

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.

DECLARATION OF GLENN E. VALLEE, PH.D
U.S. PATENT NO. 11,034,007

Case No. IPR2025-00261

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

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I. INTRODUCTION

A. Background

1. My name is Glenn E. Vallee, Ph.D.
2. I have been retained by Koki Holdings America Ltd. (“Koki” or “Petitioner”) as an independent expert consultant.
3. I have been asked to provide my opinions on various issues pertinent to the validity of U.S. Patent No. 11,034,007 (the ’007 patent).
4. In forming my opinions, I rely on my knowledge and experience in the field, and on the documents and information referenced in this declaration. If called to testify in this matter, I am prepared to explain in detail, with appropriate visual aids, the opinions expressed in this declaration and my basis for those opinions.

B. Qualifications

5. I am employed by Western New England University as an Associate Professor and Chair of Mechanical Engineering. My background is in the areas of mechanical engineering, design, product development and quality assurance. I teach courses in Mechanical Design, Kinematics, Vibrations, Mechanics of Materials, Materials Science and a Product Development and Innovation (PDI) course where students design consumer products having commercial potential. Six utility patents have been filed for student inventions developed in the course. I also teach undergraduate engineers how to design products involving air flow. Finally, I teach laboratory courses where students utilize a variety of electrical transducers and data

acquisition systems. I received a Ph.D. in Mechanical Engineering and Applied Mechanics from the University of Rhode Island in 1995, where my thesis research focused on the mechanical behavior of elastomeric materials under impact loading. I received a Master of Science degree in Mechanical Engineering and Applied Mechanics in 1990 where my thesis research focused on the mechanical behavior of an epichlorohydrin elastomer used as an impact absorber in pneumatic fastening tools.

6. I also serve as a consultant in the areas of mechanical engineering design, numerical stress analysis, new product development and mechanical testing. In this capacity I've worked on a number of products related to power nailers since 2002. I developed and fabricated a prototype CO2 cartridge powered fastening tool, developed a dynamic material model for a nitrile elastomer used in impact bumpers in pneumatic fastening tools and also developed a dynamic load-deflection test system for verifying the response of impact bumpers in pneumatic fastening tools as predicted using finite element analysis. I have also served as project supervisor and advisor for a number of Capstone Senior Design Projects related to pneumatic nailers. These projects included the design and fabrication of recoil reduction devices for pneumatic and powder actuated nailers, the development of a predictive design methodology for polymeric components used in pneumatic nailers which are susceptible to creep rupture failures, the development of a double capacity

pneumatic nailer magazine, and the development of a portable energy measuring device for pneumatic nailers. I have also served as a technical expert in product liability and patent litigation involving nailers, as well as other products. I am a member of the American Society of Mechanical Engineers (ASME member no. 1259837) and I am a licensed Professional Engineer (RI Lic. No. 6765).

7. As set forth in more detail in my curriculum vitae, I have substantial experience in the areas of mechanical engineering, product design and development, quality assurance and mechanical testing. Before joining Western New England University, I served as the Director of Engineering and Quality Assurance, Worldwide for Remington Products Company, L.L.C. in Bridgeport, CT from 1997 until 2002. Remington Products Company is a major manufacturer of products, including electric shavers, beard trimmers and hair dryers. My responsibilities included directing the activities of Design and Product Engineering, Quality Assurance and Manufacturing departments in the U.S., U.K. and Asia. I was responsible for the design and development of international consumer products, and for focusing new product engineering toward continuously improving customer satisfaction through improved product design, performance and quality. I gained considerable experience in the utilization of rechargeable batteries in a number of different products, including the use of NiCad and Nickel metal hydride battery technologies

8. Before my employment at Remington Products, I served as the Manager of the Engineering Laboratories at the Stanley Bostitch Company, now a division of Stanley/Black & Decker. Stanley Bostitch is a leading manufacturer of pneumatic nailers and staplers, and a variety of hand tools such as hammer tackers and staplers. I was employed by Stanley Bostitch from 1985 until 1997, serving first as a Technician, then Test Engineer, then Product Design/Development Engineer and was promoted to Manager of the Engineering Laboratories in 1995. A large portion of my work at Bostitch focused on pneumatic nailers, but I was involved in the development of all products. My work as a Technician and then Test Engineer allowed me to acquire experience in conducting and developing test methodologies for all products. I also worked on the development of a portable combustion nailer which utilized both MAPP gas and rechargeable NiCad battery technology. My work as a Product Design/Development Engineer involved designing and developing products from conception through manufacture and quality control. As the Manager of the Engineering Laboratories, I managed the largest of the Engineering Laboratories in Stanley Works and supervised 18 employees. This position required that I coordinate testing and allocate resources to meet stringent scheduling requirements of the Product Development, Manufacturing and Marketing departments.

9. I am an inventor on 9 patents, including patents related to pneumatic nailers, hand tools, surgical devices and a water purification system. I have given deposition testimony as a technical expert fifteen times in patent related matters and testified three times before the International Trade Commission. I have also given deposition testimony in cases involving a Petition for *Inter Partes* Review (“IPR”) for patents related to hole saws and accessories for mobile phones, and cases involving patent infringement and/or non-infringement related to gas spring-powered nailers and beveling miter saws, and a number of consumer products, including spring-loaded desktop staplers, air mattresses with embedded air pumps, hand held razors, recreational coolers, hoverboards, toy car and track systems, and e-cigarettes, where again I served as a technical expert. I have also given deposition testimony eight times as a technical expert in product liability matters and I have testified in court four times in such matters.

10. A copy of my curriculum vitae, which further expands on my qualifications and expertise and includes a listing of other cases in which I have testified as an expert at trial or by deposition within the preceding five years, as well as articles I have published is attached as Appendix A.

11. I am being compensated for my time at my standard rate of \$500 per hour. For time spent providing deposition and trial testimony, I am being compensated at my standard rate of \$600 per hour. I am also being reimbursed for

reasonable expenses and out-of-pocket expenses at cost. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no other interest in this proceeding.

II. MATERIALS CONSIDERED

12. In forming my opinions, in addition to my knowledge and experience, I have considered the materials cited in this Declaration and the following documents and things that I have obtained, or that have been provided to me:

- The '007 Patent;
- The '007 Patent's prosecution history and the references cited therein;
- The various prior art references cited in this Declaration;

13. In addition to the materials provided to me, I have also relied on my own education, training, experience, and knowledge in the field of mechanical engineering.

14. I may rely on any of these materials, experiences and knowledge, in addition to the evidence specifically cited as supportive examples in particular sections of this report, as additional support for my opinions.

15. I reserve the right to supplement or amend this report if additional facts and information that affect my opinions become available.

III. LEGAL PRINCIPLES

16. In expressing my opinions and considering the subject matter of the claims of the '007 Patent and the other documents I considered, I am relying upon and applying certain legal principles that I have been provided. My understanding of these principles is reflected below.

17. I understand that the prior art and claimed invention should be viewed from the reference point of a person of ordinary skill in the art. I understand that a person having ordinary skill in the art is a hypothetical person used to analyze the prior art without the benefit of hindsight. A person of ordinary skill in the art is presumed to be a person who thinks along the lines of conventional wisdom in the art and is not one who undertakes to innovate, whether by extraordinary insights or by patient and often expensive systematic research. I understand that the hypothetical person of ordinary skill is presumed to have knowledge of all references that are sufficiently related to one another and to the pertinent art, and to have knowledge of all arts reasonably pertinent to the particular problem that the claimed invention addresses.

18. I understand that invalidity of an issued patent in an IPR proceeding must be shown by a preponderance of the evidence.

19. I understand that determining anticipation of a patent claim requires a comparison of the construed claim language with the prior art on a limitation-by-

limitation basis. I understand that a prior art reference “anticipates” a patent claim, and thus renders it invalid, if all elements of the claim are disclosed in that prior art reference either explicitly or inherently, *i.e.*, necessarily present or implied.

20. I understand that patent claims are obvious if the claimed subject matter of each claim as a whole would have been obvious to a person of ordinary skill in the art as of the date of invention. This determination is made after weighing factors that include: (1) the level of ordinary skill in the pertinent art; (2) the scope and content of the prior art; (3) the differences between the prior art as a whole and the claim at issue; and (4) secondary considerations of non-obviousness, if any. I understand that framework for analyzing obviousness should be an expansive and flexible approach using common sense. I understand that claims directed to nothing more than a combination of known elements driven by non-innovative factors such as market demands should be obvious. I also understand that if a person of ordinary skill in the art can implement the claimed invention as a predictable variation of a known product, it is obvious.

21. I have been informed of other factors that may show obviousness, including (1) whether the claims are directed to a combination of old elements with no change to their functions that yields predictable results, (2) whether the claims simply substitute one known element for another to obtain predictable results, (3) whether the claimed solution was that were obvious to try from a finite number of

identified, predictable solutions, with a reasonable expectation of success, and (4) whether there was an explicit teaching, suggestion, or motivation in the prior art.

22. I understand that even if a claimed invention involves more than the substitution of one known element for another or the application of a known technique to a piece of prior art ready for improvement, the invention may still be obvious. In such circumstances, the analysis looks at interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art to determine if the claimed invention is obvious.

23. I understand that secondary considerations of non-obviousness may include (1) a long-felt but unmet need in the prior art that was satisfied by the invention of the patent; (2) commercial success or lack of commercial success of processes covered by the patent; (3) unexpected results achieved by the invention; (4) praise of the invention by others skilled in the art; (5) respect for the patent in the form of arms-length bona fide licenses under the patent by others; and (6) deliberate copying of the invention. I also understand that there must be a relationship between any alleged secondary considerations and the claimed invention.

IV. TECHNOLOGY BACKGROUND

24. The technology at issue in this investigation involves fastener driving tools, which include staplers, nailers, or other fastener tools. The primary product

in this field has been powered nailers or nail guns. Nailers were commercially introduced starting in the 1950s to assist in construction projects, such as building houses.

25. A powered nailer is a tool that is used to drive nails, staples, or other linearly driven fasteners into wood, metal, or other types of material. Powered nailers are used in many types of construction, ranging from heavy-duty and high-volume applications to smaller jobs and precision work. Some example of powered nailers include: (i) framing nailers that handle large projects such as framing houses and building decks; (ii) finishing nailers used for assembling furniture and installing cabinets; (iii) brad nailers used for securing crown molding or baseboards; and (iv) roofing nailers for applying roof shingles.

26. Nailers require a power source to drive the fastener into a workpiece during operation. There have conventionally been two main types of powered nailers: pneumatic nailers and combustion nailers.

27. Pneumatic nailers have been used for decades to quickly and efficiently drive a wide variety of different nails in many different work environments, including construction, furniture assembly and pallet fabrication. These nailers typically use compressed air from a separate compressor as the working fluid connected to the nailer using an air hose. The compressor is driven using an electric motor with the compressed air stored in a gas reservoir. Once the nailer is connected

to the compressed air supply, an internal reservoir within the body of the nailer stores the compressed air. This reservoir typically surrounds a portion of a piston-cylinder arrangement used to drive fasteners. This location of the reservoir allows for quick transfer of the compressed gas to the engine. When the nailer is activated, the compressed gas is delivered to the piston which then drives a nail. This piston is connected to a driver, which is a component that drives the nail into the workpiece. As the gas expands above the piston, the piston is forced down the cylinder which in turn moves the driver down the drive channel and in contact with the head of the nail located at the bottom of the drive channel. This action causes the nail to be driven into a workpiece. Once the nail has been driven, a portion of the remaining compressed gas can be used to return the piston to its original position at the top of the cylinder so that the process may be repeated.

28. Combustion nailers arose from the desire to have a cordless tool that could be moved throughout a job site without being tied to a separate compressor. With pneumatic nailers, the tool itself not only has to be connected to a separate compressor, but the compressor likewise has to be wired to a source of power to supply its energy requirements. Combustion nailers provide a tool that has no hose or electrical wiring but instead use combustible fuel canisters. Like a car with an internal combustion engine, combustion nailers ignite a flammable gas with a spark such that it expands in a chamber containing a piston. The piston then drives the

driver into the nail which is then driven into the workpiece in the same fashion as a pneumatic nailer as described above. Combustion nailers solved the problem of pneumatic nailers in that they “cut the cord” to the compressor.

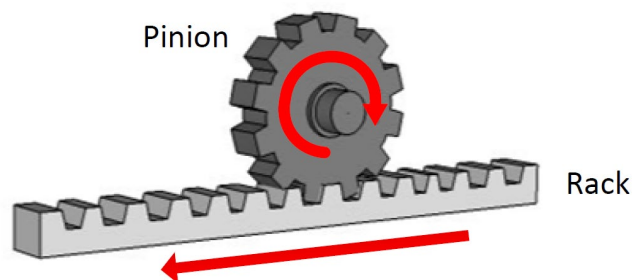
29. However, combustion nailers have their own issues. One issue is that, again like a car with an internal combustion engine, they require a costly supply of fuel to operate and must be periodically refueled. Another issue, again like a car with an internal combustion engine, is that combustion nailers emit fumes and other waste products from the combustion process that may result in undesirable smells and raise health concerns for the tool’s operator.

30. Over the years, engineers in this field have occasionally considered nailer designs that could have the cordless benefits of a combustion nailer but without its fuel requirements or combustion byproducts. The primary manifestation of that consideration has been to use the well-known gas spring approach. In a gas spring nailer, a gas chamber containing a finite amount of a compressible gas, typically air, includes a drive piston which serves as a movable wall which may be used to adjust the volume of the chamber. A drive mechanism moves the drive piston in a direction opposite the driving direction to compress the gas within the gas chamber. The driver can be moved from this upper driving position by the pressure of the compressed gas for driving the fasteners. However, historically realization of this design had been limited by its energy requirements relative to

commercially existing battery technologies that had not developed far enough to meet those energy demand requirements.

31. One such gas spring nailer was described by Roger Sollberger in a patent application he filed in 1978. The patent application eventually issued as U.S. Patent No. 4,215,808 (“Sollberger”). Sollberger modified the standard pneumatic nailer known since the 1950s by removing the external compressor and hose, thus improving portability. Sollberger describes a device which utilized a gas spring to provide the energy to drive the fasteners (called a gas spring or gas spring nailer). The gas spring is charged by using a motor driving a rack-and-pinion gear that “jacks” a piston to an upper driving position (thereby compressing the air above the piston) and then releasing the driver to drive the fastener into a workpiece.

32. Generally, a rack and pinion gear is a linear actuator that includes a pair of gears that converts rotational motion to linear motion. While there are many variations of rack and pinion gears, an illustration of a typical rack and pinion is provided below:



33. The circular gear is the “pinion” and engages teeth on a linear gear bar called the “rack”. Typically, the pinion is in a fixed position and a rotational motion applied to the pinion causes the rack to move relative to the pinion. This operation translates rotational motion of the pinion into linear motion of the rack.

34. Masayoshi Kondo of Makita Corporation developed further improvements to gas spring nailers. In 1996, Kondo filed a U.S. patent application that ultimately issued as U.S. Patent No. 5,720,423 (“Kondo”). In his patent, Kondo integrated the driving motor into the body of the nailer, with the motor energized using an on-board battery. Integrating the driving motor into the body of the nailer eliminated the need for an external motor and associated components like those described by Sollberger (*e.g.*, drive cable and power cord). Similar to Sollberger, Kondo’s device used a gas spring energized by compressing the gas spring using a piston lifted by a drive member connected to the motor via a gear train. Kondo also described the use of an air replenishing device within the tool that supplied compressed air to the air chamber when the pressure within the air chamber is lower than a predetermined value. Kondo also described lifting the drive member using a rotating drive gear containing a pair of crank pins used to raise the drive member to compress the gas spring.

35. Chris Pedicini contributed additional improvements to gas spring nailers described in a patent application that published as U.S. Patent Application

Publication No. 2006/01800631 (“Pedicini”). Pedicini described using a rack and pinion system which is capable of decoupling from the driving member. In this design, some of the teeth of the pinion are removed which allows the rack, piston and anvil assembly to disengage from the drive when the rack is presented with the missing pinion teeth. At this disengagement point, the piston, rack and anvil assembly (called a fastener driving output assembly) is driven by the highly compressed air and rapidly drives the fastener into a workpiece. The fastener driving assembly is effectively decoupled from the motor drive assembly, which increases the durability of the device. Additionally, a release valve is included to replenish any air which may be lost between nail drives.¹

36. However, the problem with each of these approaches was that battery technologies had not yet progressed to the point where a reasonably priced portable battery pack could provide the power needed to make these tools commercially marketable. Cost effective battery technology was the key missing element. But battery technologies continued to advance, largely driven by smartphones and other computer technologies in the early 2000s. Eventually battery technologies sufficiently advanced to the point that the old gas spring designs of Sollberger,

¹ The discussion of Sollberger, Kondo, and Pedicini above is for purposes of providing a summary of the history of gas spring nailer technology. It is not intended to be limiting or convey that there is no other literature describing gas spring nailers or related components.

Kondo, Pedicini, and others could be taken off the shelf and made into commercially marketable products.

37. The recent introduction of gas spring nailers strongly mirrors the growing availability of electrically-powered cars. Both were designed years ago but limited by insufficiently-powered battery technologies. Both were desirable because they removed the need for constant refueling of combustible fuel and eliminated the hazardous combustion byproducts that harm both people and the environment. And both were unlocked not by some dramatic invention in their own field, but simply by advancements in unrelated battery technologies developed by others. The actual implementation of gas spring nailers largely matches its dormant predecessors, with only minor differences due to particular design choices or incremental improvements to specific aspects of the tool.

38. The '007 Patent acknowledges prior art designs of gas spring nailers, such as Sollberger and Kondo, and describes a gas spring nailer that is said to be an improvement over those prior art designs. ('007 Patent at 1:58-2:2). In particular, the '007 Patent describes a structural departure from the rack and pinion lifting system used by Sollberger and Pedicini. The lifter mechanism in the '007 Patent includes contact surfaces on the driving member which are inclined at an angle of 90 degrees with respect to the lifting direction. The '007 Patent describes a lifting function carried out by a rotating gear cam (referred to as a “lifting member”) with

pins extending from its face surface that make contact with protrusions (*i.e.*, teeth) on a “driving member.” Because the pins extend from the face surface instead being located on the outer perimeter, there does not need to be a one-to-one relationship between the pins and the teeth and therefore, these pins can be spaced differently from the spacing of the teeth on the driving member, so as to allow for positions which better facilitate lifting of the driving member in a portable tool and more quickly release the driving member for a driving stroke.

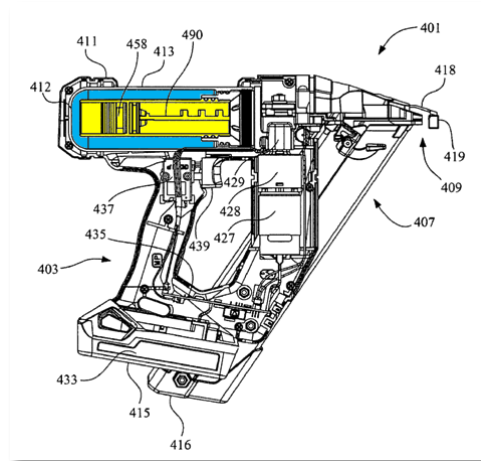
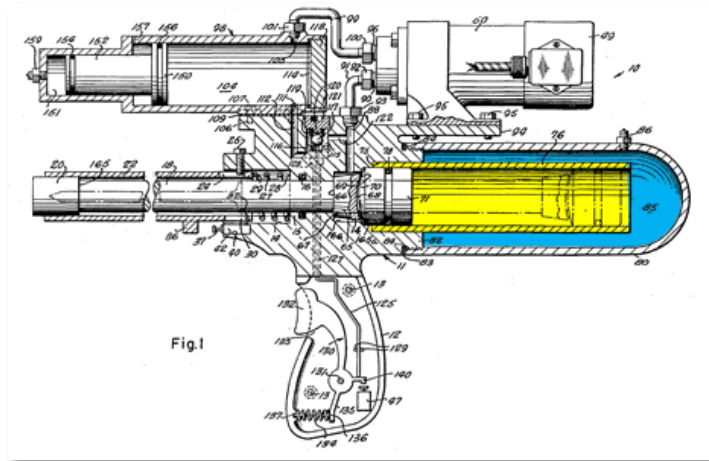
39. In response to an office action issued during prosecution of the applications that ultimately led to the '007 patent, one of the named inventors, Thomas A. McCardle, submitted an affidavit discussing the prior art, disadvantages of prior nailer designs, and the advantages of Complainant's patented design as compared to the prior art. Specifically, McCardle discussed (i) U.S. Patent No. 4,215,808 (“Sollberger”); (ii) U.S. Patent No. 2,575,455 (“Lang”); (iii) U.S. Patent No. 6,997,367 (“Hu”); and, (iv) U.S. Patent No. 7,225,961 (“Lee”). For instance, McCardle criticized Sollberger for having a one-to-one relationship between the linear gear and the driven rack because the gear can rotate one time for every lift cycle. McCardle contrasted this with the Complainant's patent design where the lifter's design allowed for variability of the lift height. (McCardle Affidavit at 5). McCardle also noted that in Complainant's design, the piston is held at what he calls a “ready position,” which is the point at which “a fastener driving movement is

imminent” and the piston “is capable of being released virtually immediately.” (*Id.* at 5, 10). McCardle further explains that since the piston’s rest position is at the top of the cylinder “when the user pulls the trigger, the piston is already in its proper position to initiate driving a fastener.” (*Id.* at 10).

A. The Haley Prior Art

40. U.S. Pat. No. 3,150,488 (“Haley”) issued on September 29, 1964 and is prior art to the ’007 Patent.

41. Haley is directed to a gas spring nailer and predates all three prior art references discussed in the ’007 Patent. One of the stated goals of Haley “is to provide a new and improved power device having a power reservoir in which a compressible fluid, such as gas, is maintained under pressure, and is employed to impart movement to a non-compressible driving fluid which in turn actuates a suitable driving means, such as a drive piston or hammer of a hand tool.” Haley at 1:17–23. Haley’s “power reservoir” consists of a storage chamber 85 (blue, below left) that entirely surrounds the piston cylinder (yellow), which is the same arrangement of the ’007 Patent (below right). *See* Haley at Fig. 1 (below left); ’007 Patent at Fig. 17 (below right). The Haley prior art thus disclosed this key feature that the ’007 Patent inventors later claimed to be their contribution to gas spring nailers.



42. Haley also described reusing the same pressurized gas for multiple driving operations instead of using either an on-board source of pressurized gas or an external hose connected to a pressurized gas source. Haley taught use of O-rings or other suitable means to seal in the pressurized gas in its main storage chamber. *See, e.g.*, Haley at 3:35–45.

43. Haley also described a sophisticated control scheme for managing both the lifting and driving stages of the operation cycle. Of course, since Haley dates back to 1964 the control is carried out by a hardwired circuit rather than a modern

programmed computer. But that change to using a programmed computer became rudimentary now that cheap, tiny, and powerful microprocessors have become ubiquitous.

44. Haley's lifting approach also reflects the era in which it came about. In particular, Haley uses a hydraulic system that pumps an incompressible liquid to lift its piston against the pressurized gas in the main storage chamber. That approach was powerful, but also unrefined, messy, and inefficient. It was one of a number of Haley's aspects that was ripe for improvement by the later inventions that followed, including those of the admitted prior art references described above.

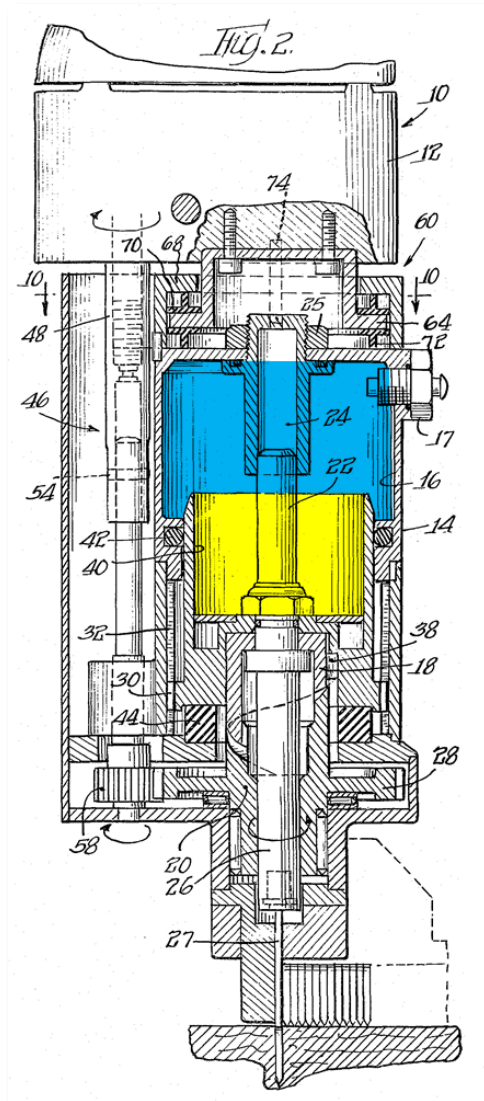
B. The Enstrom/Saari Prior Art

45. U.S. Patent No. 3,913,685 ("Enstrom") issued on October 21, 1975. U.S. Pat. No. 3,924,692 ("Saari") issued on December 9, 1975. Both are prior art to the '007 Patent.

46. Both Enstrom and Saari were filed by the same company (Illinois Tool Works, Inc.) on the same day (February 6, 1974) and describe the same fastener driving tool using compressible gas as the spring means. Accordingly, in my opinion one of ordinary skill in the art would have looked at Enstrom and Saari's teachings together and would have combined them as a matter of course. To the extent there are aspects described in only one of Enstrom or Saari, one of ordinary skill in the art would understand that that is due to their separate focuses on different inventive

aspects of the tool (warranting the separate patents for different inventors). Accordingly, one of ordinary skill in the art would combine the two teachings to achieve the complete tool worked on by Enstrom and Saari for Illinois Tool Works, Inc. As such, in this report I refer to the combined teachings of Enstrom and Saari together as Enstrom/Saari.

47. Enstrom/Saari explain that pneumatic nailers “require[] convenient sources of compressors and air hoses which makes a tool undesirable for the various remote locations required on a construction site,” while combustible fuel nailers “provide a high energy source for a single shot tool but suffer from certain disadvantages, such as the noise and disposal of cartridges.” Enstrom at 1:10–18. Enstrom/Saari therefore describe a driving tool (below) with an air spring mechanism that includes a cup-like piston with a displacement volume (yellow) that is lifted up to compress air in a surrounding chamber (light blue). The lifting is accomplished by co-acting helicoidal cams moved by an electrically powered drive train.



C. The Level of Ordinary Skill in the Art

48. I understand that factors that may be considered in determining the level of ordinary skill in the art include the educational level of the inventor; the type of problems encountered in the art; the prior solutions to the problems; the rapidity with which innovations were made; the sophistication of the technology; and the educational level of active workers in the field.

49. Applying this standard, I believe that a person of ordinary skill relevant to the '007 Patent would have either (i) a Master's degree in mechanical engineering with at least two years of experience in power nailer design; (ii) a Bachelor's degree in mechanical engineering with at least five years of experience in powered nailer design; or (iii) ten (or more) years of experience in powered nailer design. This experience in powered nailer design would include mechanical design, tool design, manufacturing, mechanics of materials, stress analysis, ergonomics, and human factors. I understand that International Trade Commission (ITC) agreed that the level of skill proposed above best reflects the level of skill in the art at the time of patents that are related to the '007 Patent. Not only do I meet this level of skill, but I have taught persons of ordinary skill in my capacity as a professor at Western New England University. I have further applied this level of ordinary skill in reaching my conclusions in this report.

V. CLAIMS 1, 7–8, 17, 20 ANTICIPATED BY HALEY, CLAIMS 2–6, 9–16, 18–20 OBVIOUS BASED ON HALEY IN VIEW OF LAI

A. Claim 1

50. *Element [1.P]*: Haley discloses “[a] gas pressure system for a portable power 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.

51. *Element [1.I]*: Haley discloses “a hollow cylinder having a movable piston therewithin.” Haley refers to its hollow cylinder (yellow below) as “extension

Haley, 3:33 and 3:35–39, Figs. 1 (below), 3, and 4.



52. **Element [1.2]:** Haley discloses “a storage chamber that is in

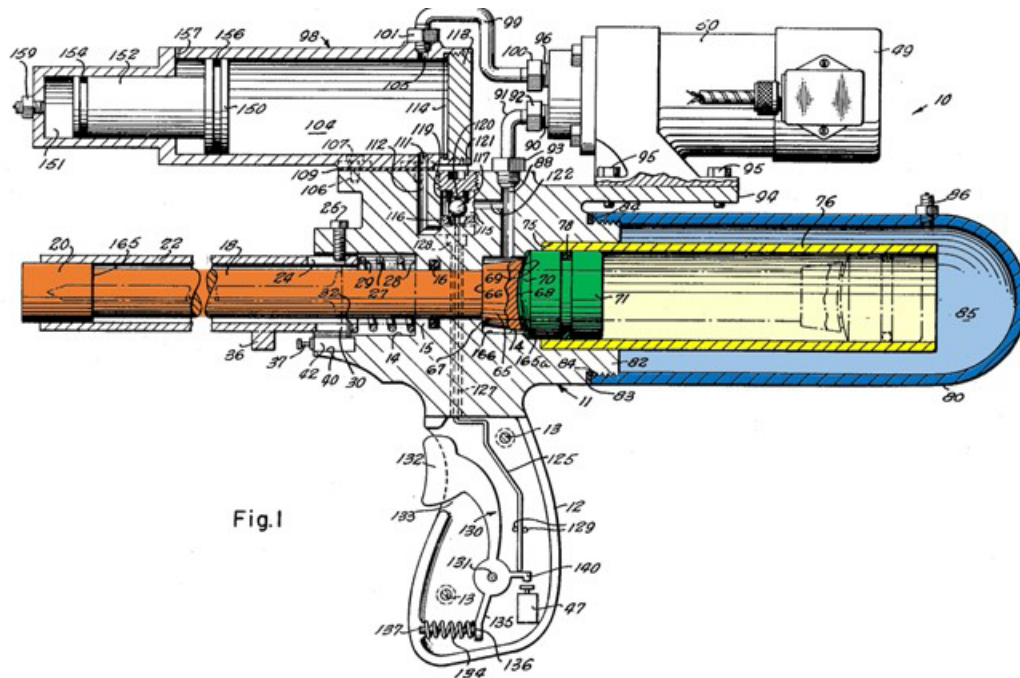
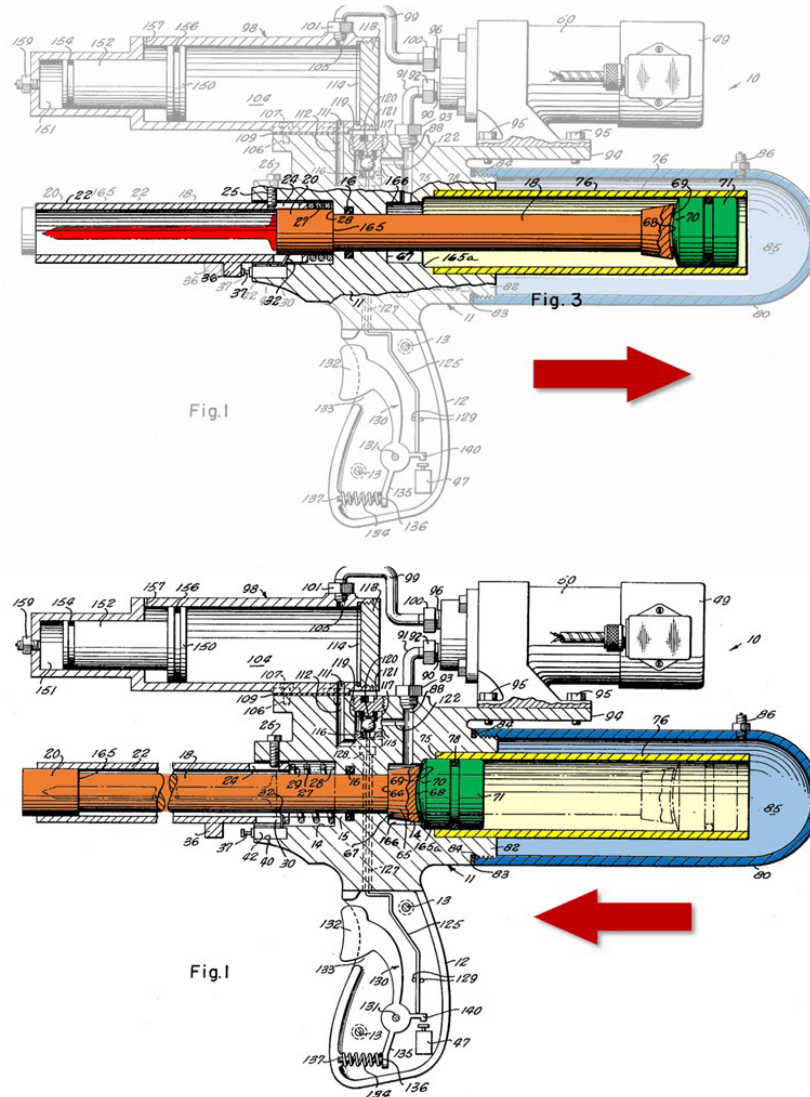


Fig. 1

53. As shown above, Haley's main storage chamber 85 (blue) is distinct from the cylinder 76 (yellow) and remains in fluidic communication at all times with the cylinder's displacement volume, which is shown in Figure 1, where the first end of cylinder 76 (the right side in Figure 1) is open to chamber 85.

54. Haley also discloses "said storage chamber being charged with a pressurized gas." Haley states that "the gas introduced into the gas chamber 35 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. *See, e.g.,* Haley, 7:6-10. Both values are above atmospheric pressure (14.7 psi).

55. ***Element [1.3]***: Haley discloses “wherein: said movable piston moves in a reciprocating pattern during an operating cycle, including moving through a drive stroke that is caused by said pressurized gas.” Haley’s “cylinder extension” (yellow below) and “chamber 85” (blue) contain compressed gas and move the moveable piston (“accumulator piston 71,” green) and the driver (“drive piston 18” and its “hammerhead 20,” orange) through a drive stroke toward the exit end (the left side in the figures) to drive a nail (red) into a workpiece. Haley, 5:74–6:7; 6:7–26; 6:48–53; 7:6–13, Figs. 1, 3 (below), and 4. Haley’s movable piston is then lifted during the operation cycle in preparation for another drive stroke, and thus moves in a reciprocating pattern. Haley, 5:32–74, 6:54–75, Figs. 1, 3 (below), and 4.



