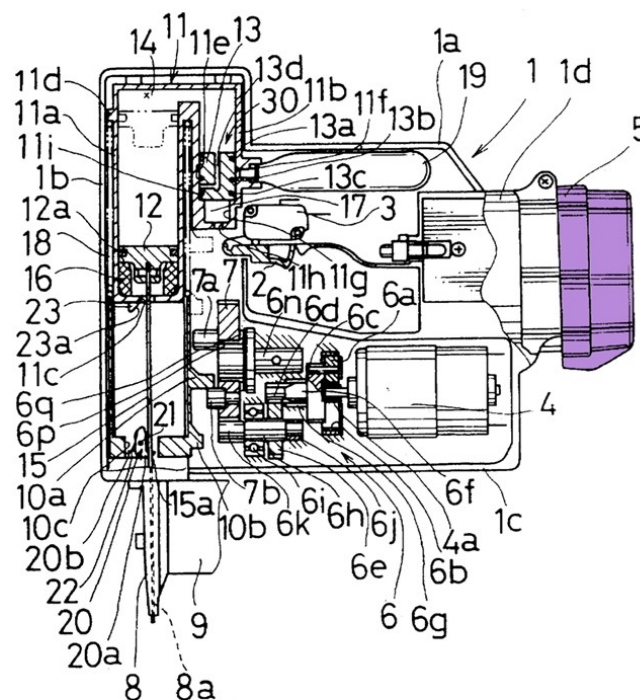


FIG.1

Element [1.7]

Kondo discloses “said storage chamber being in fluidic communication with a first end of said hollow cylinder.”

Kondo’s main storage chamber (“air chamber 14” of its “auxiliary cylinder portion 11b,” blue) is in fluidic communication with the first end (top) of hollow cylinder (“cylindrical main body 11a,” yellow). Kondo, 4:37-40, Figs. 1-2.

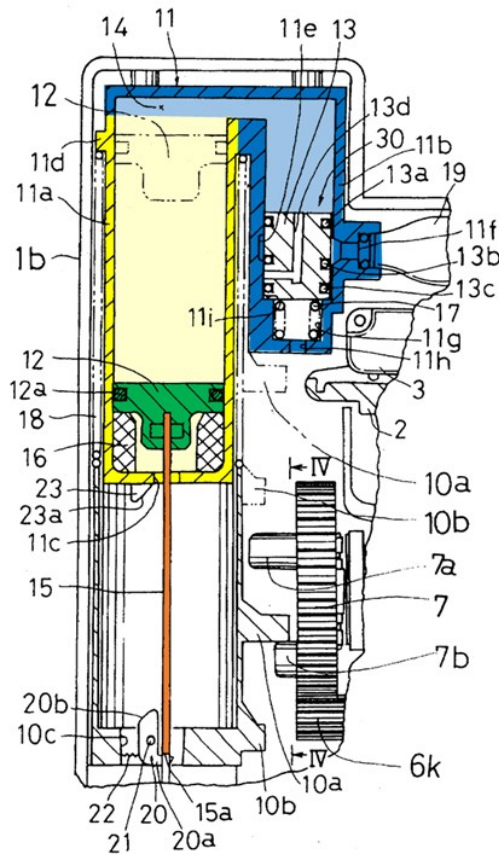


FIG. 2

Kondo’s main storage chamber (the “air chamber 14” of its “auxiliary cylinder portion 11b”) is distinct from the cylinder (“cylindrical main body 11a”). While Kondo generally refers to a “cylinder 11,” it also distinctly references “cylindrical

main body 11a” and “auxiliary cylinder portion 11b” of cylinder 11. Kondo, 4:35-40. Dr. Vallee explains that a POSITA would consider Kondo’s cylinder (“cylindrical main body 11a,” yellow) to be distinct from the portion of the “air chamber 14” above and beside it, because that portion of the chamber is surrounded by a structure with a different arrangement, radius, and alignment than the “cylindrical main body 11a.” Vallee, ¶167; Kondo, Figs 1-2.

Element [1.8]

Kondo does not explicitly disclose a removable top cap, but it was obvious to have “said storage chamber including a removable top cap at a location proximal to said first end of said hollow cylinder.” Vallee, ¶168. As explained by Dr. Vallee, a removable top cap was an obvious solution to carry out Kondo’s disclosure of two high pressure cylinders (“cylindrical main body 11a” and “auxiliary cylinder portion 11b”) in fluidic communication. Kondo, 4:58-62; Vallee, ¶168. According to Dr. Vallee, a POSITA was motivated to use a removable top cap to implement Kondo’s teachings, because it would allow for the use of off-the-shelf cylinders and because it would enable tool maintenance inside the cylinders, such as repairing or replacing the piston. Vallee, ¶168.

Element [1.9]

Kondo discloses “wherein: said piston travels through said hollow cylinder between a higher pressure position and a lower pressure position; said piston has a

the drive stroke—both of which were identified and predictable solutions. Vallee, ¶170. For example, Haley, Saari/Enstrom, and Pedicini all disclose a higher pressure rest position after the return stroke (with Pedicini teaching both positions). *Id.* According to Dr. Vallee, a POSITA would have understood that there was a simple design choice with a well-understood tradeoff, that is, having the rest position at the higher pressure position will achieve “essentially instantaneous driving” (Saari, 3:21-24) in exchange for “losing the benefit of the heat of compression of the air thus reducing the overall efficiency” (Pedicini, ¶[0080]). *Id.* According to Dr. Vallee, by the filing of the ’167 patent, advancements in portable battery power lessened the importance of the incremental efficiency gain provided by the lower pressure rest position, such that market forces and design incentives favored the high pressure rest position, *i.e.*, after said return stroke. Vallee, ¶170. Accordingly, this claim limitation is rendered obvious by Kondo alone, or in view of Haley, Saari/Enstrom, or Pedicini.

Element [1.10]

Kondo discloses “said pressurized gas is not vented to atmosphere after said drive stroke.” Dr. Vallee explains that the design of the “auxiliary piston 13” shows that Kondo’s main storage chamber remains above atmospheric pressure during all portions of the operating cycle and that the pressurized gas is therefore not vented to the atmosphere after a drive stroke. Vallee, ¶171. While Kondo discloses a gas

replenishment system, that system is only meant to be used after “the use of the nailer for a long time” (Kondo, 7:63-67), *i.e.*, after the pressurized gas is re-used for a plurality of operating cycles. Vallee, ¶171.

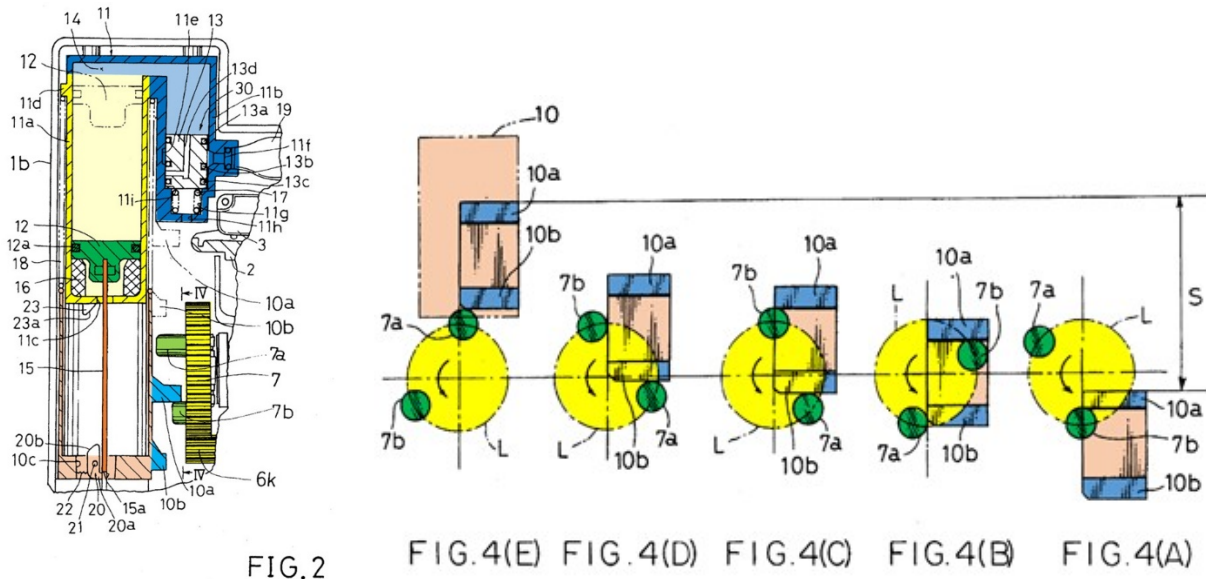
2. Claim 2

Kondo discloses “said movable driver including at least one protrusion; and said lifter including at least one extension; wherein: said at least one extension of the lifter mechanically engages with said at least one protrusion of the driver during said return stroke.”

As noted above, Kondo’s movable driver 15 is lifted via protrusions 10a and 10b (light blue) on intermediate member 10 (light orange), which are mechanically engaged by extensions (crank pins 7a and 7b) of the lifter (rotatable drive gear 7) during a return stroke. Kondo, 3:39-52, Figs. 2, 4A-4E.

While protrusions 10a and 10b are not located on driver 15, Dr. Vallee explains that a POSITA would understand that these protrusions are included as part of the driver because they are what the driver uses to engage with the lifter. Vallee, ¶174. To the extent that this claim is interpreted to require the “at least one protrusion” to be physically located on the driver itself, Dr. Vallee explains that it would have been obvious to a POSITA to modify Kondo to have protrusions 10a and 10b be on the driver 15. Vallee, ¶¶174-175. In fact, Kondo itself discloses, in its third embodiment, a driver (“driver 52”) with a protrusion (“stepped portion 52a”)

that is directly engaged by the lifter. Vallee, ¶174; Kondo, 8:62-67, Fig. 8. It was an simple design choice as to whether or not to have the protrusion on the driver itself (as in Kondo's third embodiment) or on an intermediate member (as in Kondo's first embodiment), and that a POSITA would have been motivated to have the protrusion on the driver for a less complex design when possible, *i.e.*, for nailers designed to drive higher gauge nails and thus requiring a thicker driver that would be strong enough to have protrusions. Vallee, ¶¶174-175.



3. Claim 3

Element [3.1]

Kondo discloses “a guide body with a linear passageway for said driver.” Kondo's guide body (“driver guide 8,” grey) has a linear passageway (“guide hole 8a”) for the driver (“driver 15,” orange). Kondo, 5:7-11, Figs. 1-2.

