

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. 10,478,954

Case No. IPR2025-00262

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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. 10,478,954.
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 '954 Patent;
- The '954 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 '954 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.

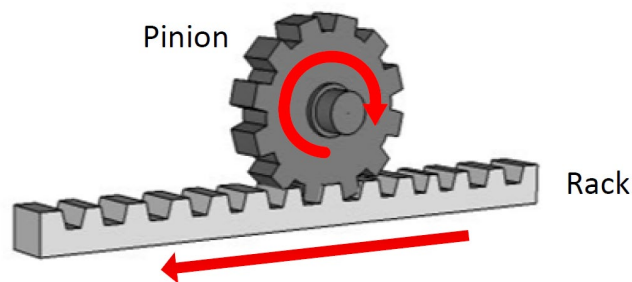
29. However, combustion nailers have their own issues. One issue is that, again like a car with an internal combustion engine, they require a costly supply of fuel to operate and must be periodically refueled. Another issue, again like a car with an internal combustion engine, is that combustion nailers 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.

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, 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 '954 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. ('954 Patent at 1:56-67). In particular, the '954 Patent describes a structural departure from the rack and pinion lifting system used by Sollberger and Pedicini. The lifter mechanism in the '954 Patent includes contact surfaces on the driving member which are inclined at an angle of 90 degrees with respect to the lifting direction. The '954 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.

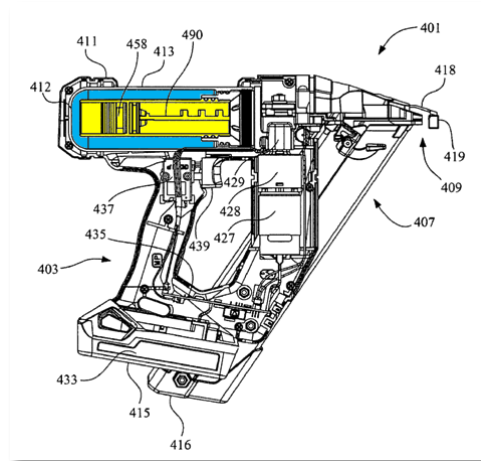
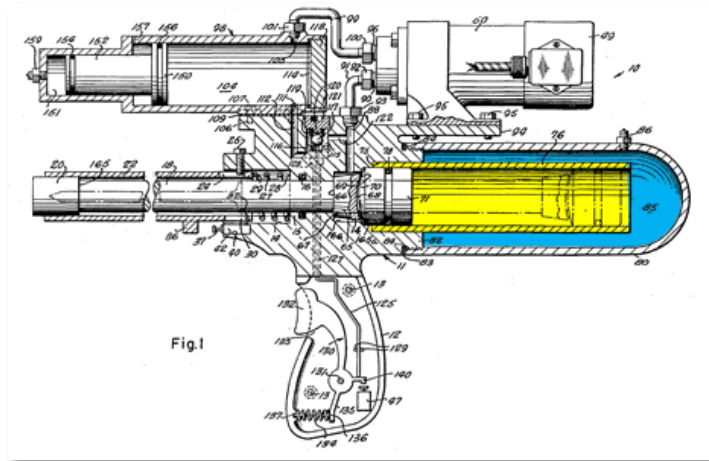
39. In response to an office action issued during prosecution of the applications that ultimately led to the '954 patent, one of the named inventors, Thomas A. McCardle, submitted an affidavit discussing the prior art, disadvantages of prior nailer designs, and the advantages of Complainant's patented 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 ’954 Patent.

41. Haley is directed to a gas spring nailer and predates all three prior art references discussed in the ’954 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 ’954 Patent (below right). *See* Haley at Fig. 1 (below left); ’954 Patent at Fig. 17 (below right). The Haley prior art thus disclosed this key feature that the ’954 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.

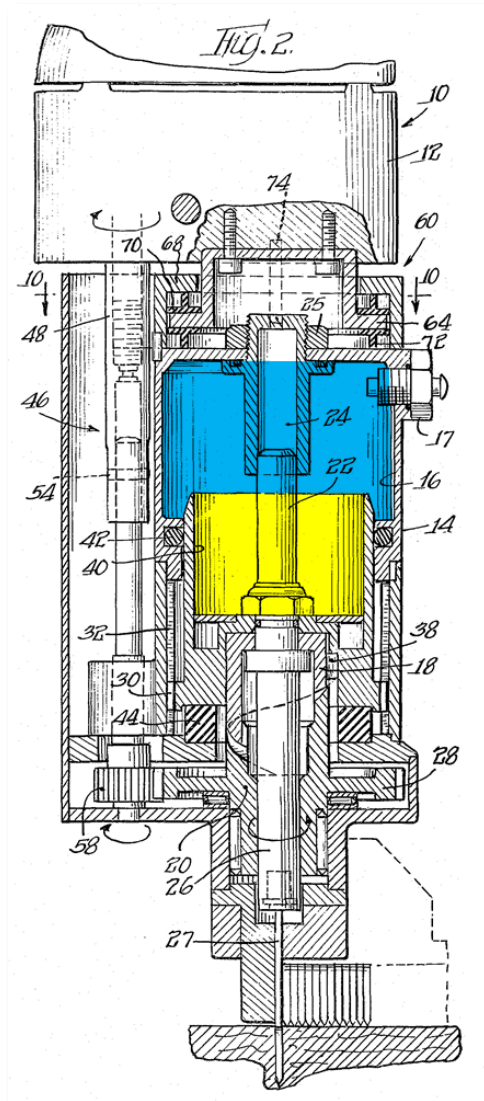
B. The Enstrom/Saari Prior Art

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 '954 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.