56. **Element [1.4]:** Haley discloses “said pressurized gas is not vented to atmosphere after said drive stroke, but instead said pressurized gas is re-used for a plurality of said operating cycles.” 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. Haley

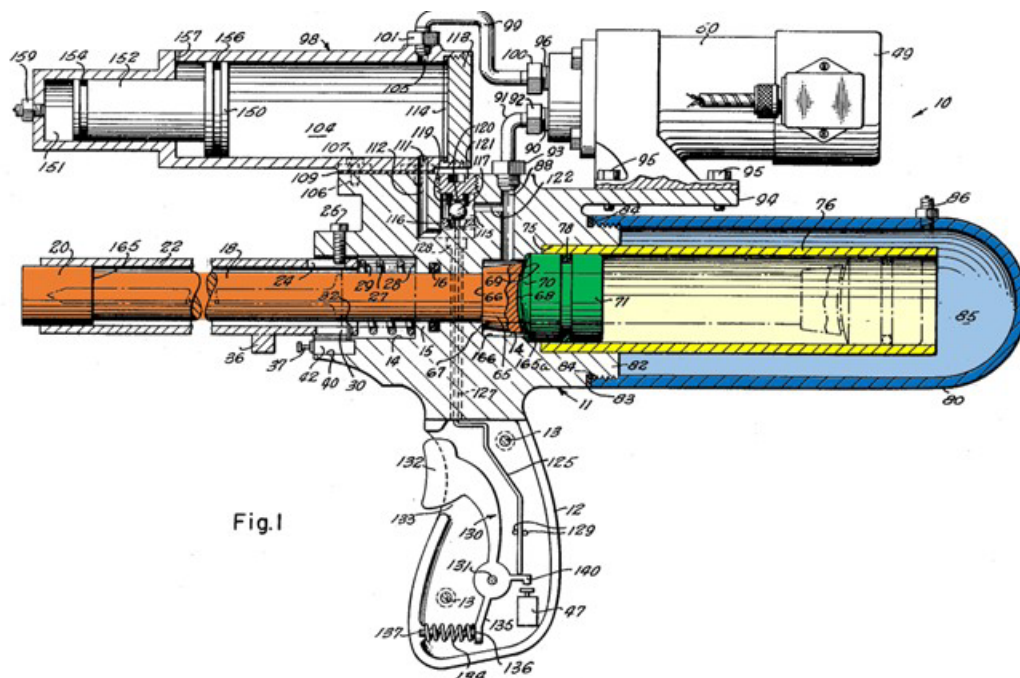
discloses a sealing means 83 for its elongate accumulator shell 80 (which contains the storage chamber, “chamber 85”) to “effect a fluid tight seal,” which prevents the pressurized gas from being vented to the atmosphere and allows it to instead be re-used. Haley, 3:40–45, Fig. 1.

57. **Element [1.5]:** Haley discloses “said movable piston is the sole movable piston in the gas pressure system.” While Haley has another movable piston (“piston 150”), that piston is used for pushing non-compressible power fluid in reservoir 98 of large chamber 104. Haley, 4:62–67, Fig. 1. That is, Haley’s other piston is in its *hydraulic* system and thus is not another piston “in the gas pressure system”—the “accumulator piston 71” is the sole movable piston in that gas pressure system. In addition, Haley’s other piston forms part of its lifting mechanism and would be eliminated in the combination with Lai discussed below in relation to claim 2. Thus, alternatively this element is obvious based on Haley in view of Lai for the reasons discussed below

B. Claim 2

58. **Elements [2.1] and [2.2]:** Claim 2 requires “(a) a movable driver that is in communication with said piston, said movable driver including at least one protrusion” and “(b) a lifter that causes said driver and said piston to move through a return stroke, by a mechanical engagement between said lifter and said at least one protrusion of the driver.” Haley has a “movable driver” (“drive piston 18” and its

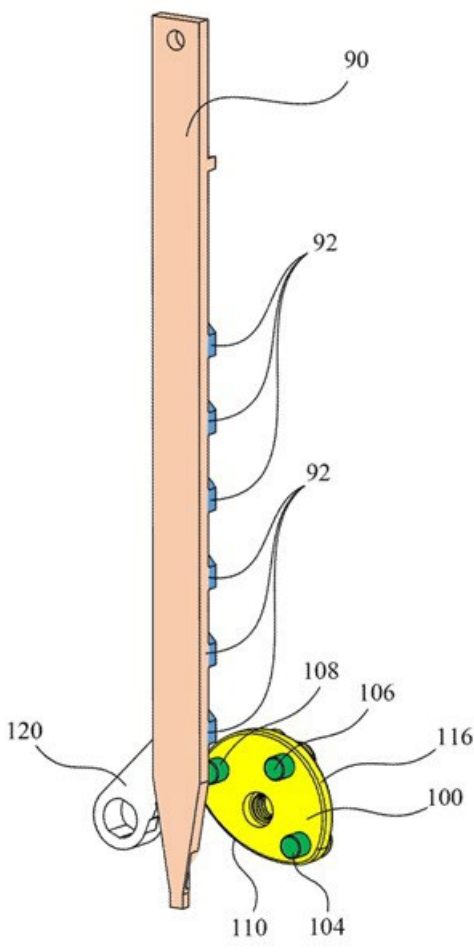
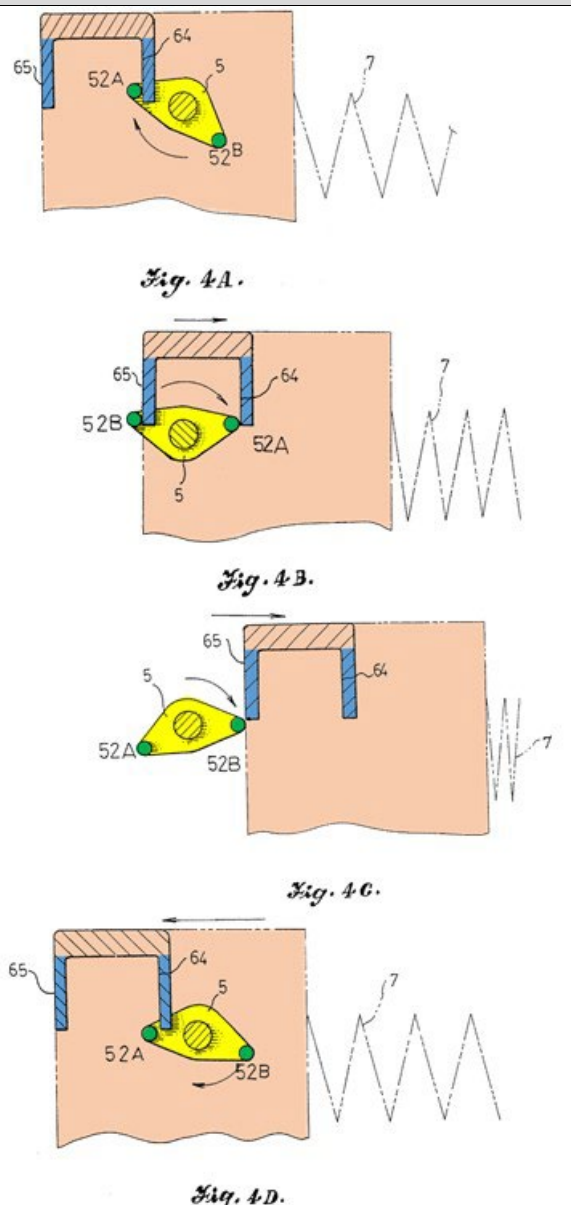
“hammerhead 20,” orange) that is in communication with its piston (“accumulator piston 71,” green). Haley, 2:20–23, 5:51–70, 5:74–6:7, Fig. 1 (below), 3, 4.



59. Haley discloses a hydraulic lifting mechanism and thus does not have a protrusion on its movable driver or a lifter that mechanically engages with a protrusion on the driver to move it through its return stroke. In my opinion, it was obvious—at the filing of the '007 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, which is disclosed by U.S. Patent No. 5,503,319 (“Lai”).

60. Lai discloses an electrically-powered, mechanical lifting mechanism with a structure that is essentially identical to the “lifter member” disclosed in the

'007 patent. *Compare* '007 patent, Fig. 12 with Lai, Figs. 3, 4A–D. In particular, the “lifter” (“lifter member”) of the '007 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). '007 patent, 9:36–52, 16:38–53, Fig. 12. The '007 patent also discloses two-pin variants: lifter members 465 and 480 in Figs. 31 and 33. 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.

'007 Patent Lifter	Lai Lifter Member
 Fig. 12	 Fig. 4A. Fig. 4B. Fig. 4C. Fig. 4D.

61. While Lai is directed to an “electric stapling gun (*see* Lai, 1:1–2), a person of ordinary skill in the art (“POSITA”) would consider staplers to be a subcategory of nailers. For instance, 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. *See generally* Ex. 1010. Thus, Lin is directly relevant prior art for the '007 patent.

62. Moreover, developments in portable nailers would tend to appear first in the context of portable staplers, such as Lin and Lai, because of the lower power needed to drive staples as compared to nails. These improvements would later be applied generally to portable nail guns, notwithstanding their larger power drain requirements, as battery technology continued to improve. In addition, while Lin and Lai use metal springs rather than compressed gas springs, a POSITA would consider metal springs and compressed gas springs to be interchangeable depending on the use case. This is reflected by various prior art references—for example, the Saari patent discloses an embodiment “which utilizes a compressible gas, such as air or the like, as the spring means” (Ex. 1006 [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 (Ex. 1011 [Wolf], ¶[0048]). The '007 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.” '007 patent, 20:3–10. 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 '007 patent as battery technologies had continued to progress following Lai’s issuance in 1996.

63. In addition, a POSITA at the filing of the '007 patent would have been motivated to replace Haley's hydraulic lifting mechanism with Lai's lifter member. Haley's hydraulic lifting mechanism is bulky and subject to the risk of hydraulic fluid leaking into the compressed gas chambers. This problem was explicitly discussed less than a decade later in U.S. Patent No. 3,636,707 ("the Saari '707 patent," 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.

64. These identified problems stemmed solely from Haley's hydraulic lifting mechanism. 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. 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 generally* Ex. 1006 [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.” Ex. 1010 [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.” Ex. 1010 [Lin], 1:56–58.

65. Lai 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). *See* Ex. 1005 [Lai], cover page. Specifically, 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.

66. At the time of the ’007 patent, a POSITA would have solved Haley’s problem by incorporating Lai’s lifter member. Lai was a known solution to Haley’s identified 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 due to Lai’s improved design for its specific mechanical lifter member) and Haley’s identified 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). A POSITA would have been able to implement Lai's lifter member in Haley with predictable results. Specifically, 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. Ex. 1005 [Lai], 2:4–7. In the same way, POSITA would have understood that by adding protrusions to Haley's driver blade it could be lifted by Lai's lifter member and would have achieved the same results predicted by Lai. For example, the elimination of the closed hydraulic system of Haley would allow Haley's driver blade to be modified away from the circular cross section typically required for hydraulic seals. The majority of the driver blade cross section could then be easily modified to have a thinner, rectangular cross section which would significantly reduce the driver blade weight and allow the addition of Lai's protrusions 64 and 65 to be added. Haley's hydraulic system which includes the bulky pump and piston could then be replaced with Lai's battery operated motor and rotating cam and pin arrangement in a position adjacent to the driver member to allow lifting of the driver member.

67. There is also an additional, independent motivation to replace Haley's hydraulic lifting mechanism with Lai's lifter member due to market forces and design needs favoring a portable, battery-powered nailer. POSITAs in the field had

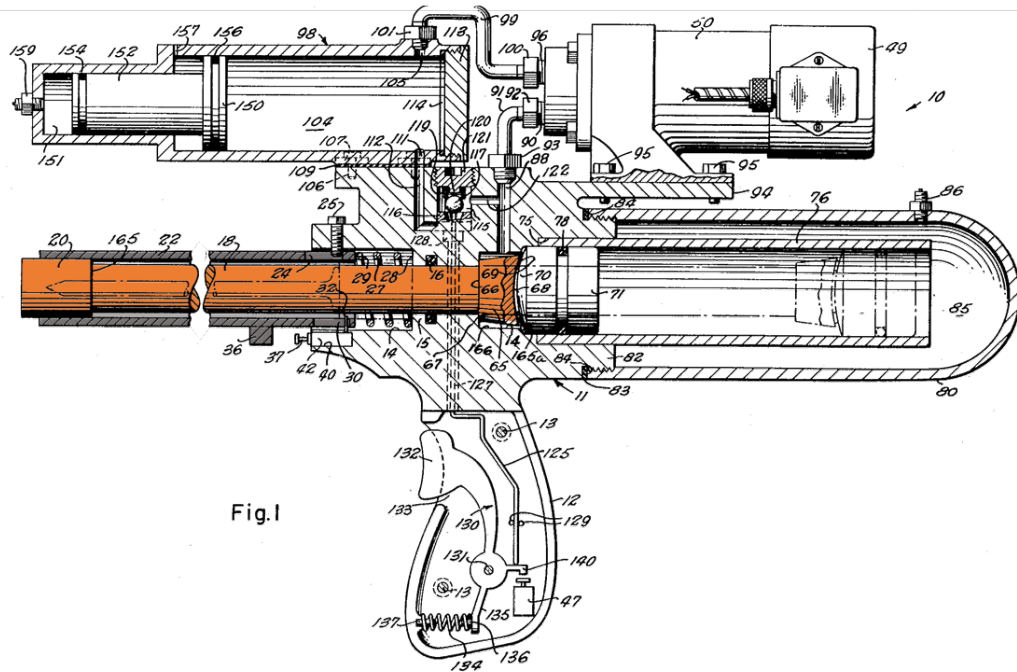
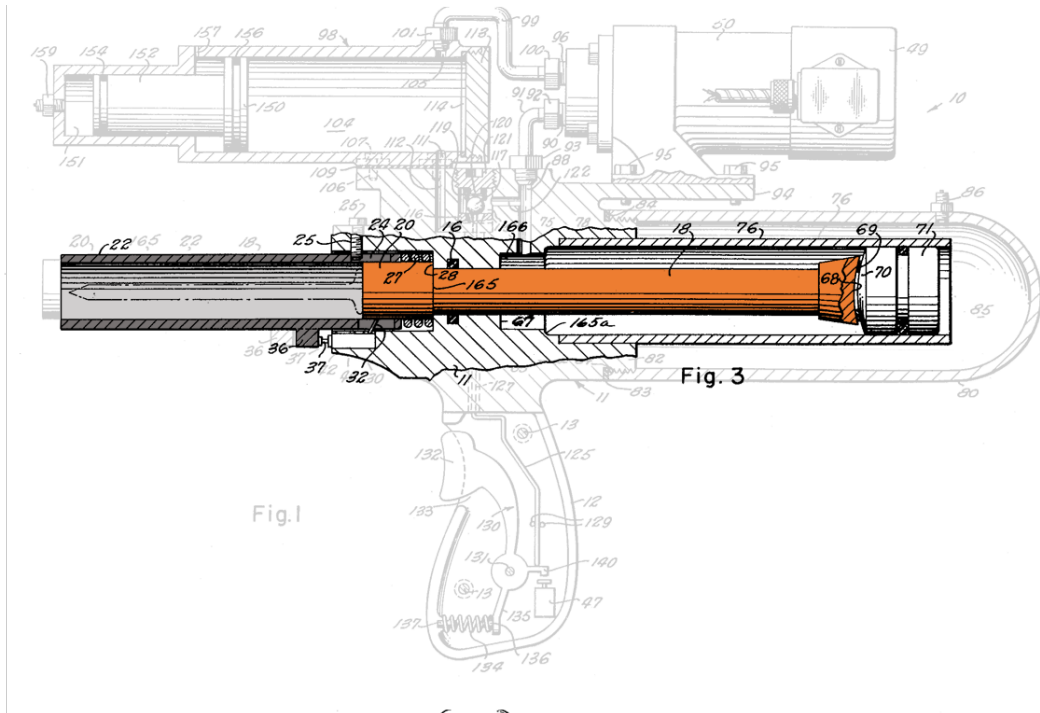
repeatedly highlighted the problems with prior nailer designs. Ex. 1010 [Lin], 1:6–31 (discussing state of the art in 1989); Ex. 1008, U.S. Patent No. 5,720,423 (“Kondo”), 1:9–44 (same for 1998); Ex. 1009, U.S. Publication No. 2006/0180631 (“Pedicini”), ¶¶[0003]–[0019] (same for 2006). Artisans repeatedly 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. Ex. 1010 [Lin], 1:21–26; Ex. 1008, [Kondo], 1:9–29; Ex. 1009 [Pedicini], ¶[0005]. But the commercially-available portable power nailers were either combustion nailers (which required costly fuel and emitted waste fumes) or electrical flywheel nailers (which had low power output). Ex. 1009 [Pedicini], ¶¶[0006]–[0007].

68. The clear and 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. 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. Battery technologies continued to advance, largely driven by smartphones and electric vehicles in the early 2000s, such that by the filing of the ’007 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. Put another way, the compressed gas nailer claimed by the ’007 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 that was motivated by the market need for a battery-powered nailer and the market availability of suitable portable batteries.

C. Claim 3

69. *Element [3.1]*: Haley discloses “[t]he gas pressure system of claim 2, further comprising: a guide body with a linear passageway for said driver.” Haley discloses a guide body (“guide barrel 22,” grey below) with a linear passageway for the driver (“drive piston 18,” orange). Haley, 2:23–27, Figs. 1, 3 (below).



70. **Element [3.2]:** The combination of Haley and Lai discloses “wherein: said lifter moves in a rotational motion and causes said driver to move in a linear motion.” In that combination, the lifter taught by Lai is a rotatable cam 5 (yellow,

below) that moves in rotational motion (curved arrows) to cause the driver (light orange) to move in a linear motion (straight arrow). Lai, Figs. 4A–D (below), 1:62–63, 2:14–25.

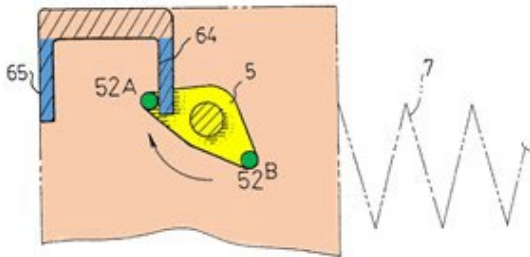


Fig. 4A.

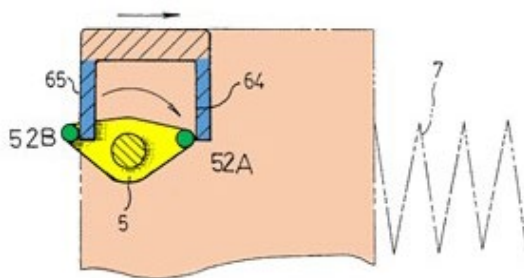


Fig. 4B.

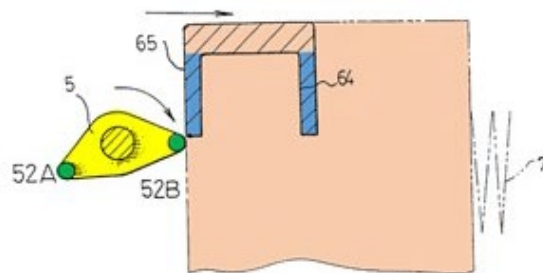
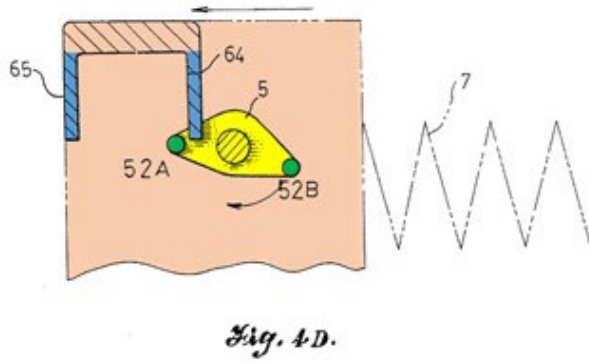


Fig. 4C.

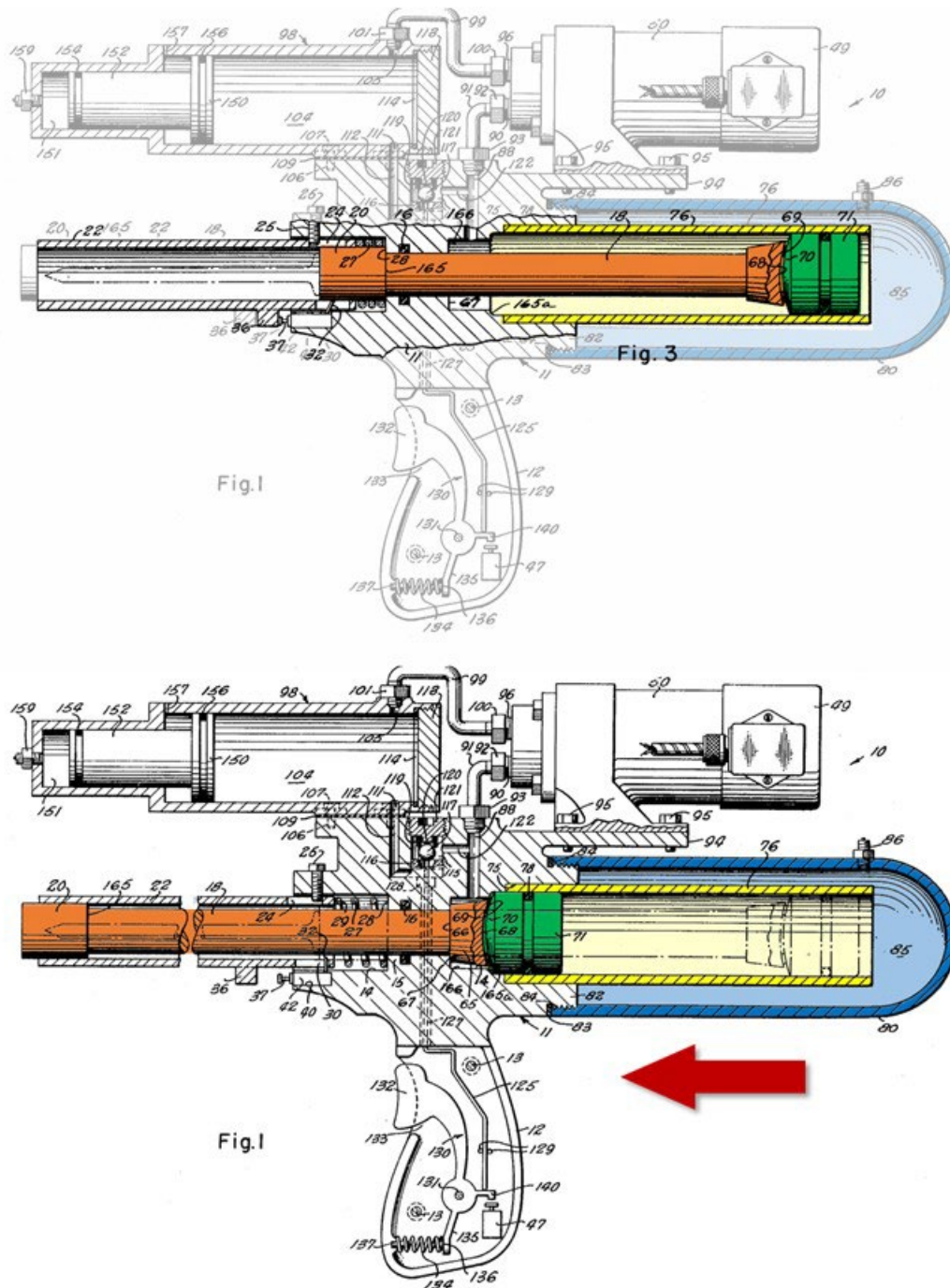


D. Claim 4

71. *Element [4.1]*. Haley discloses “[t]he gas pressure system of claim 2, wherein: said cylinder and piston act as a gas spring 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, Figs. 1, and 4; 5:74–6:7; 6:7–26; 6:48–53; 7:6–13. 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 below) is pushed by the piston upward into in the cylinder and into the main storage chamber (blue)—and that further compressed gas “is employed to

operate the drive piston which may perform such functions as the driving of a nail.”

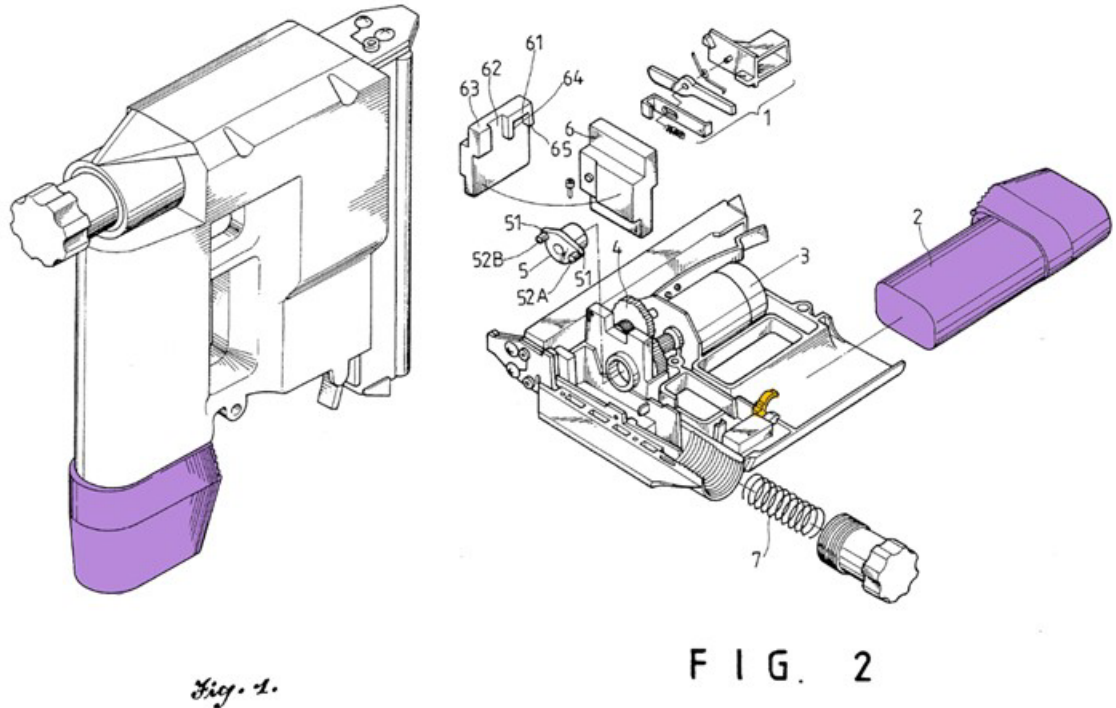
Haley, 7:1–13, Figs. 1 and 3 (below).



72. ***Element [4.2]***. The combination of Haley and Lai discloses “said lifter does not engage said driver during said drive stroke.” In that combination, the lifter taught by Lai (cam 5) does not engage (“is separated from”) the protrusions of the driver (U-shaped member 61 on hammer 6) during the drive stroke. Lai, 2:22–25, Fig. 4D.

E. Claim 5

73. The combination of Haley and Lai discloses “[t]he gas pressure system of claim 2, further comprising: a motor and an on-board electrical power source, wherein said motor provides motive power for said lifter.” In that combination, Lai’s lifter is provided with motive power by a motor (“motor 3”). Lai, 2:14–16. Lai’s motor is powered by an on-board electrical power source (Lai’s battery 2). Lai, Figs. 1–2 (below), Title, Abstract, 1:25–35, 1:44–54, 1:60–62, 2:2, Claim 1.

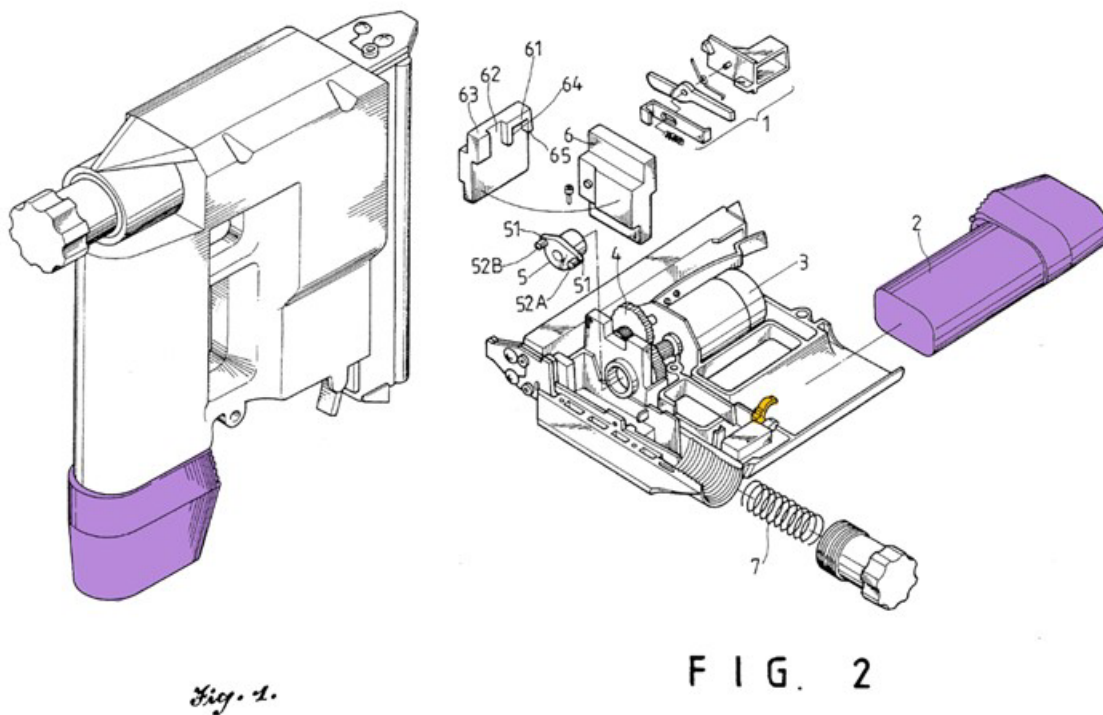


74. I note that while Lai does not explicitly identify element 2 in the figures as a power supply, a POSITA reading Lai would understand that element 2 is a battery from its location and visual appearance, and by the context of Lai being an “electric stapling gun” that is ideally “energy saving.” In addition, a prior patent to the same inventor (U.S. Patent No. 4,953,774, Ex. 1013) has a nearly identical figure (Fig. 2) and explicitly identifies that same component as the “power supply” (2:47–49).

F. Claim 6

75. The combination of Haley and Lai discloses “[t]he gas pressure system of claim 5, wherein: (a) said on-board electrical power source comprises a detachable battery; and (b) said motor comprises an electric motor.” In that

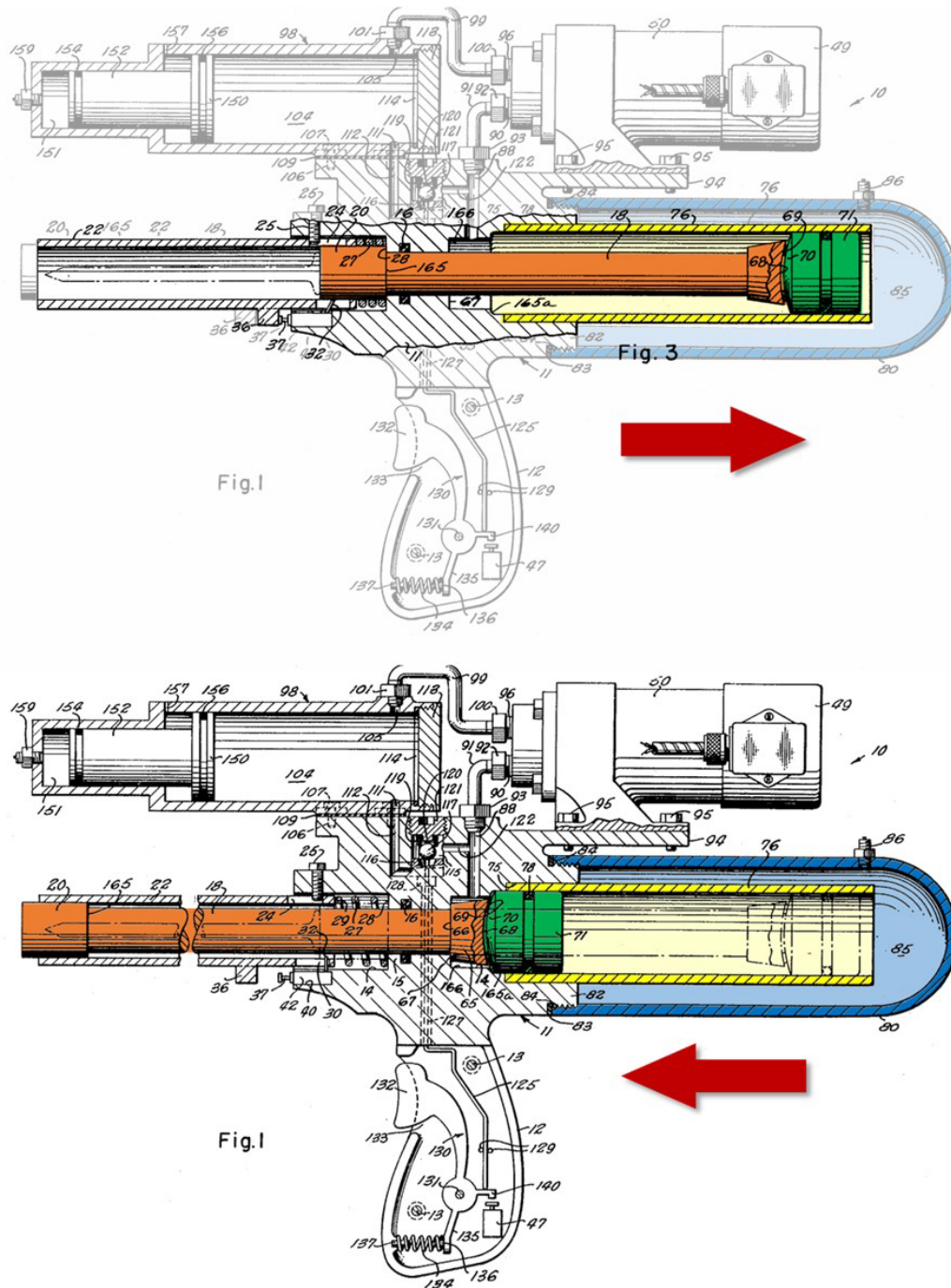
combination, Lai's on-board electrical power source is an detachable battery pack, as reflected by Fig. 1 showing battery 2 (purple below) attached and Fig. 2 showing battery 2 detached and showing an internal attachment clip (orange below). Lai, Figs. 1–2 (below). Lai's motor ("motor 3") is powered by that electrical power source and thus is an electric motor. Lai, 1:25–35, 1:44–54, 1:60–62, 2:2, Claim 1.