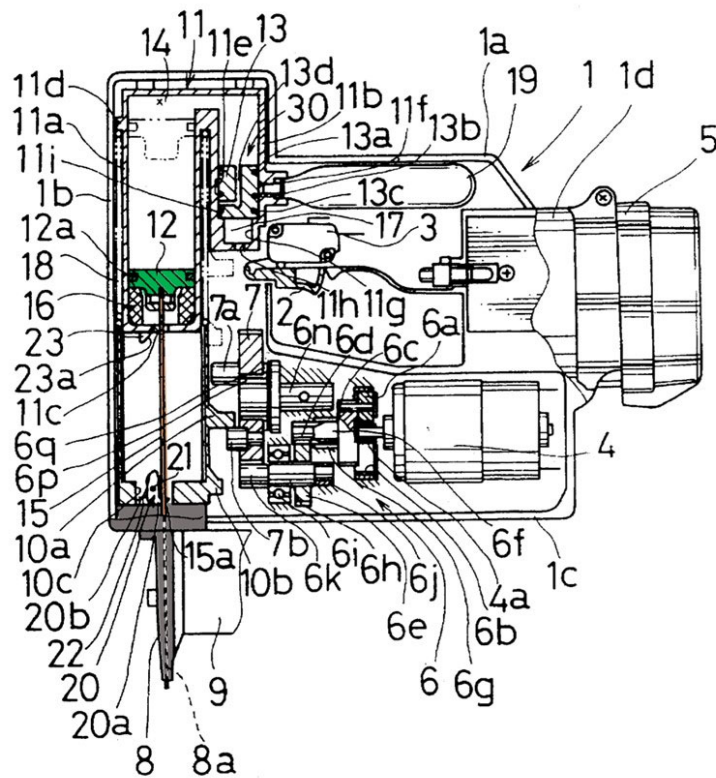


FIG.1

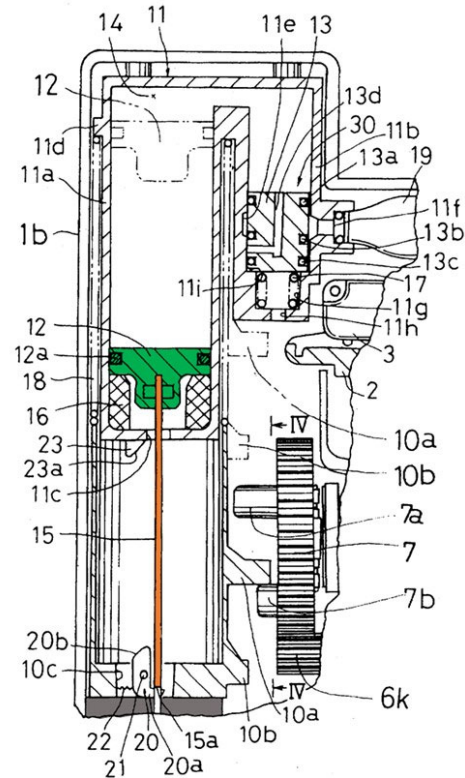


FIG.2

Element [3.2]

Kondo discloses “wherein: said lifter moves in a rotational motion and causes said driver to move in a linear motion along said linear passageway.” Kondo’s lifter is a drive gear (yellow) that moves in rotational motion (curved arrows) to cause the driver (via the intermediate member 10, light orange) to move in a linear motion (upward from right to left in Figs. 4A-4E) along the linear passageway of the guide body. Kondo, Figs. 4A-E, 3:64-4:25.

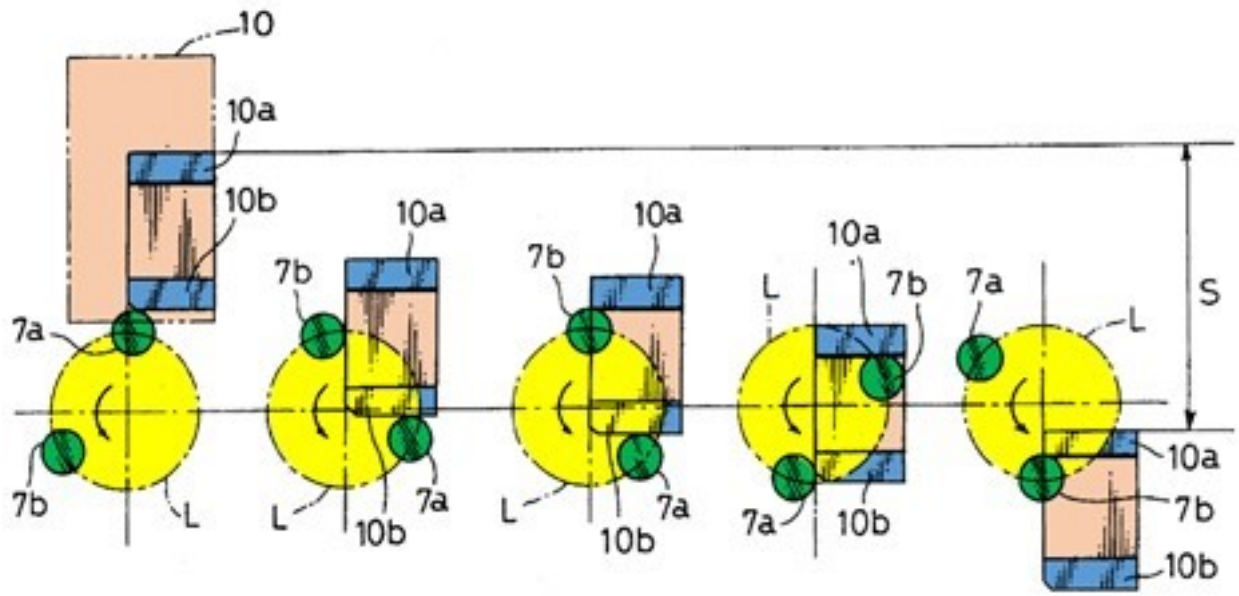


FIG. 4(E) FIG. 4(D) FIG. 4(C) FIG. 4(B) FIG. 4(A)

4. Claim 4

Kondo discloses “wherein: said cylinder and piston act as a gas spring during said drive stroke, and said lifter does not mechanically engage said driver during said drive stroke.” In Kondo, the pressurized gas of the storage chamber (“air chamber 14”) and the cylinder (“cylinder 11”) form a gas spring to propel the piston (“drive piston 12”) to drive a nail during a drive stroke. Kondo, Figs. 1-2, 4A-4E, 5:53-55, 6:1-7. When the driver 15 is released from mechanical engagement with the lifter, “the drive piston 12 is forced downwardly by the expanding force of the air compressed within the air chamber 14.” Kondo, 6:1-7.

5. Claim 5

Kondo discloses “wherein the piston is positioned inside the top cover when the piston is at or near the first end of the hollow cylinder.” When the piston is near the first end (top) of the hollow cylinder (piston 12, green, dashed outline below left), it is positioned at the top of the “cylindrical main body 11a” (yellow) and thus positioned inside the top cover/cap in the obvious implementation where a removable top cap connects Kondo’s two high pressure cylinders. Vallee, ¶179.

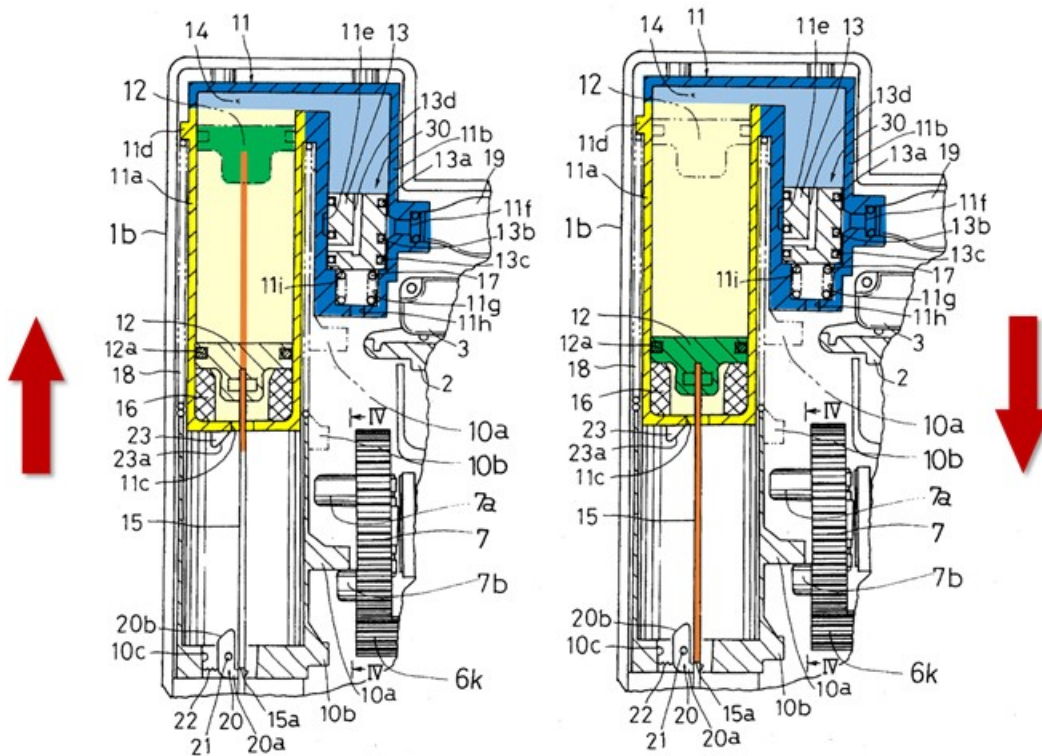


FIG. 2

FIG. 2

6. Claim 6

Elements [6.P]-[6.7]

Elements [6.P]-[6.7] are substantially identical to Elements [1.P], [1.1], [1.2], [1.7], [1.10], [1.3], [1.4], and [3.1], respectively, and are met as described above.

Element [6.8]

Kondo discloses “a handle portion.” Kondo refers to its handle as “grip portion 1a” on the upper side of housing 1 (green). Kondo, 2:54-55, Fig. 1.

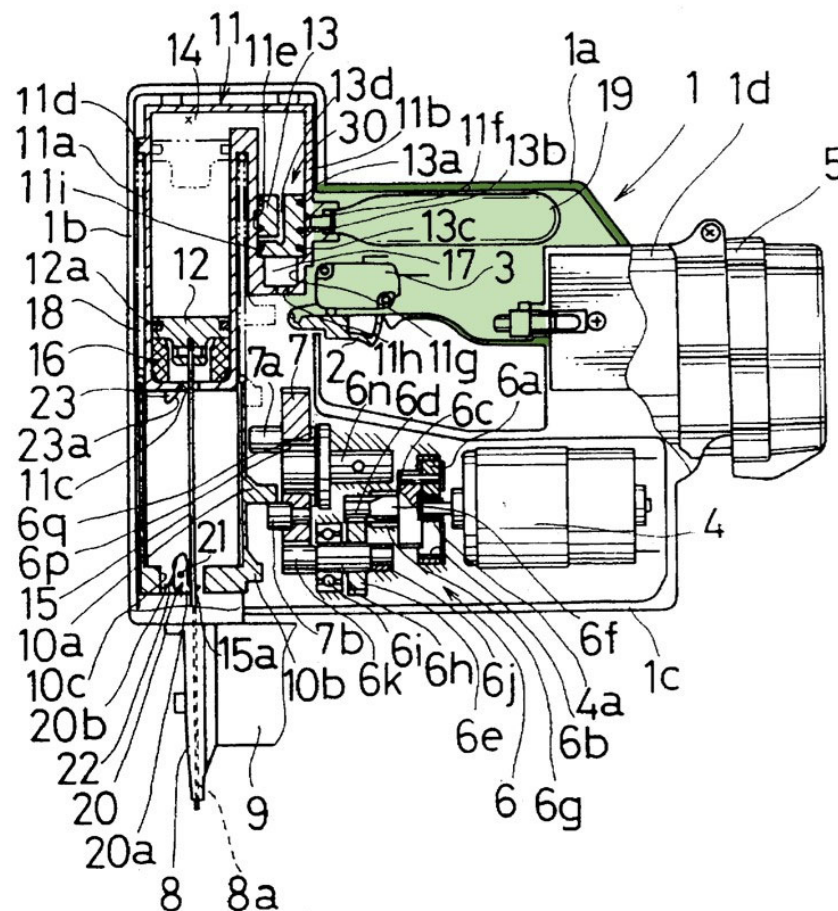


FIG.1

Element [6.9]

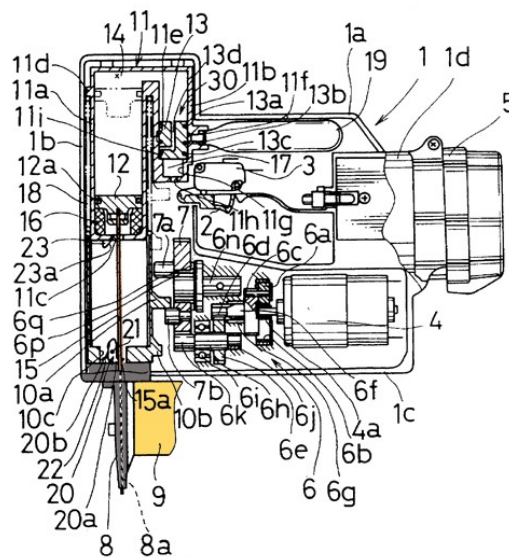
Element [6.9] recites “a motor that provides motive power for said lifter” and is met for the reasons described above for Element [1.5], which recites “a prime mover.”