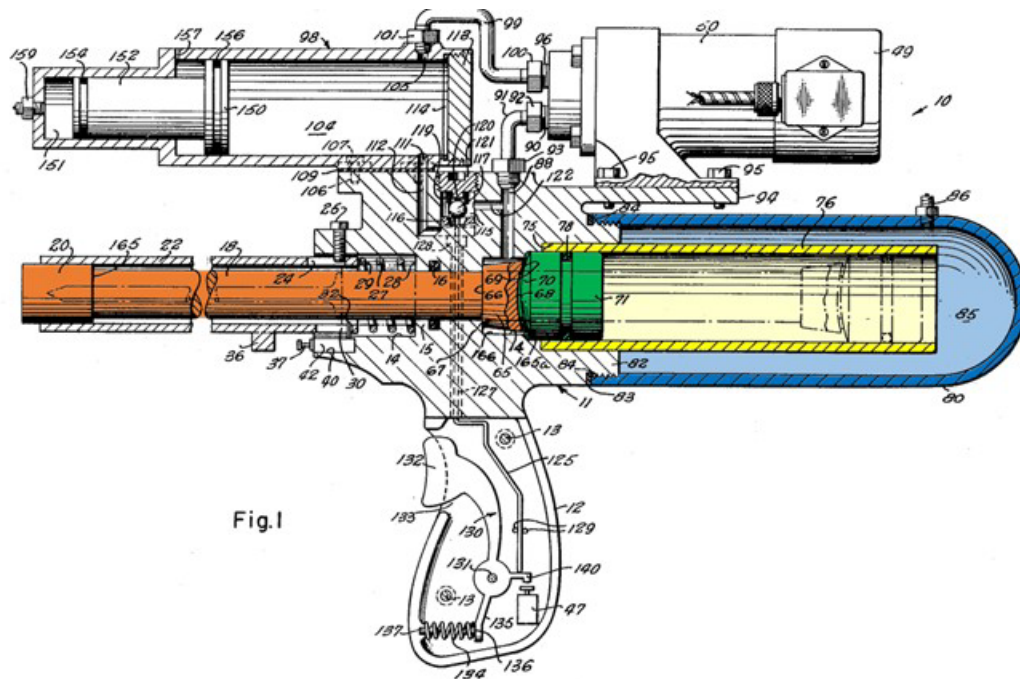
49. Applying this standard, I believe that a person of ordinary skill relevant to the '954 Patent would have either (i) a Master's degree in mechanical engineering with at least two years of experience in power nailer design; (ii) a Bachelor's degree in mechanical engineering with at least five years 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 '954 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 1–20 ARE OBVIOUS UNDER § 103 BASED ON U.S. PATENT NO. 3,150,488 (“HALEY”) IN VIEW OF U.S. PATENT NO. 5,503,319 (“LAI”)

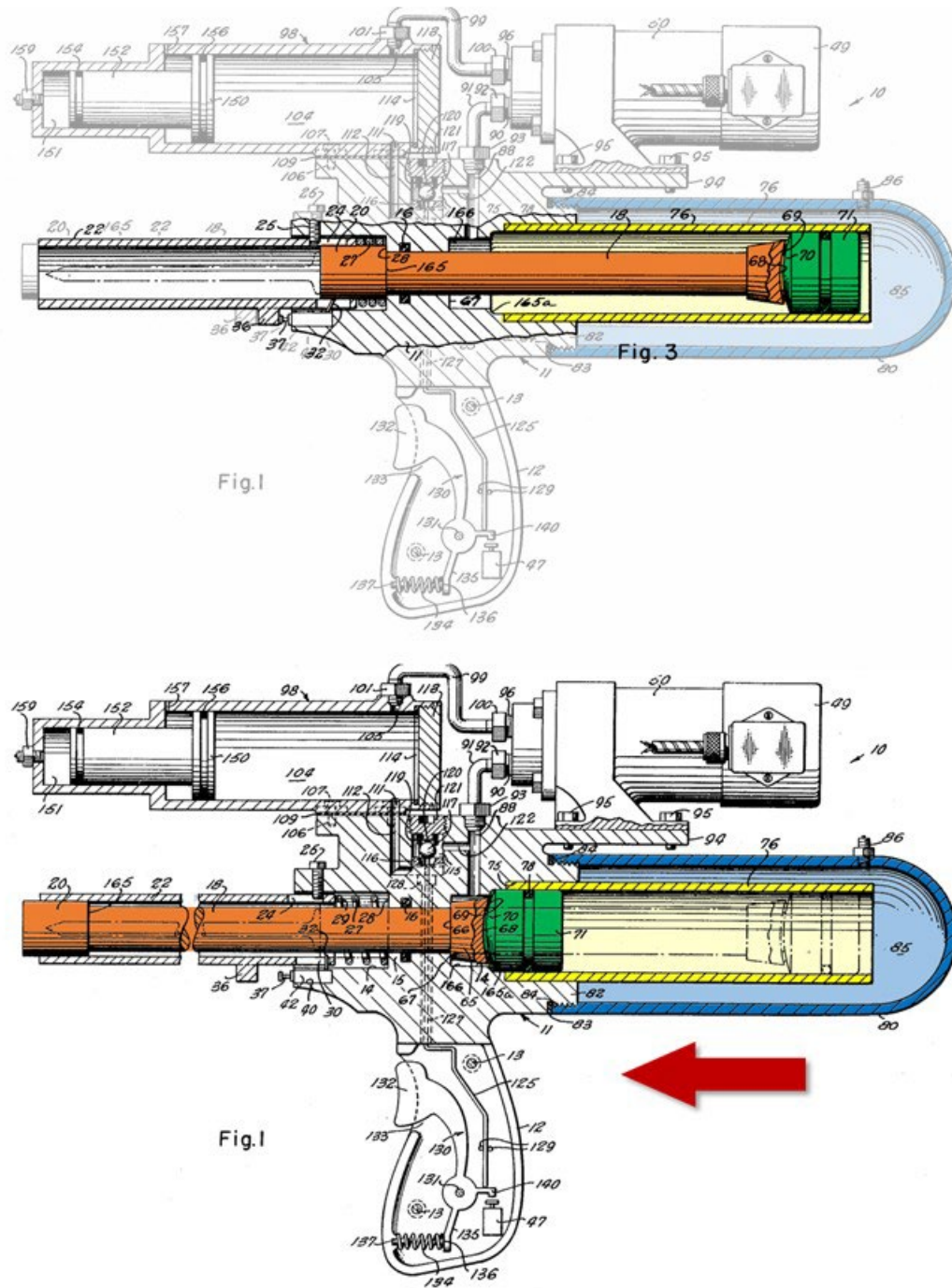
A. Claim 1

50. *Element [1.P]*: Haley discloses “[a] fastener driver adapted for use in a 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.