G. Claim 7

76. Haley discloses “[t]he gas pressure system of claim 1, wherein: said movable piston moves through a pathway through said hollow cylinder between a higher pressure position and a lower pressure position.” In Haley, the movable piston (“accumulator piston 71,” green below) moves through a pathway along the axis of 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 (the leftward position shown in Fig. 1, which Haley says can be 1,000 psi). Haley, Figs. 1, 3 (below), 7:4–10.



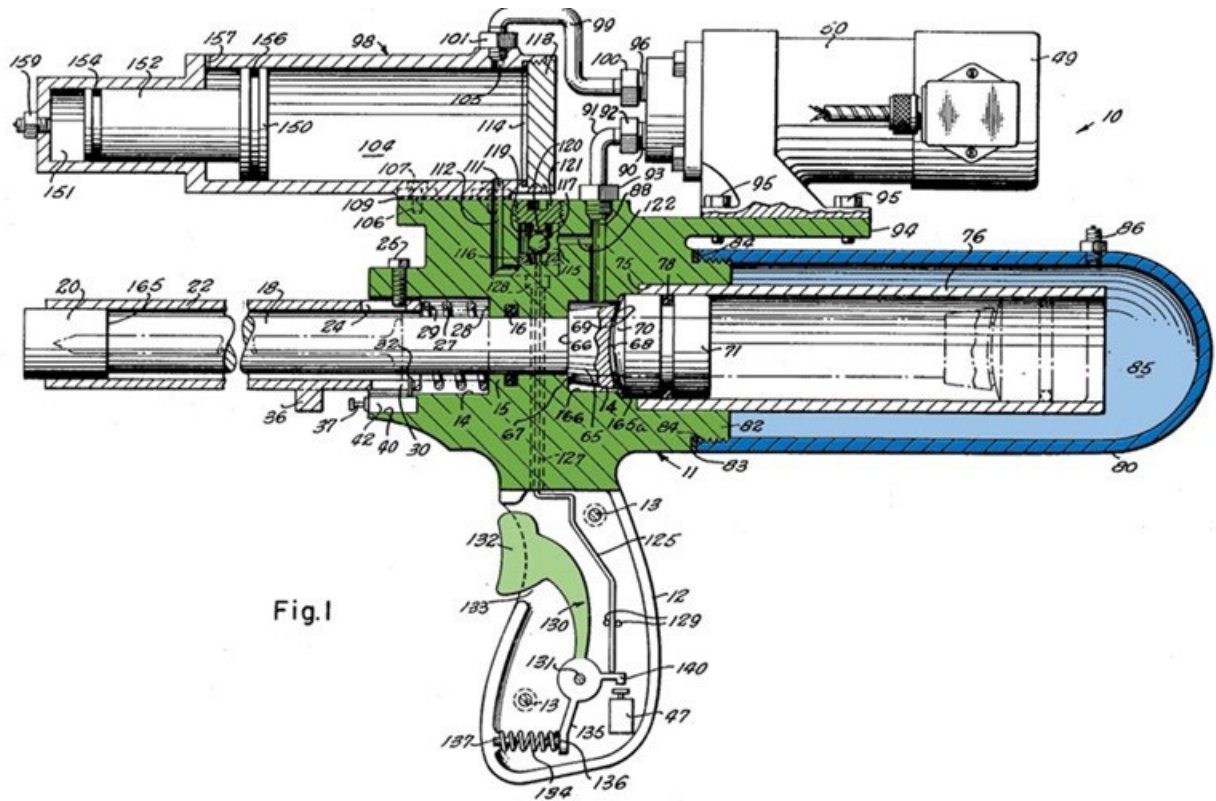
H. Claim 8

77. Haley discloses “[t]he gas pressure system of claim 1, wherein: said pressurized gas in the storage chamber remains above atmospheric pressure during all portions of an operating cycle.” Haley states that “the gas introduced into the gas chamber 35 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. *See, e.g.*, Haley, 7:6–10. Both values are above atmospheric pressure (14.7 psi).

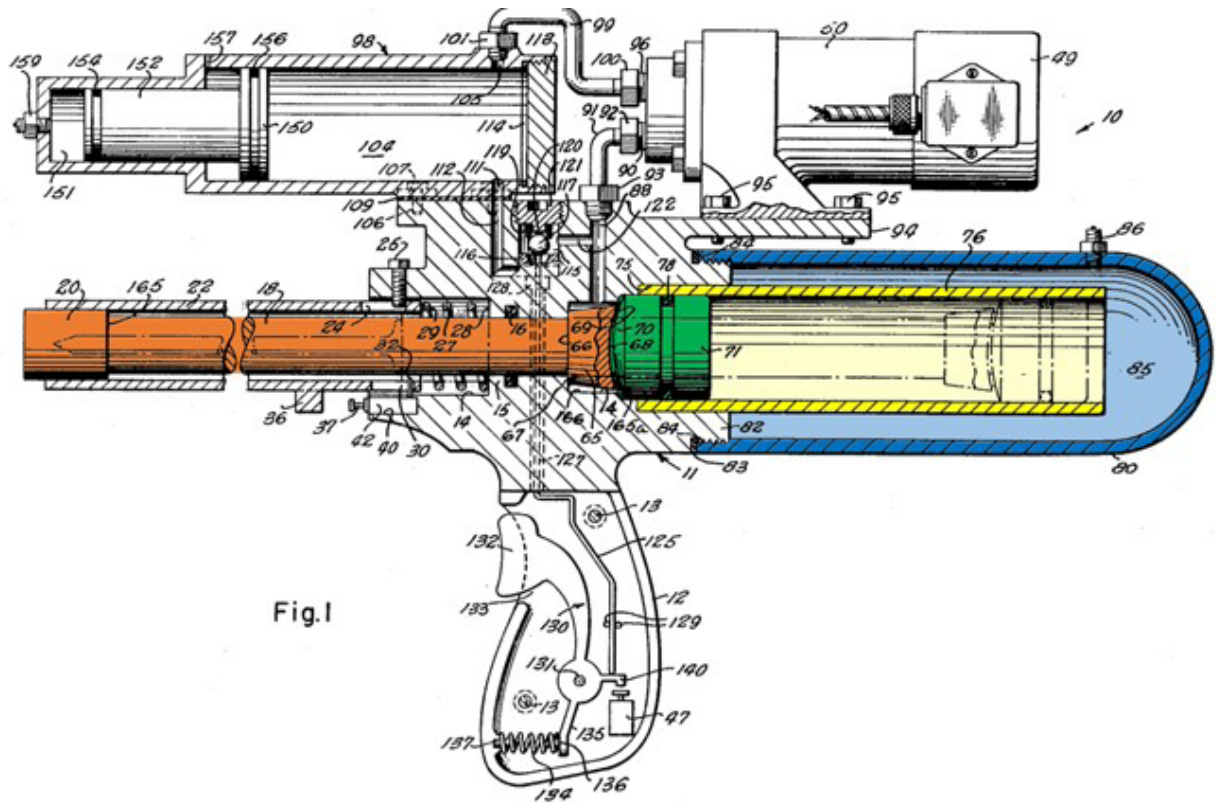
I. Claim 9

78. ***Element [9.P]***: 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.

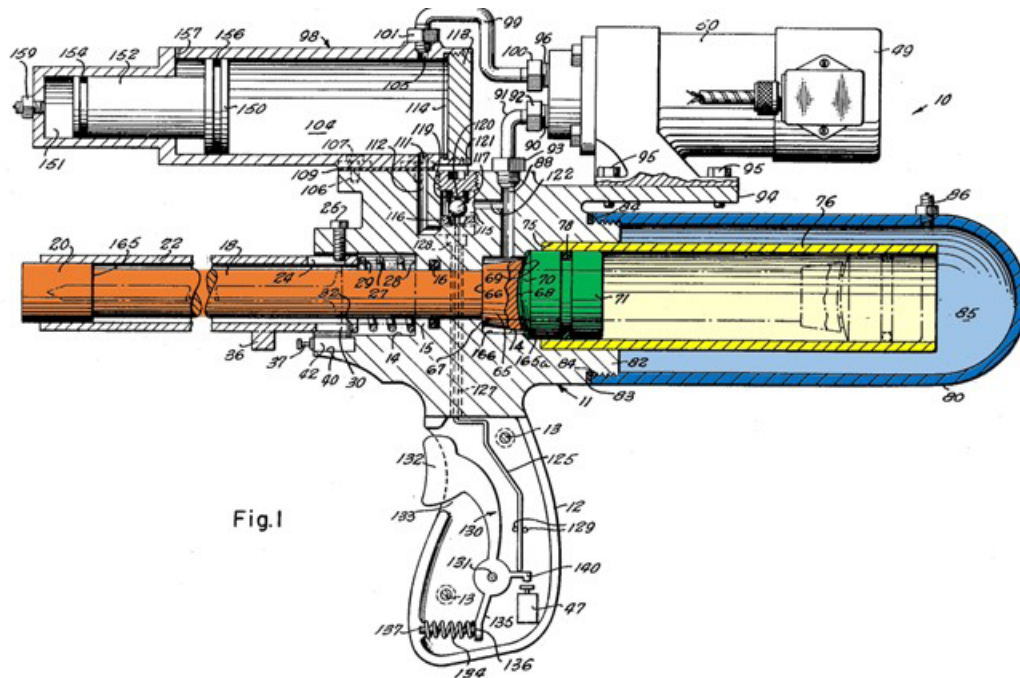
79. ***Element [9.1]***: Haley discloses “a housing with a storage chamber that contains a pressurized gas.” Haley’s housing (“housing 40”) is shown below in green. Haley, 2:47, Fig. 1 (below). Haley’s storage chamber “chamber 85” (blue below) contains a pressurized gas. Haley, Fig. 1; 3:40–54, 7:1–13.



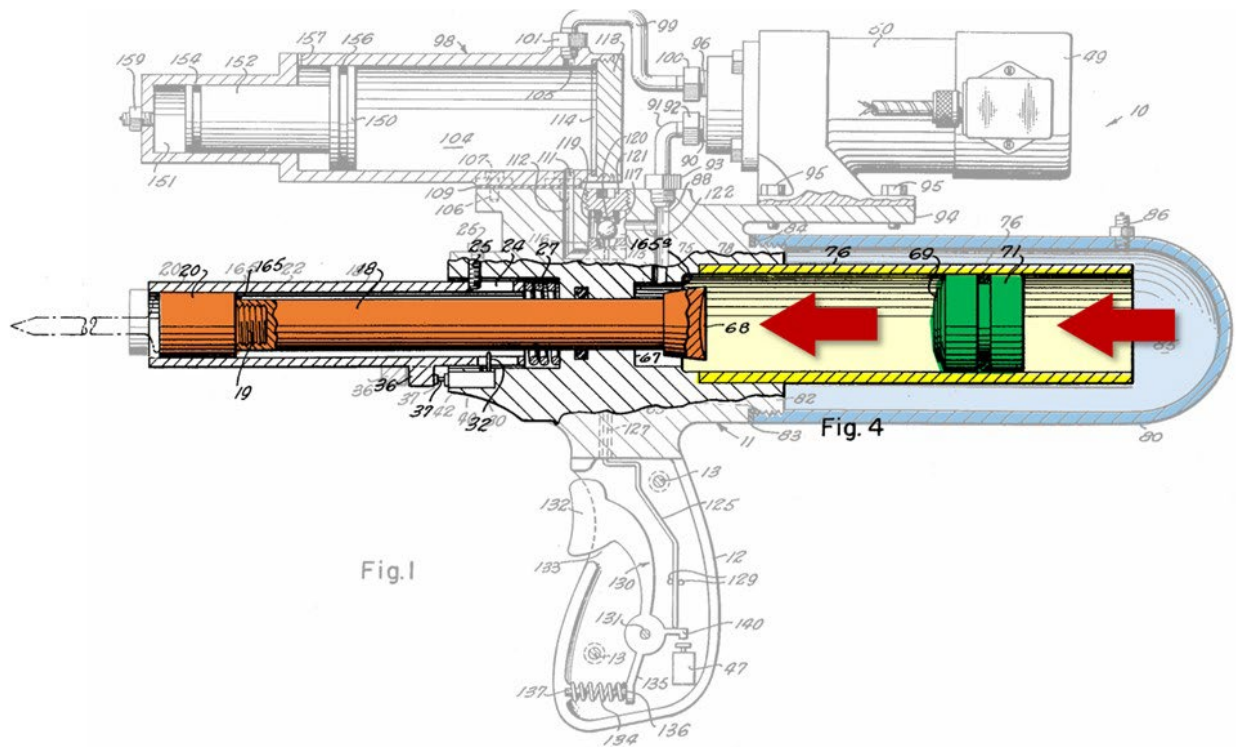
80. Haley discloses “a hollow cylinder that includes a movable piston.” Haley refers to its hollow cylinder (yellow below) as “extension cylinder 76,” refers to the piston (green) within that hollow cylinder as “accumulator piston 71,” and says that the piston is “moveable within the cylinder extension.” Haley, 3:33 and 3:35–39, Figs. 1 (below), 3, and 4.



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



82. Haley's piston detaches from being in direct physical contact with the driver during the drive stroke, as illustrated in Fig. 4. Haley, 6:16–31, Fig. 4. However, the compressed gas in the storage chamber (“chamber 85”) continues to exert force on the driver (“drive piston 18”) through both the piston (“accumulator piston 71”) and the incompressible power fluid in the hollow cylinder (“extension cylinder 76”) between the piston and the driver. Haley, Fig. 4 (below). Haley explicitly states that “the movement of the drive piston is primarily due to the force exerted by the compressed gas in the chamber 85 which is transmitted through the accumulator piston to the power fluid.” Haley, 6:50–53. Accordingly, Haley's piston and driver remain in communication throughout the drive stroke via the power fluid.



83. To the extent that “in communication with” requires direct contact, this element would still be rendered obvious by the combination of Haley and Lai. Specifically, Haley’s piston detaches from its driver solely as a result of its hydraulic lifting mechanism, which would be replaced with Lai’s mechanical lifter in the combination. In such a combination, a POSITA would not need or want to have the piston and driver detach during the drive stroke and it was therefore obvious that they would remain in direct contact throughout the drive stroke.

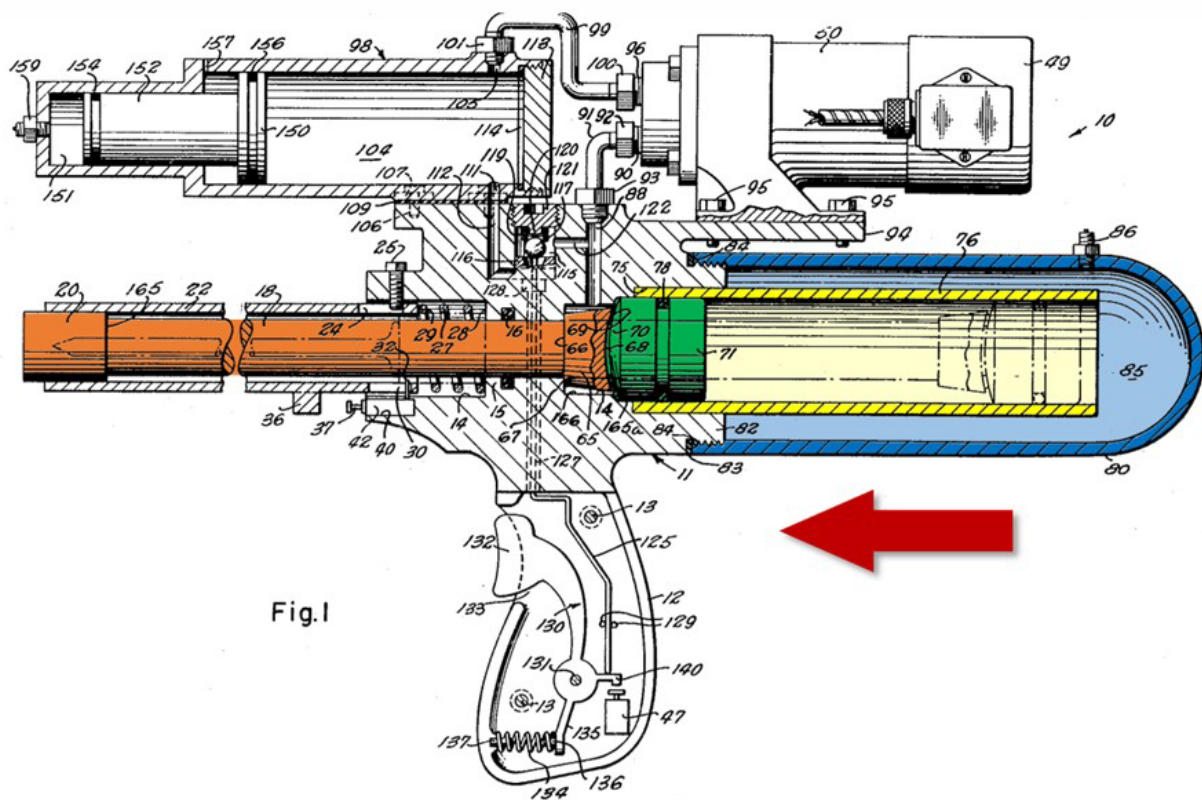
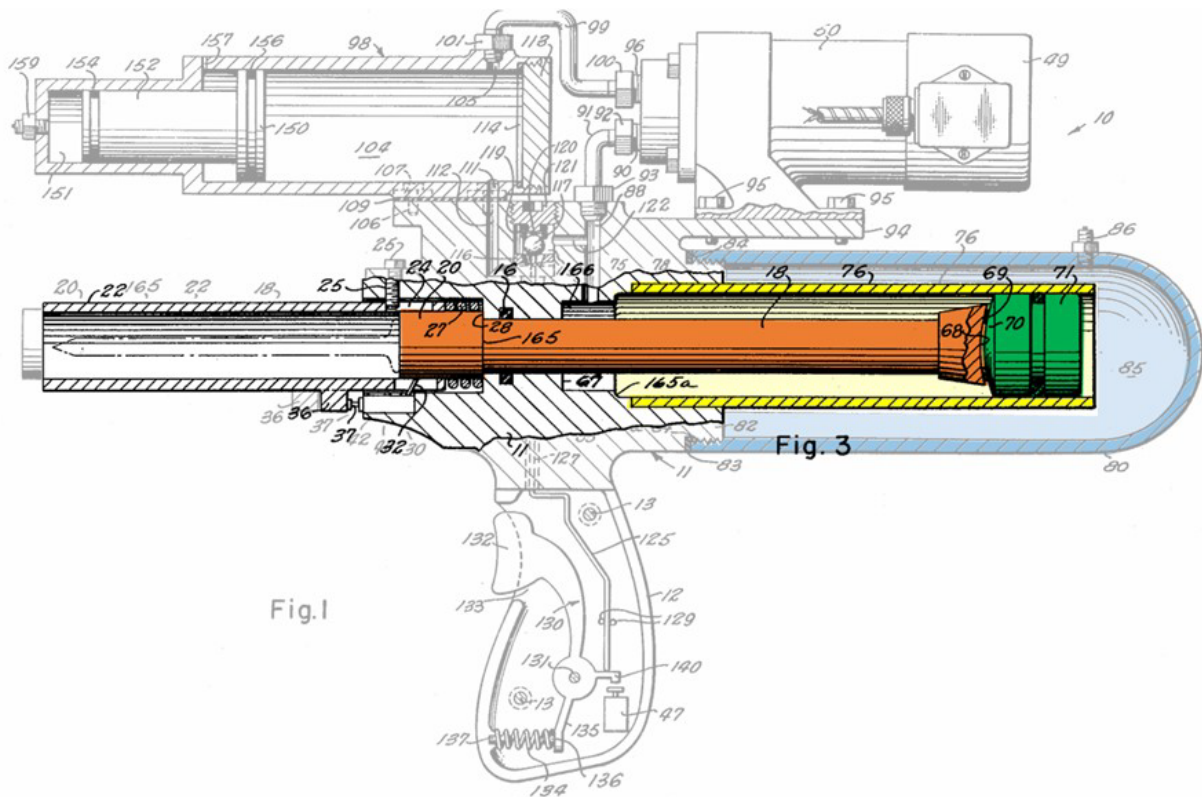
84. The combination of Haley and Lai discloses “a lifter that is in communication with said driver at least during a return stroke.” As explained above in relation to claim 2, Haley discloses a hydraulic lifting mechanism and thus does

not have a lifter that mechanically engages a driver, but it was obvious to replace Haley's hydraulic lifter with the claimed "lifter," which is disclosed by Lai. In the combination of Haley and Lai, the lifter (Lai's cam 5) is in communication with the driver during the return stroke. Lai, 2:13–21, Figs. 4A–4D.

85. The combination of Haley and Lai discloses "a prime mover. In that combination, Lai's lifter is moved by a prime mover ("motor 3"). Lai, 2:14–16, Fig. 2.

86. The combination of Haley and Lai discloses "a source of energy." Lai's motor is powered by a source of energy (Lai's battery 2). Lai, Figs. 1–2 (below), Title, Abstract, 1:25–35, 1:44–54, 1:60–62, 2:2, Claim 1.

87. ***Element [9.2]***: Haley discloses "said pressurized gas is used as a gas spring to propel said piston during said drive stroke." The pressurized gas in Haley's storage chamber ("chamber 85," blue below) is used to propel the piston ("accumulator piston 71," green) during the drive stroke. Haley, 5:74–6:7; 6:7–26; 6:48–53; 7:6–13, Figs. 1, 3 (below), and 4.



88. **Element [9.3]:** The combination of Haley and Lai discloses “said prime mover causes said lifter to mechanically engage said driver during said return stroke.” In that combination, Lai’s prime mover (“motor 3”) causes Lai’s lifter (“cam 5”) to mechanically engage protrusions that Lai teaches to add to a protrusionless driver such as, in the combination, Haley’s driver (“drive piston 18”). Lai, 2:14–21, Figs. 4A–4D.

89. **Element [9.4]:** The combination of Haley and Lai discloses “said housing has no external energy source cable and no external hose attached thereto.” That combination is spurred on by the need for a portable, battery-powered nailer, and Lai both teaches and encourages its energy-efficient and compact lifting mechanism powered by its portable battery pack, as noted above with respect to claim 2. Accordingly, in that combination, Haley’s electrical cable is replaced with Lai’s portable battery (Lai’s battery 2), and there would be no external cable or hose.

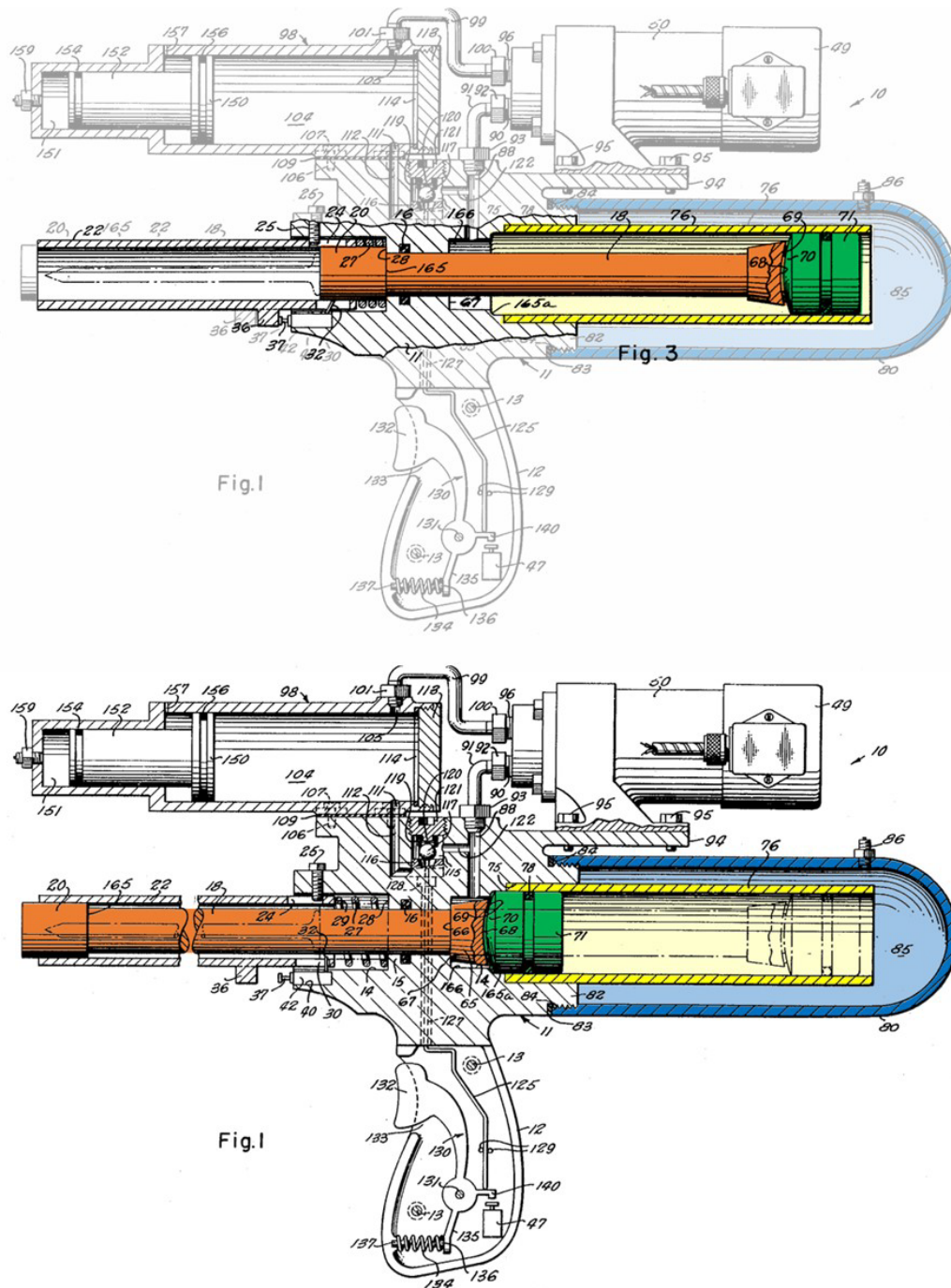
90. **Element [9.5]:** The combination of Haley and Lai discloses “said movable piston of the hollow cylinder is the sole movable piston that is in fluidic communication with the storage chamber.” Haley does have another movable piston (“piston 150”), but that piston is used for pushing non-compressible power fluid in reservoir 98 of large chamber 104. Haley, 4:62–67, Fig. 1. That is, Haley’s other piston is in its *hydraulic* system and thus is not another piston “in fluidic communication with the storage chamber” (which stored compressible gas, not

incompressible power fluid)—the “accumulator piston 71” is the sole movable piston in fluidic communication with the storage chamber.

91. In any event, Haley’s other piston forms part of its lifting mechanism and would be eliminated in the combination with Lai, since that combination replaces Haley’s hydraulic lifting mechanism with Lai’s mechanical lifter.

J. Claim 10

92. Haley discloses “[t]he portable fastener driving tool of claim 9, wherein: said storage chamber and said hollow cylinder are always in fluidic communication.” Haley’s storage chamber (“chamber 85”) and hollow cylinder (“extension cylinder 76”) are always in fluidic communication, as shown by Figs. 1 and 3, below. Haley, Figs. 1, 3.



K. Claim 11

93. Haley discloses “[t]he portable fastener driving tool of claim 10, wherein: said pressurized gas is re-used for a plurality of operational cycles that each

include said drive stroke and said return 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. 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 for a plurality of operational cycles. Haley, 3:40–45, Fig. 1. Haley’s operational cycles further include a drive stroke and a return stroke. Haley, 5:38–74 (return stroke); 5:74–6:53 (drive stroke).

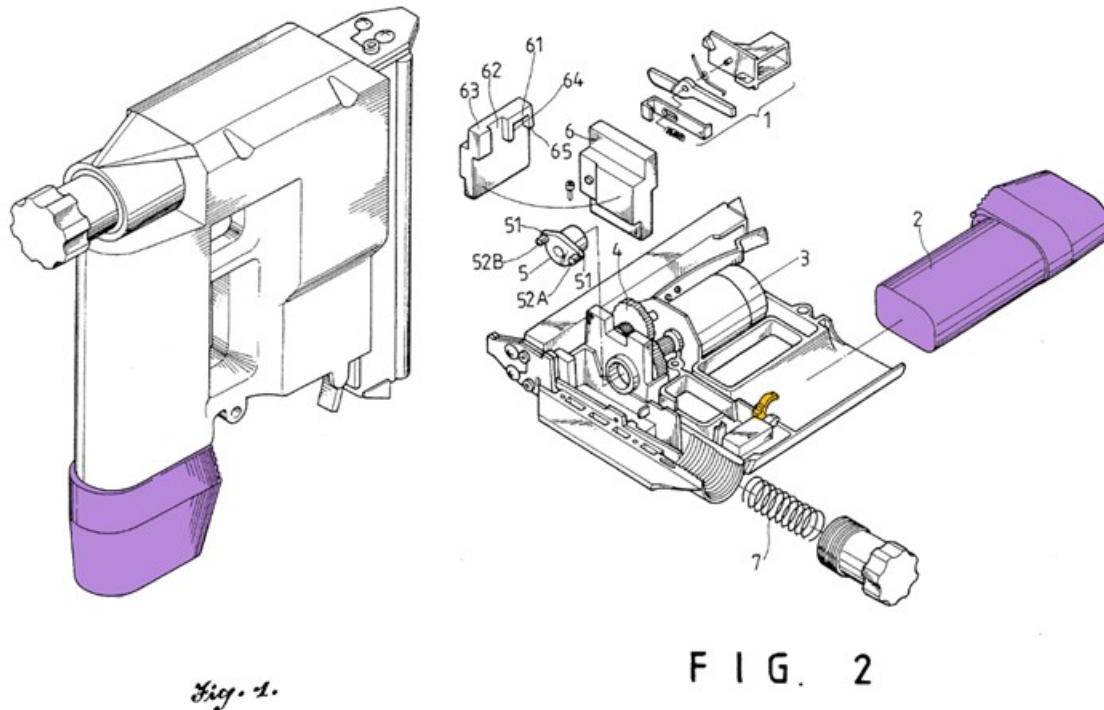
L. Claim 12

94. Haley discloses “[t]he portable fastener driving tool of claim 9, wherein: said piston has a rest position between operational cycles; and said rest position is achieved after said return stroke.” Haley discloses two positions: (1) 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 (2) 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). Haley expressly discloses that the tool will rest at or near the higher position (i.e., 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. 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.

M. Claim 13

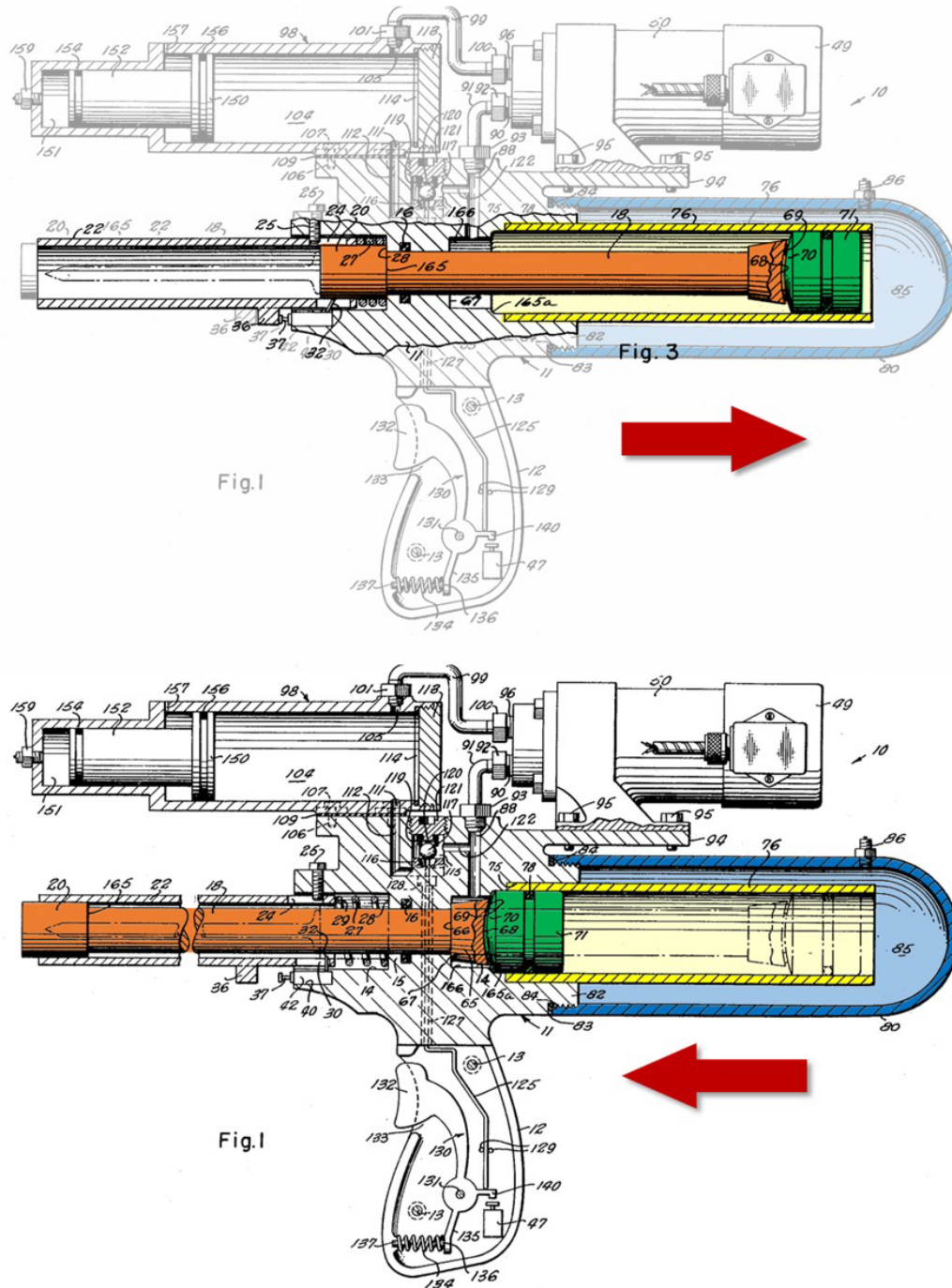
95. The combination of Haley and Lai discloses “[t]he portable fastener driving tool of claim 9, wherein: said prime mover comprises an electric motor; and said source of energy comprises a detachable battery.” Lai’s prime mover (“motor 3”) is powered by an electrical power source and thus is an electric motor. Lai, 1:25–35, 1:44–54, 1:60–62, 2:2, Claim 1. That electrical power source is Lai’s battery 2, which is a detachable battery as reflected by Fig. 1 showing battery 2 (purple below) attached and Fig. 2 showing battery 2 detached and showing an internal attachment clip (orange below). Lai, Figs. 1–2 (below).