Element [6.10]

Element [6.10] recites “a removable battery pack that provides energy for said motor” and is met for the reasons described above for Element [1.6], which recites “a source of electrical energy that is removably attached to said housing.”

Element [6.11]

Kondo discloses “a removable magazine that holds a plurality of fasteners.” Kondo’s removable magazine (“nail magazine 9” shown “attached to the housing 1,” orange) holds a plurality of fasteners (“a nail stick consisting of a series of nails bonded to each other”). Kondo, 5:15-19, Fig. 1.



Element [6.12]

Kondo discloses “wherein: said removable battery pack is attached proximal to said handle portion.” Kondo’s removable battery pack (“battery 5,” purple) is attached proximal to the handle portion (“grip portion 1a,” green). Kondo, Fig. 1.

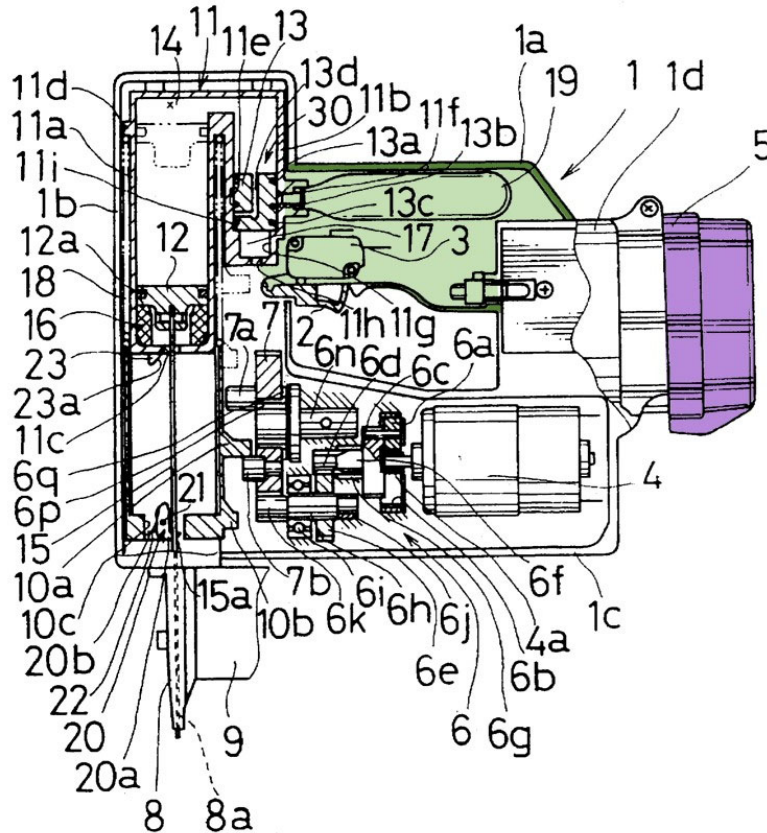


FIG.1

Element [6.13]

Kondo discloses “said removable magazine is attached proximal to an exit end of said guide body, wherein said magazine extends past said removable battery pack.” Kondo’s magazine (orange) is attached proximal to the exit end of the guide

body (grey) so that the nails are “supplied to the guide hole 8a of the driver guide 8.” Kondo, 5:15-19, Fig. 1.

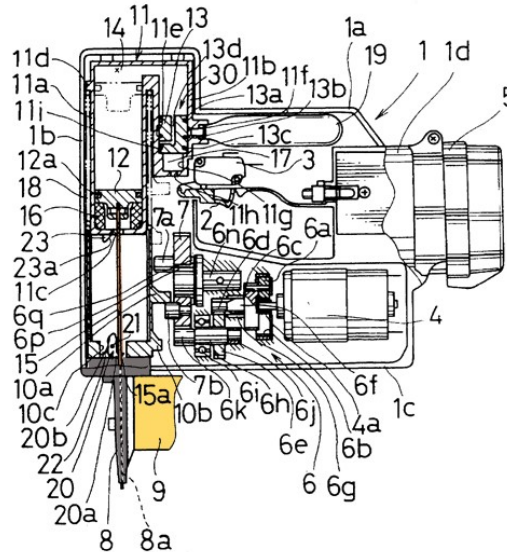


FIG.1

Dr. Vallee explains that Kondo’s magazine would obviously extend past the removable battery pack in designs with high capacity magazines, since increasing the magazine size will extend it outward from the tool at a greater pace than increasing the battery, because the magazine holds nails linearly whereas the battery holds charge based on volume. Vallee, ¶¶187-188.

7. *Claim 7*

Elements [7.1]-[7.2] are substantially identical to Claim 2 and Element [3.2], respectively, and are met as described above.

8. *Claim 8*

Claim 8 is substantially identical to Claim 4 and is met as described above.

9. Claim 9

Kondo discloses “wherein: a bottommost surface of said magazine is farther from a centerline of said exit end of the guide body than is a bottommost surface of said battery pack.” As explained above for Element [6.13], Dr. Vallee explains that designs with high capacity magazines will obviously have a magazine that extends further outward from the tool than the battery pack, and thus the magazine’s bottommost surface will be farther away from the centerline than the battery’s bottommost surface. Vallee, ¶191.

10. Claim 10

Elements [10.P]-[10.4]

Elements [10.P]-[10.4] are substantially identical to Elements [6.P], [6.1], [6.2]-[6.3], [6.5], and [6.6], respectively, and are met as described above.

Element [10.5]

Element [10.5] recites “a guide body . . . having a linear passageway for said driver,” which is substantially identical to Element [6.7], and further recites that the guide body is “located proximal to said hollow cylinder” and “having an exit end that is located distal from said hollow cylinder.” Element [10.5] is met for the reasons discussed above for Element [6.7].

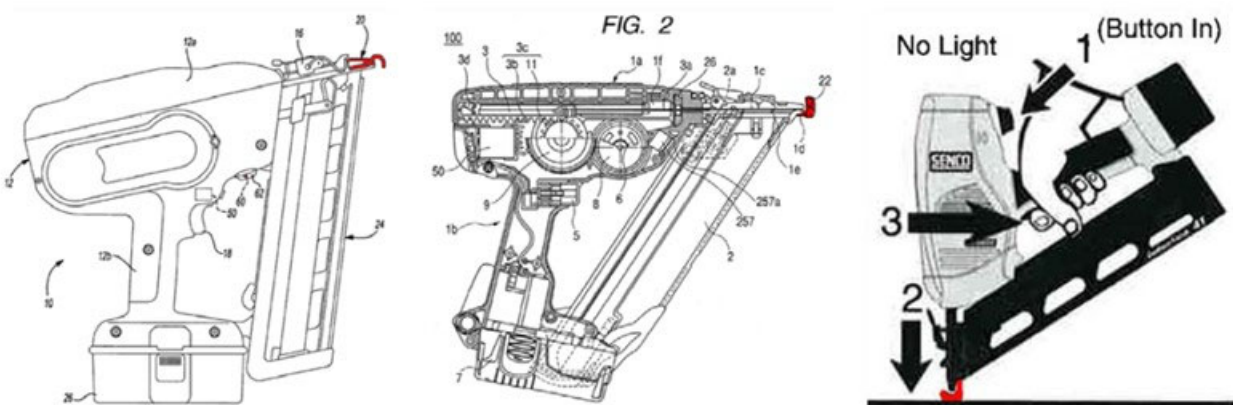
Element [10.6]

Element [10.6] recites “a removable battery pack,” which is identical to Element [6.10], and further recites that it “is located at a rear portion of said tool.” Element [10.6] is met for the reasons discussed above for Element [6.10].

Element [10.7]

Kondo is silent about a safety contact, but it would have been obvious to a POSITA to have “a safety contact element proximal to said exit end, said safety contact element being disposed at a front portion of the tool, above said guide body.”

Dr. Vallee explains that a POSITA would be motivated to incorporate such a safety contact element into Kondo based on design choice and market forces, because that was the conventional design taught by numerous prior art references, including Forster, Shima, and Senco. Forster, ¶[0024], ¶[0028], Fig. 1 (below left); Shima, ¶[0054], Fig. 2 (below middle); Senco, 13-14 (below right); Vallee, ¶196.



11. Claim 11

Claim 11 recites “an electric motor that derives energy from said battery pack, which provides motive power for said lifter” and is met for the reasons discussed above for Element [6.9].

12. Claim 12

Kondo discloses “wherein: said safety contact element prevents said drive stroke from occurring unless said safety contact element is pressed against a solid surface.” The conventional safety contact element taught by numerous prior art references (Forster, Shima, Senco) prevents said drive stroke from occurring unless said safety contact element is pressed against a solid surface. Vallee, ¶198.

13. Claim 13-14

Claims 13 and 14 are identical to Claims 7 and 8, respectively, and are met as described above.

14. Claim 15

Kondo discloses “wherein: said safety contact element is located directly above said guide body and extends from said front portion of the tool toward a rear portion of the tool, extending along at least a surface of the guide body that is on the opposite side of the tool from where said battery pack is located.” The conventional safety contact element taught by numerous prior art references (Forster, Shima, Senco) is located directly above the guide body, extends from the front of the tool

toward the rear, and extends along a surface of the guide body opposite the battery.
Vallee, ¶200.

D. Ground 4: Claims 1-15 are Obvious based on Pedicini

1. Claim 1

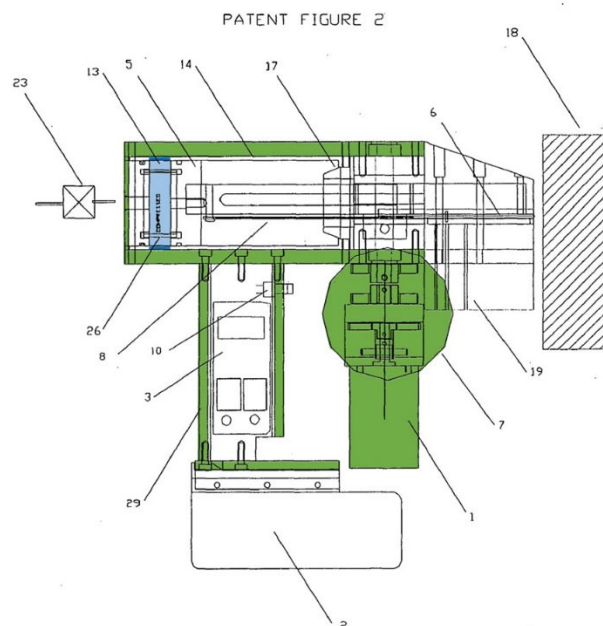
Element [1.P]

U.S. Patent Publication No. 2006/0180631 (“Pedicini”) discloses “[a] portable fastener driving tool.” Pedicini discloses a fastener driving tool (“fastener device 100”). Pedicini, Figs. 1-4; ¶[0077].