51. **Element [1.1]:** Haley discloses “a hollow cylinder having a movable piston therewithin, said hollow cylinder containing a displacement volume created by a stroke of said 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 states that the piston is “moveable within the cylinder extension.” Haley, 3:33 and 3:35–39, Figs. 1 (below), 3, and 4.

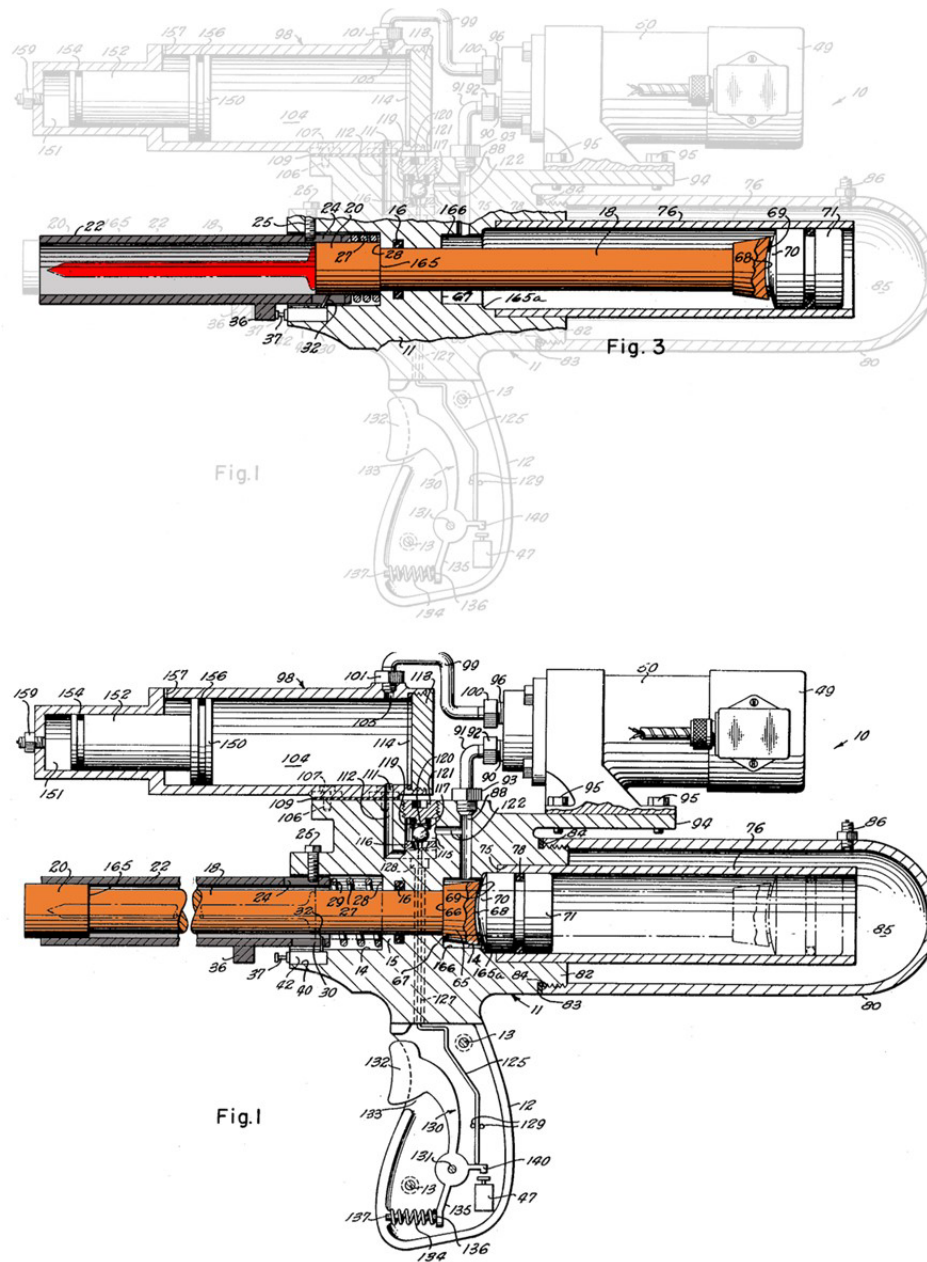


52. The hollow cylinder has a displacement volume created by the stroke of the piston. This is indicated by Figure 1’s dashed-line illustration of the piston at its raised position and also shown by Figure 3. Haley, Figs. 1 and 3 (below).



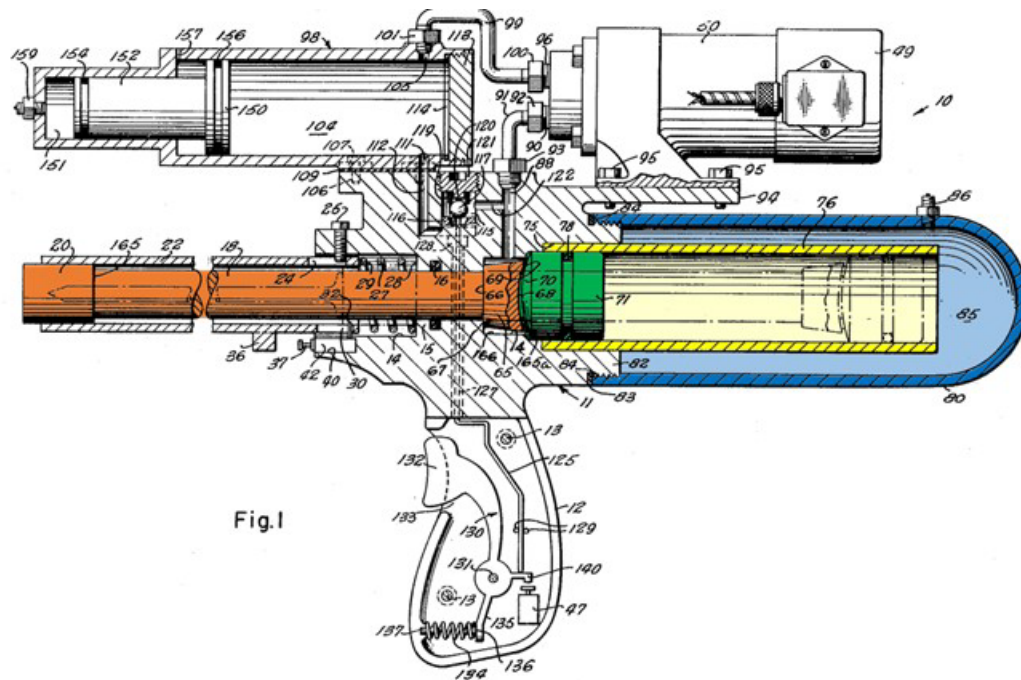
53. **Element [1.2]:** Haley discloses “a guide body that is sized and shaped to receive a fastener that is to be driven.” As shown below, Haley discloses a guide

body (“guide barrel 22,” grey below) sized and shaped to receive a fastener (nail, red). Haley, 2:23–27, Figs. 1, 3 (below).