N. Claim 14

96. **Elements [14.P]–[14.4]:** These elements are identical to Elements [9.P]–[9.4], respectively, and are met as described above

Element [14.5]: Haley discloses “said piston travels through said hollow cylinder between a higher pressure position and a lower pressure position.” In Haley, the piston (“accumulator piston 71,” green below) 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 (the leftward position shown in Fig. 1, which Haley says can be 1,000 psi). Haley, Figs. 1, 3 (below), 7:4–10.



97. **Element [14.6]:** Haley discloses “said piston has a rest position between operational cycles; and a location of said rest position is proximal to said higher pressure position.” As discussed above with respect to Claim 12, Haley

discloses two rest positions, including a rest position where the piston is at 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, Fig. 3, 5:70–6:7, 6:13–14. This rest position shown in Figure 3 is between operational cycles and at a location proximal to the higher pressure position.

O. Claims 15-16

98. Claims 15–16 are identical to Claims 10–11, respectively, and are met as described above.

P. Claim 17

99. *Elements [17.P]–[17.4]*: Elements [17.P]–[17.4] are identical to Elements [1.P]–[1.4], respectively, and are met as described above.

100. *Element [17.5]*: Haley discloses “said movable piston of the hollow cylinder is the sole movable piston that is in fluidic communication with the storage chamber of the gas pressure system.” As discussed above in relation to Claim 9, Element 9.5, Haley does have another movable piston (“piston 150”), but that other piston is used for pushing non-compressible power fluid and is not “in fluidic communication with the storage chamber of the gas pressure system.” See Haley, 4:62–67, Fig. 1. Furthermore, Haley’s other piston forms part of its lifting mechanism and would be eliminated in the combination with Lai, since that

combination replaces Haley’s hydraulic lifting mechanism with Lai’s mechanical lifter.

Q. Claims 18-20

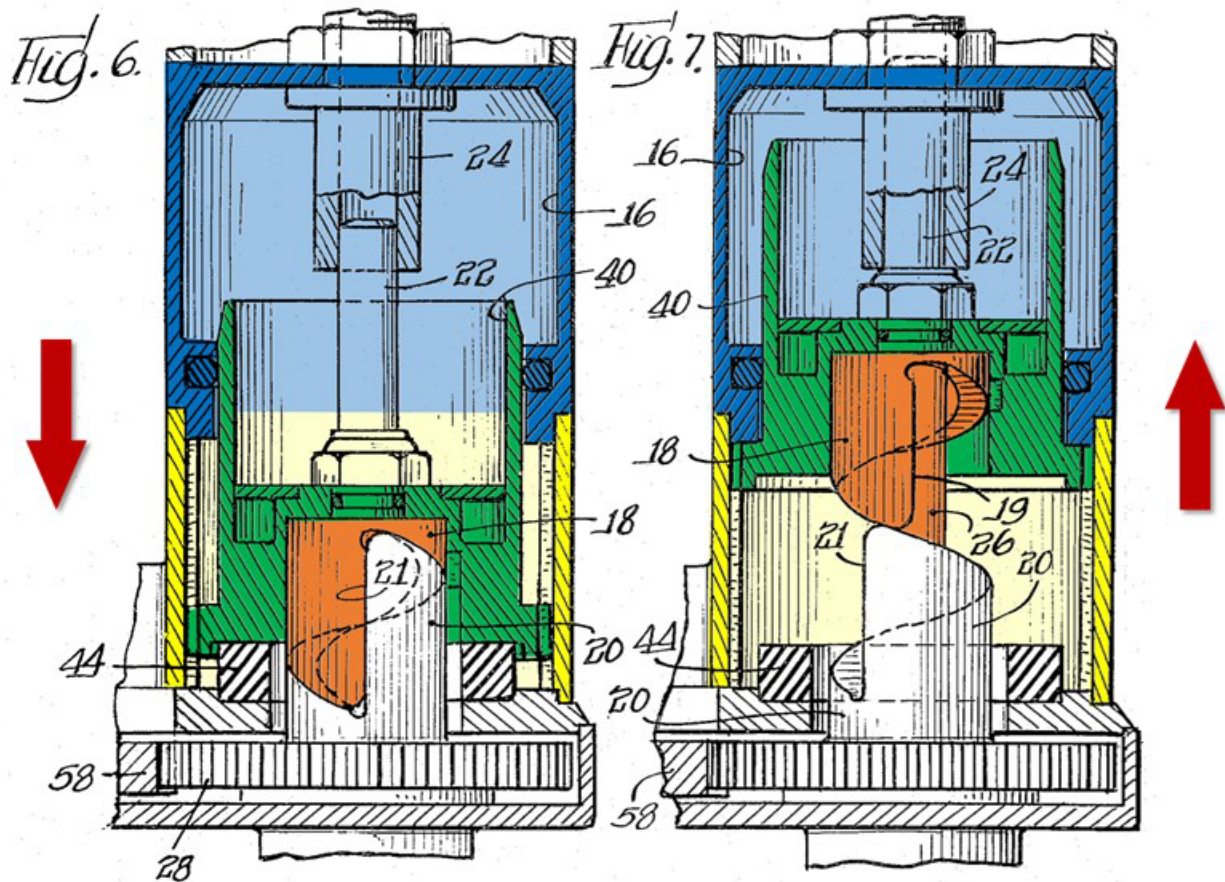
101. Claims 18–20 are identical to Claims 2, 5 and 8, respectively, and are met as described above.

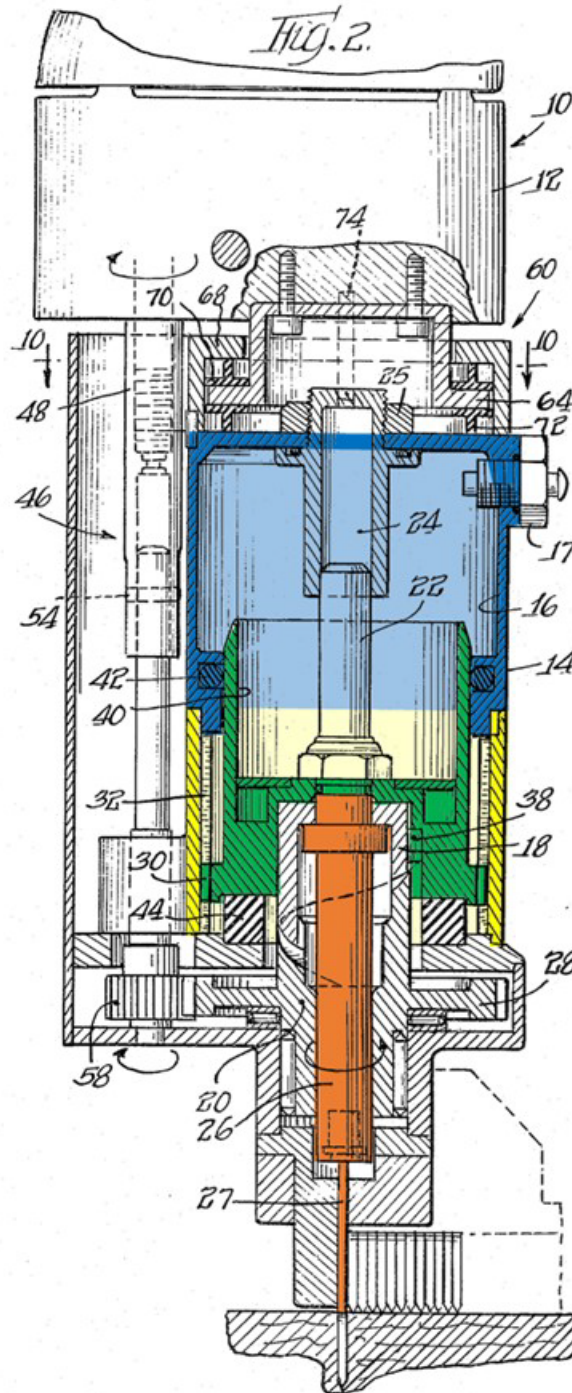
VI. CLAIMS 1–20 ARE OBVIOUS BASED ON SAARI AND ENSTROM IN VIEW OF LAI

A. Claim 1

102. *Element [1.P]*: Saari/Enstrom discloses “[a] gas pressure system for a portable power 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 at 1:27–33; Enstrom at 1:27–32.

103. *Element [1.1]*: Saari/Enstrom discloses “a hollow cylinder having a movable piston therewithin.” Saari/Enstrom’s hollow cylinder (yellow below) 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 (below); Saari, 4:1–9, Fig. 10.





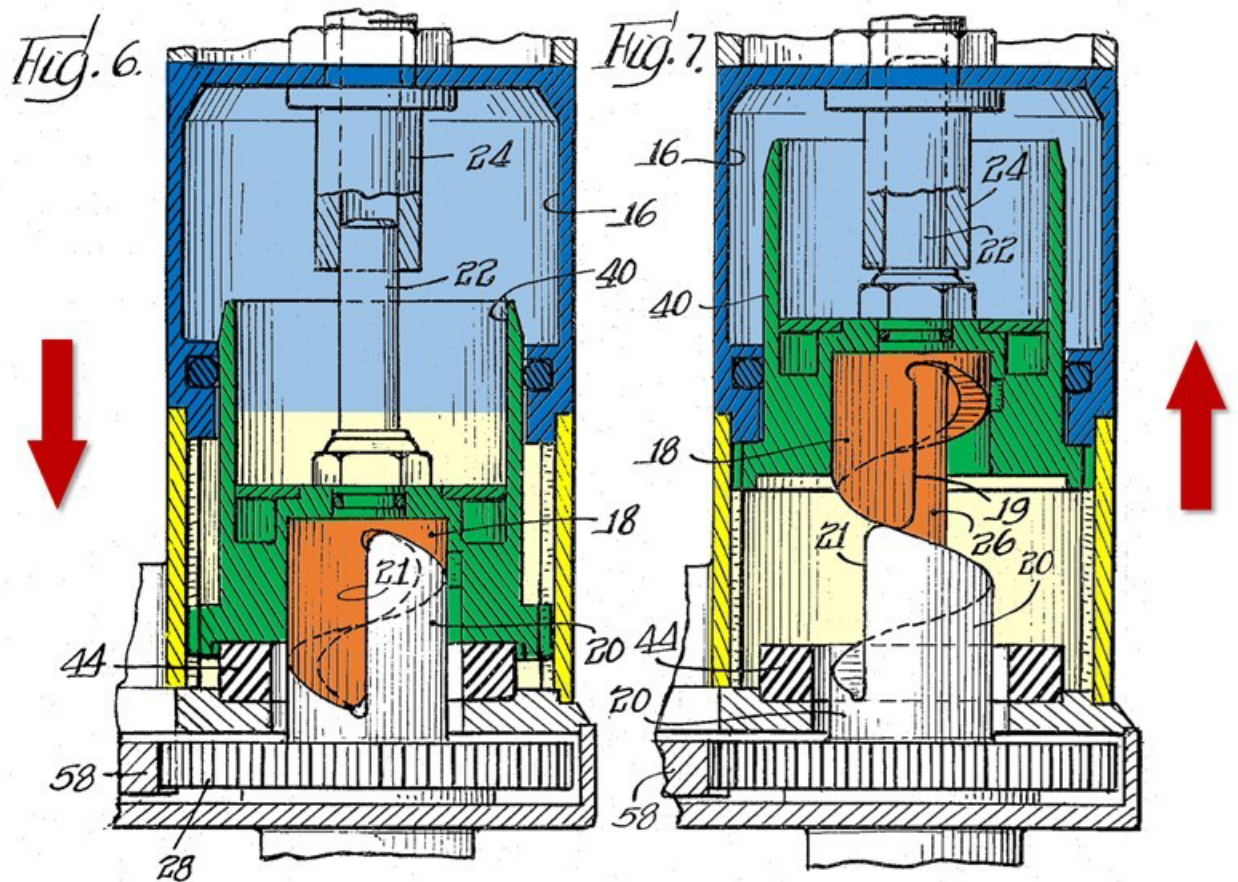
104. *Element [1.2]*: Saari/Enstrom discloses “a storage chamber that is in fluidic communication at all times with said cylinder.” Saari/Enstrom refers to its main storage chamber as “chamber 16” (blue above). Enstrom, 2:35–39, Figs. 1 and

6–7 (above); Saari, 4:1–9, Fig. 10. Saari/Enstrom’s storage chamber 16 is distinct from the cylinder (yellow) and remains in fluidic communication at all times with the cylinder, which is shown in Figure 1, where the displacement volume (light yellow) within the cup-like piston 40 (green) is open to chamber 16.

105. Saari/Enstrom also discloses “said storage chamber being charged with a pressurized gas.” In particular, 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 “charged with a pressurized gas,” since a charging valve would have no use if the chamber is allowed to reach atmospheric pressure. A POSITA also would not 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.

106. **Element [1.3]:** Saari/Enstrom discloses “wherein: said movable piston moves in a reciprocating pattern during an operating cycle, including moving through a drive stroke that is caused by said pressurized gas.” Saari/Enstrom’s storage chamber (“chamber 16,” blue) and cylinder (yellow) contain compressed gas that cause the moveable piston (“cup-like piston 40,” green) and the driver (“ram 26,” orange) to move through a drive stroke, i.e., “driven downwardly under the bias of the compressed gas.” Enstrom, 2:45–46, Figs. 6–7 (below); Saari, Fig. 10.



107. Saari/Enstrom's movable piston is then lifted during the operation cycle in preparation for another drive stroke, and thus moves in a reciprocating pattern. Enstrom, Figs. 6–7, 2:32–46; Saari, 2:51–61, 4:45–46, 5:6–7.

108. **Element [1.4]:** Saari/Enstrom discloses “said pressurized gas is not vented to atmosphere after said drive stroke, but instead said pressurized gas is re-used for a plurality of said operating cycles.” As discussed above in relation to Element 1.2, Saari/Enstrom disclose a valve for “charging the chamber,” which chamber is “sealed by suitable seal means.” Saari, 4:6–9, 4:11–14, Fig. 10; *see also* Enstrom, Fig. 2:52–55, Figs. 1–2 and 6–7. As I noted above, a POSITA would understand the disclosure of a sealed storage chamber and a valve for “selectively charging the chamber” means that the pressurized gas is “not vented to atmosphere” and instead is “re-used for a plurality of said operating cycles,” since a charging valve would have no use if the chamber is vented to reach atmospheric pressure. A POSITA also would not 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.

109. *Element [1.5]*: Saari/Enstrom discloses “said movable piston is the sole movable piston in the gas pressure system.” Saari/Enstrom’s cup-like piston 40 is the sole piston. Enstrom, 2:52–55, Figs. 2, 6–7; Saari, Fig. 10.

B. Claim 2

110. *Elements [2.1] and [2.2]*: The elements of claim 2 require: “(a) a movable driver that is in communication with said piston, said movable driver including at least one protrusion” and “(b) a lifter that causes said driver and said piston to move through a return stroke, by a mechanical engagement between said lifter and said at least one protrusion of the driver.” Saari/Enstrom discloses a lifting mechanism with “a pair of coaxing 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/Enstrom’s lifting structure (“cam 20”) moves a movable driver (“upper cam 18 and associated ram 26”), which is connected to the piston (“cup-like piston 40”), through a return stroke (“a purely axial rearwardly motion”). Enstrom, 2:55–59, Figs. 6–7; *see also* Saari, 2:51–54, Figs. 1–2.

111. It was obvious—at the filing of the ’007 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.

112. Moreover, a POSITA would have been motivated to replace Saari/Enstrom's helicoidal lifting mechanism with Lai's lifter member. 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. *See* Enstrom, Fig. 1 (power cord 34). As explained above in relation the combination of Haley with Lai, at the filing of the '007 patent, market forces and design needs favored a portable, battery-powered nailer. 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. Ex. 1010 [Lin], 1:21–26; Ex. 1008, [Kondo], 1:9–29; Ex. 1009 [Pedicini], ¶[0005].

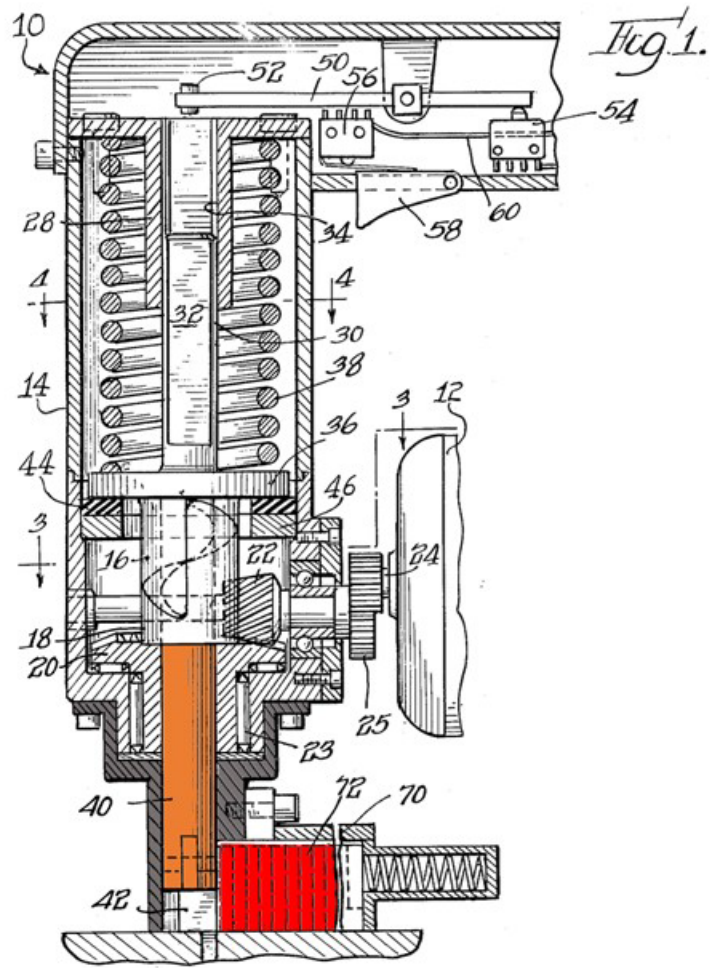
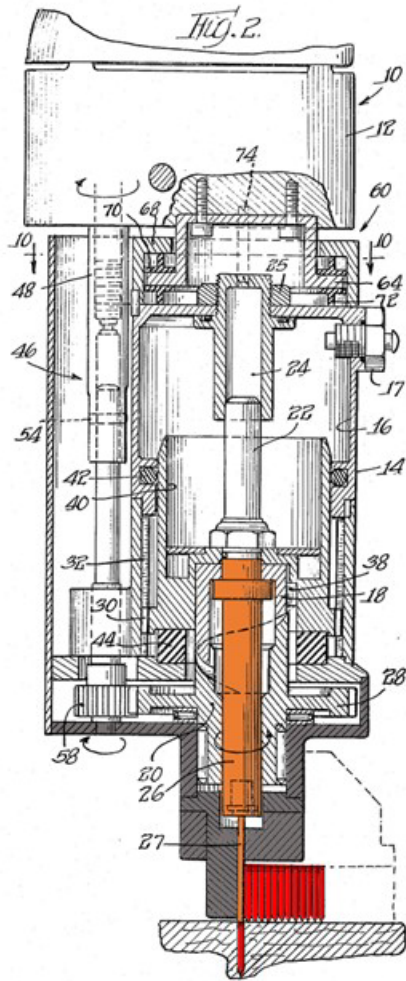
113. As noted above, Lai discloses a battery-powered nailer and expressly touts one of its benefits as being electrical efficiency. Specifically, Lai identifies an “ideal” electric stapling gun as being “energy saving” and explains that its disclosed lifter member can “provide the same hitting effect with less power consumption.” Lai at 1:9–10. 2:34–42. Accordingly, at the filing of the '007 patent, a POSITA would have replaced Saari/Enstrom's helicoidal lifting mechanism with Lai's lifter member in order to eliminate the electrical power cable and achieve a portable, battery-powered nailer.

114. In this combination, a POSITA would modify Saari/Enstrom's movable driver to include “at least one protrusion” so that the POSITA could incorporate the

lifter from Lai that moves the driver and piston through a return stroke by “mechanical engagement between said lifter and said at least one protrusion of the driver.” Lai teaches adding a “U-shaped member 61” with protrusions to a protrusion-less driver blade so that it can be engaged by pins 52A and 52B of Lai’s lifter member. Ex. 1005 [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. For example, the coacting helical cams of Saari/Enstrom could be replaced with a straight member having a rectangular cross section which would allow a straightforward addition of Lai’s protrusions to this straight member. The gear drives, already located adjacent to the lifting mechanisms in Saari/Enstrom, could be replaced with the rotary cam of Lai and actuated using Lai’s battery powered motor. This motor could be positioned in a similar orientation (perpendicular to the drive axis) and positioned to improve the balance of the driving tool.

C. Claim 3

115. *Element [3.1]*: Saari/Enstrom discloses “[t]he gas pressure system of claim 2, further comprising: a guide body with a linear passageway for said driver.” Saari/Enstrom’s guide body (grey below) has a linear passageway for the driver (26/40, orange below). Enstrom, Fig. 2 (below left); Saari, Fig. 1 (below right).



116. **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.” In that combination, the lifter taught by Lai is a rotatable cam 5 (yellow, below) that moves in rotational motion (curved arrows) to cause the driver (light orange) to move in a linear motion (straight arrow). Lai, Figs. 4A–D (below), 1:62–63, 2:14–25.

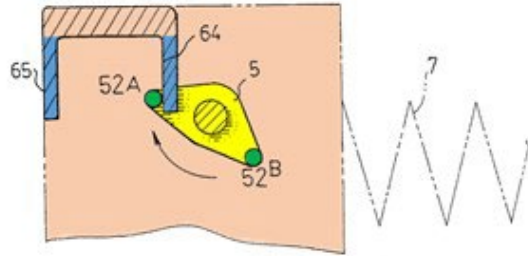


Fig. 4A.

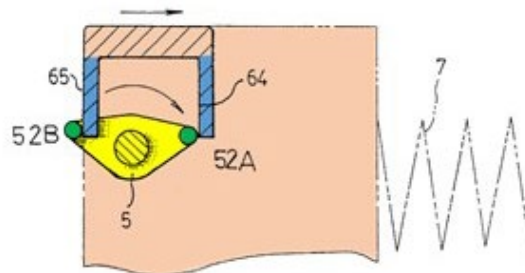


Fig. 4B.

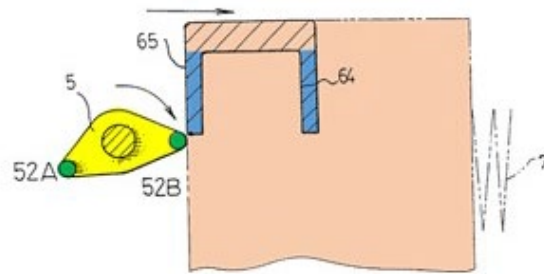


Fig. 4C.

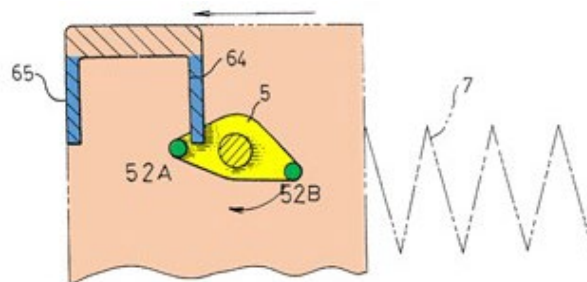
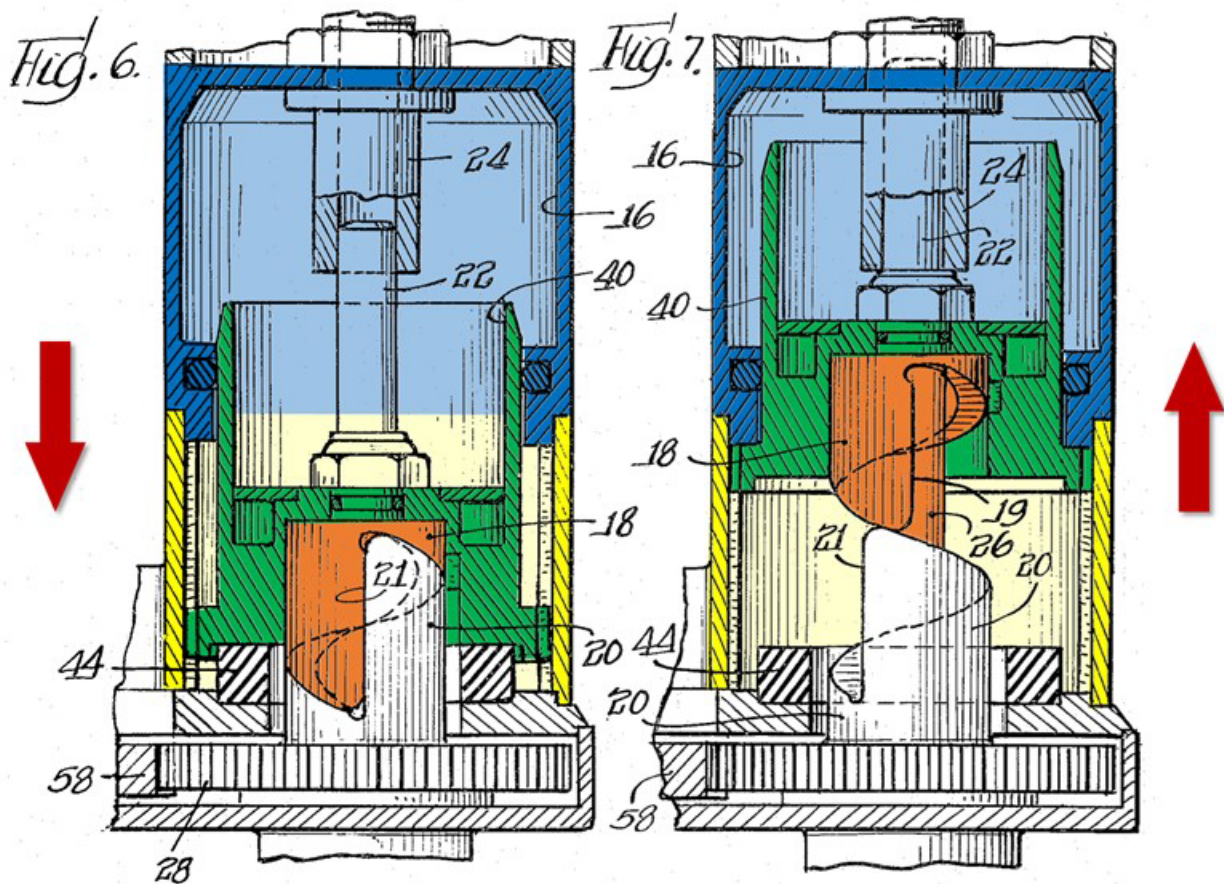


Fig. 4D.

D. Claim 4

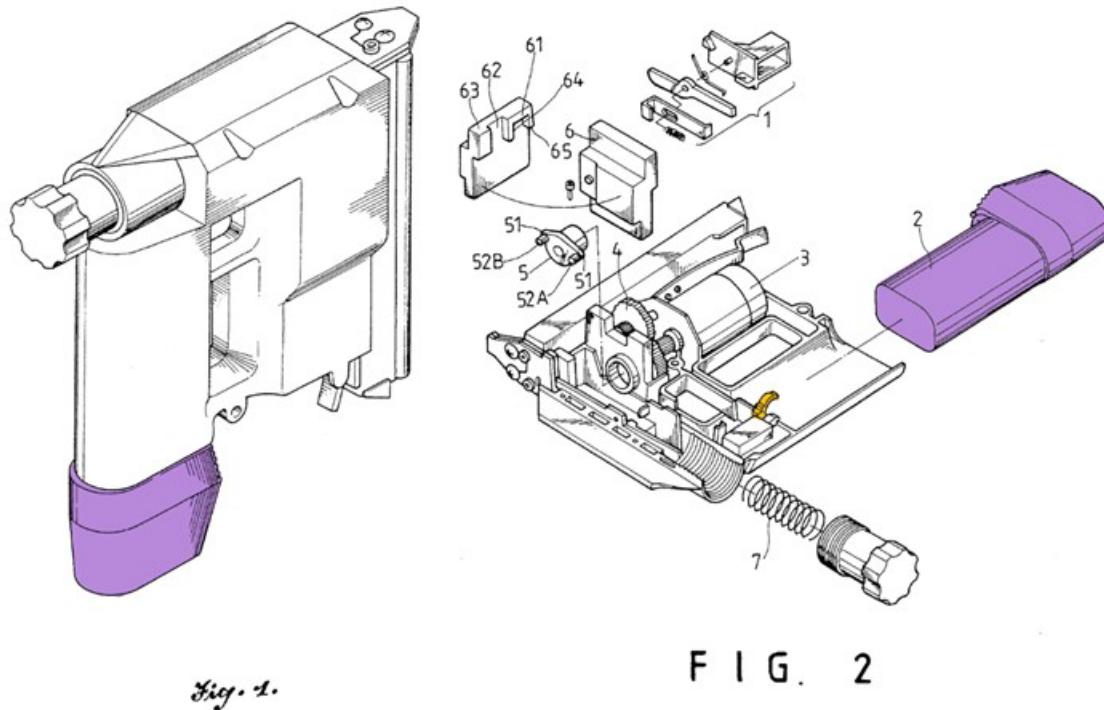
117. *Element [4.1]*: Saari/Enstrom discloses “[t]he gas pressure system of claim 2, wherein: said cylinder and piston act as a gas spring during said drive stroke.” In Saari/Enstrom, the cylinder (yellow below) and piston (“cup-like piston 40,” green) act as a gas spring during the drive stroke. When the cup-like piston 40 is raised, the gas in the displacement volume of the cylinder within the cup of piston (yellow below) and the gas in chamber 16 (blue) are compressed, and the ram is then “driven downwardly under the bias of the compressed gas.” Enstrom, 2:45–46, Figs. 6–7 (below); Saari, Fig. 10.



118. *Element 4.2]*: The combination of Saari/Enstrom and Lai discloses “said lifter does not engage said driver during said drive stroke.” In that combination, the lifter taught by Lai (cam 5) does not engage (“is separated from”) the protrusions of the driver (U-shaped member 61 on hammer 6) during the drive stroke. Lai, 2:22–25, Fig. 4D.

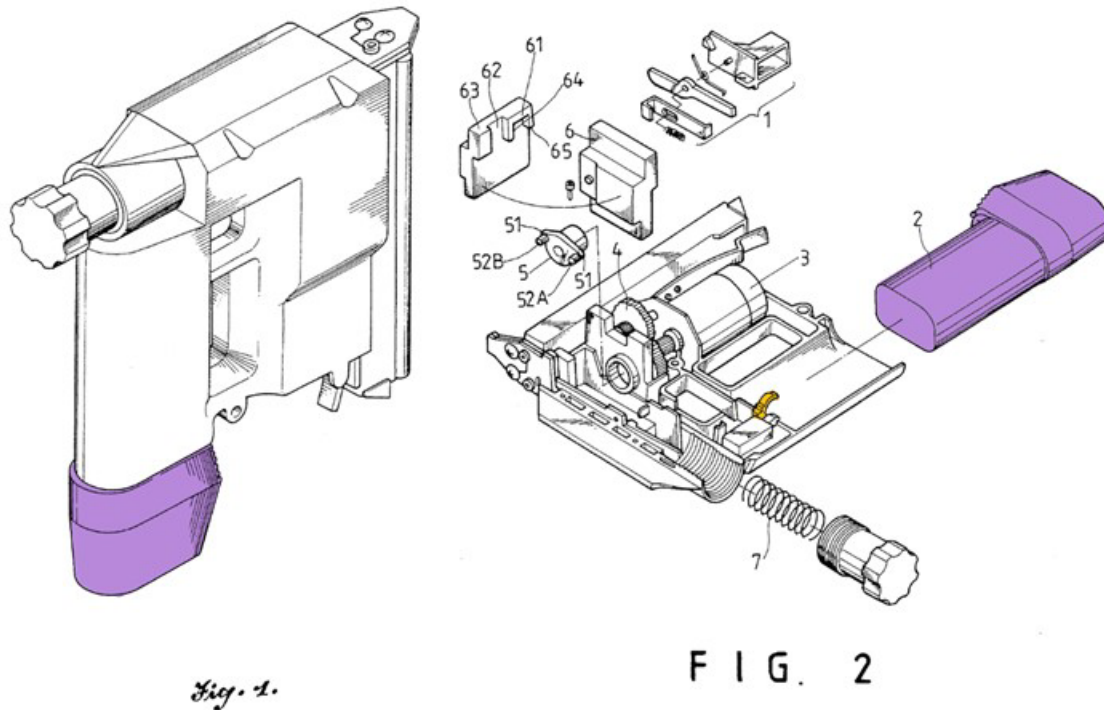
E. Claim 5

119. The combination of Saari/Enstrom and Lai discloses “[t]he gas pressure system of claim 2, further comprising: a motor and an on-board electrical power source, wherein said motor provides motive power for said lifter.” In that combination, Lai’s lifter is provided with motive power by a motor (“motor 3”). Lai, 2:14–16. Lai’s motor is powered by an on-board electrical power source (Lai’s battery 2). Lai, Figs. 1–2 (below), Title, Abstract, 1:25–35, 1:44–54, 1:60–62, 2:2, Claim 1.