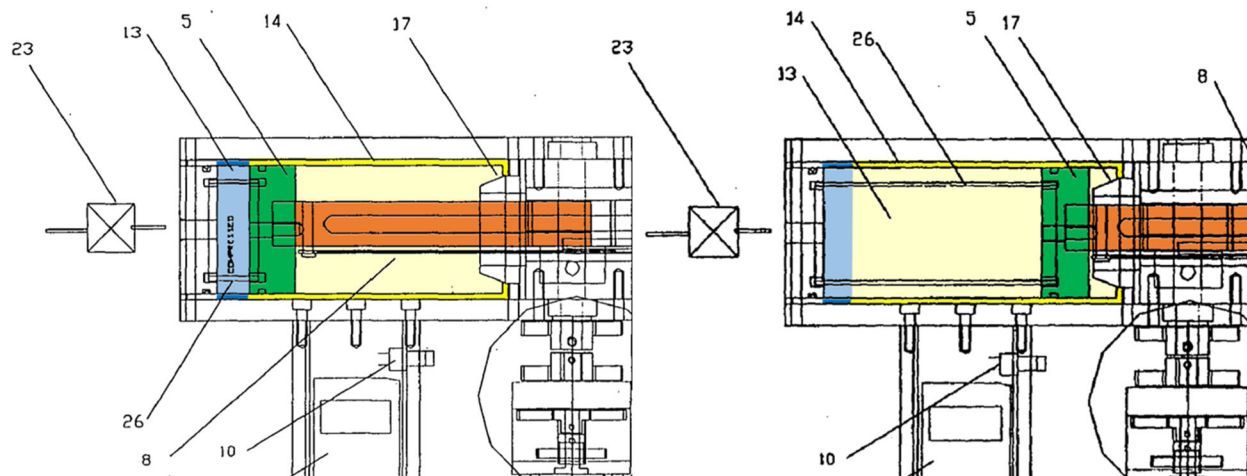
Element [1.1]

Pedicini discloses “a housing with a storage chamber that contains a pressurized gas that is always above atmospheric pressure.”

Pedicini’s housing is shown below in green. Pedicini, Figs. 1-2; Vallee, ¶203.



Pedicini has a storage chamber that contains a pressurized gas, which is the overhead portion of the “chamber (13)” within “cylinder 14,” *i.e.*, the volume above the piston (blue). Pedicini, Figs. 1-2.



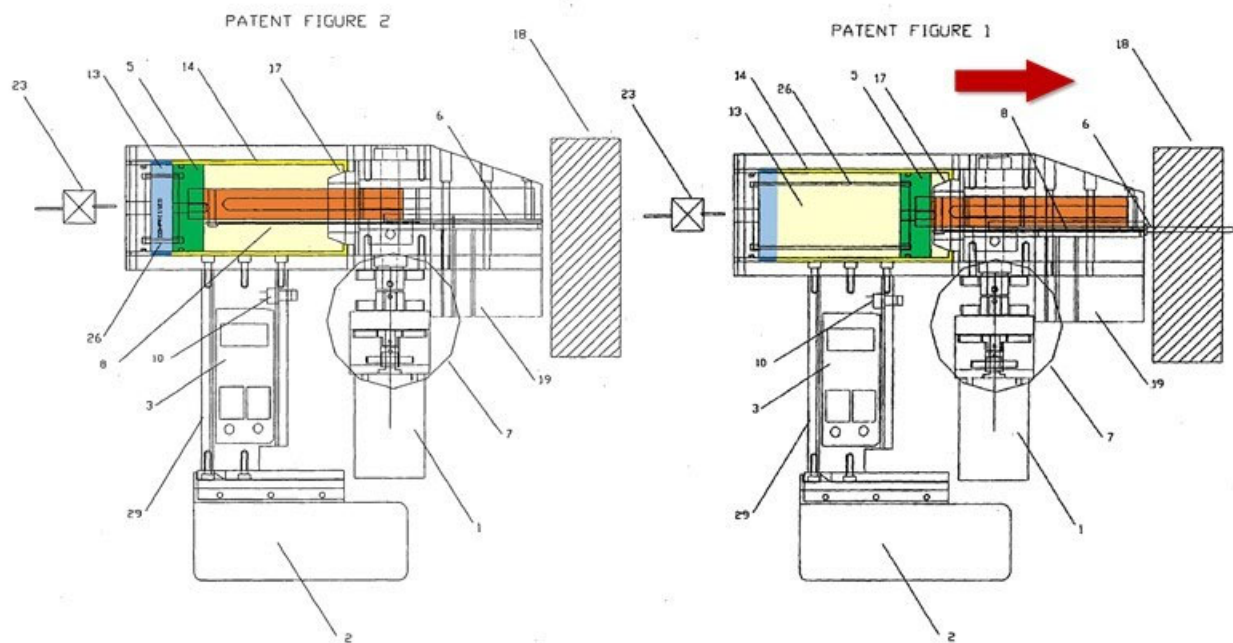
Pedicini’s storage chamber (blue) is distinct from the displacement volume (yellow) of cylinder 14, which is shown in Figures 1-2 where the storage chamber is directly adjacent to the displacement volume. As explained above, *see* §VI, the ITC’s decision regarding “main storage chamber” was based on Patent Owner’s post-agreement argument that the agreed construction required the “main storage chamber” to be distinct from *any* region within the “hollow cylinder,” and not—as Petitioner understood the agreement—distinct from the “displacement volume” recited in the claims, which is the region “created by a stroke of said piston.” ’167 patent, 10:22-25. The region annotated above in blue is above the travel path of the piston and thus is not part of the “displacement volume.” Vallee, ¶205. Accordingly, that blue region is distinct from the claimed “displacement volume”

and constitutes a separate volume that should satisfy the “storage chamber” limitation.

Pedicini’s storage chamber contains a pressurized gas that is always above atmospheric pressure. Pedicini states that “[a] release valve (23) is used to replenish the air which may be lost between nail drives.” Pedicini, ¶[0077], Figs. 1-2. Pedicini also states that “it is possible to precharge the air chamber (13) to eliminate the piston return spring (26)”--while Pedicini goes on to say that “this is not preferable since it complicates recovering from fastener jams,” Pedicini includes an embodiment (Figure 4) where the piston return spring 26 is indeed eliminated. Pedicini, ¶[0077], Fig. 4. A POSITA would understand the disclosure of a sealed main storage chamber and a release valve for “replenishing the air” means that the chamber is “charged with a pressurized gas” and that it will remain above atmospheric pressure during all portions of an operating cycle, since a charging valve would have no use if the chamber is allowed to reach atmospheric pressure. Vallee, ¶206. Nor would a POSITA misinterpret the valve in Pedicini as a connection point for a pneumatic hose to attached and supply gas throughout operation (as opposed to only an initial charge), since Pedicini explicitly denigrates the “[n]on-portability” of “[t]raditional nail guns [that] are tethered to a fixed compressor.” Pedicini, ¶[0017].

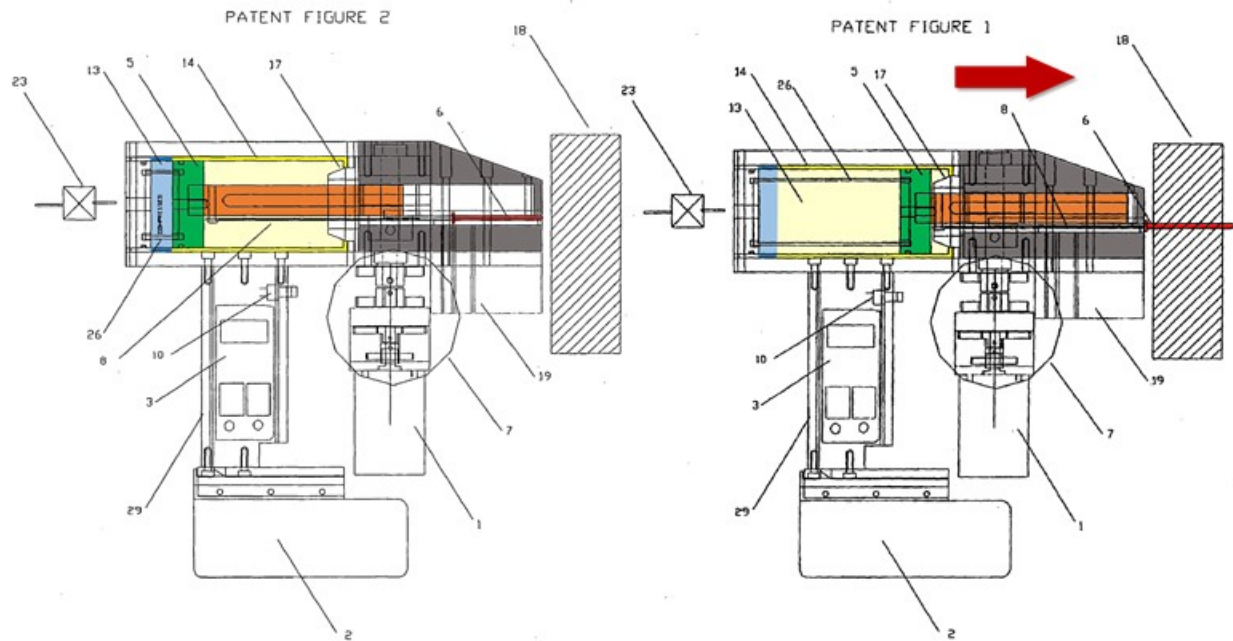
Element [1.2]

Pedicini discloses “a hollow cylinder that includes a movable piston.” Pedicini’s hollow cylinder (“cylinder (14),” yellow) includes a piston (“piston (5),” green) that can “move within the cylinder (14).” Pedicini, ¶¶[0077]-[0078], Figs. 1-4. The hollow cylinder has a displacement volume created by the stroke of the piston (yellow), which is reflected by the piston illustrated at its raised position in Fig. 2 and at its lower position in Fig. 1. Pedicini, Figs. 1-3.



Element [1.3]

Pedicini discloses “a movable driver that is in communication with said piston at least during a drive stroke.” Pedicini’s movable driver (“rack (4)” orange, which also includes “anvil (8)”), is in communication with the piston (“piston (5),” green) during a drive stroke. Pedicini, Figs. 1-2, ¶¶[0077]-[0078].