54. **Element [1.3]:** Haley discloses “a movable driver that is in communication with said piston, said movable driver being sized and shaped to push said fastener from said guide body.” As can be seen below, 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.



55. **Element [1.4]:** Haley discloses “a storage chamber that is in fluidic communication at all times with said displacement volume of the cylinder.” Haley refers to its storage chamber as “chamber 85” (blue below) which is a chamber formed by “elongate accumulator shell 80.” Haley, Fig. 1; 3:40–54.

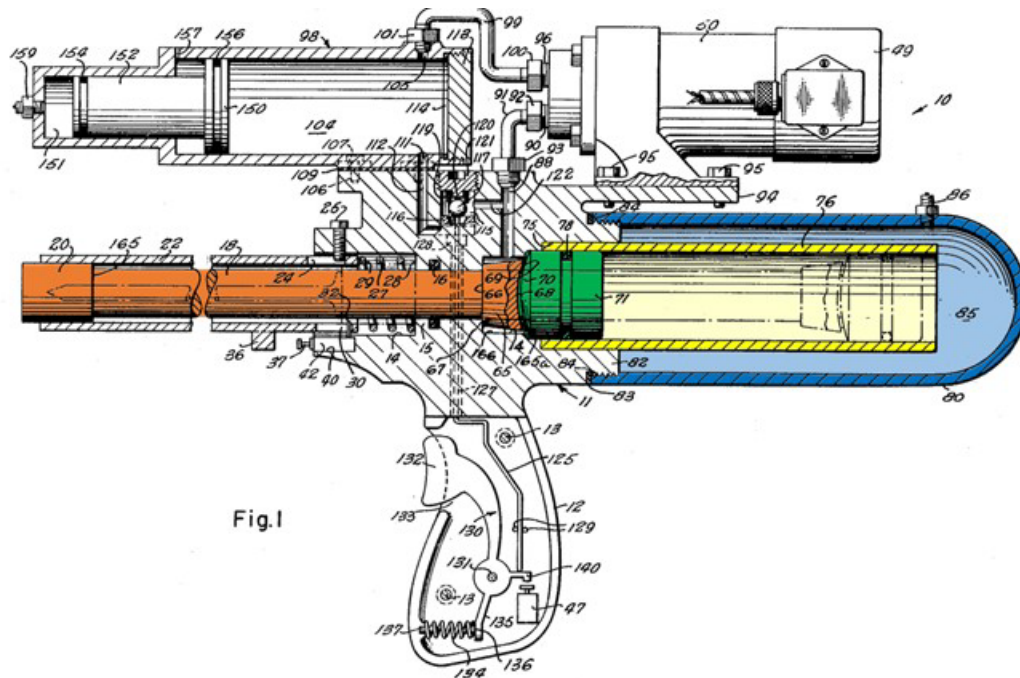


Fig.1

56. As seen above, Haley's storage chamber 85 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.

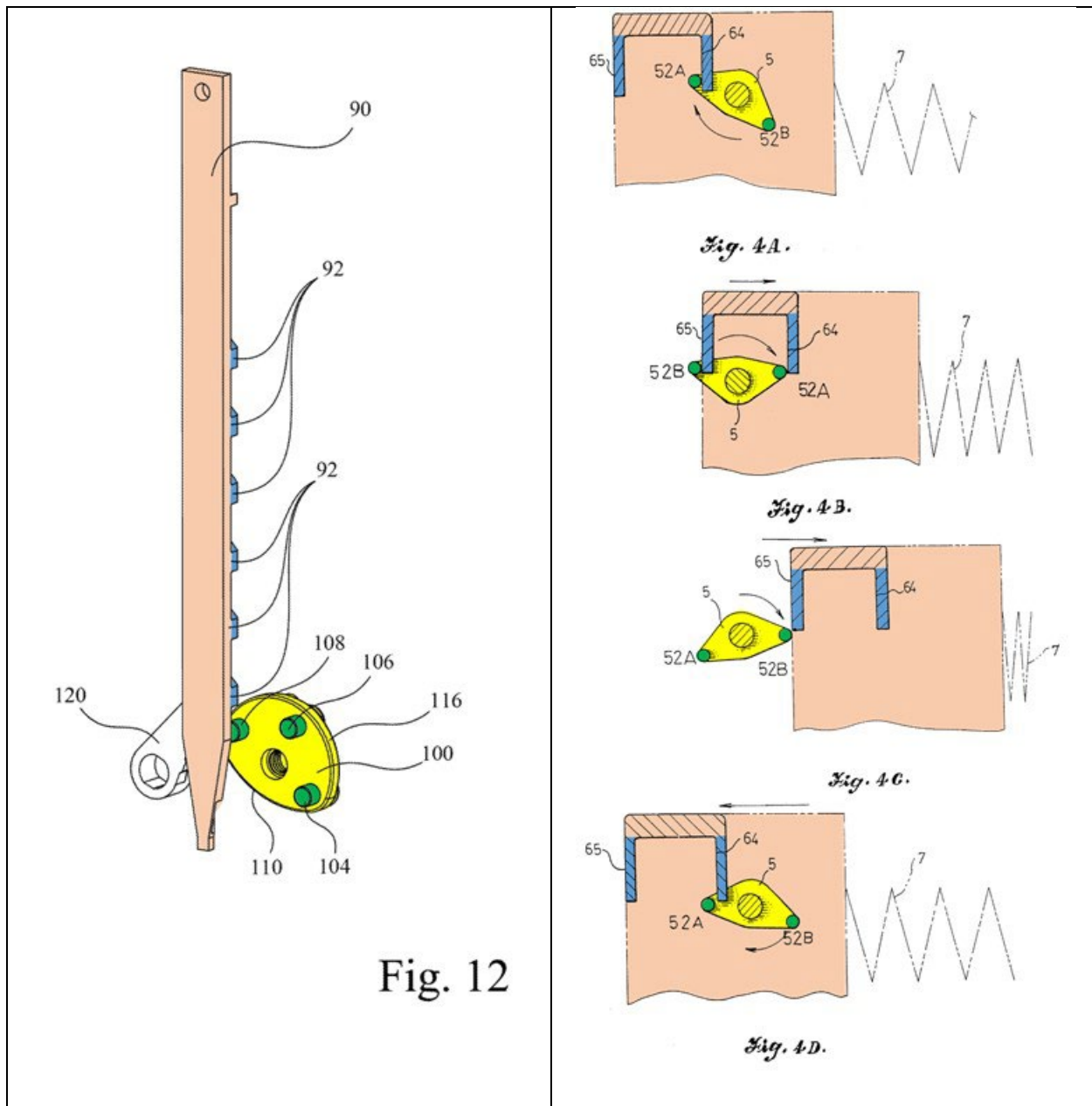
57. Haley's storage chamber and said displacement volume are "initially charged with a pressurized gas and remain above atmospheric pressure during all portions of an operating cycle, in which said pressurized gas is re-used for more than one driving cycle." Haley explains that "the gas introduced into 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).