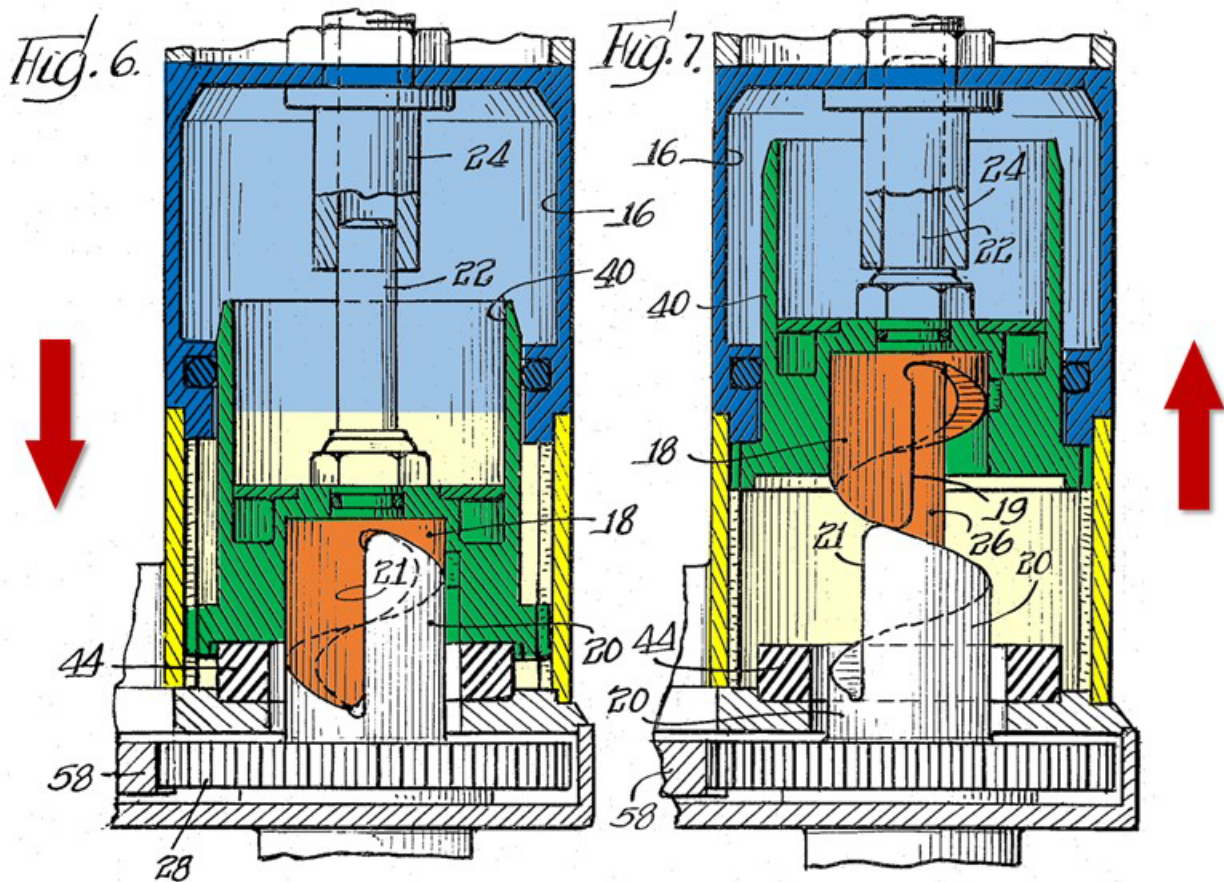
F. Claim 6

120. The combination of Saari/Enstrom and Lai discloses “[t]he gas pressure system of claim 5, wherein: (a) said on-board electrical power source comprises a detachable battery; and (b) said motor comprises an electric motor.” In that combination, Lai’s on-board electrical power source is an detachable battery pack, as reflected by Fig. 1 showing battery 2 (purple below) attached and Fig. 2 showing battery 2 detached and showing an internal attachment clip (orange below). Lai, Figs. 1–2 (below). Lai’s motor (“motor 3”) is powered by that electrical power source and thus is an electric motor. Lai, 1:25–35, 1:44–54, 1:60–62, 2:2, Claim 1.



G. Claim 7

121. Saari/Enstrom discloses “[t]he gas pressure system of claim 1, wherein: said movable piston moves through a pathway through said hollow cylinder between a higher pressure position and a lower pressure position.” In Saari/Enstrom, the movable piston (“cup-like piston 40,” green below) moves through a pathway along the axis of the hollow cylinder (yellow) between a higher pressure position (the upper position shown in Fig. 7) and a lower pressure position (the lower position shown in Fig. 6). Enstrom, 2:35–45, Figs. 6–7 (below); Saari, 4:1–11, Fig. 10.



H. Claim 8

122. Saari/Enstrom discloses “[t]he gas pressure system of claim 1, wherein: said pressurized gas in the storage chamber remains above atmospheric pressure during all portions of an operating cycle.” The pressurized gas in Saari/Enstrom’s storage chamber “remains above atmospheric pressure during all portions of an operating cycle.” In particular, 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

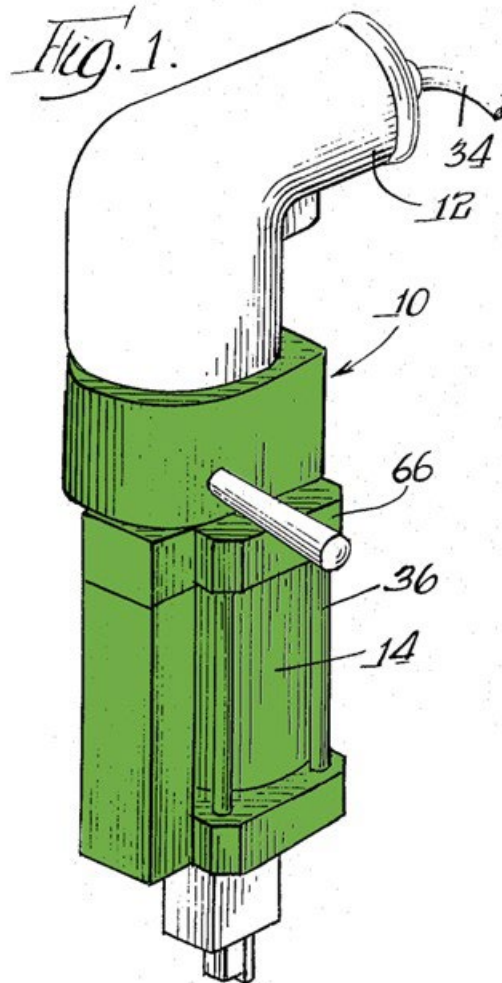
suitable seal means 84 between the inner walls of the housing 14a and the outer side walls of the piston 80.” Saari 4:6–9, Fig. 10; *see also* Enstrom, 2:52–55, Figs. 1 and 6–7.

123. A POSITA would have understood the disclosure of a sealed storage chamber and a valve for “selectively charging the chamber” means that the chamber will “remain above atmospheric pressure during all portions of an operating cycle,” since a charging valve would have no use if the chamber were allowed to reach atmospheric pressure. A POSITA also would not have misinterpreted 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.

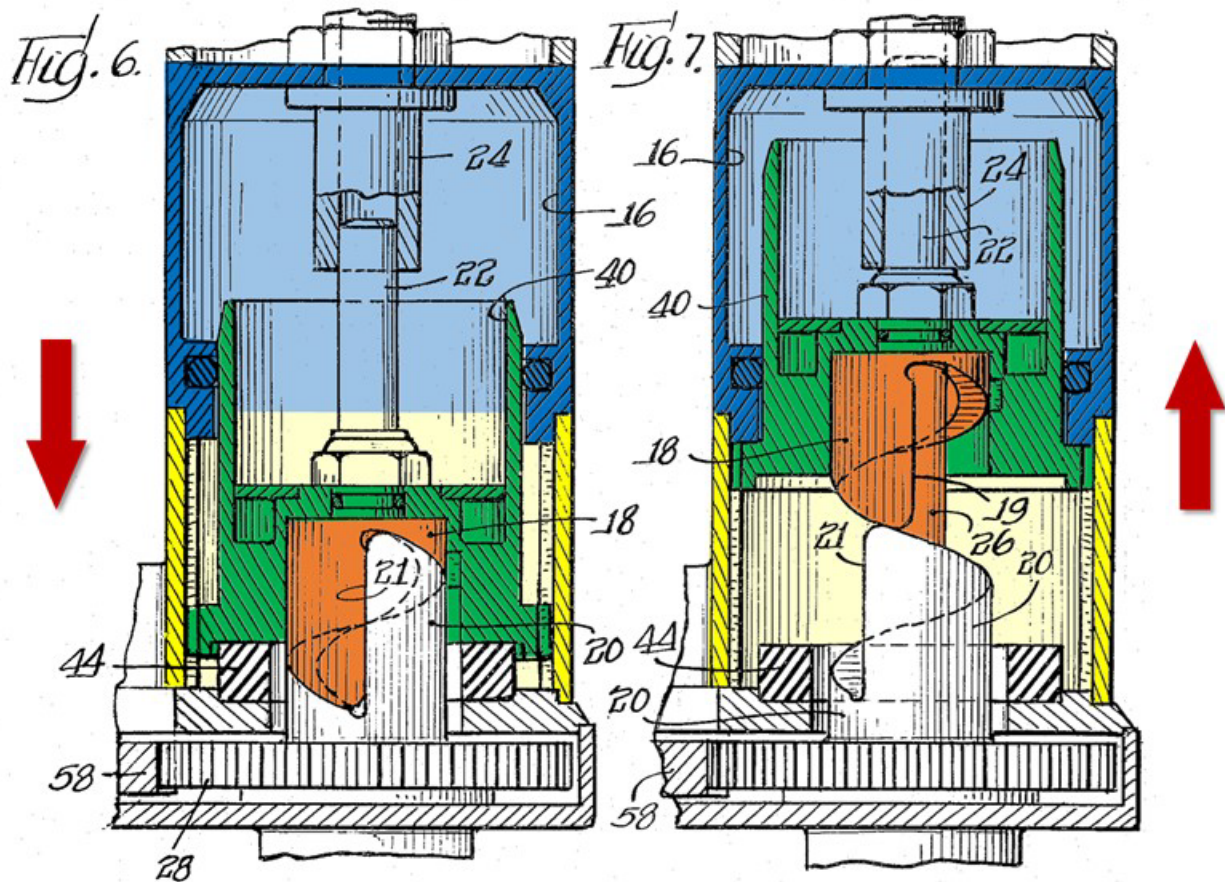
I. Claim 9

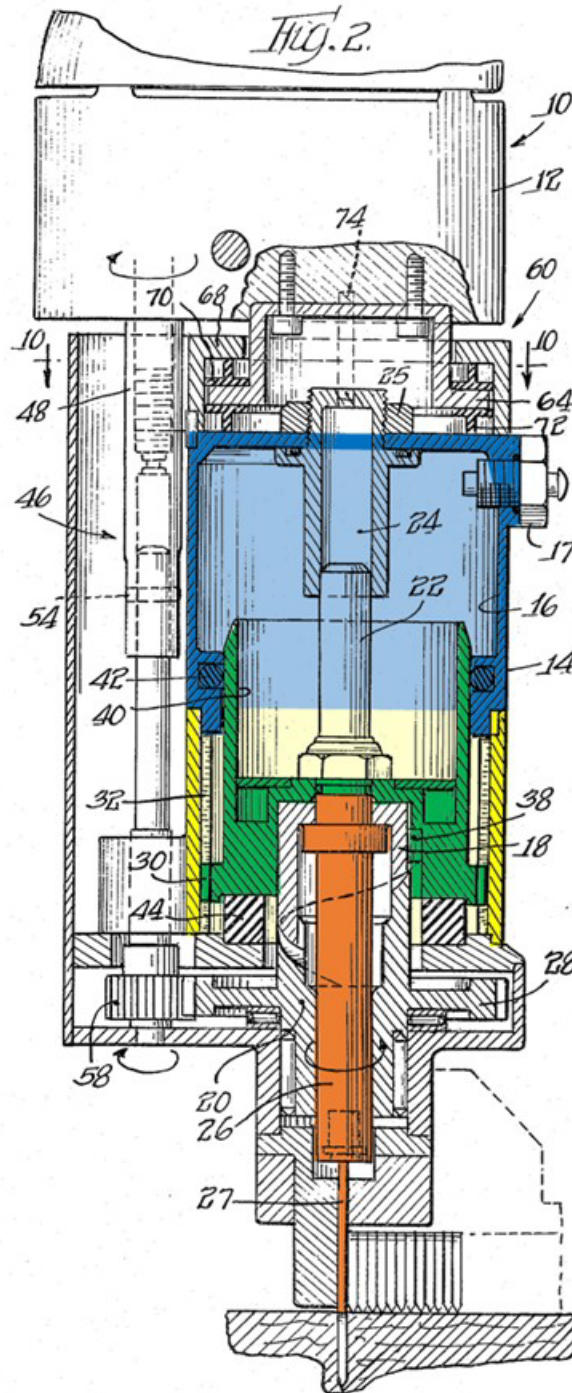
124. ***Element [9.P]***: Saari/Enstrom discloses “[a] portable fastener driving tool.” Saari/Enstrom disclose a “driving tool” with a spring (including a compressed gas spring) to “provide the actual driving force to seat the fastener.” Saari at 1:27–33; Enstrom at 1:27–32.

125. **Element [9.1]:** Saari/Enstrom discloses “a housing with a storage chamber that contains a pressurized gas.” Saari/Enstrom’s housing is shown below in green. Saari, Fig. 1; Enstrom, Fig. 1 (below).



126. Saari/Enstrom’s housing has a storage chamber containing pressurized gas, which is referred to as “chamber 16” (blue below). Enstrom, 2:35–39, Figs. 1 and 6–7 (below); Saari, 4:1–9, Fig. 10. Saari/Enstrom’s storage chamber 16 is distinct from the cylinder (yellow), which is shown in Figure 1.

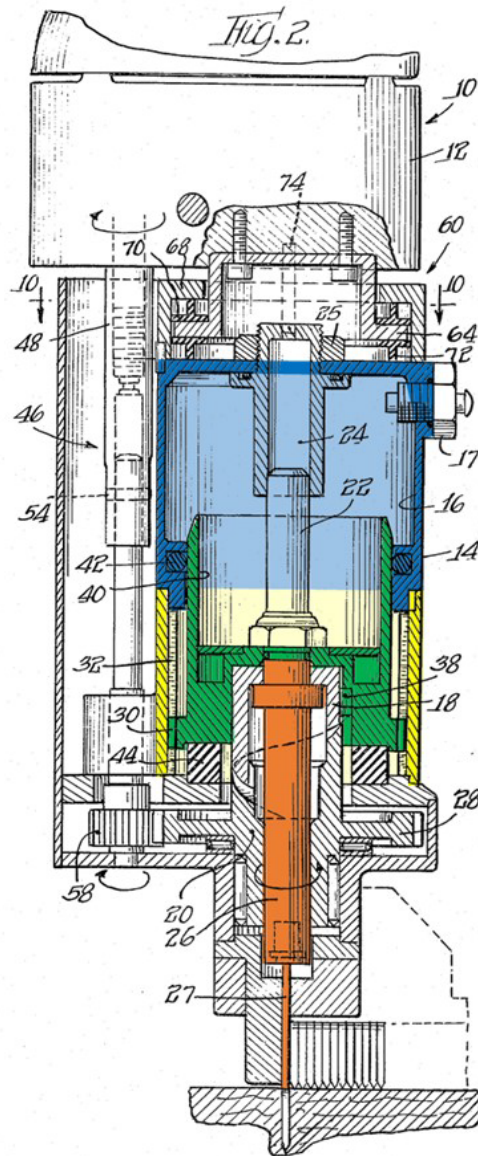




127. Saari/Enstrom discloses “a hollow cylinder that includes a movable piston.” Saari/Enstrom’s hollow cylinder (yellow above) contains a piston (“cup-

like piston 40”) movable within the cylinder along “key and spline devices 30 and 32.” Enstrom, 2:52–60, Figs. 2, 6–7 (above); Saari, 4:1–9, Fig. 10.

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

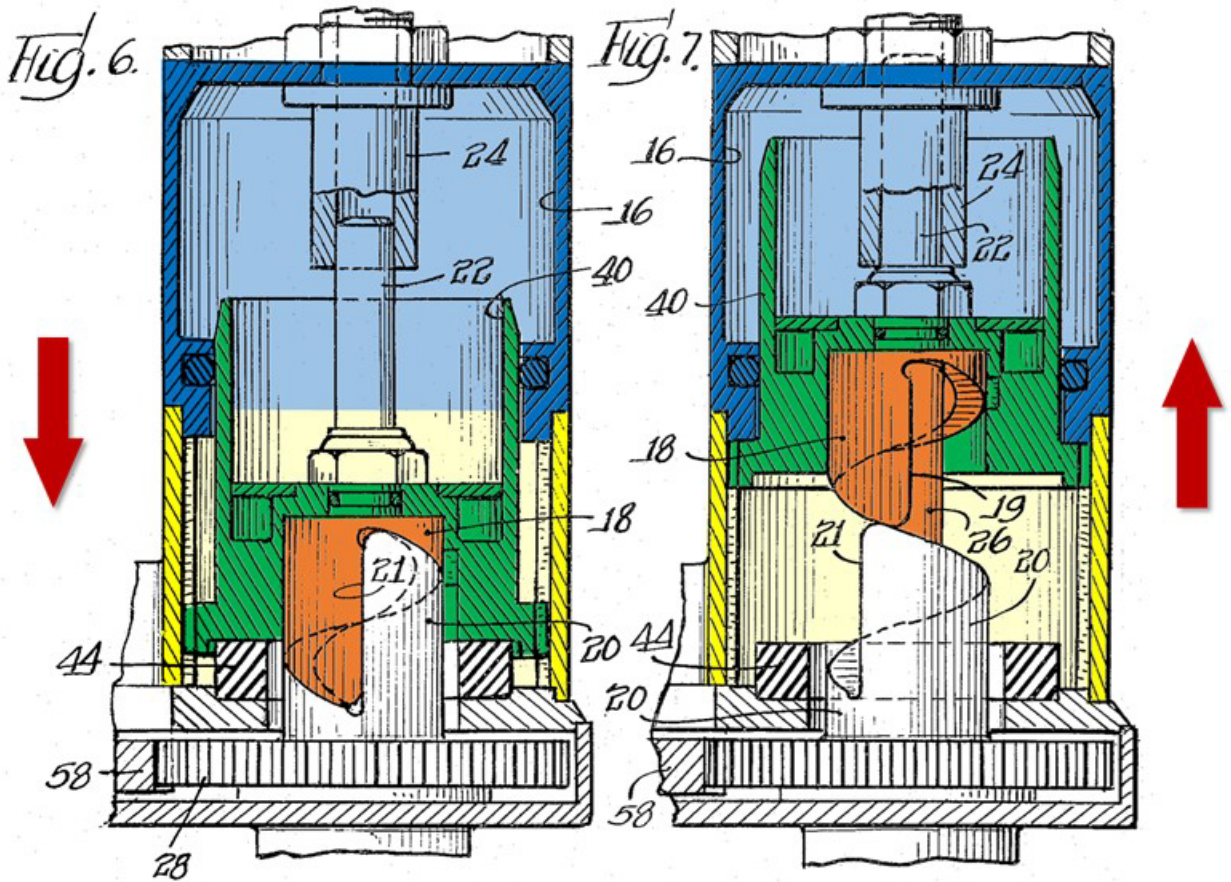


129. The combination of Saari/Enstrom and Lai discloses “a lifter that is in communication with said driver at least during a return stroke.” As explained above in relation to claim 2, it was obvious to replace Saari/Enstrom’s lifting mechanism with the claimed “lifter,” which is disclosed by Lai. In the combination of Saari/Enstrom and Lai, the lifter (Lai’s cam 5) is in communication with the driver during the return stroke. Lai, 2:13–21, Figs. 4A–4D;

130. The combination of Saari/Enstrom and Lai discloses “a prime mover. In that combination, Lai’s lifter is moved by a prime mover (“motor 3”). Lai, 2:14–16, Fig. 2.

131. The combination of Saari/Enstrom and Lai discloses “a source of energy.” Lai’s motor is powered by a source of energy (Lai’s battery 2). Lai, Figs. 1–2 (below), Title, Abstract, 1:25–35, 1:44–54, 1:60–62, 2:2, Claim 1;

Element [9.2]: Saari/Enstrom discloses “said pressurized gas is used as a gas spring to propel said piston during said drive stroke.” The pressurized gas in Saari/Enstrom’s storage chamber (“chamber 16,” blue below) is used to propel the piston (“cup-like piston 40,” green) during the drive stroke. Enstrom, 2:45–46, Figs. 6–7 (below); Saari, Fig. 10.



132. The combination of Saari/Enstrom and Lai discloses “said prime mover causes said lifter to mechanically engage said driver during said return stroke.” In that combination, Lai’s prime mover (“motor 3”) causes Lai’s lifter (“cam 5”) to mechanically engage protrusions that Lai teaches to add to a protrusion-less driver such as, in the combination, Saari/Enstrom’s driver (“upper cam 18 and the associated ram 26”). Lai, 2:14–21, Figs. 4A–4D.

133. **Element [9.4]:** The combination of Saari/Enstrom and Lai discloses “said housing has no external energy source cable and no external hose attached thereto.” As discussed above with respect to claim 2, that combination is spurred on

by the need for a portable, battery-powered nailer, and Lai both teaches and encourages its energy-efficient and compact lifting mechanism powered by its portable battery pack. Accordingly, in that combination, Saari/Enstrom's electrical cable is replaced with Lai's portable battery (Lai's battery 2), and there would be no external cable or hose.

134. ***Element [9.5]:*** Saari/Enstrom discloses "said movable piston of the hollow cylinder is the sole movable piston that is in fluidic communication with the storage chamber." Saari/Enstrom's cup-like piston 40 is the sole piston. Enstrom, 2:52–55, Figs. 2, 6–7; Saari, Fig. 10.

J. Claim 10

135. Saari/Enstrom discloses "[t]he portable fastener driving tool of claim 9, wherein: said storage chamber and said hollow cylinder are always in fluidic communication." Saari/Enstrom's storage chamber remains in fluidic communication at all times with the cylinder, which is shown in Figure 1, where the displacement volume (light yellow) within the cup-like piston 40 (green) is open to chamber 16. Enstrom, Fig. 1; *see also* Saari, Fig. 10.

K. Claim 11

136. Saari/Enstrom discloses "[t]he portable fastener driving tool of claim 10, wherein: said pressurized gas is re-used for a plurality of operational cycles that each include said drive stroke and said return stroke." As discussed above in relation

to Elements 1.2 and 1.4, Saari/Enstrom disclose a valve for “charging the chamber,” which chamber is “sealed by suitable seal means.” Saari, 4:6–9, 4:11–14, Fig. 10; *see also* Enstrom, Fig. 2:52–55, Figs. 1–2 and 6–7.

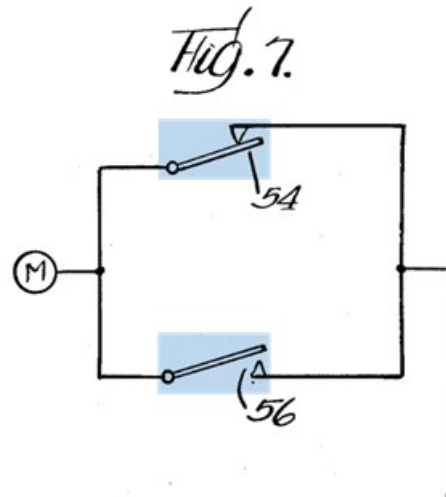
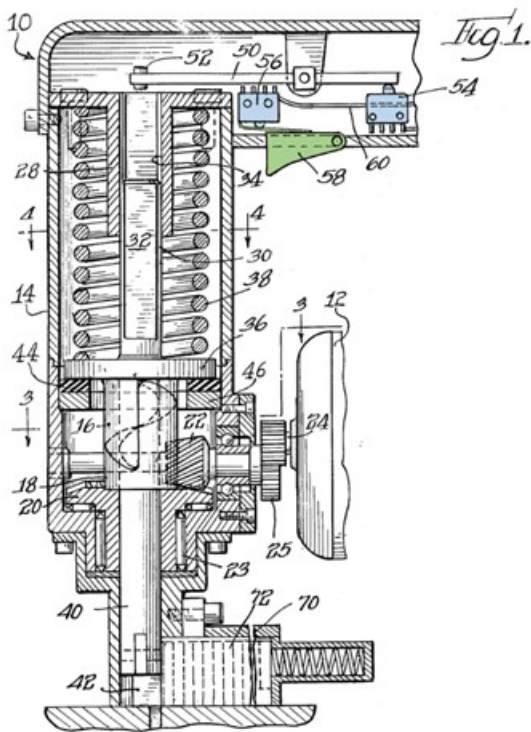
137. As I noted above, a POSITA would understand the disclosure of a sealed storage chamber and a valve for “selectively charging the chamber” means that the pressurized gas is not vented to atmosphere and instead is “re-used for a plurality of said operating cycles,” since a charging valve would have no use if the chamber is vented to reach atmospheric pressure. 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.

L. Claim 12

138. Saari/Enstrom discloses “[t]he portable fastener driving tool of claim 9, wherein: said piston has a rest position between operational cycles; and said rest position is achieved after said return stroke.”

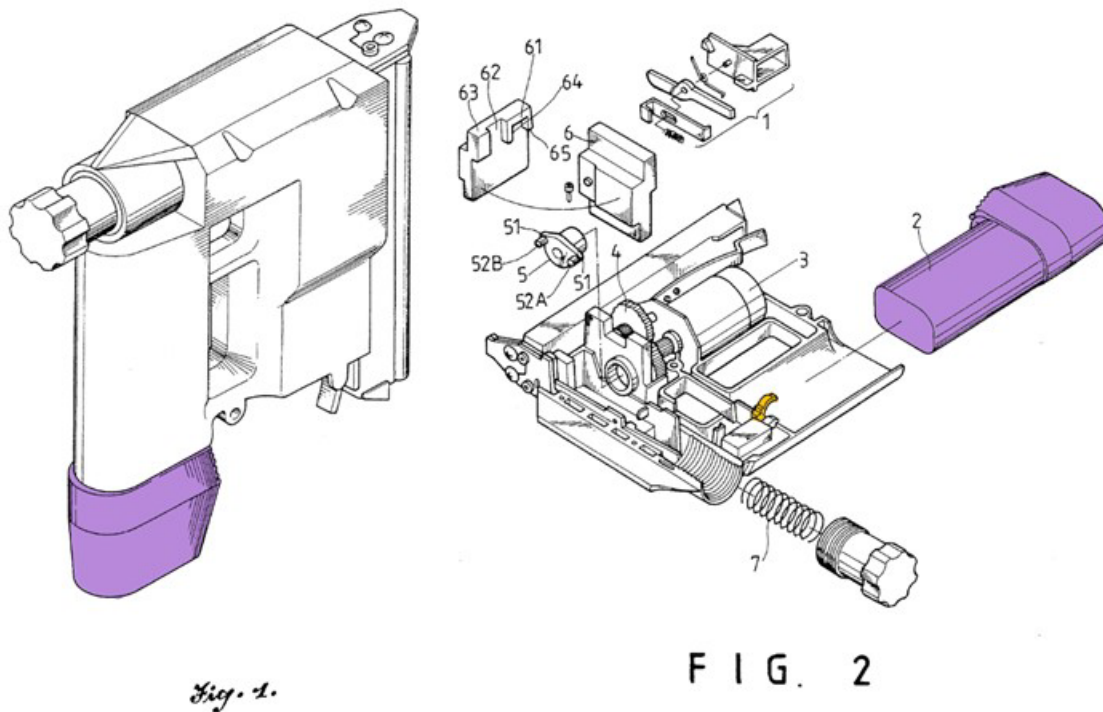
139. Saari/Enstrom discloses a circuit that supplies power to the motor (“M” in Fig. 7) based on input from “switch 54” (which is opened by guide shaft 30 engaging pivot arm 50 when driving ram 40 is raised to its cocked position) and

“switch 56” (which is closed by actuation of trigger 58). Saari, 3:19–63, Figs. 1, 7 (below), and 8–9; *see also* Enstrom, Fig. 2 (guide shaft 22). Switches 54 and 56 are wired in parallel between the motor and power supply, meaning that the motor will be actuated so long as either switch is closed. Saari, Figs. 7–9. Switch 54 is “normally closed”—and thus allowing power to be supplied to the motor, but is opened when actuated by the driving ram 40 being raised to its cocked position after a return stroke. Saari, 3:29–31, Figs. 1 and 7–9. Switch 56 is closed when a user actuates the trigger 58. Saari, 3:19–20, Figs. 1 and 7–9. The driving cycle thus begins with the driving ram 40, and its connected piston (“cup-like piston 40”), resting in its upper, cocked position and both switches open. Saari, Fig. 8.



M. Claim 13

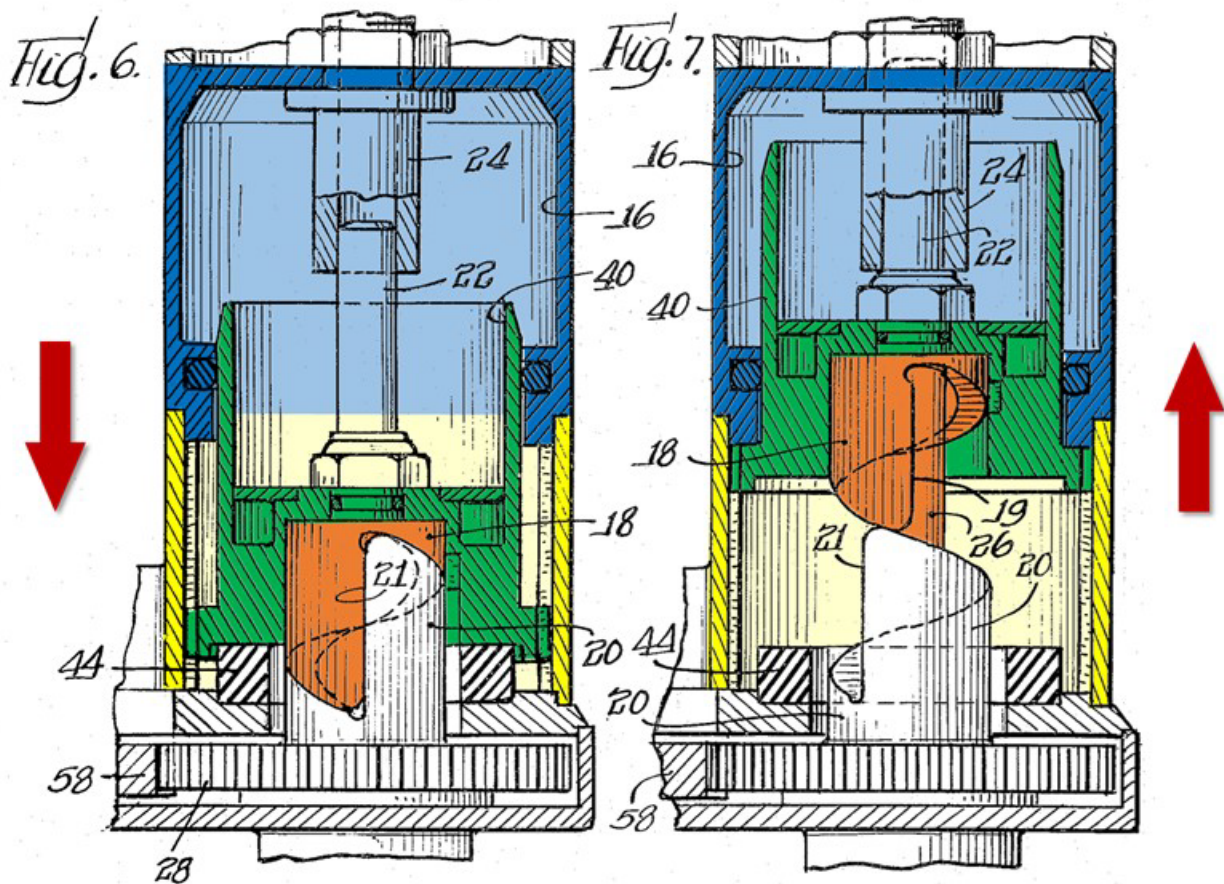
140. The combination of Saari/Enstrom and Lai discloses “[t]he portable fastener driving tool of claim 9, wherein: said prime mover comprises an electric motor; and said source of energy comprises a detachable battery.” Lai’s prime mover (“motor 3”) is powered by an electrical power source and thus is an electric motor. Lai, 1:25–35, 1:44–54, 1:60–62, 2:2, Claim 1. That electrical power source is Lai’s battery 2, which is a detachable battery as reflected by Fig. 1 showing battery 2 (purple below) attached and Fig. 2 showing battery 2 detached and showing an internal attachment clip (orange below). Lai, Figs. 1–2 (below).



N. Claim 14

141. *Elements [14.P]–[14.4]*: Elements [14.P]–[14.4] are identical to Elements [9.P]–[9.4], respectively, and are met as described above.

142. *Element [14.5]*: Saari/Enstrom discloses “said piston travels through said hollow cylinder between a higher pressure position and a lower pressure position.” In Saari/Enstrom, the piston (“cup-like piston 40,” green below) moves through the hollow cylinder (yellow) between a higher pressure position (the upper position shown in Fig. 7) and a lower pressure position (the lower position shown in Fig. 6). Enstrom, 2:35–45, Figs. 6–7 (below); Saari, 4:1–11, Fig. 10.



143. ***Element [14.6]***: Saari/Enstrom discloses “said piston has a rest position between operational cycles; and a location of said rest position is proximal to said higher pressure position.” As discussed above in relation to Claim 12, Saari/Enstrom discloses a rest position at its upper, cocked position. This rest position is between operational cycles and at a location proximal to the higher pressure position.

O. Claims 15-16

144. Claims 15–16 are identical to Claims 10–11, respectively, and are met as described above.

P. Claim 17

145. ***Elements [17.P]–[17.4]***: Elements [17.P]–[17.4] are identical to Elements [1.P]–[1.4], respectively, and are met as described above.

146. ***Element [17.5]***: Saari/Enstrom discloses “said movable piston of the hollow cylinder is the sole movable piston that is in fluidic communication with the storage chamber of the gas pressure system.” Saari/Enstrom’s cup-like piston 40 is the sole piston. Enstrom, 2:52–55, Figs. 2, 6–7; Saari, Fig. 10.

Q. Claims 18-20

147. Claims 18–20 are identical to Claims 2, 5 and 8, respectively, and are met as described above.

VII. CLAIMS 1–20 ARE OBVIOUS BASED ON KONDO

A. Claim 1

148. *Element [1.P]*: Kondo discloses “[a] gas pressure system for a portable power tool.” Kondo “provide[s] a fastener driving tool which is operable to drive fasteners,” Kondo, 1:48–49.

149. *Element [1.1]*: Kondo discloses “a hollow cylinder having a movable piston therewithin.” Kondo refers to its hollow cylinder (yellow below) as “cylindrical main body 11a,” refers to the movable piston (green) within that hollow cylinder as “drive piston 12,” and says that the piston 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 and 2 (below).