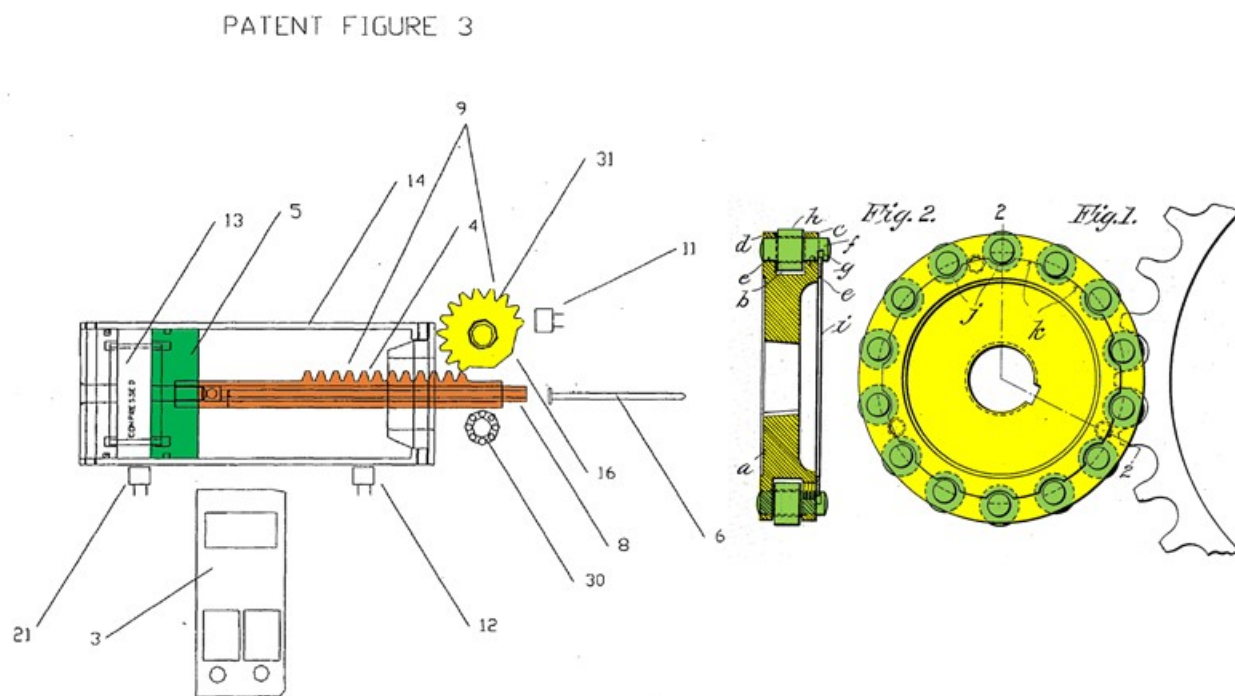


Element [1.4]

Pedicini discloses “a lifter that is in communication with said driver at least during a return stroke.”

Pedicini discloses a rack-and-pinion gear with gear teeth on its outer perimeter (“rack pinion (31),” yellow), which is rotatable and contacts protrusions of the driver member during the return stroke but is not the claimed “lifter.” Pedicini, ¶[0078], Figs. 3 (below left), 4; Vallee, ¶209. Dr. Vallee explains that an obvious variant of Pedicini’s rack-and-pinion gear would have been to implement the well-known “roller” modification—where the gear teeth are replaced with rollers along the outer perimeter that can better handle friction and are thus less at risk to wearing down over time—to obtain a “roller pinion,” which is disclosed and touted by U.S. Patent No. 860,536 (“Ellingham”). Vallee, ¶210; Ellingham, 1:8-14, Figs. 1-2 (below

right). The Patent Owner has accused such a “roller pinion” lifting mechanism in Petitioner’s products as being a “lifter member.” While Petitioner disagrees with the Patent Owner’s infringement allegations, assuming *arguendo* such a lifting mechanism could constitute a “lifter,” it would be rendered obvious by Pedicini in view of the well-known “roller pinion” such as that disclosed by (and whose use is encouraged by) Ellingham, for example. That obvious variant of Pedicini has the claimed “rotatable lifter member.”



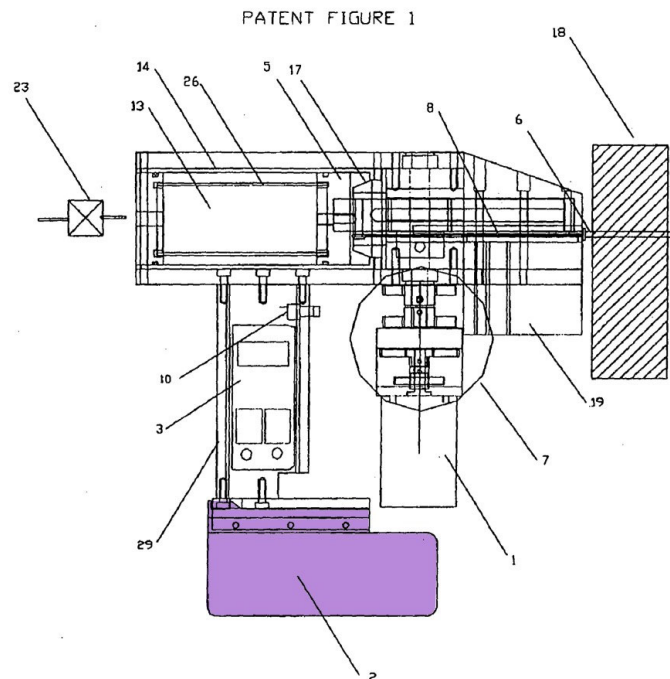
Element [1.5]

Pedicini discloses “a prime mover.” Pedicini’s prime mover (“motor (1)”) will drive the lifter member (“rack pinion (31),” in its roller pinion variant as discussed

above), by rotating it, thereby causing the driver member (“rack (4)”) to be moved toward the ready position. Pedicini, ¶¶[0077], [0080]; Vallee, ¶211.

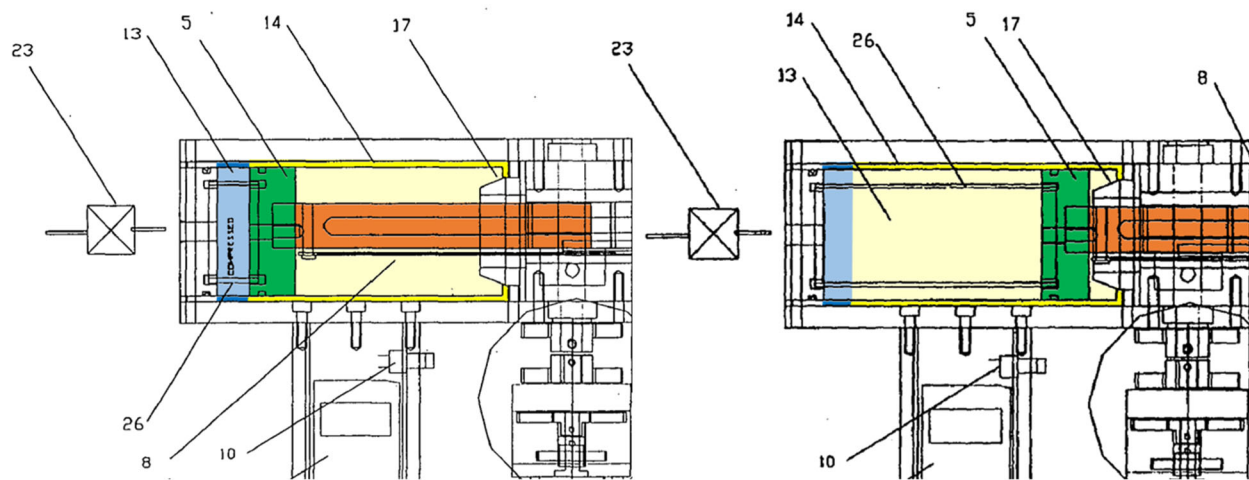
Element [1.6]

Pedicini discloses “a source of electrical energy that is removably attached to said housing.” Pedicini’s source of energy is a “rechargeable battery.” Pedicini, ¶[0077], Fig. 1. Pedicini also refers to its rechargeable battery as a “battery pack.” Pedicini, Abstract. Dr. Vallee explains that a POSITA would understand based on its shape and appearance in the figures, and Pedicini’s characterization of it as a “battery pack,” that the rechargeable battery is removably attached to the housing. Vallee, ¶212.



Element [1.7]

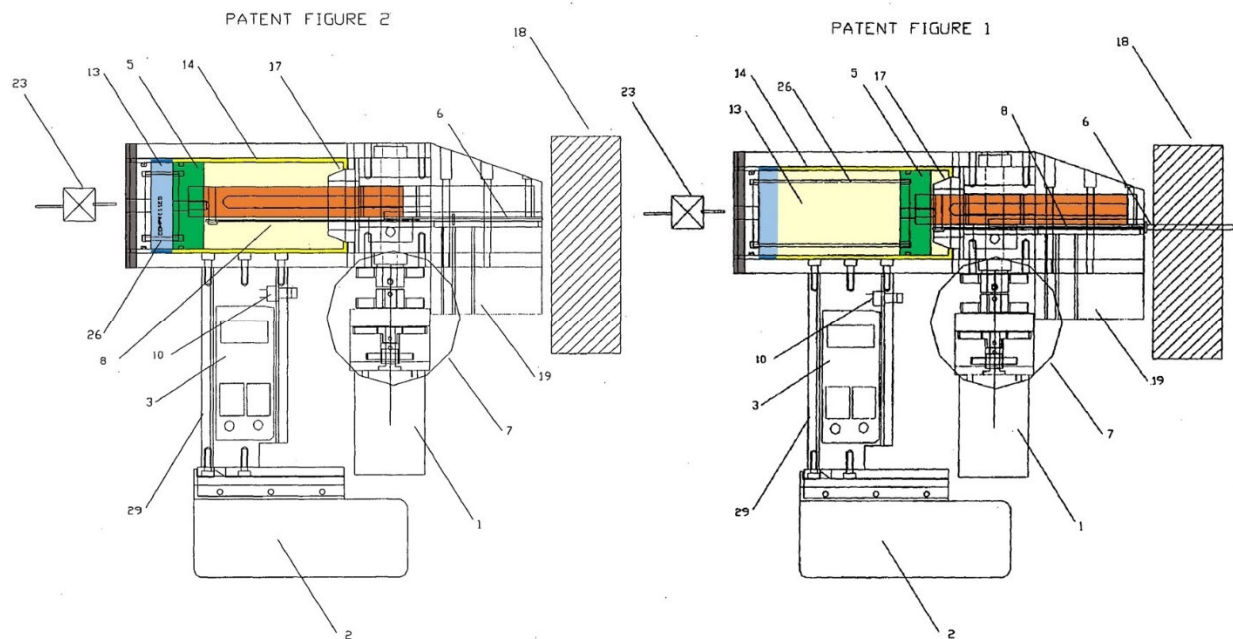
Pedicini discloses “said storage chamber being in fluidic communication with a first end of said hollow cylinder.” Pedicini’s storage chamber (blue) remains in fluidic communication at all times with the cylinder 14 (yellow) and its displacement volume, which is shown in Figures 1-2 where the storage chamber is directly adjacent to the displacement volume. Pedicini, Figs. 1-2.