58. ***Element [1.5]***: Haley discloses a hydraulic lifting mechanism and thus does not have “a lifter that, under first predetermined conditions, moves said movable driver toward a ready position.” In my opinion, it was obvious at the filing of the ’954 patent to replace Haley’s hydraulic lifter with the claimed “lifter,” which is disclosed by U.S. Patent No. 5,503,319 (“Lai”).

59. Lai discloses an electrically-powered, mechanical lifting mechanism with a structure that is essentially identical to the “lifter member” disclosed in the ’088 patent. *Compare* ’954 patent, Fig. 12 with Lai, Figs. 3, 4A–D. In particular, the “lifter member” of the ’954 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). ’954 patent, 9:25–41, 16:32–46, Fig. 12. The ’954 patent also discloses two-pin variants: lifter members 465 and 480 in Figs. 31 and 33. ’954 patent, 32:12–27, 32:45–60. 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.

’954 Patent Lifter Member	Lai Lifter Member
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60. Lai is directed to an “electric stapling gun.” Lai, 1:1–2. However, the claims of the ’954 patent recite methods for controlling “a fastener driving tool,” which the ’954 patent describes more particularly as “portable tools that drive staples, nails, or other linearly driven fasteners.” ’954 patent, 1:27–29.

61. A POSITA would consider staplers to be a subcategory of nailers. For example, U.S. Patent No. 4,834,278 (“Lin,” Ex. 1010) is titled “Structure of DC Motorized Nailing Machine” and discloses a preferred embodiment that drives staples. *See generally* Ex. 1010. Thus, Lin is directly relevant prior art for the ’954 patent.

62. Furthermore, developments in portable nailers tend to appear first in the context of portable staplers such as Lin and Lai due to the lower power needed to drive staples as compared to nails, and these improvements would later be applied generally to portable nail guns, notwithstanding their larger power drain requirements, as battery technology continued to improve. 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]). In fact, the ’954 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.” ’954 patent, 28:58–65. 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 '954 patent as battery technologies had continued to progress following Lai's issuance in 1996.

63. Moreover, a POSITA at the time the '954 patent was filed would have been motivated to replace Haley's hydraulic lifting mechanism with Lai's lifter member. Haley's hydraulic lifting mechanism was a known problem, because it was bulky and subject to the risk of hydraulic fluid leaking into the compressed gas chambers.

64. 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. These problems stemmed solely from Haley's hydraulic lifting mechanism, however, 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.

65. 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 was 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.

66. Lai further refines the battery-powered mechanical lifter of Lin. Lai expressly discusses its benefits in efficiency, power, and compactness over the prior art (such as Lin, which is prior art of record in Lai). *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.

67. At the filing of the ’954 patent, a POSITA would have solved Haley’s problem by incorporating Lai’s lifter member. Lai was a known solution to Haley’s

known 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 known 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).

68. A POSITA also 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. Hayley's hydraulic system which includes the bulky pump and piston could then be replaced with Lai's battery operated motor

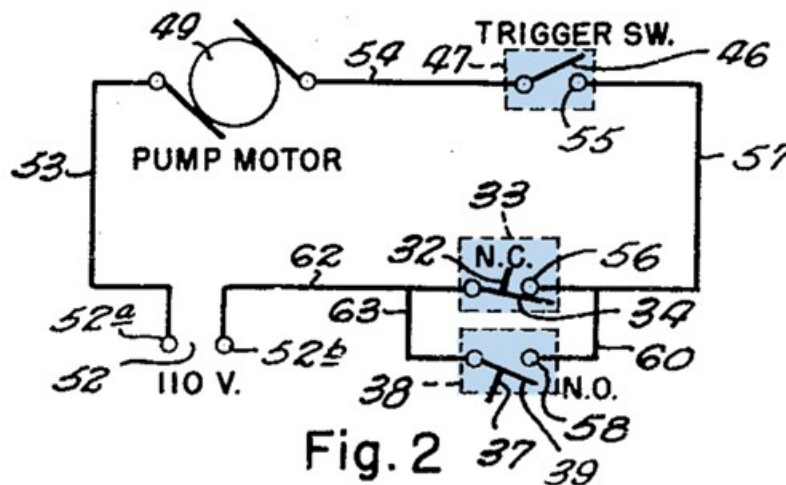
and rotating cam and pin arrangement in a position adjacent to the driver member to allow lifting of the driver member.

69. There was an additional, independent motivation to replace Haley's hydraulic lifting mechanism with Lai's lifter member based on market forces and design needs favoring a portable, battery-powered nailer. Specifically, artisans in the field had repeatedly highlighted the problems with prior nailer designs. *See e.g.*, 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). As part of this, 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 they lacked 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].