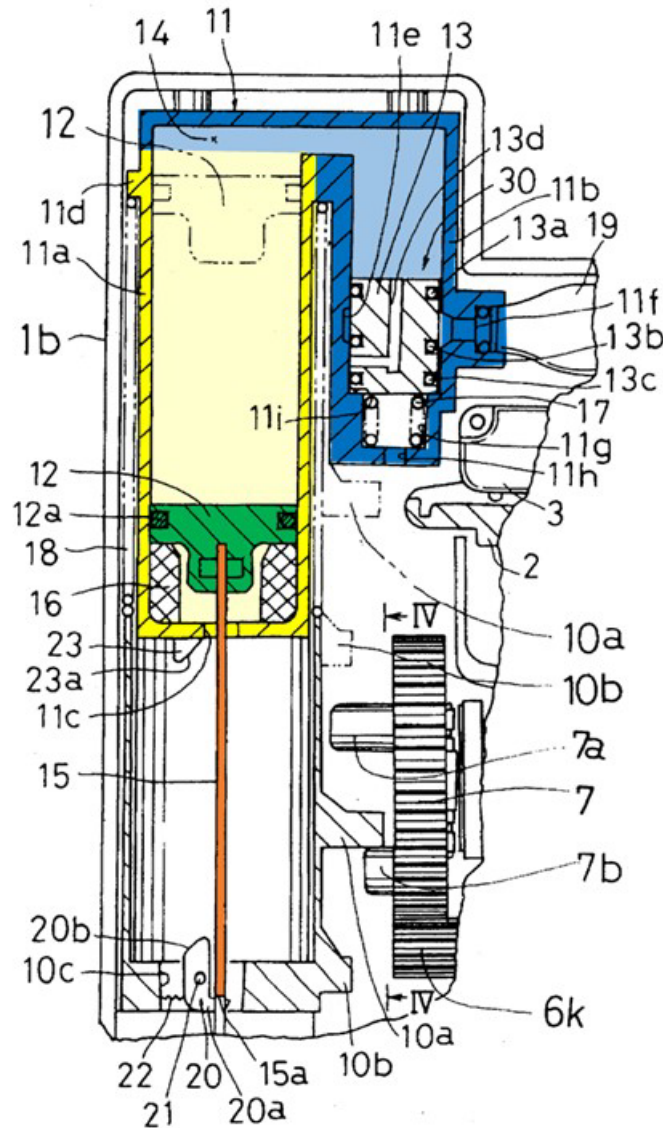


FIG. 2

150. **Element [1.2]:** Kondo discloses “a storage chamber that is in fluidic communication at all times with said cylinder.” Kondo’s storage chamber is the “air chamber 14” of its “auxiliary cylinder portion 11b” (blue, below), which is in fluidic communication at all times with said displacement volume of the cylinder (“cylindrical main body 11a”). Kondo, 4:37–40, Figs. 1 and 2 (below).

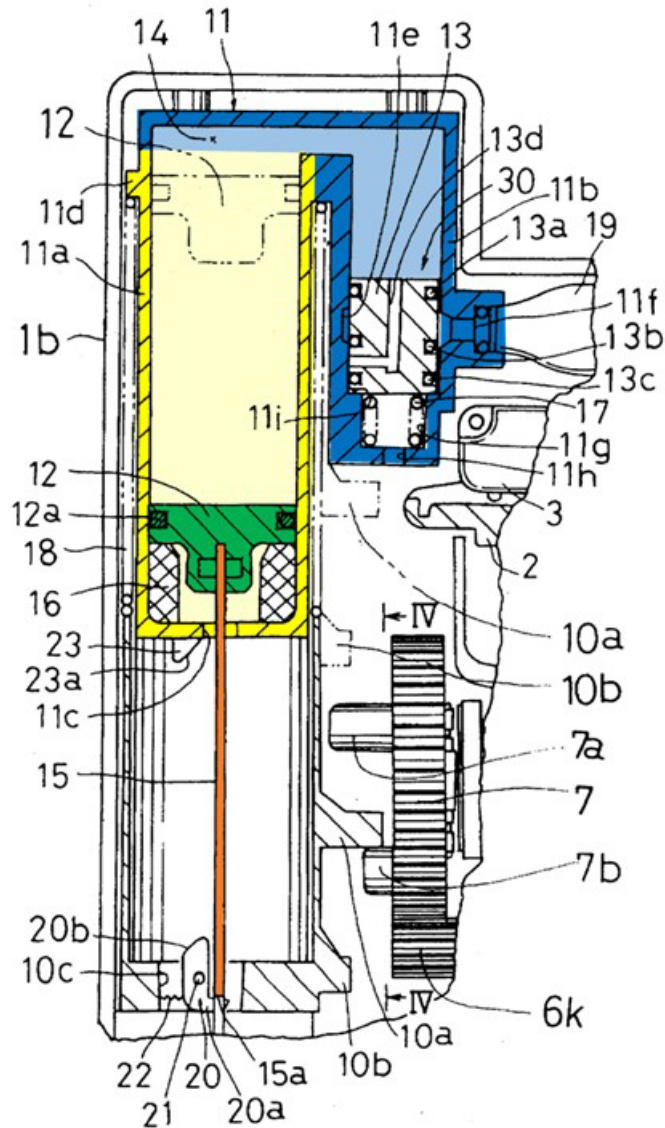


FIG. 2

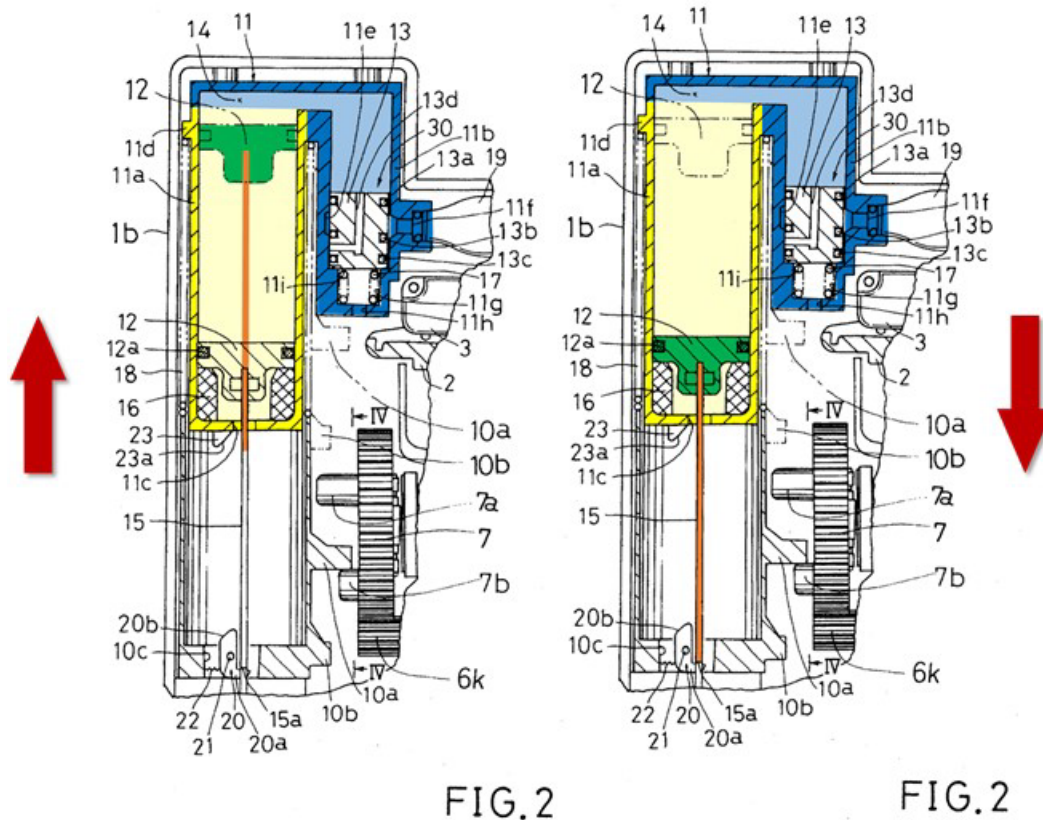
151. Kondo's storage chamber (the "air chamber 14" of its "auxiliary cylinder portion 11b") is distinct from the cylinder ("cylindrical main body 11a"). Specifically, while Kondo generally refers to a "cylinder 11," it also distinctly references "cylindrical main body 11a" and "auxiliary cylinder portion 11b" of cylinder 11. Kondo, 4:35–40.

152. 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." Kondo, Figs 1–2.

153. Kondo discloses "said storage chamber being charged with a pressurized gas." The design of the "auxiliary piston 13" shows that Kondo's main storage chamber is charged with a pressurized gas. Specifically, 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.

154. ***Element [1.3]***: Kondo discloses "wherein: said movable piston moves in a reciprocating pattern during an operating cycle, including moving through a drive stroke that is caused by said pressurized gas." In Kondo, the pressurized gas of both the storage chamber ("air chamber 14" of "auxiliary cylinder portion 11b") and the displacement volume (in "cylindrical main body 11a") move the piston

(“drive piston 12”) through a drive stroke. Kondo, 4:58–62, 7, 20–26, Figs. 1 and 2 (below).



155. Kondo’s movable piston is then lifted during the operation cycle in preparation for another drive stroke, and thus moves in a reciprocating pattern. Kondo, 3:1–4:32, Fig. 2.

156. **Element [1.4]:** Kondo discloses “said pressurized gas is not vented to atmosphere after said drive stroke, but instead said pressurized gas is re-used for a plurality of said operating cycles.” 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. 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.

157. ***Element [1.5]***: Kondo’s discloses a separate “air replenishing piston 13” and thus does not expressly meet the requirement of “said movable piston is the sole movable piston in the gas pressure system.” However, it would have been obvious at the filing of the ’007 patent to omit Kondo’s gas replenishment system and therefore satisfy this claim limitation. Kondo’s own claims relegate the gas replenishment system to dependent claims, clearly establishing that it is an optional feature that can be excluded. *See* Kondo, Claims 1–3. Moreover, a POSITA would understand that Kondo’s gas replenishment system is an optional feature because it is not used during normal operation, but rather is intended to recharge the main storage chamber when the pressure level eventually degrades due to minor leaks of pressurized gas after “the use of the nailer for a long time.” Kondo, 7:62–8:1. Furthermore, a POSITA would understand that Kondo’s gas replenishment system adds weight, cost, and complexity to the tool in exchange for an improvement in longevity, and that the decision as to whether to include it would be a simple design choice with predictable results.

158. Moreover, a POSITA would have been motivated at the filing of the '007 patent to not include Kondo's gas replenishment system due to market and design pressures favoring compact, lightweight, and less expensive tools. *See* Lai, 1:9–10 (“As we know, the ideal electric stapling gun should be energy saving, strong in hitting force and compact in size.”). Kondo's “air replenishing piston 13” is only used as part of its gas replenishment system, thus without that system the tool would satisfy the limitation that “said movable piston is the sole movable piston in the gas pressure system.”

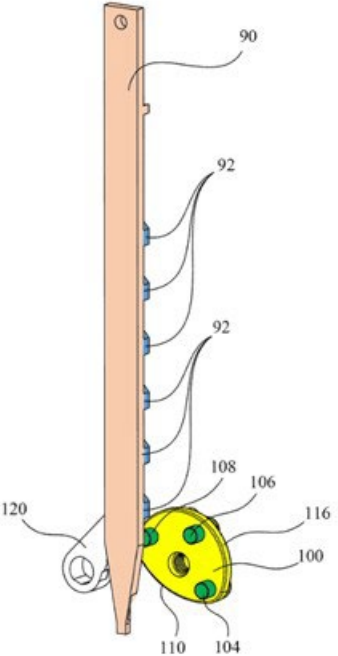
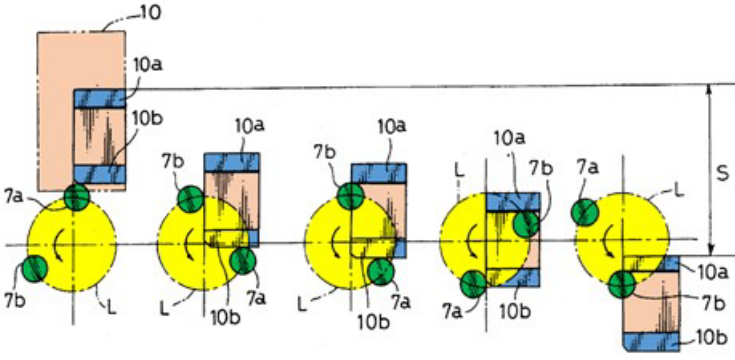
B. Claim 2

159. *Elements [2.1] and [2.2]*: The elements of claim 2 require: “(a) a movable driver that is in communication with said piston, said movable driver including at least one protrusion” and “(b) a lifter that causes said driver and said piston to move through a return stroke, by a mechanical engagement between said lifter and said at least one protrusion of the driver.”

160. 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 '007 patent. *Compare* '007 patent, Fig. 12 with Kondo, Figs. 1–3 and 4A–E. In particular, the “lifter member” of the '007 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). '007 patent, 9:36–52, 16:39–53, Fig. 12. The '007 patent also discloses two-pin variants: lifter members 465 and 480 in Figs. 31 and 33. '007 patent, 32:23–35, 32:56–33:4. 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. 1–3 and 4A–E.² Kondo’s lifter member is moved by a prime mover (“motor 4”). Kondo, 3:1–10, Fig. 2.

² Note that Figs. 4A–E are illustrated from right-to-left (with 4(A) on the right and 4(E) on the left), rather than left-to-right.

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

161. Kondo differs slightly from the '007 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. However, a POSITA would consider this difference to be insignificant, because Kondo's actual lifting structure is still the same as that of the "lifter member" in the '007 patent and the intermediate member simply channels the lifting force from that lifter member to the driver blade 15.

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Ex. 1003

163. While protrusions 10a and 10b are not located on driver 15, 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. Furthermore, to the extent that this claim is interpreted to require the “at least one protrusion” to be physically located on the driver itself, it would have been obvious to a POSITA to modify Kondo to have protrusions 10a and 10b be on the driver 15. 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. 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 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.

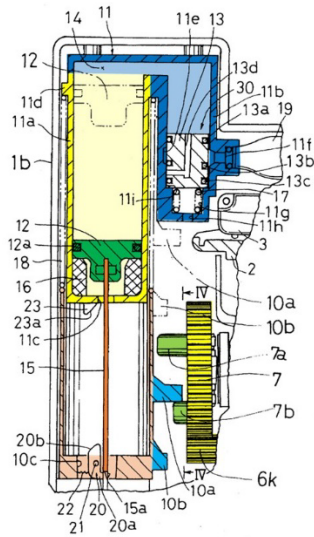


FIG. 2

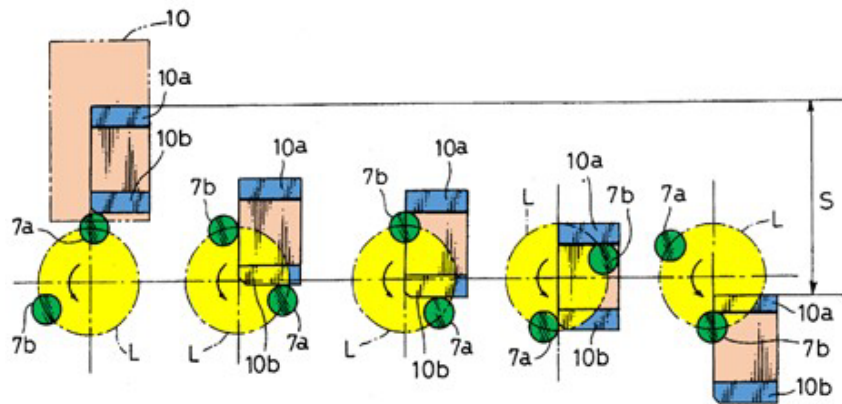
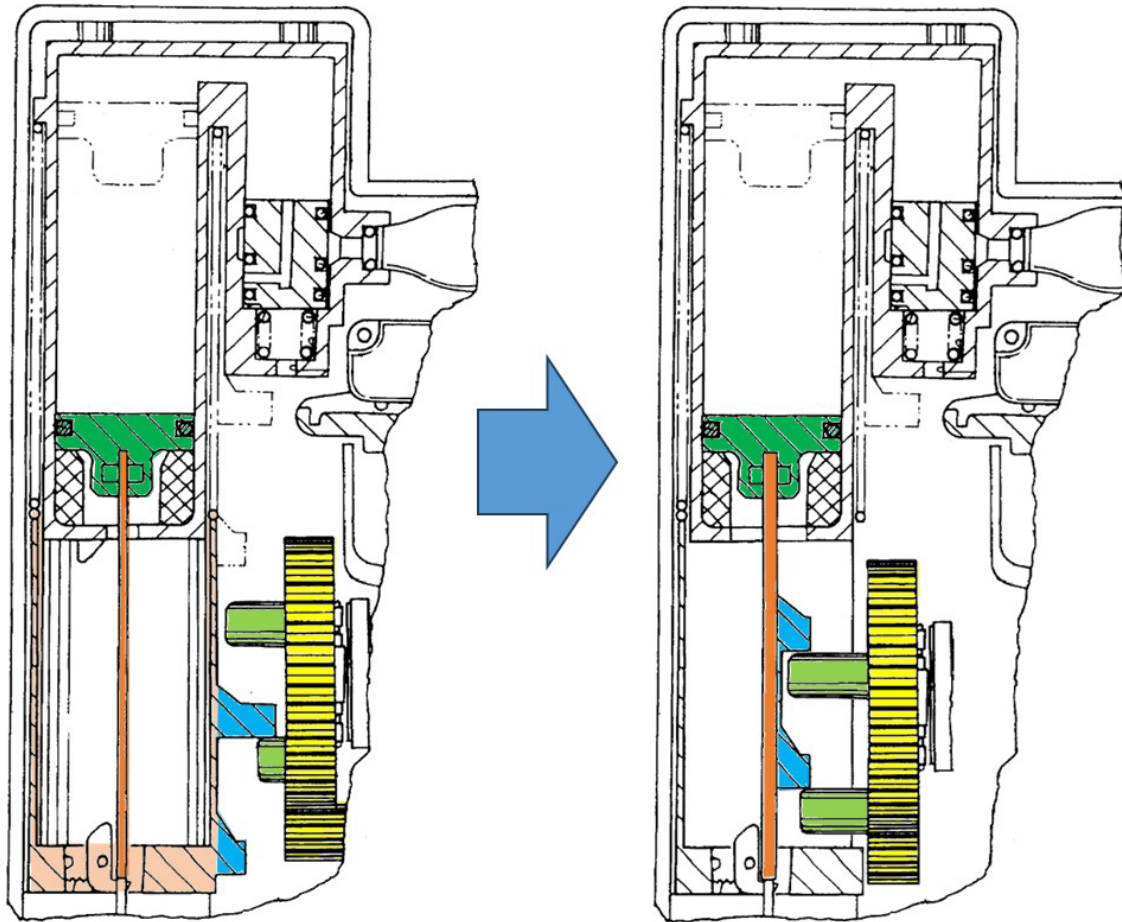


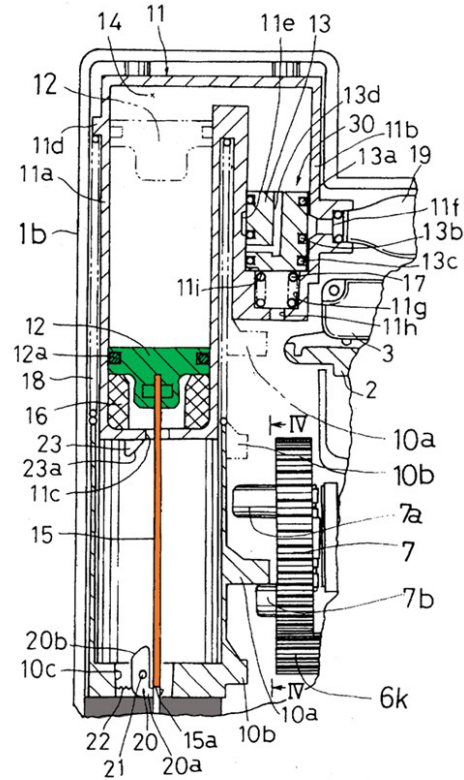
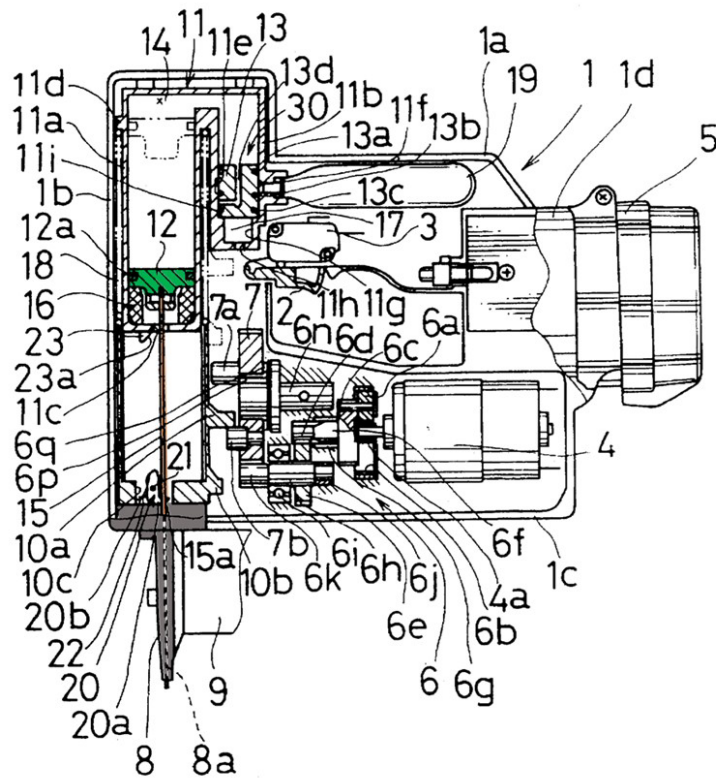
FIG. 4(E) FIG. 4(D) FIG. 4(C) FIG. 4(B) FIG. 4(A)

164. Moving Kondo's protrusions 10a and 10b to be directly on its driver 15 would have been a simple design change. As shown below, the intermediate member 10 (light orange) could be eliminated, either entirely or partially. Its protrusions (blue) could then be moved to the driver (orange), particularly a thicker driver used for higher gauge nails. Kondo's lifter member (yellow cam and green pins) could then be moved closer to the driver 15 to engage those protrusions. This design was very obvious and is actually preferable because it is simpler, due to having fewer parts, and is more compact, due to moving the lifter member closer to the driver. The reason this design was not shown in Kondo itself was likely due to Kondo's very narrow driver designed for small gauge nails, which was a remnant of the lower power provided by the contemporary batteries when Kondo issued. As battery technologies improved, higher powered nailers were made possible, thereby leading to this obvious design.



C. Claim 3

165. **Element [3.1]:** Kondo discloses “[t]he gas pressure system of claim 2, further comprising: a guide body with a linear passageway for said driver.” Kondo discloses a guide body (“driver guide 8,” grey below) with a linear passageway (“guide hole 8a”) for the driver (“driver 15,” orange). Kondo, 5:7–11, Figs. 1–2 (below).



166. ***Element [3.2]***: Kondo discloses “wherein: said lifter moves in a rotational motion and causes said driver to move in a linear motion.” Kondo’s lifter is a drive gear (yellow, below) 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). Kondo, Figs. 4A–E (below), 3:64–4:25.

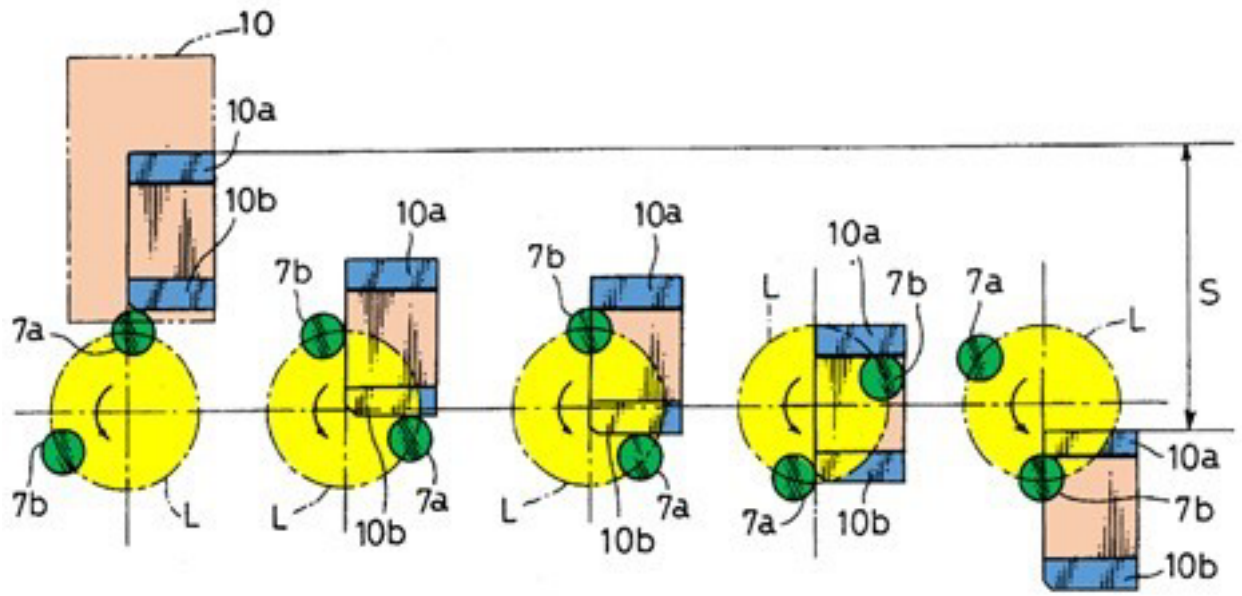


FIG. 4(E) FIG. 4(D) FIG. 4(C) FIG. 4(B) FIG. 4(A)

D. Claim 4

167. **Element [4.1]:** Kondo discloses “[t]he gas pressure system of claim 2, wherein: said cylinder and piston act as a gas spring during said drive stroke.” In Kondo, the pressurized gas of the storage chamber (“air chamber 14”) and the cylinder (“cylinder 11”) act on the piston (“drive piston 12”) to form a gas spring for driving a nail during a drive stroke. Kondo, Figs. 1, 2, and 4A–4E; 5:53–55, 6:1–7. When the driver 15 is released, “the drive piston 12 is forced downwardly by the expanding force of the air compressed within the air chamber 14.” Kondo, 6:1–7.

168. **Element [4.2]:** Kondo discloses “said lifter does not engage said driver during said drive stroke.” Kondo’s lifter does not engage (“brought to be free from”)

the intermediate member or the driver during the drive stroke. Kondo, Fig. 2, 4:25–32; 6:1–7.

E. Claim 5

169. Kondo discloses “[t]he gas pressure system of claim 2, further comprising: a motor and an on-board electrical power source, wherein said motor provides motive power for said lifter.” Kondo’s lifter is provided with motive power by a motor (“motor 4”). Kondo, 3:35–38, 4:1–6, Figs. 4A–E. Kondo discloses an on-board electrical power source (“battery 5”) as the “power source for driving the motor 4” such that “it is not necessary to be connected to an external power source by means of a cord.” Kondo, 7:51–55, Fig. 1. Kondo notes that “[t]his means that the nailer of this embodiment is hoseless and cordless.” Kondo, 7:54–55.

F. Claim 6

170. Kondo discloses “[t]he gas pressure system of claim 5, wherein: (a) said on-board electrical power source comprises a detachable battery; and (b) said motor comprises an electric motor.” Kondo’s battery 5 is a detachable battery that “is set into the battery housing portion 1d” and “can be removed from the battery housing portion 1d for charging purposes.” Kondo, 2:61–65. Kondo’s motor 4 is powered by the battery and therefore is an electric motor. Kondo, 7:51–55, Fig. 1.

G. Claim 7

171. Kondo discloses “[t]he gas pressure system of claim 1, wherein: said movable piston moves through a pathway through said hollow cylinder between a

H. Claim 8

172. Kondo discloses “[t]he gas pressure system of claim 1, wherein: said pressurized gas in the storage chamber remains above atmospheric pressure during all portions of an operating cycle.” The design of the “auxiliary piston 13” shows that Kondo’s storage chamber remains above atmospheric pressure during all portions of an operating cycle. Specifically, 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.

I. Claim 9

173. *Element [9.P]*: Kondo discloses “[a] portable fastener driving tool.” Kondo “provide[s] a fastener driving tool which is operable to drive fasteners,” Kondo, 1:48–49.

174. *Element [9.1]*: Kondo discloses “a housing with a storage chamber that contains a pressurized gas.” Kondo’s housing (“housing 1”) is shown below in green

and its storage chamber (“air chamber 14”) is shown below in light blue and contains pressurized gas. Kondo, 2:50–53, 4:37–40, Figs. 1 (below), 2.

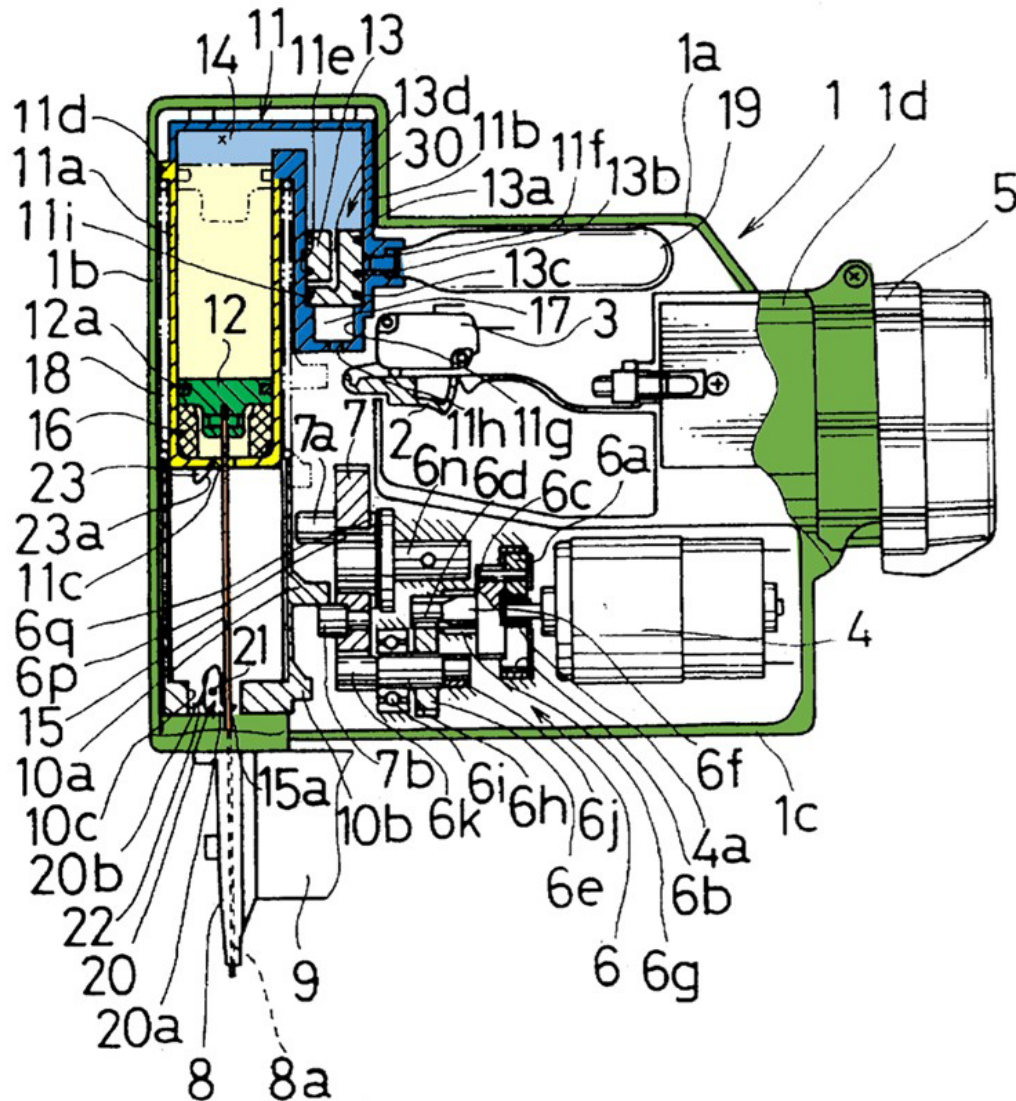


FIG.1

175. Kondo discloses “a hollow cylinder that includes a movable piston.” Kondo refers to its hollow cylinder (yellow below) as “cylindrical main body 11a,” refers to the movable piston (green) within that hollow cylinder as “drive piston 12,”

and says that the piston 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 (above) and 2 (below).

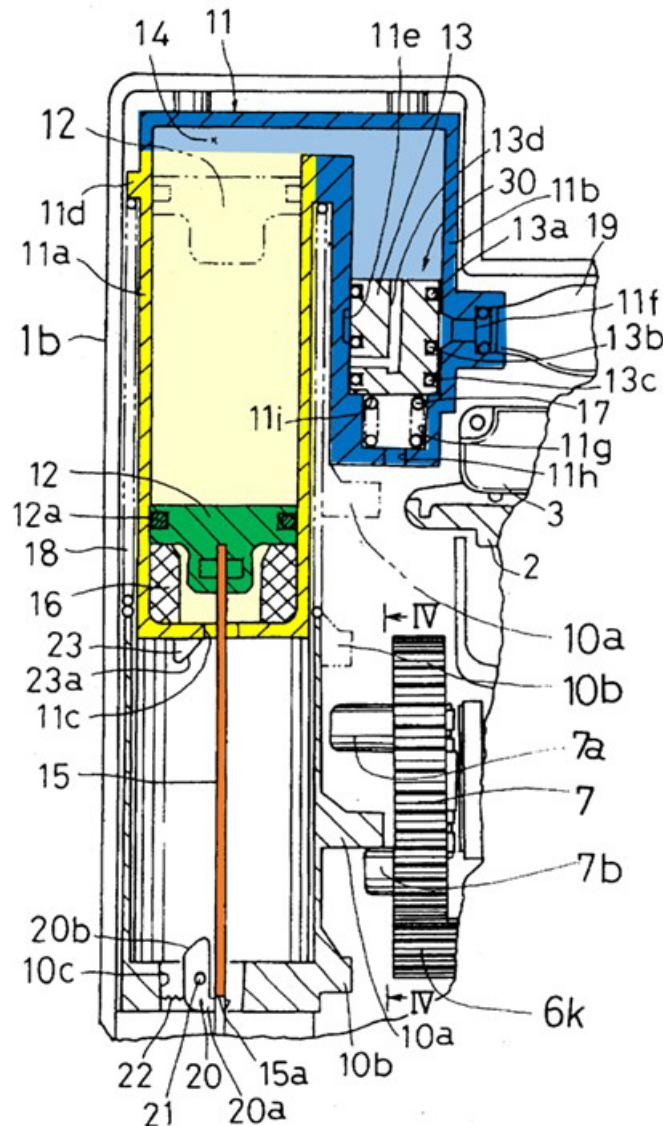


FIG. 2

176. Kondo discloses “a driver that is in communication with said piston at least during a drive stroke.” Kondo’s driver (“driver 15,” orange above) is in

communication with its piston (“piston 12,” green) during the drive stroke. Kondo, 4:66–67, Figs. 1, 2 (above).