Element [1.8]

Pedicini does not explicitly disclose a removable top cap, but it would have been obvious to have “said storage chamber including a removable top cap at a location proximal to said first end of said hollow cylinder.” Vallee, ¶214. As explained by Dr. Vallee, Pedicini’s Figs. 1-2 illustrate a top cap (grey) of the storage chamber (blue) that is located proximal to the first end (left) of the hollow cylinder (yellow), and a removable top cap was an obvious way to carry out Pedicini’s teaching. Pedicini, Figs. 1-2; Vallee, ¶214. According to Dr. Vallee, a POSITA was

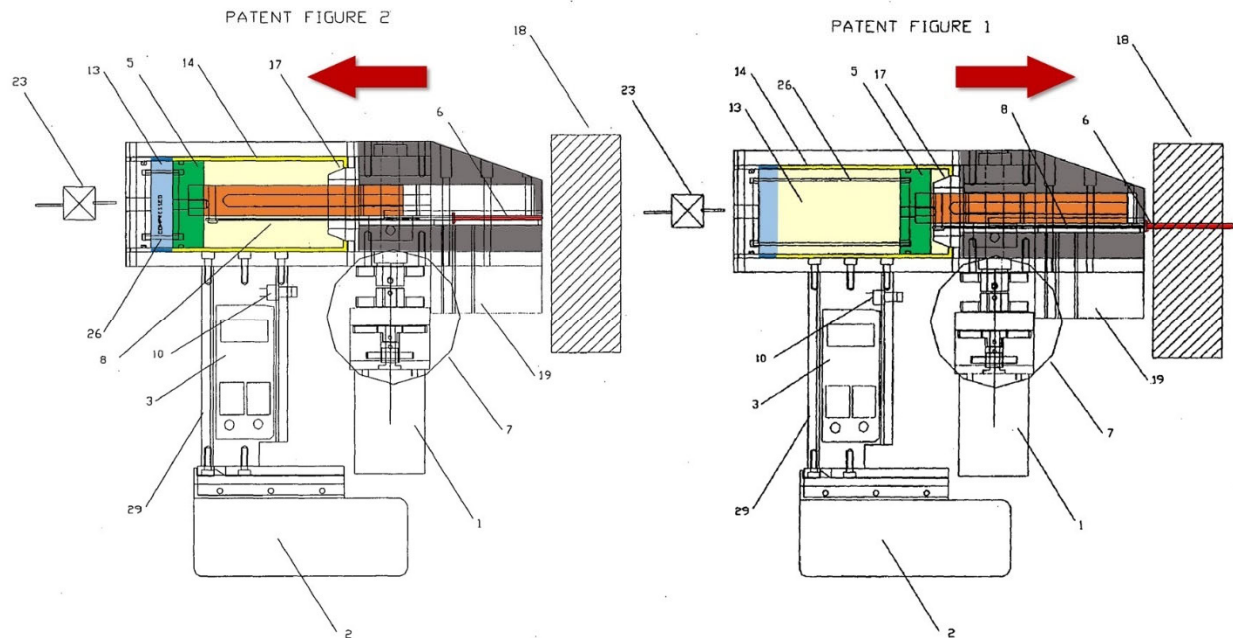
motivated to use a removable top cap to implement Pedicini's teaching, because it would allow for the use of an off-the-shelf cylinder and because it would enable tool maintenance inside the cylinder, such as repairing or replacing the piston. Vallee, ¶214.



Element [1.9]

Pedicini discloses “wherein: said piston travels through said hollow cylinder between a higher pressure position and a lower pressure position; said piston has a rest position between operational cycles; and a location of said rest position is proximal to said higher pressure position.”

Pedicini's piston (green) travels through the hollow cylinder (yellow) between a higher pressure position (Fig. 2, left) and a lower pressure position (Fig. 1, right). Pedicini, Figs. 1-2.



Pedicini's piston has a rest position between operational cycles located proximal to the higher pressure position. Pedicini discloses "a sear pin or lever (28) which maintains the rack (4), piston (5) and anvil (80) in the energized state," that is, the holding position of the lifter member and ready position of the driver member, such that "[u]pon actuation of the trigger (32) of the sear lever, the mechanism is released and energetically pushes the fastener into the substrate." Pedicini, ¶[0080], Fig. 4.

Element [1.10]

Pedicini discloses "said pressurized gas is not vented to atmosphere after said drive stroke." In particular, Pedicini states that "[a] release valve (23) is used to replenish the air which may be lost between nail drives." Pedicini, ¶[0077], Figs. 1-2. Pedicini also states that "it is possible to precharge the air chamber (13) to

eliminate the piston return spring (26)”--while Pedicini goes on to say that “this is not preferable since it complicates recovering from fastener jams,” Pedicini includes an embodiment where the piston return spring 26 is indeed eliminated. Pedicini, ¶[0077], Fig. 4. Dr. Vallee explains that a POSITA would understand the disclosure of a sealed main storage chamber and a release valve for “replenishing the air” means that the pressurized gas is “not vented to atmosphere after said drive stroke,” but instead “is re-used for a plurality of said operating cycles,” since a charging valve would have no use if the chamber is allowed to reach atmospheric pressure. Vallee, ¶219. Nor would a POSITA misinterpret the valve in Pedicini as a connection point for a pneumatic hose to attached and supply gas throughout operation (as opposed to only an initial charge), since Pedicini explicitly denigrates the “[n]on-portability” of “[t]raditional nail guns [that] are tethered to a fixed compressor.” Pedicini, ¶[0017].

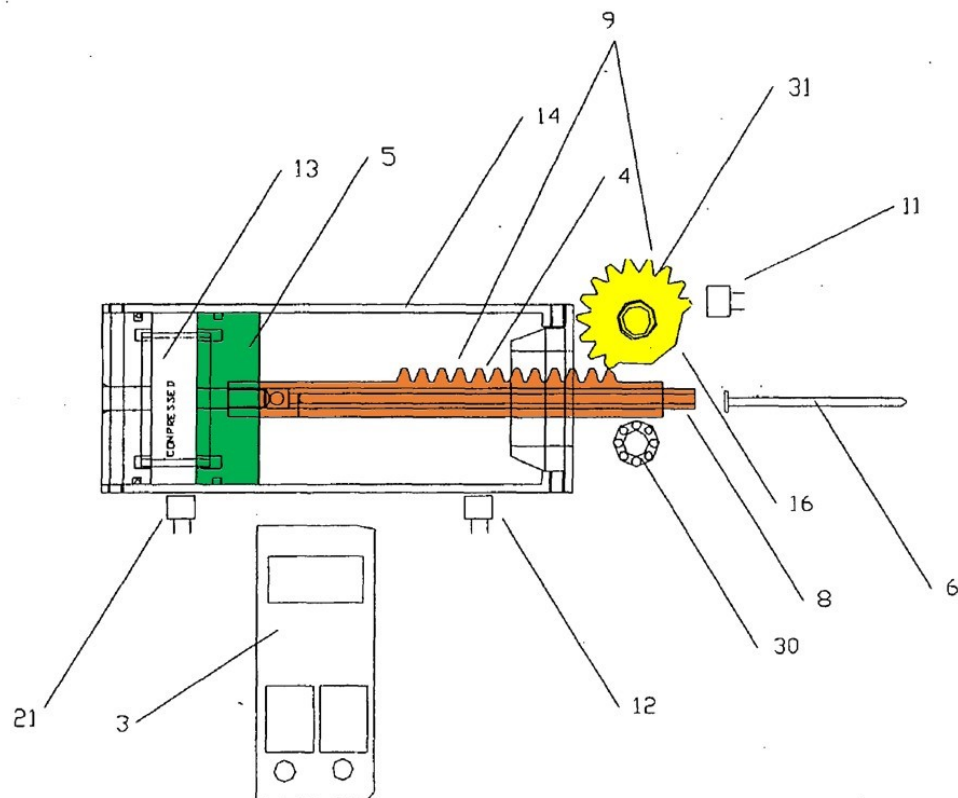
2. Claim 2

Pedicini discloses “said movable driver including at least one protrusion; and said lifter including at least one extension; wherein: said at least one extension of the lifter mechanically engages with said at least one protrusion of the driver during said return stroke.”

Pedicini's movable driver ("rack (4)" and "anvil (8)," orange) has numerous (and thus "at least one") protrusions, which are the gear teeth shown below in Fig.

3. Pedicini, Fig. 3, ¶[0078]; Vallee, ¶221.

PATENT FIGURE 3



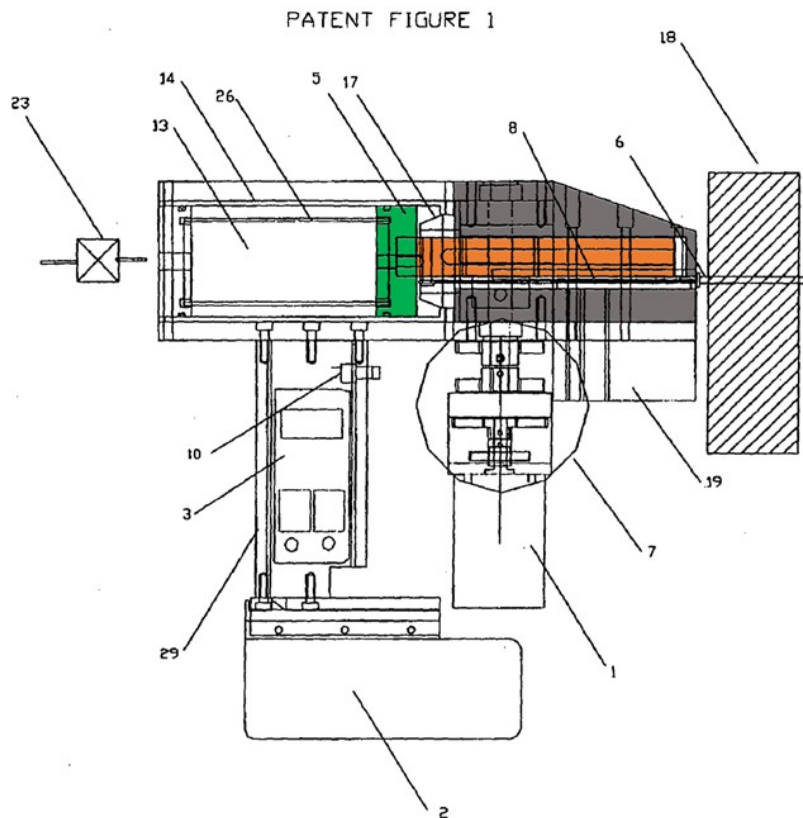
Pedicini's modified roller pinion lifter has multiple extensions that mechanically engage with said the protrusions of the driver during said return stroke.

Pedicini, ¶[0078], Fig. 3; Ellingham, 1:8-14, Figs. 1-2; Vallee, ¶222.