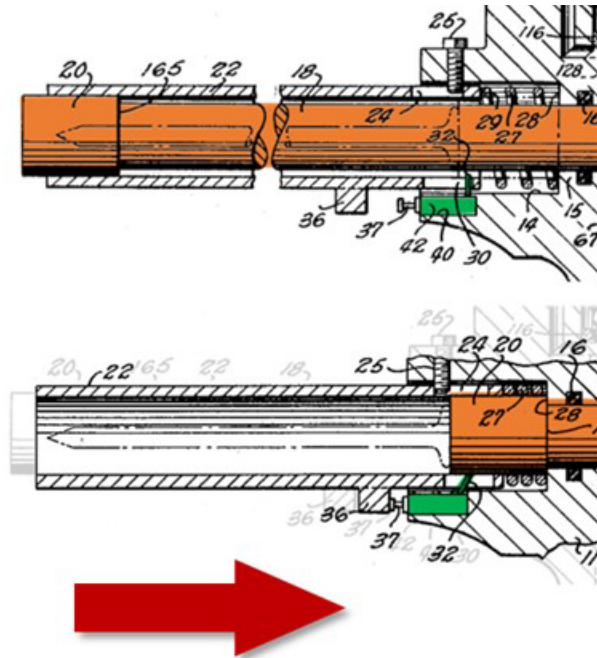
70. The clear and obvious solution presented by the prior art discussed above was to take the compressed gas spring design first conceived by Haley and make it portable by implementing the battery-powered lifter member of Lai. The only missing piece for that solution was a reasonably-priced portable battery pack

that could provide the power needed to make these off-the-shelf designs commercially feasible. After Haley, battery technologies continued to advance, largely driven by smartphones and electric vehicles in the early 2000s, such that by the filing of the '954 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. The compressed gas nailer claimed by the '954 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.

71. In the Haley/Lai combination, Lai's lifter would "under first predetermined conditions, moves said movable driver toward a ready position." Specifically, Haley discloses an "electric control circuit" in Fig 2 that receives input signals from "trigger switch 47" and "switches 33 and 38" (below in light blue) and thereby controls operation of the tool. Haley, 1:70–71, 2:59–63, Fig. 2 (below). Haley states that "whenever one of the switches 33 or 38 is closed and the trigger switch is closed, the motor 49 will be connected across the input circuit 52 and will thus be energized." Haley, 3:5–8.



72. With reference to the figure above, switch 33 is “normally closed” and “has a contact 34 which is actuated by the operating arm 32 each time it is engaged by the hammerhead 20 to open the switch as the piston and the hammerhead are retracted inwardly.” Haley, 2:39–43. Thus, “as the drive piston is moved inwardly from the position illustrated in FIGURE 1 to the retracted or cocked position illustrated in FIGURE 3, the normally closed switch 33 is first opened and maintained open as long as the drive piston is in substantially its fully retracted position and the normally open switch 38 is closed as the guide barrel is moved to its fully retracted position.” Haley, 2:51–58, Figs. 1 and 3 (below).

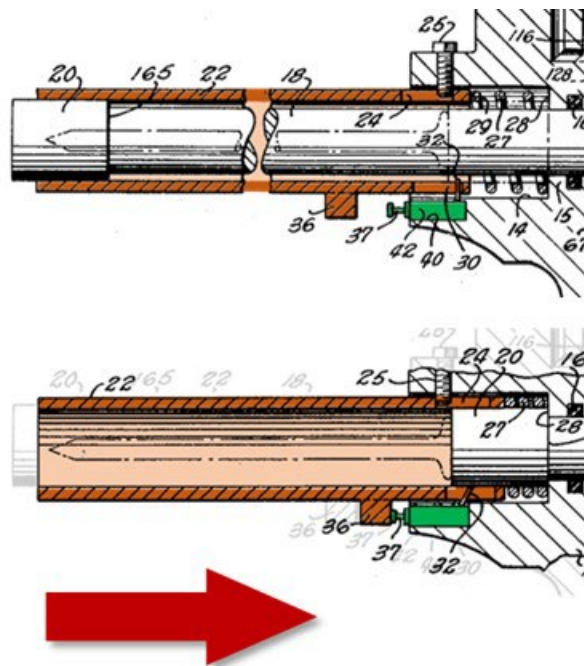


73. The trigger switch 47 is closed by actuating the trigger. Haley, 4:47–52.

74. Thus, under first predetermined conditions—that is, with the drive piston not yet raised to its retracted or cocked position and with the trigger actuated—Haley’s circuit will provide power to its lifter to move the movable driver toward the ready position.