177. Kondo discloses “a lifter that is in communication with said driver at least during a return stroke.” As explained above in relation to claim 2, Kondo discloses the claimed “lifter” that is in communication with its driver 15, via intermediate member 10, during a return stroke. Kondo, Fig. 1–2, 4A–E, 3:39–4:32, 4:66–5:14.

178. Kondo discloses “a prime mover. Kondo’s lifter is moved by a prime mover (“motor 4”). Kondo, 3:35–38, 4:1–6, Figs. 4A–E.

179. Kondo discloses “a source of energy.” Kondo discloses a source of energy (“battery 5”) as the “power source for driving the motor 4” such that “it is not necessary to be connected to an external power source by means of a cord.” Kondo, 7:51–55, Fig. 1. Kondo notes that “[t]his means that the nailer of this embodiment is hoseless and cordless.” Kondo, 7:54–55.

180. ***Element [9.2]***: Kondo discloses “said pressurized gas is used as a gas spring to propel said piston 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, and 4A–4E; 5:53–55, 6:1–7. When the driver 15 is

released, “the drive piston 12 is forced downwardly by the expanding force of the air compressed within the air chamber 14.” Kondo, 6:1–7.

181. **Element [9.3]:** Kondo discloses “said prime mover causes said lifter to mechanically engage said driver during said return stroke.” Kondo’s prime mover (“motor 4”) causes its lifter (“drive gear 7”) to mechanically engage the driver (“driver 15”), via “intermediate member 10,” during the return stroke. Kondo, Fig. 1–2, 4A–E, 3:39–4:32, 4:66–5:14.

182. **Element [9.4]:** Kondo discloses “said housing has no external energy source cable and no externa hose attached thereto.” Kondo discloses “battery 5 as a power source for driving the motor 4” such that “it is not necessary to be connected to an external power source by means of a cord.” Kondo, 7:51–55, Fig. 1. Kondo notes that “[t]his means that the nailer of this embodiment is hoseless and cordless.” Kondo, 7:54–55.

183. **Element [9.5]:** As discussed above in connection with claim 1, Kondo does not expressly meet the requirement of “said movable piston of the hollow cylinder is the sole movable piston that is in fluidic communication with the storage chamber,” however, it would have been obvious at the filing of the ’007 patent to omit Kondo’s gas replenishment system and therefore satisfy this claim limitation. Accordingly, this claim limitation would have been obvious by Kondo alone.

J. Claim 10

184. Kondo discloses “[t]he portable fastener driving tool of claim 9, wherein: said storage chamber and said hollow cylinder are always in fluidic communication.” Kondo’s storage chamber (“air chamber 14”) is in fluidic communication at all times with the hollow cylinder (“cylindrical main body 11a”). Kondo, 4:37–40, Figs. 1 and 2 (below).

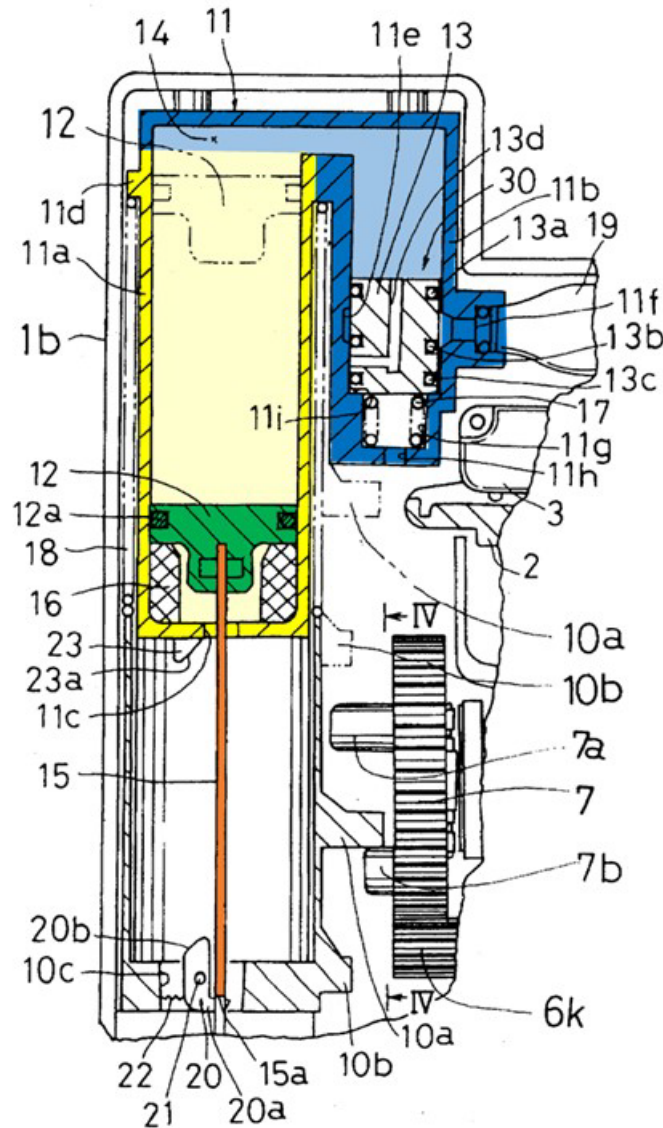


FIG. 2

K. Claim 11

185. Kondo discloses “[t]he portable fastener driving tool of claim 10, wherein: said pressurized gas is re-used for a plurality of operational cycles that each include said drive stroke and said return stroke.” As discussed above in relation to claim 1, the pressurized gas in Kondo’s main storage chamber remains above

atmospheric pressure during all portions of the operating cycle and is re-used for a plurality of operational cycles. Kondo's operational cycles include a drive stroke and a return stroke. Kondo, 3:35–4:25 (return stroke); 4:25–32 (drive stroke)

L. Claim 12

186. Kondo does not explicitly disclose “[t]he portable fastener driving tool of claim 9, wherein: said piston has a rest position between operational cycles; and said rest position is achieved after said return stroke.” However, it would have been obvious at the filing of the '007 patent to have a rest position at Kondo's higher pressure position.

187. A POSITA would understand that there are generally two potential rest positions for the piston between operational cycles—the higher pressure position after the return stroke and the lower pressure position after the drive stroke—both of which were identified and predictable solutions. For example, Haley, Saari/Enstrom, and Pedicini all disclose a higher pressure rest position after the return stroke (with Pedicini teaching both positions). *See supra*, ¶¶ [ADD], *infra* ¶ [ADD]. 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]). By the filing of the '007 patent, advancements in portable

battery power (as discussed above) 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. Accordingly, this claim limitation is rendered obvious by Kondo alone, or in view of Haley, Saari/Enstrom, or Pedicini.

M. Claim 13

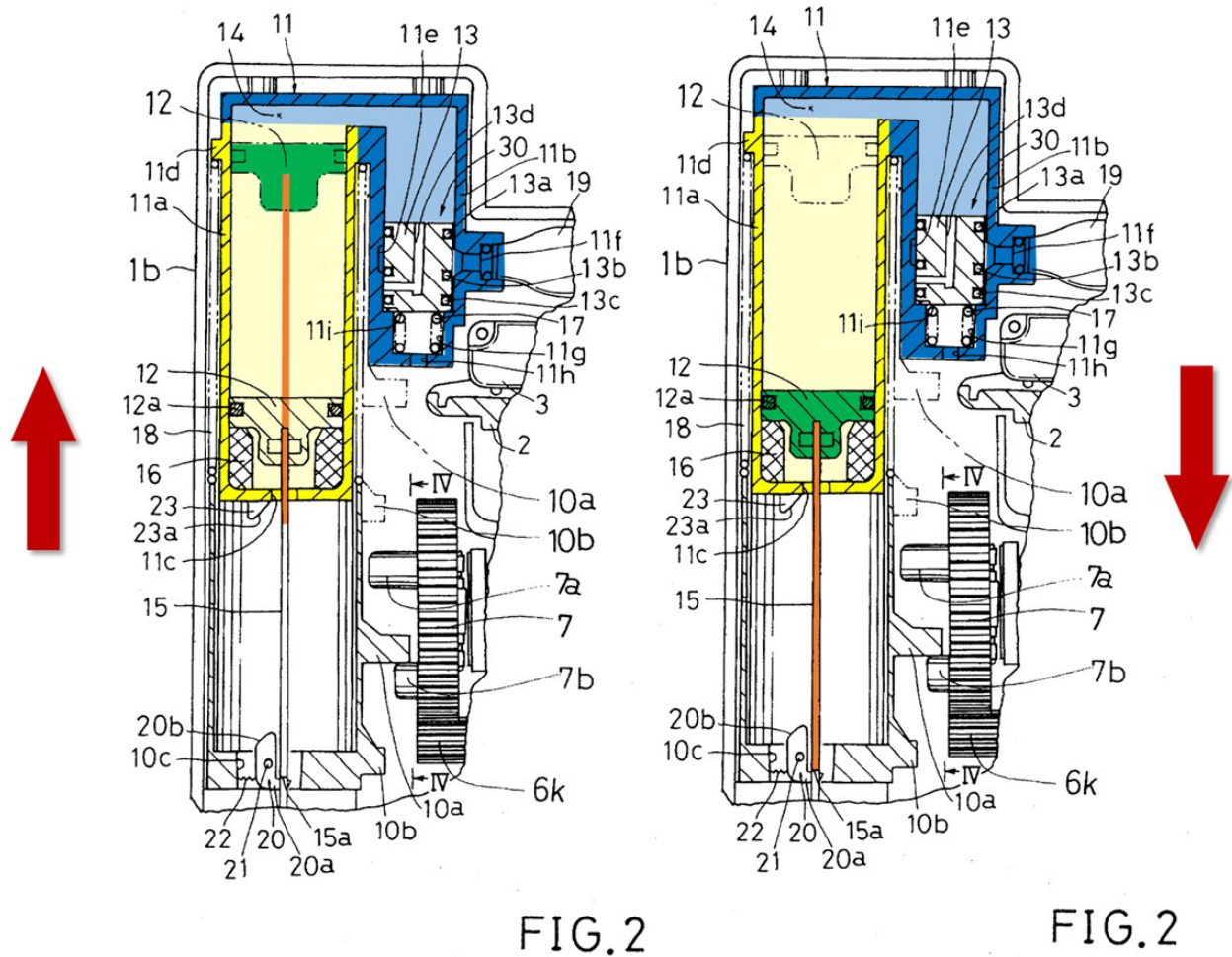
188. Kondo discloses “[t]he portable fastener driving tool of claim 9, wherein: said prime mover comprises an electric motor; and said source of energy comprises a detachable battery.” Kondo’s source of energy (“battery 5”) is a detachable battery that “is set into the battery housing portion 1d” and “can be removed from the battery housing portion 1d for charging purposes.” Kondo, 2:61–65. Kondo’s prime mover (“motor 4”) is powered by the battery and therefore is an electric motor. Kondo, 7:51–55, Fig. 1.

N. Claim 14

189. *Elements [14.P]–[14.4]*: Elements [14.P]–[14.4] are identical to Elements [9.P]–[9.4], respectively, and are met as described above.

190. *Element [14.5]*: Kondo discloses “said piston travels through said hollow cylinder between a higher pressure position and a lower pressure position.” In Kondo, the piston (“piston 12,” green below) moves through the hollow cylinder (“cylinder 11,” yellow) between a higher pressure position (the upper position shown

in dashed-lines in Fig. 2, annotated below left) and a lower pressure position (the lower position shown in solid lines in Fig. 2, annotated below right). Kondo, Fig. 2 (below), 4:15–17, 7:26–32.



191. **Element [14.6]:** Kondo does not explicitly disclose “said piston has a rest position between operational cycles; and a location of said rest position is proximal to said higher pressure position.” However, as discussed above in relation to Claim 12, it would have been obvious to have a rest position proximal to the

higher pressure position. Accordingly, this claim limitation is obvious for the reasons discussed above.

O. Claims 15-16

192. Claims 15–16 are identical to Claims 10–11, respectively, and are met as described above.

P. Claim 17

193. *Elements [17.P]–[17.4]*: Elements [17.P]–[17.4] are identical to Elements [1.P]–[1.4], respectively, and are met as described above.

194. *Element [17.5]*: As discussed above with respect to claims 1 and 9, Kondo does not expressly meet the requirement of “said movable piston of the hollow cylinder is the sole movable piston that is in fluidic communication with the storage chamber of the gas pressure system,” but it would have been obvious at the filing of the ’007 patent to omit Kondo’s gas replenishment system and therefore satisfy this claim limitation. *See* Element [1.5], Element [9.5]. Accordingly, for the reasons discussed above, this claim limitation is rendered obvious by Kondo alone

Q. Claims 18-20

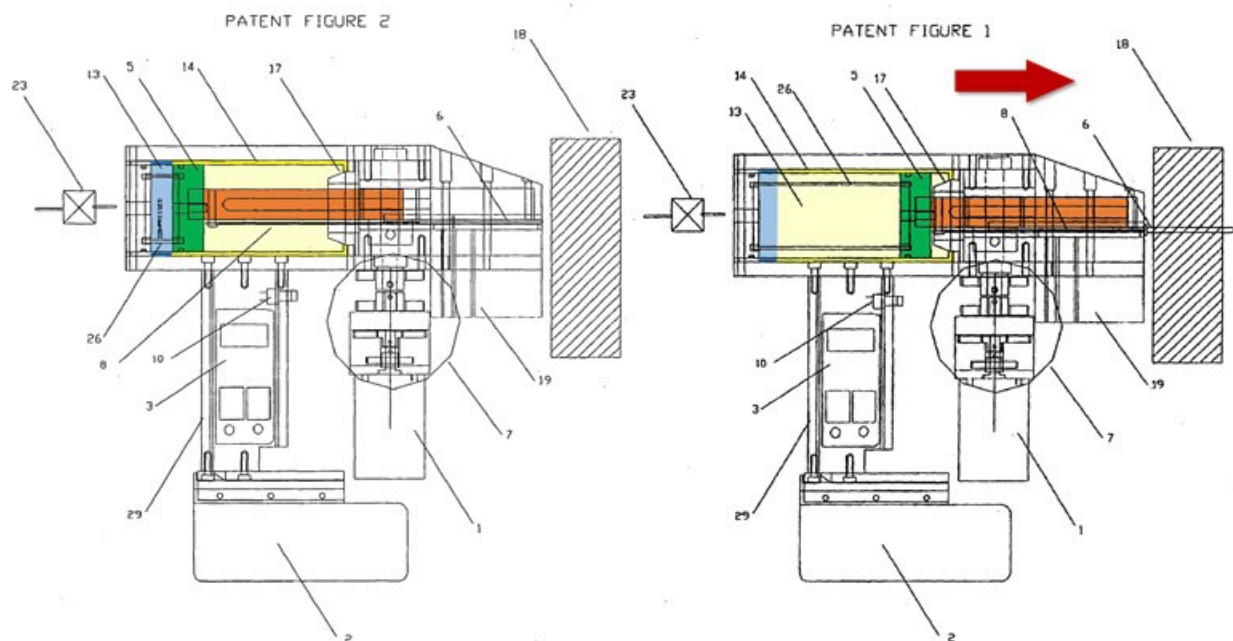
195. Claims 18–20 are identical to Claims 2, 5 and 8, respectively, and are met as described above.

VIII. CLAIMS 1–20 ARE OBVIOUS BASED ON PEDICINI

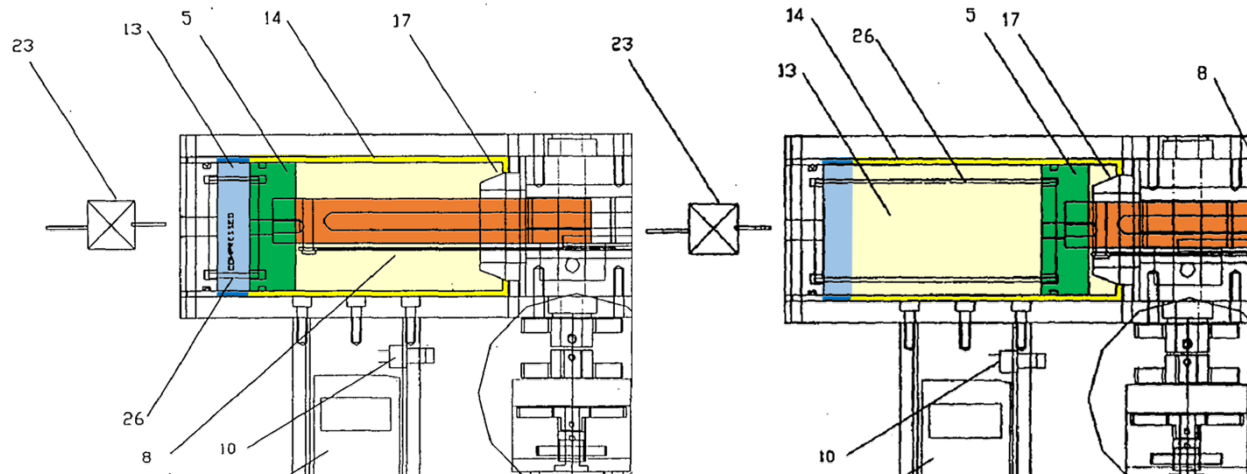
A. Claim 1

196. *Element [1.P]*: Pedicini discloses “[a] gas pressure system for a portable power tool.” Pedicini discloses a fastener driving tool (“fastener device 100”). Pedicini, Figs. 1–4; ¶ [0077].

197. *Element [1.1]*: Pedicini discloses “a hollow cylinder having a movable piston therewithin.” Pedicini’s hollow cylinder (“cylinder (14),” yellow below) 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 below), 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.



198. **Element [1.2]:** Pedicini discloses “a storage chamber that is in fluidic communication at all times with said cylinder.” Pedicini has a storage chamber, which is the overhead portion of the “chamber (13)” within “cylinder 14,” *i.e.*, the volume above the piston (blue). Pedicini, Figs. 1–2 (below, in part).



199. Pedicini’s storage chamber (blue above) is distinct from the displacement volume (yellow) of cylinder 14 and remains in fluidic communication at all times with the cylinder and its displacement volume, which is shown in Figures 1–2 where the storage chamber is directly adjacent to the displacement volume. The region annotated above in blue is above the travel path of the piston and thus is not part of the “displacement volume.” Accordingly, that blue region is distinct from the claimed “displacement volume” and constitutes a separate volume that should satisfy the “storage chamber” limitation.

200. Pedicini discloses “said storage chamber being charged with a pressurized gas.” In particular, Pedicini states that “[a] release valve (23) is used to

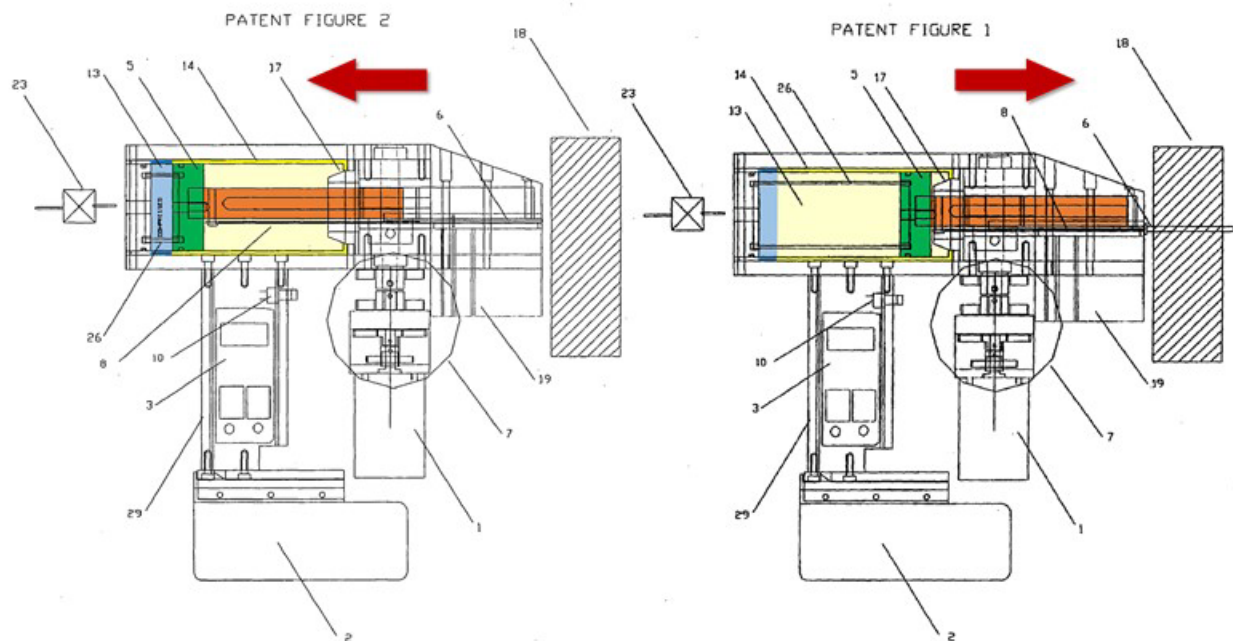
replenish the air which may be lost between nail drives.” Pedicini, ¶[0077], Figs. 1–2. Pedicini also states that “it is possible to precharge the air chamber (13) to eliminate the piston return spring (26)”—while Pedicini goes on to say that “this is not preferable since it complicates recovering from fastener jams,” Pedicini includes an embodiment (Figure 4) where the piston return spring 26 is indeed eliminated. Pedicini, ¶[0077], Fig. 4.

201. 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. Relatedly, a POSITA would not 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].

202. *Element [1.3]*: Pedicini discloses “wherein: said movable piston moves in a reciprocating pattern during an operating cycle, including moving through a drive stroke that is caused by said pressurized gas.” Pedicini’s piston (“piston (5),” green) moves in a reciprocating pattern between its lower position after a drive stroke

(Fig. 1, below right) and its upper position after a return stroke (Fig. 2, below left).

Pedicini, Figs. 1–2 (below), ¶¶[0077]–[0078], Claims 1, 8, 18.



203. Pedicini’s compressed gas causes the piston to move through a drive stroke. 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.” Pedicini, ¶[0078], Figs. 1–2.

204. **Element [1.4]:** Pedicini discloses “said pressurized gas is not vented to atmosphere after said drive stroke, but instead said pressurized gas is re-used for a plurality of said operating cycles.” In particular, Pedicini states that “[a] release valve (23) is used to replenish the air which may be lost between nail drives.”

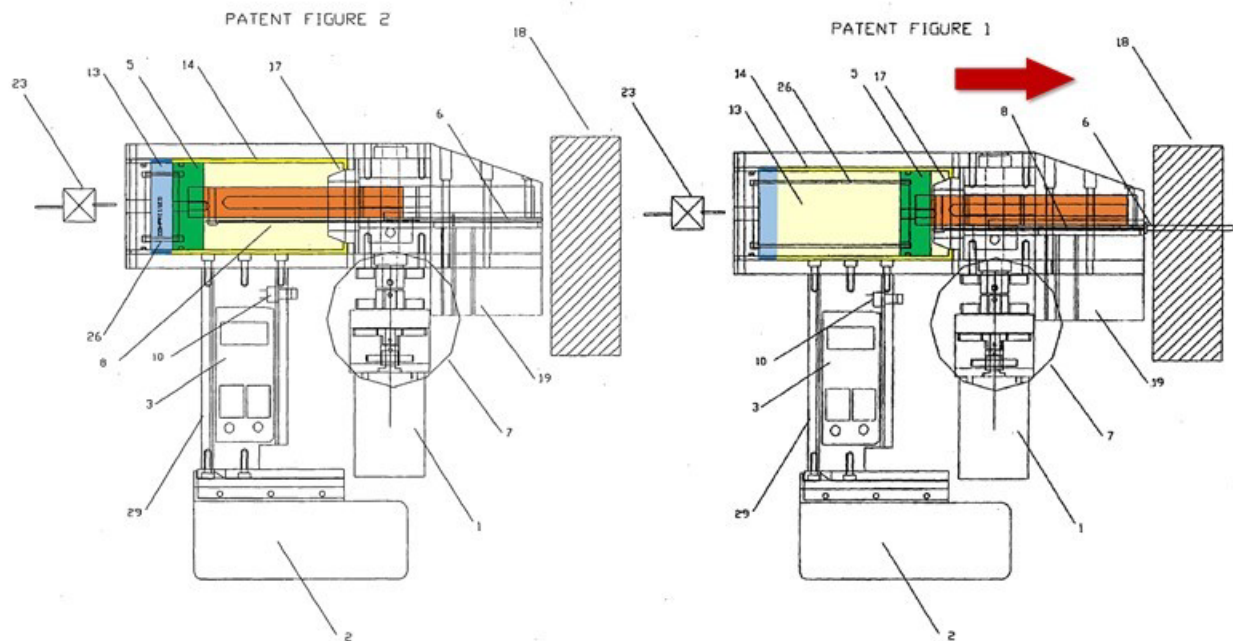
Pedicini, ¶[0077], Figs. 1–2. Pedicini also states that “it is possible to precharge the air chamber (13) to eliminate the piston return spring (26)”—while Pedicini goes on to say that “this is not preferable since it complicates recovering from fastener jams,” Pedicini includes an embodiment (Figure 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 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. A POSITA also would not 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].

205. *Element [1.5]*: Pedicini discloses “said movable piston is the sole movable piston in the gas pressure system.” Pedicini’s movable piston is the sole piston in the gas pressure system. Pedicini, Figs. 1–4.

B. Claim 2

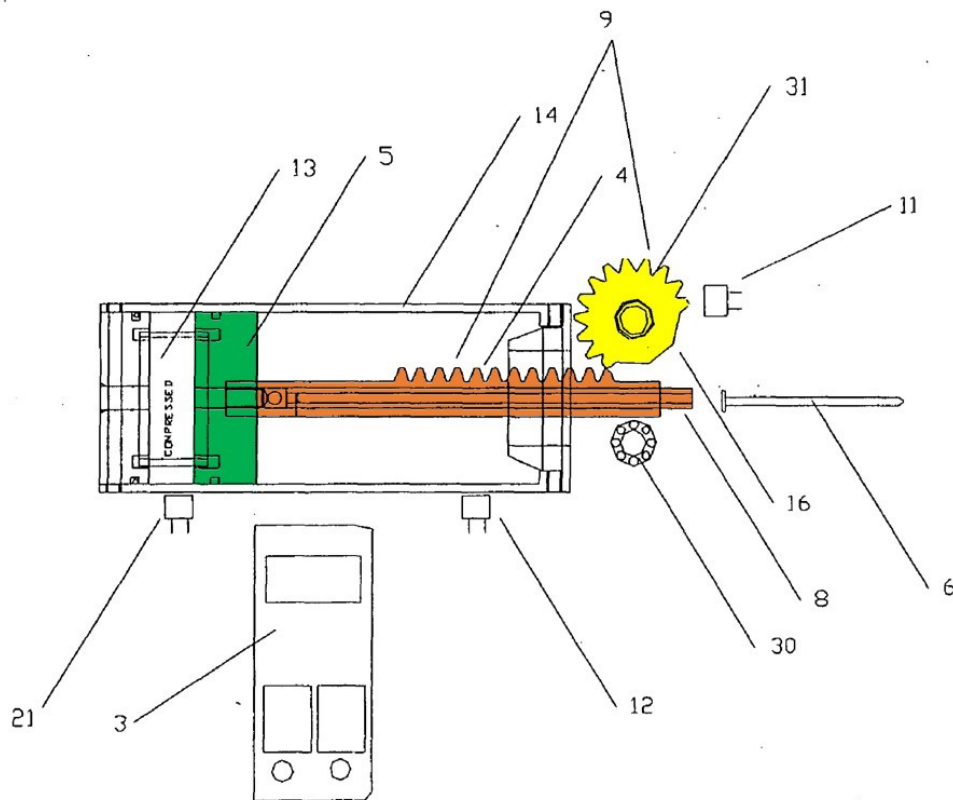
206. *Element [2.1]*: Pedicini discloses “(a) a movable driver that is in communication with said piston, said movable driver including at least one

protrusion.” Pedicini’s movable driver (“rack (4)” orange below, which also includes an “anvil (8)”) is in communication with the piston (“piston (5),” green) and moves along with the piston through the drive and return strokes. Pedicini, Figs. 1–2, ¶¶[0077]–[0078].



207. Pedicini’s movable driver has numerous (and thus “at least one”) protrusions, which are the gear teeth shown below in Fig. 3. Pedicini, Fig. 3 (below), ¶[0078].

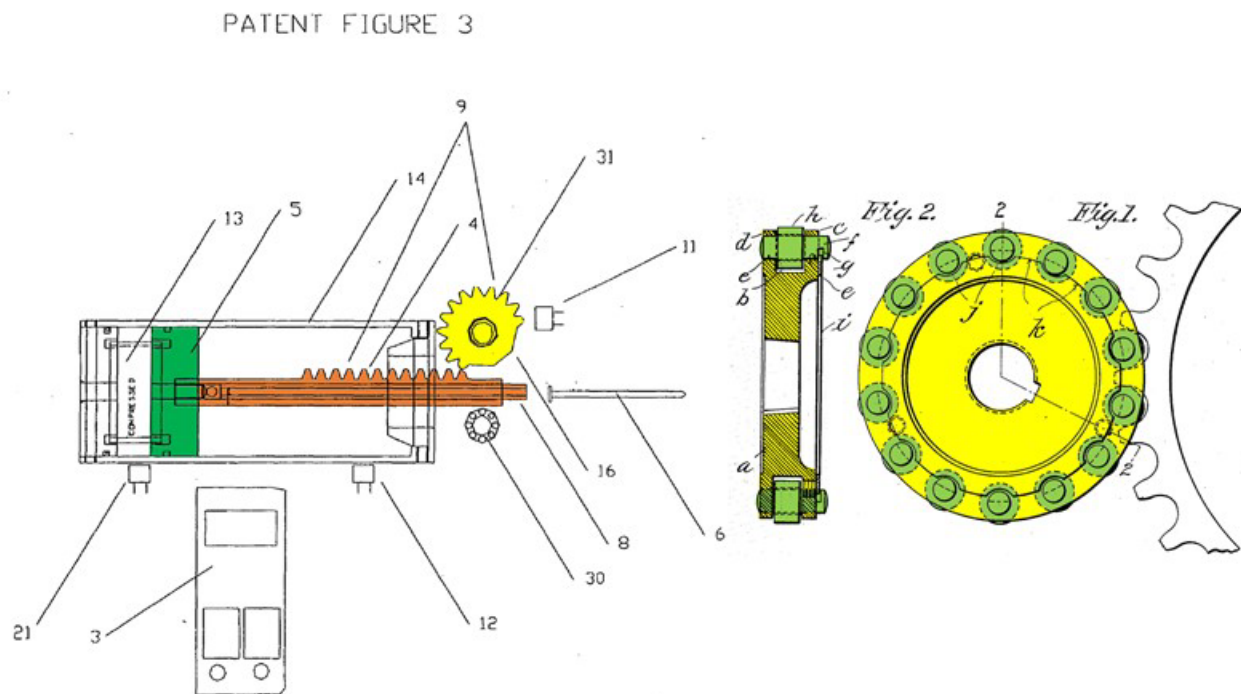
PATENT FIGURE 3



208. *[Element 2.2]*: Pedicini discloses a rack-and-pinion gear with gear teeth on its outer perimeter (“rack pinion (31)”), and thus does not disclose the claimed “lifter.” Pedicini, ¶[0078], Figs. 3 (below left), 4. However, 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”). Ellingham, 1:8–14, Figs. 1–2 (below right). I understand that during the ITC investigation, the Patent Owner accused such a

“roller pinion” lifting mechanism in Petitioner’s products as being a “lifter member.”

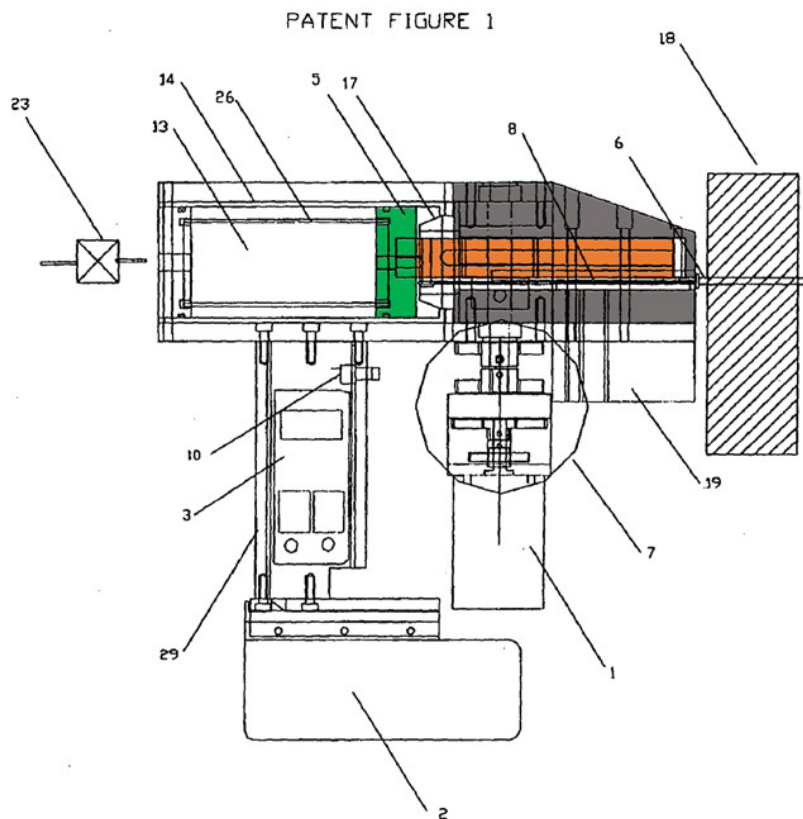
If such a lifting mechanism could constitute a “lifter,” then it would be rendered obvious by Pedicini in view of the well-known “roller pinion” such as that disclosed by (and whose use is encouraged by) Ellingham, for example. In that case, Pedicini renders obvious “(b) a lifter that causes said driver and said piston to move through a return stroke, by a mechanical engagement between said lifter and said at least one protrusion of the driver.”



209. Pedicini’s modified roller pinion lifting mechanism causes the driver and piston to move through a return stroke by mechanical engagement between the rollers of the roller pinion and the gear teeth of the driver (“rack (4)”). Pedicini, ¶[0078], Fig. 3; Ellingham, 1:8–14, Figs. 1–2.