3. Claim 3

Element [3.1]

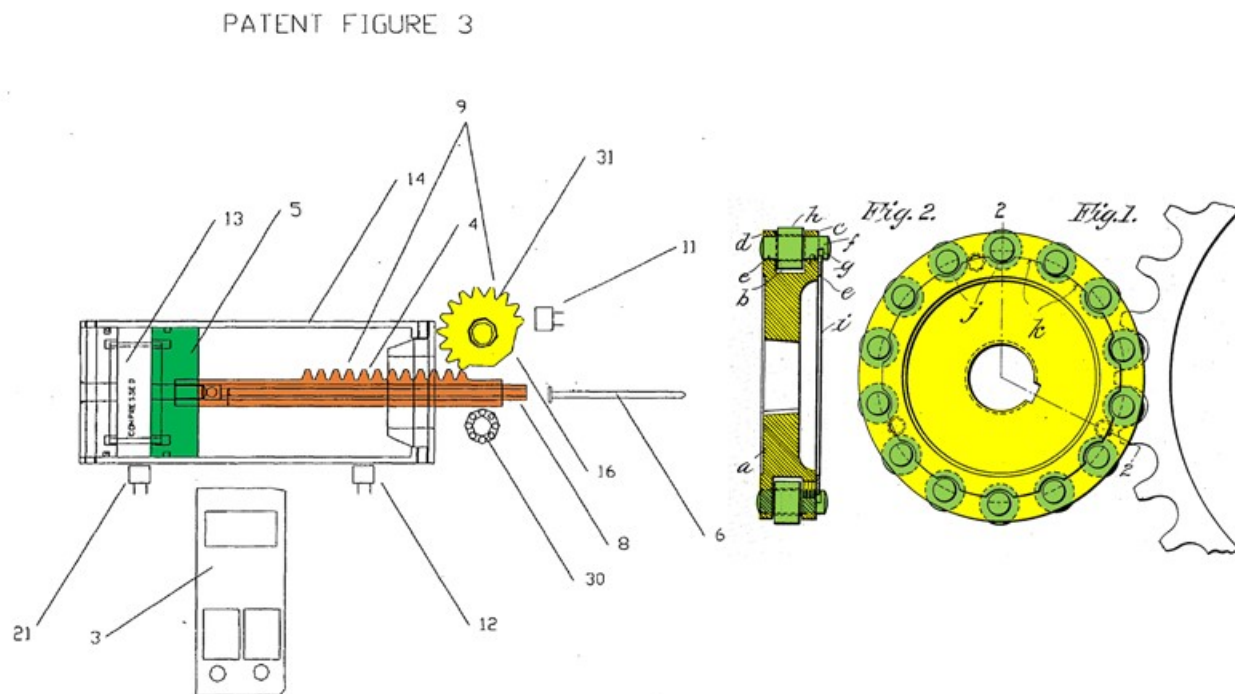
Pedicini discloses “a guide body with a linear passageway for said driver.” Pedicini’s guide body (grey) has a linear passageway for the driver (“rack (4),” orange). Pedicini, ¶[0078], Fig. 1.



Element [3.2]

Pedicini discloses “wherein: said lifter moves in a rotational motion and causes said driver to move in a linear motion along said linear passageway.” Pedicini’s lifting mechanism is a rotatable pinion (“rack pinion (31),” below left) that moves in rotational motion (clockwise in Fig. 3) to cause the driver (orange) to

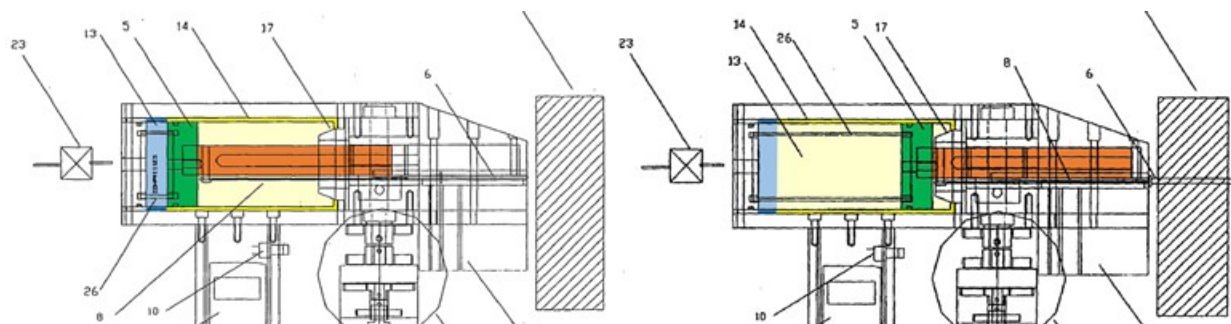
move in a linear motion (leftward in Fig. 3). Pedicini, Fig. 3, ¶[0078]. This is not altered by the roller pinion modification. Ellingham, Fig. 1 (below right); Vallee, ¶224.



4. Claim 4

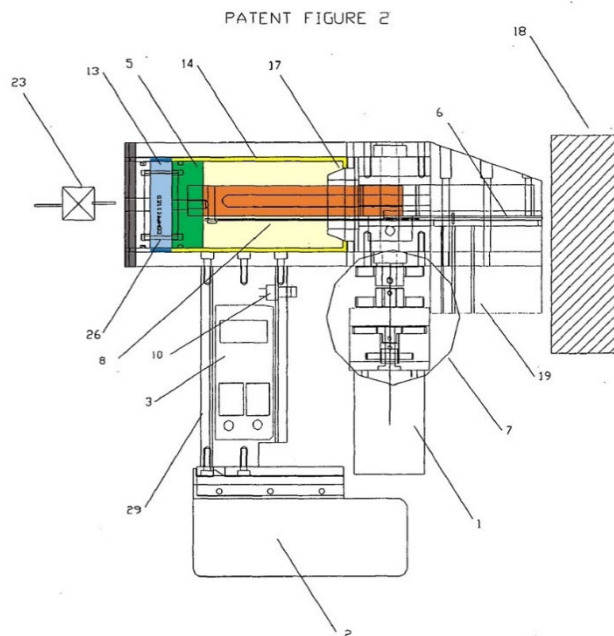
Pedicini discloses “wherein: said cylinder and piston act as a gas spring during said drive stroke, and said lifter does not mechanically engage said driver during said drive stroke.” In Pedicini, the pressurized gas of the storage chamber (blue below, the portion of “chamber (13)” above the piston) and the displacement volume in the cylinder (yellow below, the portion of “chamber (13)” within “cylinder (14)” through which the piston moves) act as a gas spring to drive the piston (“piston (5)”). When the piston is raised, the gas in the main storage chamber and the displacement volume is compressed, and when decoupled from the “rack pinion (31),” the “piston

(5),” along with its attached “rack (4)” and “anvil (8),” then “rapidly accelerate under the force of the compressed air.” Vallee, ¶225; Pedicini, ¶[0078], Figs. 1-2.



5. *Claim 5*

Pedicini discloses or at least renders obvious “wherein the piston is positioned inside the top cover when the piston is at or near the first end of the hollow cylinder.” Pedicini’s piston (green) is positioned at the inside of the top cover/cap (grey) when it is near the first end (left) of the hollow cylinder (yellow). Pedicini, Fig. 2. To the extent “inside” has a narrower meaning, such as “enclosed” or “surrounded,” this was obvious. Vallee, ¶226.



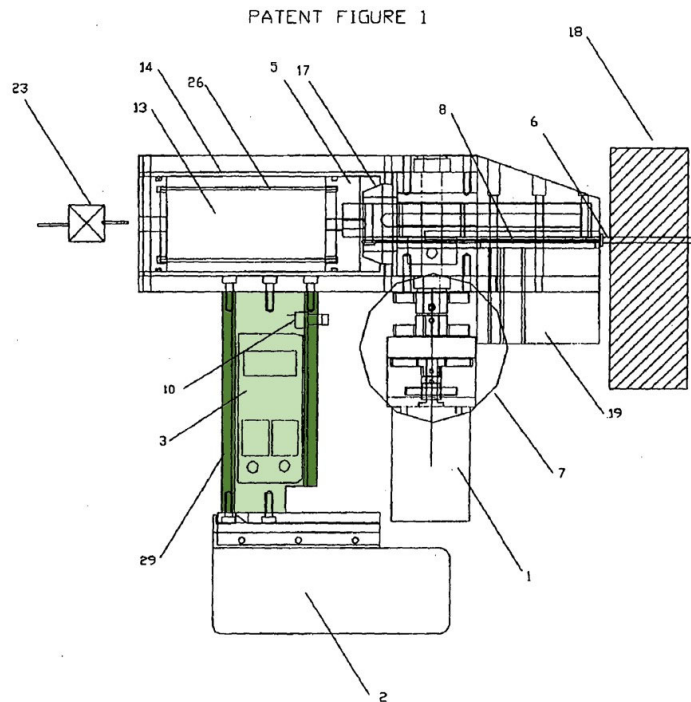
6. Claim 6

Elements [6.P]-[6.7]

Elements [6.P]-[6.7] are substantially identical to Elements [1.P], [1.1], [1.2], [1.7], [1.10], [1.3], [1.4], and [3.1], respectively, and are met as described above.

Element [6.8]

Pedicini discloses “a handle portion.” Pedicini’s handle portion is grip 29 (green,). Pedicini, ¶[0067], Fig. 1.



Element [6.9]

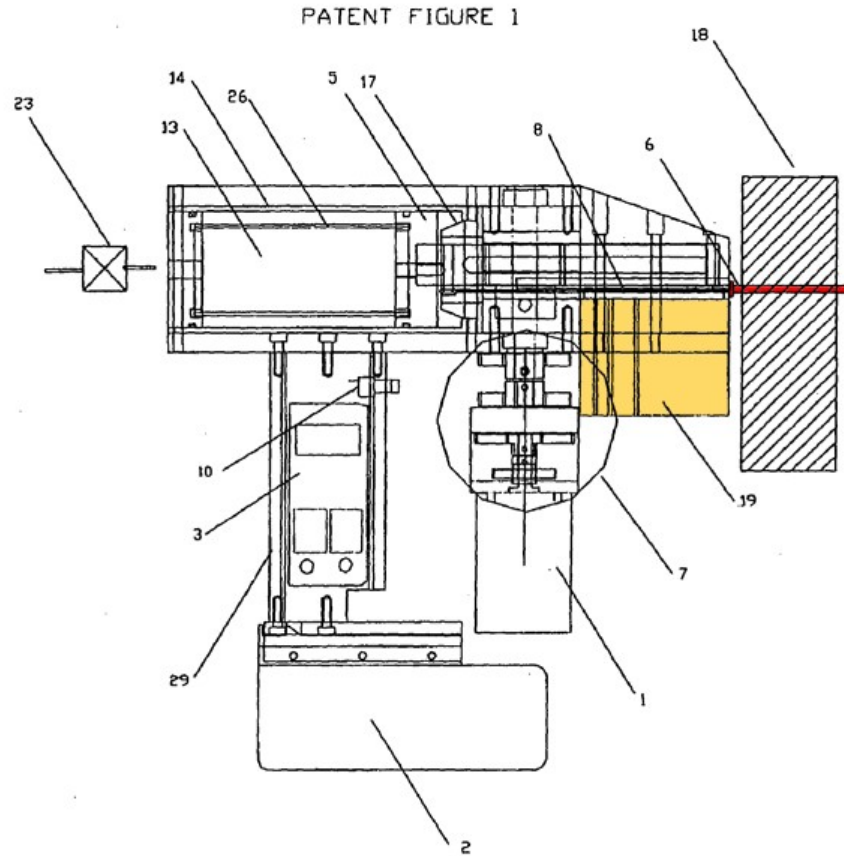
Element [6.9] recites “a motor that provides motive power for said lifter” and is met for the reasons described above for Element [1.5], which recites “a prime mover.”

Element [6.10]

Element [6.10] recites “a removable battery pack that provides energy for said motor” and is met for the reasons described above for Element [1.6], which recites “a source of electrical energy that is removably attached to said housing.”