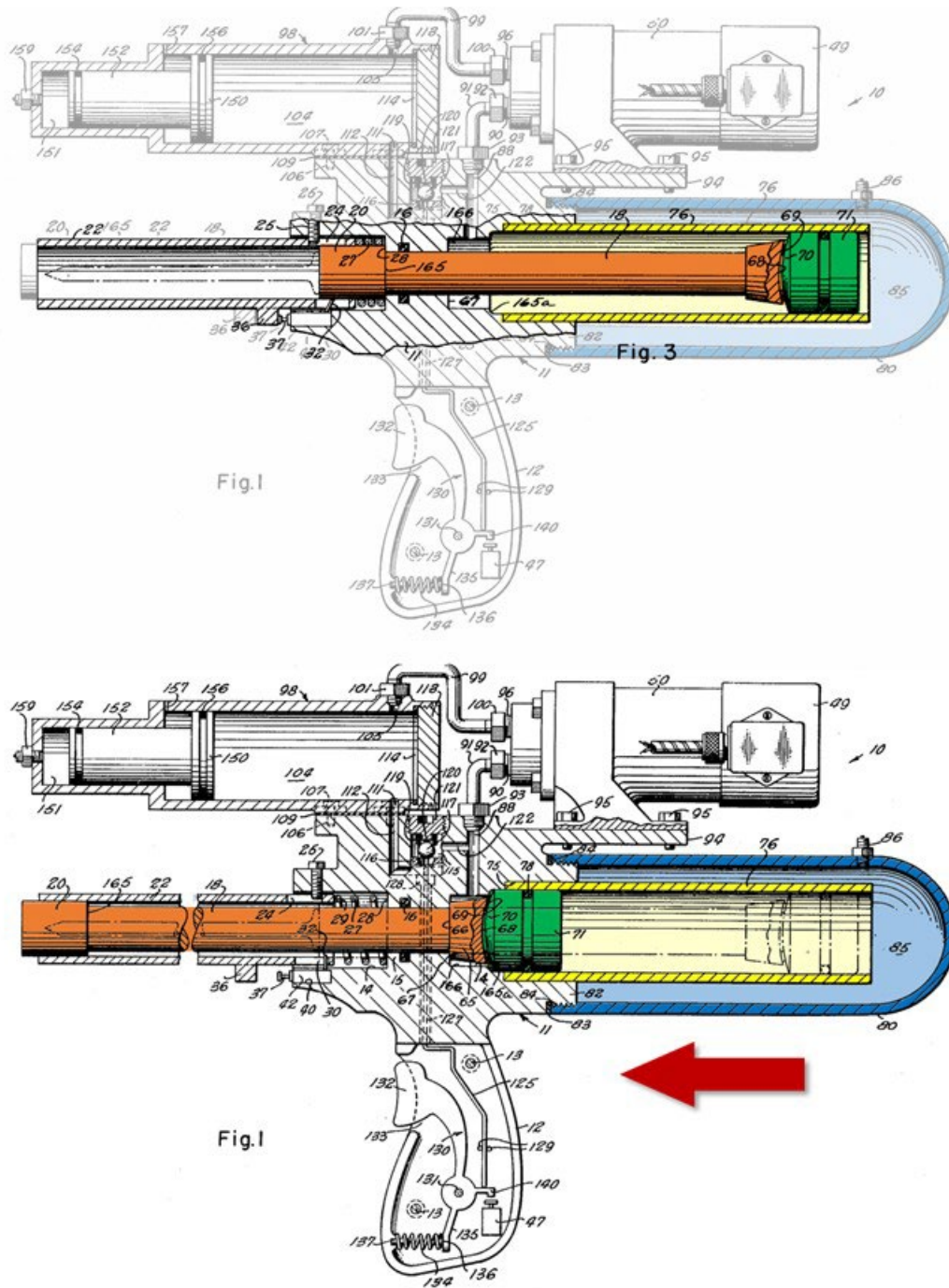
75. **Element [1.6]:** Haley discloses “wherein: said cylinder and piston act as a gas spring, under second predetermined conditions, to move said movable driver toward a driven position, using said pressurized gas of both said storage chamber and said displacement volume acting on said piston.” In Haley, switch 38 of the “electric control circuit” is closed by pressing the exit end against a workpiece. Haley states that “[t]he guide barrel also has external lug 36 which is adapted to

engage the operator arm 37 of the normally open switch 38 to move the contact 39 thereof into closed position.” Haley, 2:43–46. Thus, “[w]hen the forward end of the guide barrel is then pressed against the work piece . . . the lug 36 engages the operating rod 37 of the normally open switch 38 and closes the switch so that the motor 49 is once again connected to the input circuit 52.” Haley, 5:74–6:7. This action is shown by Figures 1 and 3, below.



76. Thus, under second predetermined conditions—that is, with the exit end pressed against a workpiece and with the trigger actuated—Haley’s circuit will “once again” provide power to its lifter and as a consequence “the drive piston is now moved forcibly and with great velocity toward the left,” *i.e.*, the exit end, which “drives the nail into the workpiece or structure.” Haley, 6:22–26, 6:30–31.

77. 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).



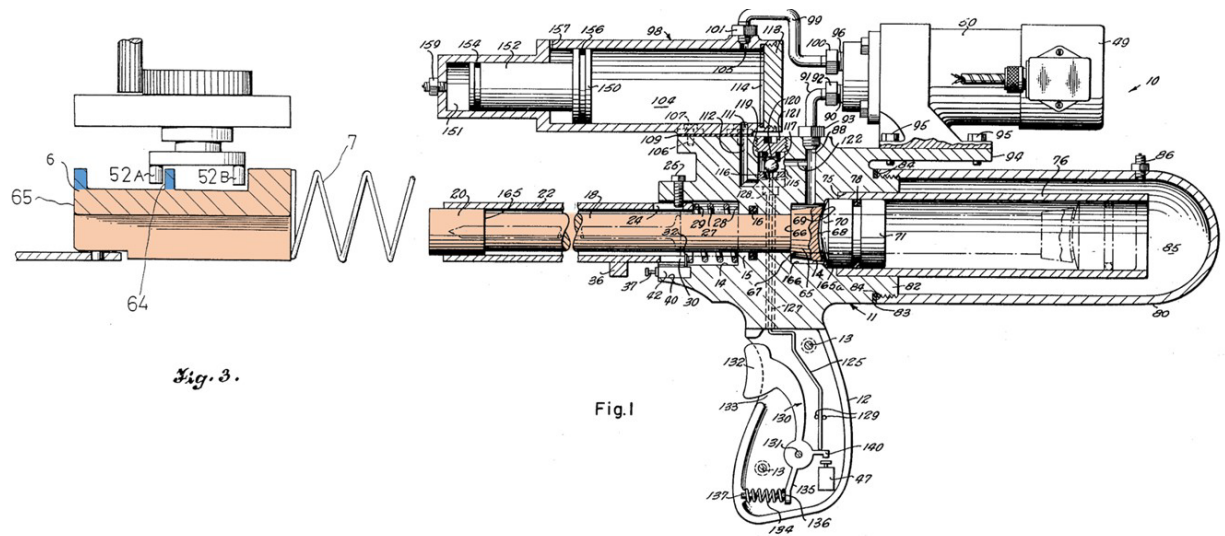
B. Claim 2

78. The combination of Haley and Lai discloses “[t]he fastener driver of claim 1, wherein said movable driver comprises an elongated shape with at least one

longitudinal edge, and having a plurality of protrusions that are located along said at least one longitudinal edge, said plurality of protrusions being spaced-apart from one another.” Haley’s movable driver (orange, below right) has an elongated shape with at least one longitudinal edge. Haley, Fig. 1 (below).

79. It was obvious at the filing of the ’954 patent that when replacing Haley’s hydraulic lifter with the claimed “lifter” taught by Lai, a POSITA would modify Haley’s driver to have protrusions so that they can be mechanically engaged by that lifter to move it through its return stroke. Specifically, as I explain above, Lai teaches adding a “U-shaped member 61” with protrusions to the driver blade (as a modification to Lai’s prior art of record 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. Likewise, a 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. The particular “U-shaped member 61” that Lai teaches to add to the driver includes a plurality (two) of spaced-apart protrusions (blue, below left) along a longitudinal edge. Lai, Fig. 3 (below). Thus, the combination made by a POSITA would result in a movable driver having an elongated shape and longitudinal edge, and with a plurality of protrusions located along the longitudinal edge and spaced-apart from one another.