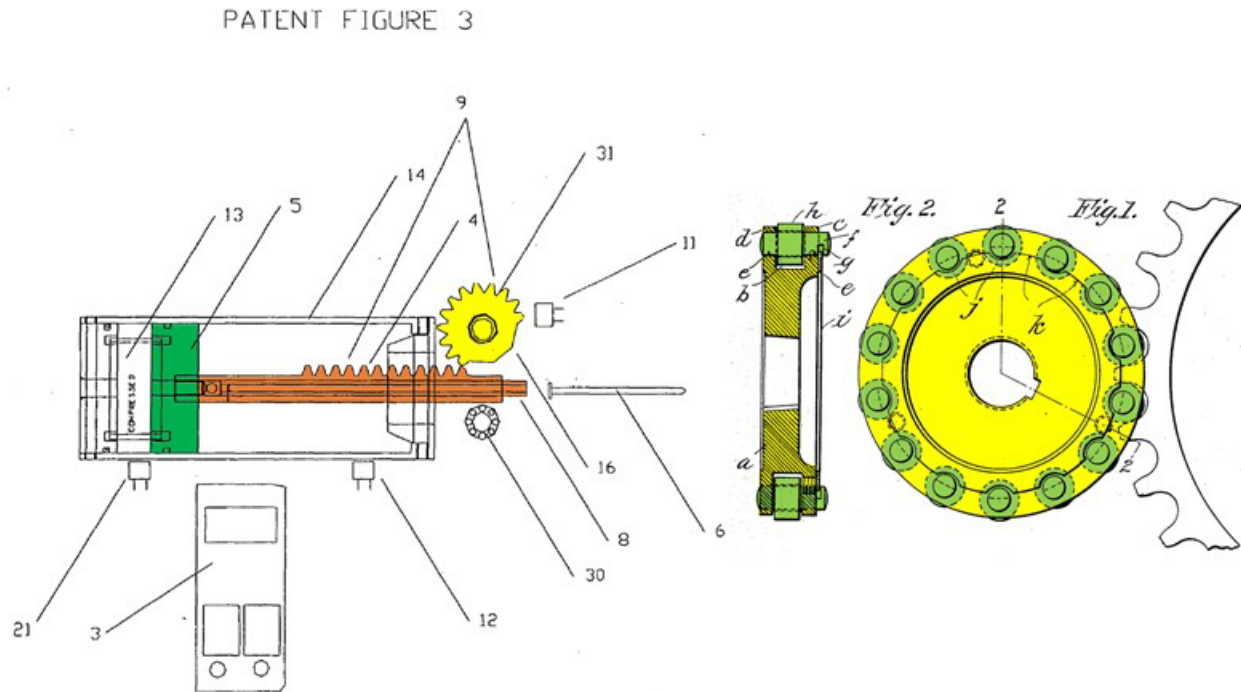
C. Claim 3

210. **Element [3.1]:** Pedicini discloses “[t]he gas pressure system of claim 2, further comprising: a guide body with a linear passageway for said driver.” Pedicini discloses a guide body (grey below) with a linear passageway for the driver (“rack (4),” orange). Pedicini, ¶[0078], Fig. 1 (below).



211. **Element [3.2]:** Pedicini discloses “wherein: said lifter moves in a rotational motion and causes said driver to move in a linear motion.” 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

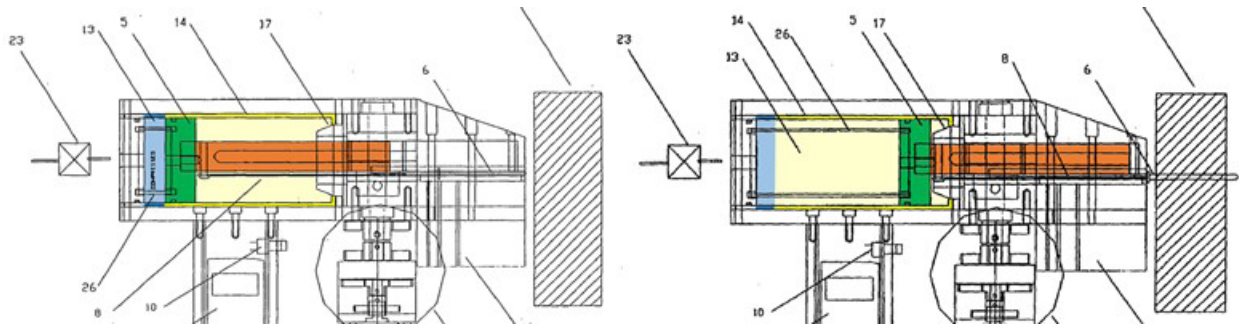
linear motion (leftward in Fig. 3). Pedicini, Fig. 3 (below), ¶[0078]. This is not altered by the roller pinion modification. See Ellingham, Fig. 1 (below right)



D. Claim 4

212. **Element [4.1]:** Pedicini discloses “[t]he gas pressure system of claim 2, wherein: said cylinder and piston act as a gas spring 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.” Pedicini, ¶[0078], Figs. 1–2.

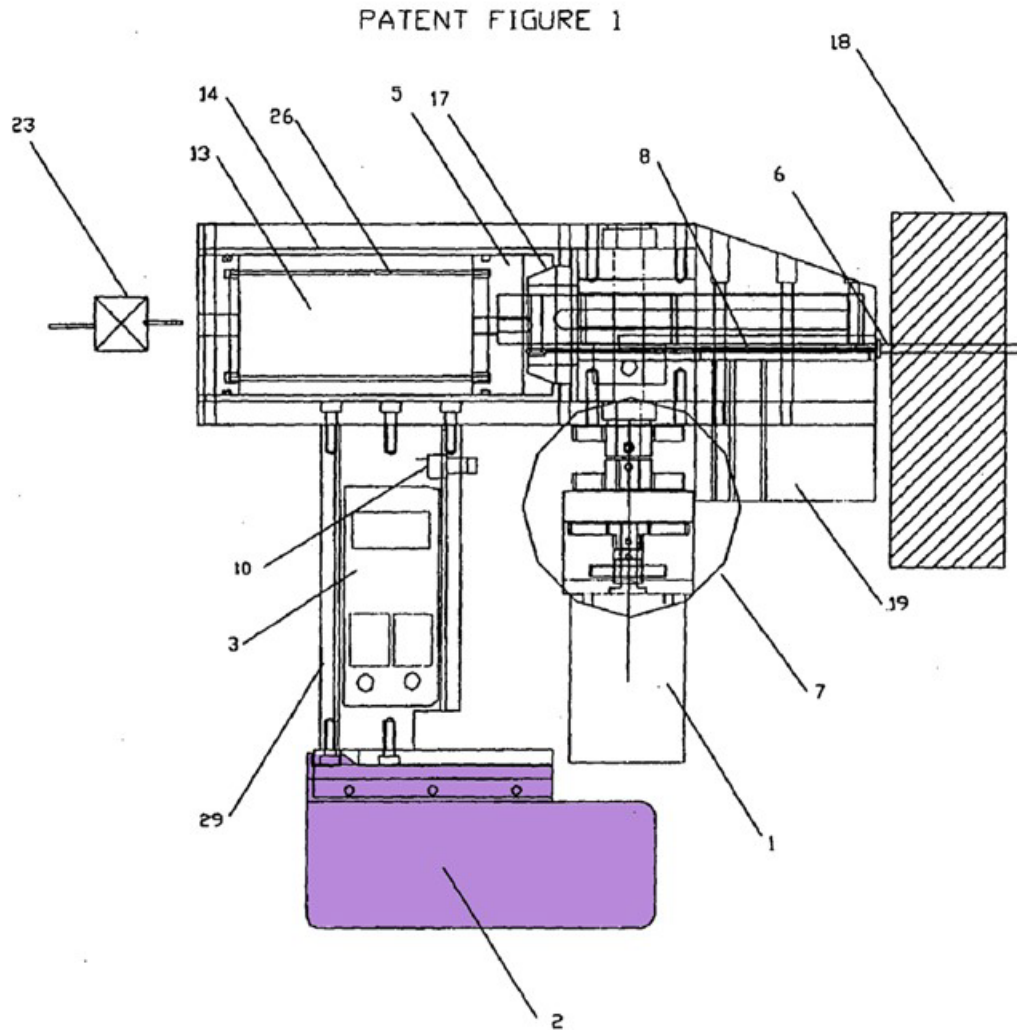


213. **Element [4.2]:** Pedicini discloses “said lifter does not engage said driver during said drive stroke.” Pedicini’s lifting mechanism includes “rack pinion cutaway teeth (16)” (i.e., a portion without teeth so as to not engage the driver during the drive stroke), such that “[w]hen the rack pinion cutaway teeth (16) are opposite the rack (4), the rack (4), piston (6) and anvil (8) are free to travel to the front of the fastener device (100) as a result of the compressed air force from the air chamber (13) and a lack of restraint from the pinion cutaway teeth (16).” Pedicini, ¶[0078], Figs. 3–4. This cutaway portion would be maintained by a POSITA when implementing the roller pinion modification into Pedicini to maintain the same operation.

E. Claim 5

214. Pedicini discloses “[t]he gas pressure system of claim 2, further comprising: a motor and an on-board electrical power source, wherein said motor provides motive power for said lifter.” Pedicini’s lifting mechanism is provided with

motive power by a motor (“motor (1)”). Pedicini, ¶[0078], Figs. 1–2. Pedicini discloses an on-board electrical power source (“power source (2), purple below), which “may be a rechargeable battery to provide power to the motor (1).” Pedicini, ¶[0077], Fig. 1 (below).



F. Claim 6

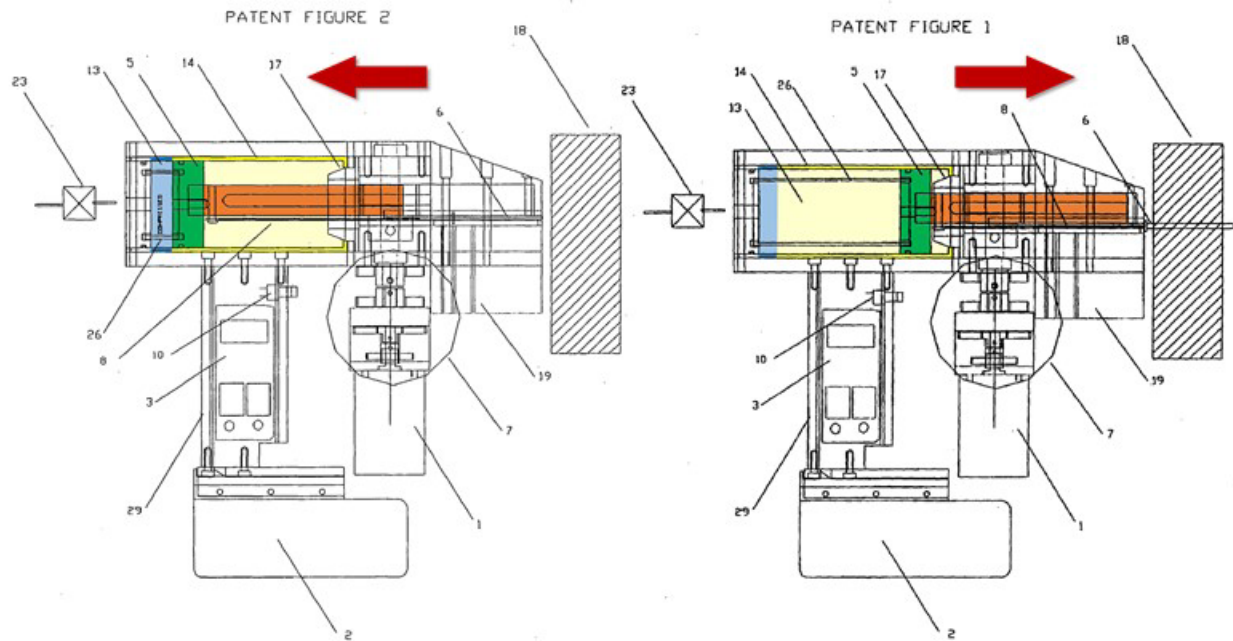
215. Pedicini discloses “[t]he gas pressure system of claim 5, wherein: (a) said on-board electrical power source comprises a detachable battery; and (b) said

motor comprises an electric motor.” Pedicini discloses a “rechargeable battery.” Pedicini, ¶[0077], Fig. 1. Pedicini also refers to its rechargeable battery as a “battery pack.” Pedicini, Abstract. 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 a detachable battery.

216. Pedicini’s motor (“motor (1)”) is referred to as “electric motor” and is powered by an electrical power source. Pedicini, Title, Abstract, ¶¶[0033]–[0034].

G. Claim 7

217. Pedicini discloses “[t]he gas pressure system of claim 1, wherein: said movable piston moves through a pathway through said hollow cylinder between a higher pressure position and a lower pressure position.” In Pedicini, the movable piston (“piston (5),” green below) moves through a pathway along the axis of the hollow cylinder (“cylinder (14),” yellow) between a higher pressure position (the leftward position shown in Fig. 2, below left) and a lower pressure position (the rightward position shown in Fig. 1, below right). Pedicini, Figs. 1–2 (below), ¶¶[0077]–[0078]



H. Claim 8

218. Pedicini discloses “[t]he gas pressure system of claim 1, wherein: said pressurized gas in the storage chamber remains above atmospheric pressure during all portions of an operating cycle.” 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.

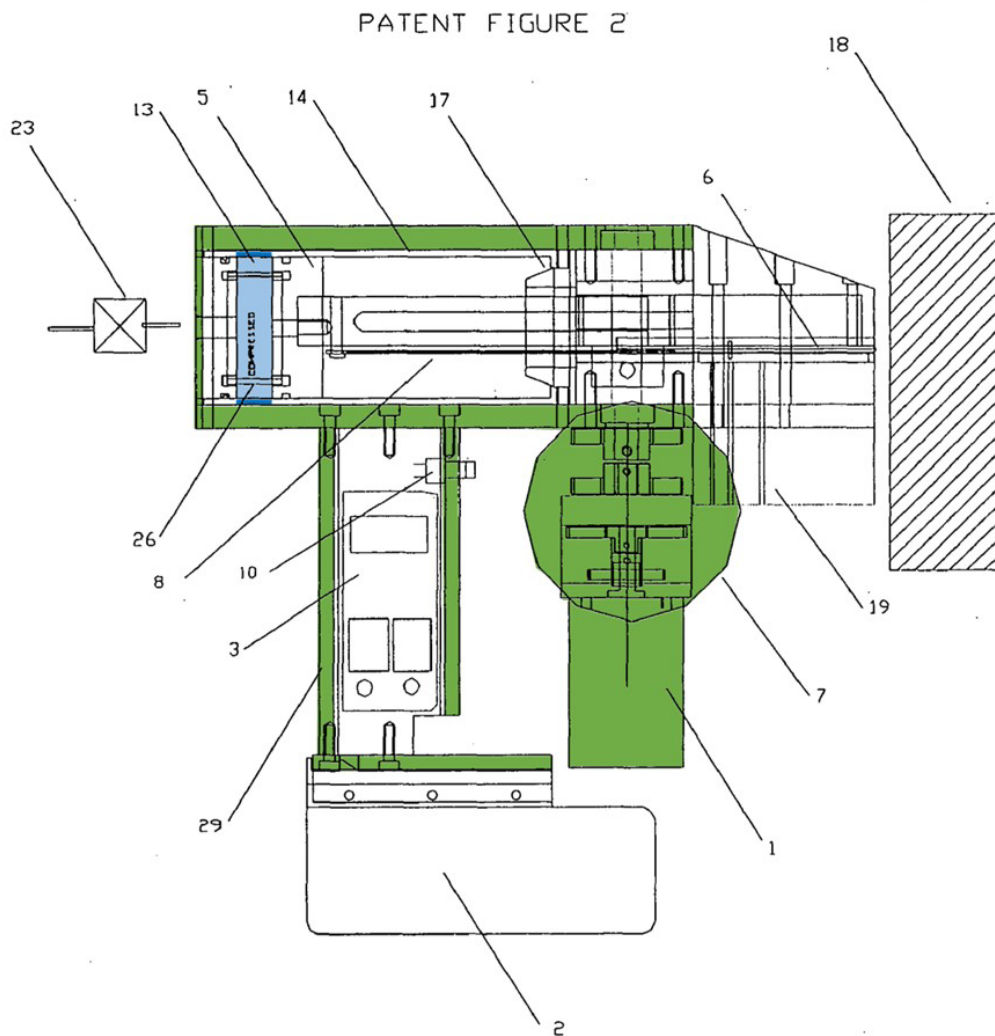
219. A POSITA would understand the disclosure of a sealed main storage chamber and a release valve for “replenishing the air” means that the chamber is

charged with a pressurized gas and then “remains 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. A POSITA would not 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].

I. Claim 9

220. *Element [9.P]*: Pedicini discloses “[a] portable fastener driving tool.” Pedicini discloses a fastener driving tool (“fastener device 100”). Pedicini, Figs. 1–4; ¶ [0077].

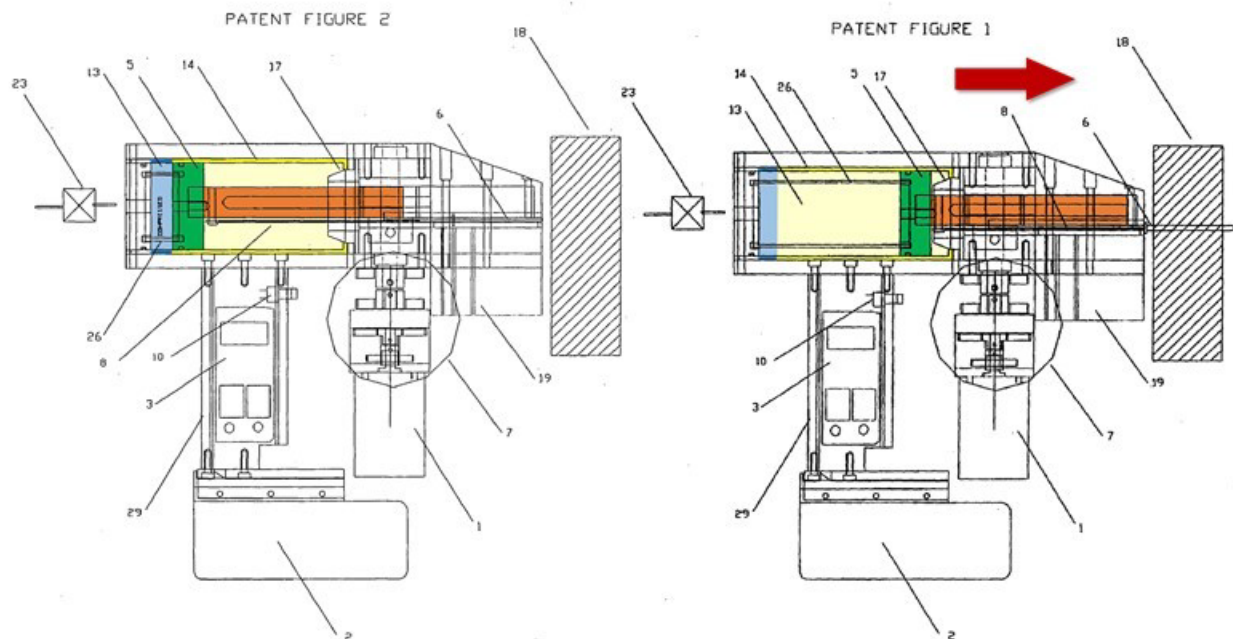
221. *Element [9.1]*: Pedicini discloses “a housing with a storage chamber that contains a pressurized gas.” Pedicini’s housing is shown below in green. Pedicini, Figs. 1, 2 (below).



222. 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 (above). As discussed above in relation to claim 1, Pedicini’s storage chamber is distinct from the displacement volume and meets the “storage chamber” limitation.

223. Pedicini discloses “a hollow cylinder that includes a movable piston.” Pedicini’s hollow cylinder (“cylinder (14),” yellow below) 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 above), 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.



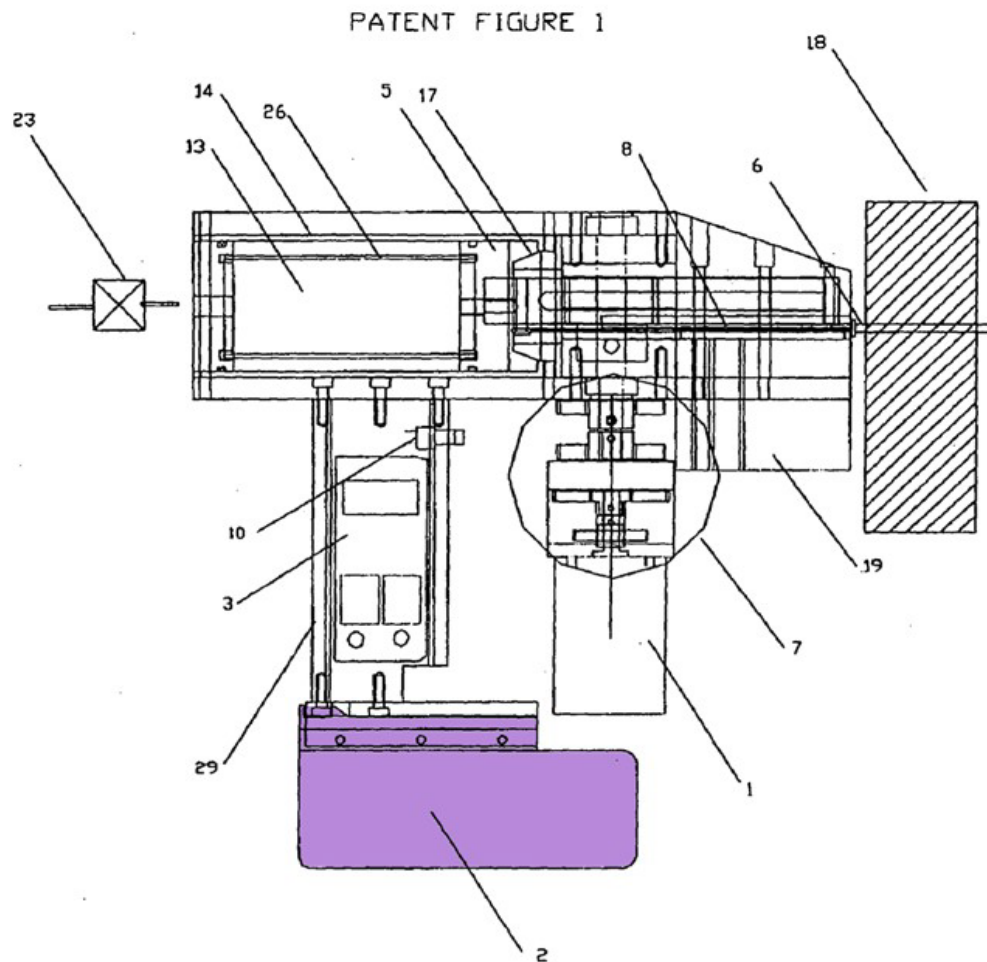
224. Pedicini discloses “a driver that is in communication with said piston at least during a drive stroke.” Pedicini’s movable driver (“rack (4)” orange above, which also includes an “anvil (8)”) is in communication with the piston (“piston (5),” green) and moves along with the piston through the drive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

225. Pedicini discloses “a lifter that is in communication with said driver at least during a return stroke.” As explained above in relation to claim 2, according to the Patent Owner’s infringement allegations in the ITC proceeding, the claimed

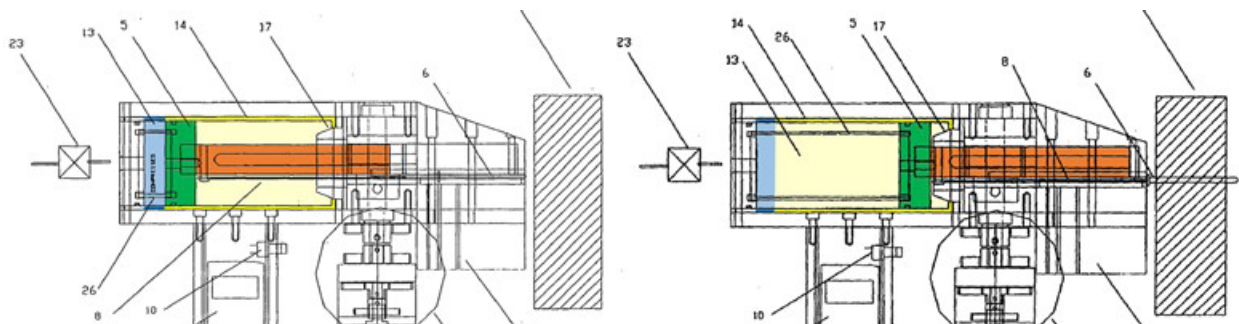
“lifter” is met by the obvious “roller pinion” of Pedicini’s lifting mechanism. Element [2.2]. That “lifter” is in communication with the driver during the return stroke. Pedicini, ¶¶[0078], Figs. 3–4.

226. Pedicini discloses “a prime mover” (“motor (1)”). Pedicini, ¶[0078], Figs. 1–2.

227. Pedicini discloses “a source of energy” (“power source (2), purple below), which “may be a rechargeable battery to provide power to the motor (1).” Pedicini, ¶[0077], Fig. 1 (below).



228. **Element [9.2]:** Pedicini discloses “said pressurized gas is used as a gas spring to propel said piston 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 propel the piston (“piston (5)”) during the drive stroke. 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.” Pedicini, ¶[0078], Figs. 1–2.



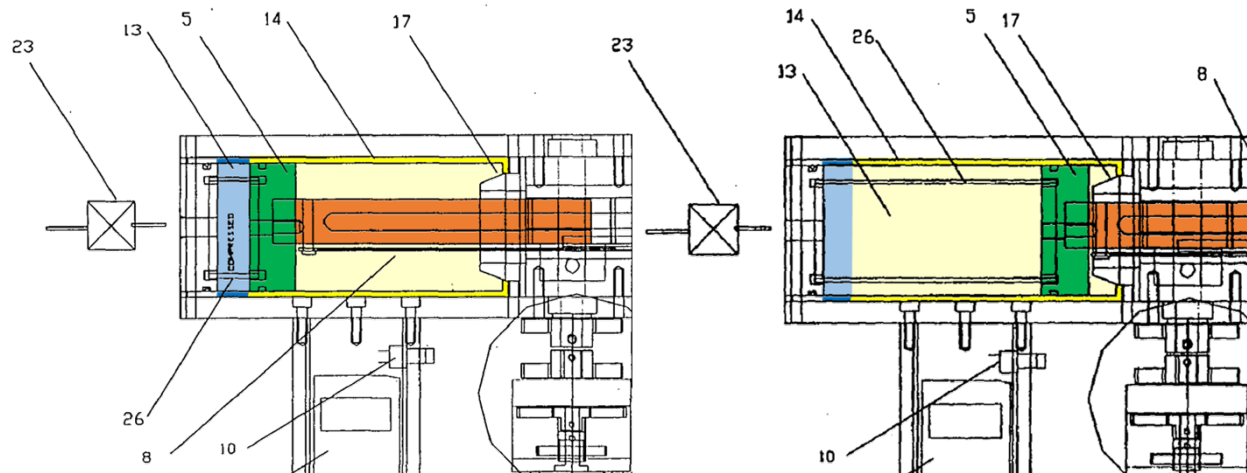
229. **Element [9.3]:** Pedicini discloses “said prime mover causes said lifter to mechanically engage said driver during said return stroke.” Pedicini’s prime mover (“motor (1)”) causes its lifting gear (“rack pinion (31)”) to mechanically engage the driver (“rack (4)”) during the return stroke. Pedicini, ¶¶[0077]–[0078], Figs. 3–4. This operation is not altered by the roller pinion modification. See Ellingham, Fig. 1.

230. *Element [9.4]*: Pedicini discloses “said housing has no external energy source cable and no external hose attached thereto.” Pedicini discloses a “rechargeable battery” and thus has no external energy source cable. Pedicini, ¶[0077], Figs. 1–2. Pedicini also discloses a “sealed chamber” and thus has no external hose attached. Pedicini, Abstract, Figs. 1–4. While Pedicini discloses a “release valve (23),” a POSITA would not misinterpret that valve to be 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];

231. *Element [9.5]*: Pedicini discloses “said movable piston of the hollow cylinder is the sole movable piston that is in fluidic communication with the storage chamber.” Pedicini’s movable piston is the sole piston. Pedicini, Figs. 1–4.

J. Claim 10

232. Pedicini discloses “[t]he portable fastener driving tool of claim 9, wherein: said storage chamber and said hollow cylinder are always in fluidic communication.” Pedicini’s storage chamber (the overhead portion of the “chamber (13)” within “cylinder 14,” *i.e.*, the volume above the piston (blue)) is directly adjacent to the hollow cylinder (“cylinder (14),” yellow), and they are therefore always in fluidic communication. Pedicini, Figs. 1–2 (below, in part).



K. Claim 11

233. Pedicini discloses “[t]he portable fastener driving tool of claim 10, wherein: said pressurized gas is re-used for a plurality of operational cycles that each include said drive stroke and said return stroke.” 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.

234. 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 operational cycles,” since a charging valve would have no use if the

chamber is allowed to reach atmospheric pressure. A POSITA would not 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].

235. Pedicini’s operational cycles include a drive stroke and a return stroke. Pedicini, ¶¶[0077]–[0078] (return stroke); ¶[0078] (drive stroke).

L. Claim 12

236. Pedicini discloses “[t]he portable fastener driving tool of claim 9, wherein: said piston has a rest position between operational cycles; and said rest position is achieved after said return stroke.” In particular, Pedicini discloses a further embodiment that “includes a sear pin or lever (28) which maintains the rack (4), piston (5) and anvil (80) in the energized state.” Pedicini, ¶[0080], Fig. 4, Claim 18. The energized state is the upper, high pressure position achieved after a return stroke. Pedicini, ¶[0080], Fig. 4.

M. Claim 13

237. Pedicini discloses “[t]he portable fastener driving tool of claim 9, wherein: said prime mover comprises an electric motor; and said source of energy comprises a detachable battery.” Pedicini’s prime mover (“motor (1)”) is referred to

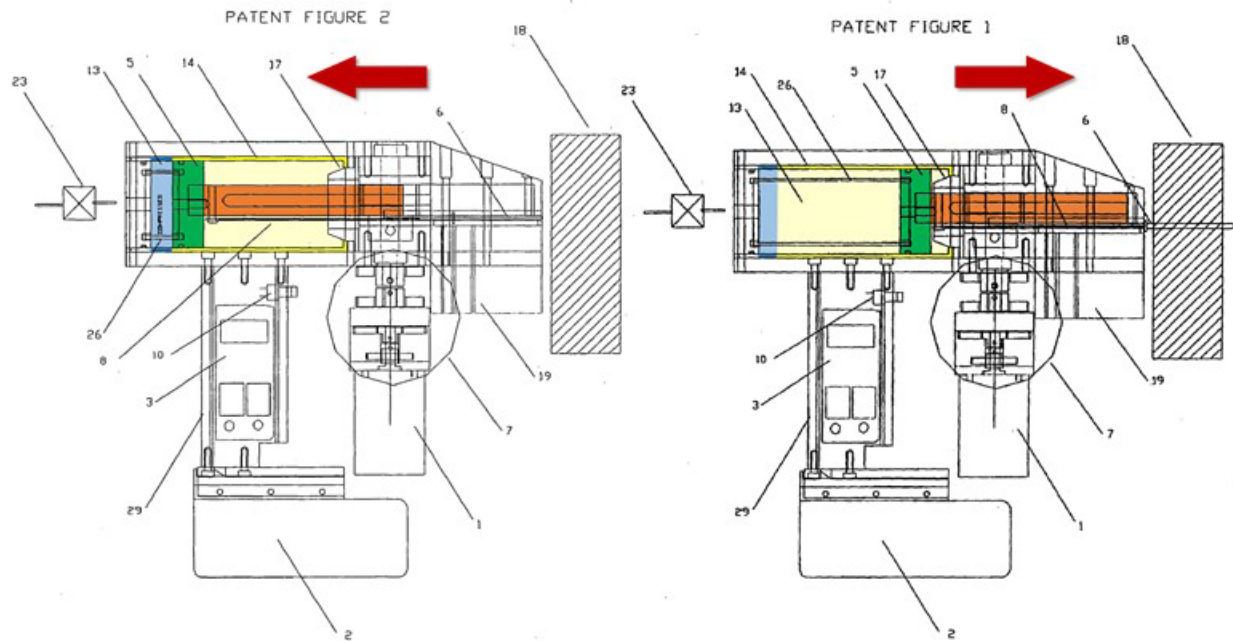
as “electric motor” and is powered by an electrical power source. Pedicini, Title, Abstract, ¶¶[0033]–[0034].

238. 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. 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 a detachable battery.

N. Claim 14

239. *Elements [14.P]–[14.4]*: Elements [14.P]–[14.4] are identical to Elements [9.P]–[9.4], respectively, and are met as described above.

240. *Element [14.5]*: Pedicini discloses “said piston travels through said hollow cylinder between a higher pressure position and a lower pressure position.” In Pedicini, the piston (“piston (5),” green below) moves through the hollow cylinder (“cylinder (14),” yellow) between a higher pressure position (the leftward position shown in Fig. 2, below left) and a lower pressure position (the rightward position shown in Fig. 1, below right). Pedicini, Figs. 1–2 (below), ¶¶[0077]–[0078].



241. **Element [14.6]:** Pedicini discloses “said piston has a rest position between operational cycles; and a location of said rest position is proximal to said higher pressure position.” discussed above in relation to Claim 12, Pedicini discloses a further embodiment that “includes a sear pin or lever (28) which maintains the rack (4), piston (5) and anvil (80) in the energized state.” Pedicini, ¶[0080], Fig. 4, Claim 18. The energized state is the upper, high pressure position achieved after a return stroke. Pedicini, ¶[0080], Fig. 4.

O. Claims 15–16

242. Claims 15–16 are identical to Claims 10–11, respectively, and are met as described above.

P. Claim 17

243. *Elements [17.P]–[17.4]*: Elements [17.P]–[17.4] are identical to Elements [1.P]–[1.4], respectively, and are met as described above.

244. *Element [17.5]*: Pedicini discloses “said movable piston of the hollow cylinder is the sole movable piston that is in fluidic communication with the storage chamber of the gas pressure system.” Pedicini’s movable piston is the sole piston. Pedicini, Figs. 1–4.

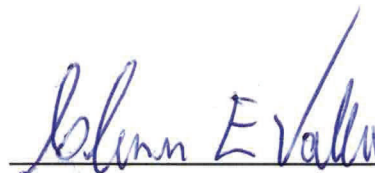
Q. Claims 18–20

245. Claims 18–20 are identical to Claims 2, 5 and 8, respectively, and are met as described above.

IX. CONCLUSION

246. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on December 13, 2024.



Glenn E. Vallee, Ph.D.