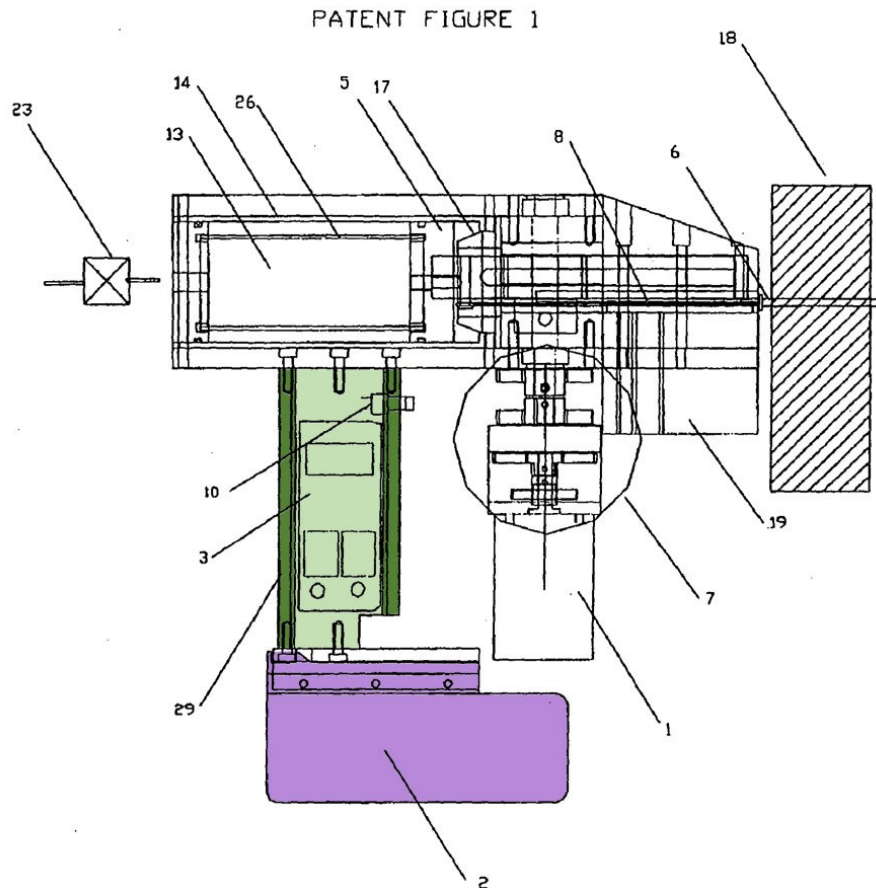
Element [6.11]

Pedicini discloses “a removable magazine that holds a plurality of fasteners.” Pedicini removable magazine (“fastener feeder (19),” orange) “supplies the fasteners (6) to the fastener driver anvil (8).” Pedicini, ¶¶[0076]-[0077], Fig. 1.



Element [6.12]

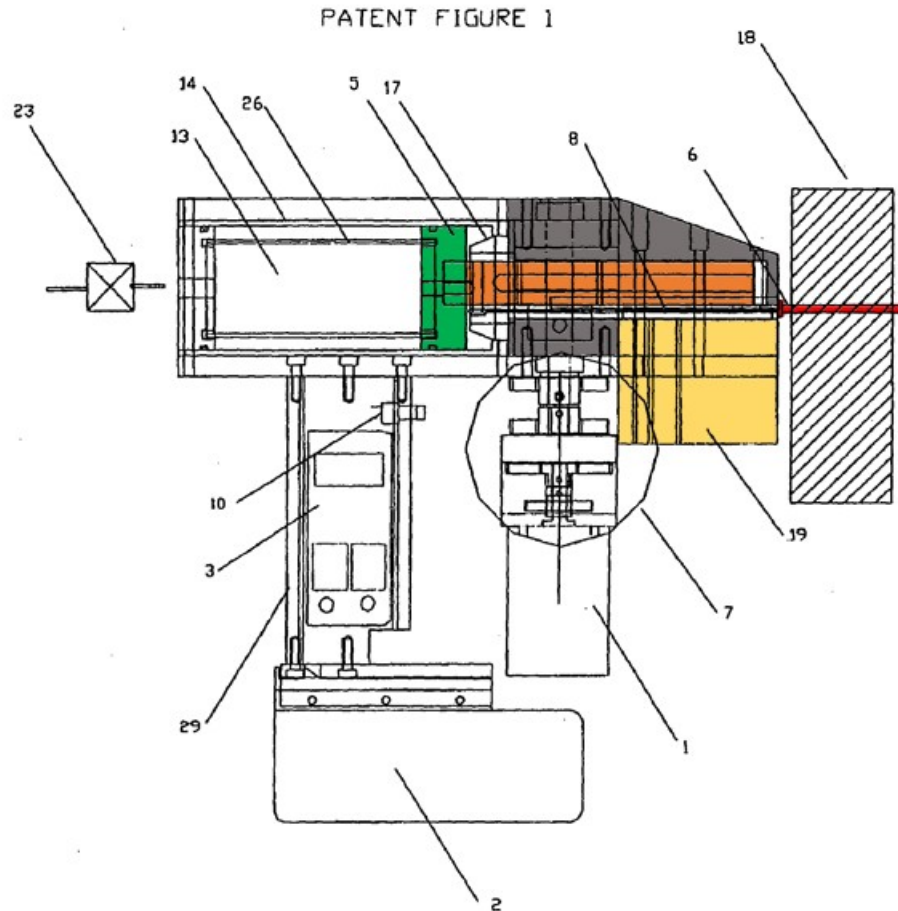
Pedicini discloses “wherein: said removable battery pack is attached proximal to said handle portion.” Pedicini’s removable battery (“battery pack,” purple) is attached proximal to the handle portion (“grip,” green). Pedicini, Fig. 1.



Element [6.13]

Pedicini discloses “said removable magazine is attached proximal to an exit end of said guide body, wherein said magazine extends past said removable battery pack.” Pedicini’s removable magazine (“fastener feeder (19),” orange) is attached proximal to the exit end of the guide body (grey). Dr. Vallee explains that Pedicini’s magazine would obviously extend past the removable battery pack in designs with high capacity magazines, since increasing the magazine size will extend it outward from the tool at a greater pace than increasing the battery, because the magazine

holds nails linearly whereas the battery holds charge based on volume. Vallee, ¶¶ 234-235.



7. Claim 7

Elements [7.1]-[7.2] are substantially identical to Claim 2 and Element [3.2], respectively, and are met as described above.

8. Claim 8

Claim 8 is substantially identical to Claim 4 and is met as described above.

9. Claim 9

Pedicini discloses “wherein: a bottommost surface of said magazine is farther from a centerline of said exit end of the guide body than is a bottommost surface of said battery pack.” As explained above for Element [6.13], Dr. Vallee explains that designs with high capacity magazines will obviously have a magazine that extends further outward from the tool than the battery pack, and thus the magazine’s bottommost surface will be farther away from the centerline than the battery’s bottommost surface. Vallee, ¶238.

10. Claim 10

Elements [10.P]-[10.4]

Elements [10.P]-[10.4] are substantially identical to Elements [6.P], [6.1], [6.2]-[6.3], [6.5], and [6.6], respectively, and are met as described above.

Element [10.5]

Element [10.5] recites “a guide body . . . having a linear passageway for said driver,” which is substantially identical to Element [6.7], and further recites that the guide body is “located proximal to said hollow cylinder” and “having an exit end that is located distal from said hollow cylinder.” Element [10.5] is met for the reasons discussed above for Element [6.7].

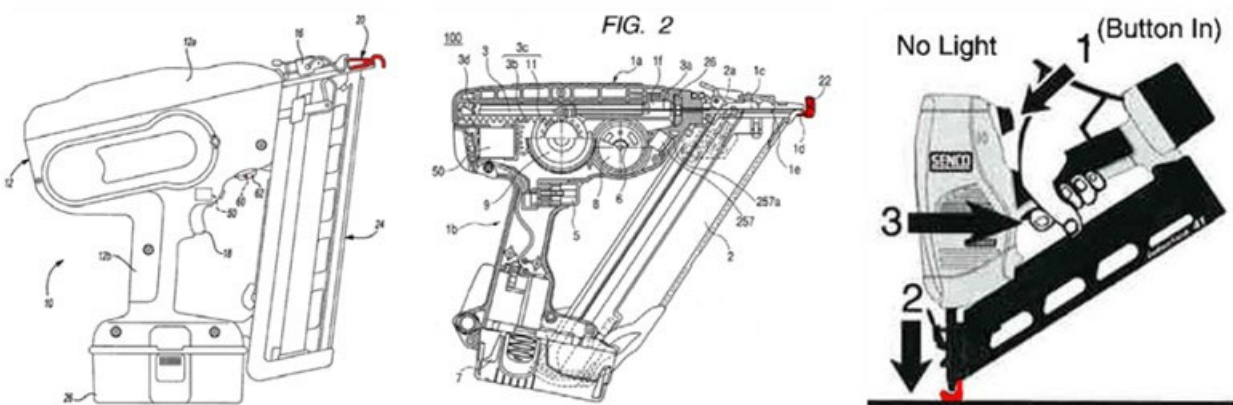
Element [10.6]

Element [10.6] recites “a removable battery pack,” which is identical to Element [6.10], and further recites that it “is located at a rear portion of said tool.” Element [10.6] is met for the reasons discussed above for Element [6.10].

Element [10.7]

Pedicini is silent about a safety contact, but it would have been obvious to a POSITA to have “a safety contact element proximal to said exit end, said safety contact element being disposed at a front portion of the tool, above said guide body.”

Dr. Vallee explains that a POSITA would be motivated to incorporate such a safety contact element into Pedicini based on design choice and market forces, because that was the conventional design taught by numerous prior art references, including Forster, Shima, and Senco. Forster, ¶[0024], ¶[0028], Fig. 1 (below left); Shima, ¶[0054], Fig. 2 (below middle); Senco, 13-14 (below right); Vallee, ¶243.



11. Claim 11

Claim 11 recites “an electric motor that derives energy from said battery pack, which provides motive power for said lifter” and is met for the reasons discussed above for Element [6.9].

12. Claim 12

Pedicini discloses “wherein: said safety contact element prevents said drive stroke from occurring unless said safety contact element is pressed against a solid surface.” The conventional safety contact element taught by numerous prior art references (Forster, Shima, Senco) prevents said drive stroke from occurring unless said safety contact element is pressed against a solid surface. Vallee, ¶245.

13. Claim 13-14

Claims 13-14 are identical to Claims 7-8, respectively, and are met as described above.

14. Claim 15

Pedicini discloses “wherein: said safety contact element is located directly above said guide body and extends from said front portion of the tool toward a rear portion of the tool, extending along at least a surface of the guide body that is on the opposite side of the tool from where said battery pack is located.” The conventional safety contact element taught by numerous prior art references (Forster, Shima, Senco) is located directly above the guide body, extends from the front of the tool

toward the rear, and extends along a surface of the guide body opposite the battery.

Vallee, ¶247.

VIII. CONCLUSION

Accordingly, Petitioner requests *inter partes* review of claims 1-15 pursuant to Grounds 1-4 set forth above.

Date: December 13, 2024

Respectfully submitted,

/Amol A. Parikh/

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Attorneys for Petitioner

CERTIFICATION UNDER 37 C.F.R. § 42.24

Under the provisions of 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter partes* Review totals 13,930 words, which is less than the 14,000 allowed under 37 C.F.R. § 42.24.

Date: December 13, 2024

/Amol A. Parikh/

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CERTIFICATE OF SERVICE

I hereby certify that on this 13th day of December, 2024, a copy of this Petition, including all exhibits, has been served in its entirety by FedEx Express to the Patent Owner by serving the correspondence address of record as follows:

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