80.



C. Claim 3

81. The combination of Haley and Lai discloses “[t]he fastener driver of claim 1, wherein said lifter comprises at least one disk that includes at least one extension that protrudes from its surface which, under first predetermined conditions, contacts said movable driver and forces said movable driver to move toward its ready position, using a rotary-to-linear motion.” In the combination, the lifter taught by Lai includes a disk (“cam 5,” yellow below) with two extensions protruding from its surface (pins 52A and 52B, green), which moves the movable driver (orange) toward its ready position under first predetermined conditions (*see supra*, Element [1.5]). Lai, Fig. 3 (below), 2:13–21.

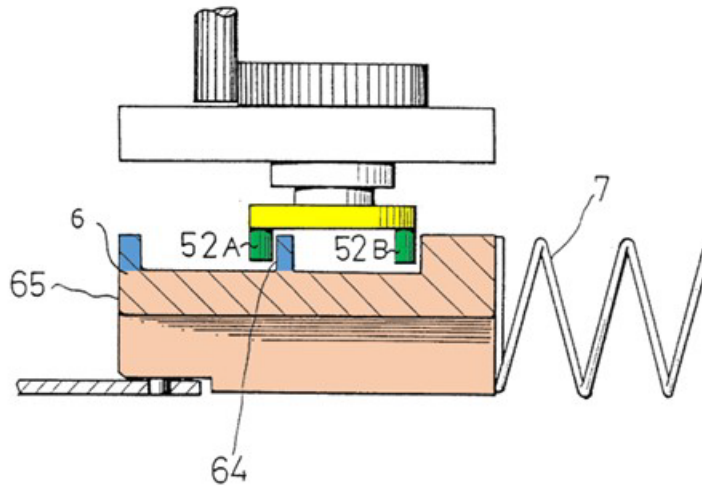


Fig. 3.

82. The lifter taught by Lai moves in rotational motion (curved arrows) to cause the driver (light orange) to move in a linear motion (straight arrow), thus using rotary-to-linear motion. Lai, Figs. 4A–D (below), 1:62–63, 2:14–25.

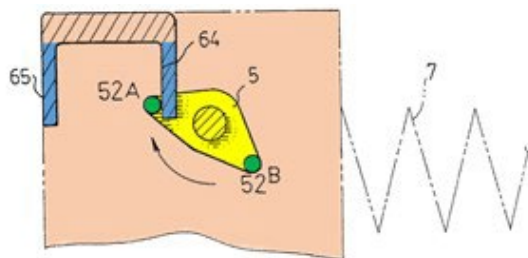


Fig. 4A.

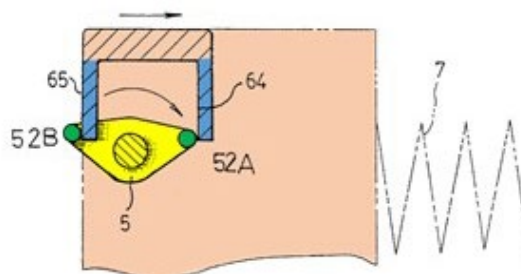


Fig. 4B.

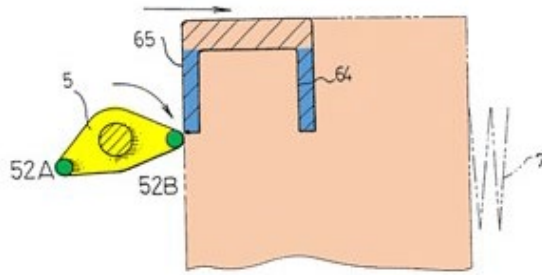


Fig. 4C.

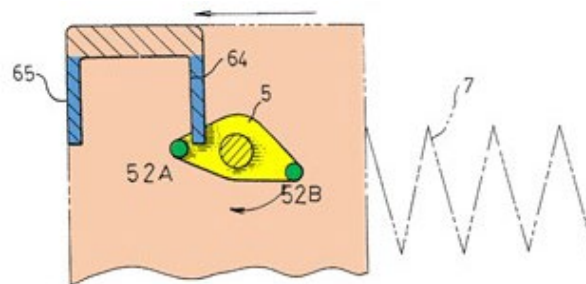


Fig. 4D.

D. Claim 4

83. **Element [4.1]:** Element 4.1 is identical to Element 2 and is met as described above.

84. **Element [4.2]:** The combination of Haley and Lai discloses “such that said at least one extension of said lifter fits in a space between said spaced-apart plurality of protrusions, and a rotating motion of said lifter causes said at least one extension of the lifter to engage said plurality of protrusions of the movable driver, thereby causing said movable driver to move in a substantially linear direction within a driver track of said guide body.” In the combination, the lifter taught by Lai includes extensions protruding from its surface (pins 52A and 52B, green below)

that fit between the spaced-apart protrusions of the driver (blue below). Lai, Fig. 3 (below), 2:13–21.

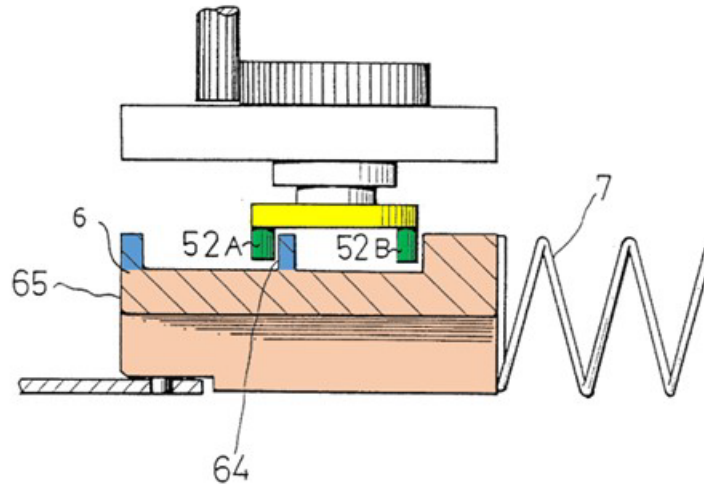


Fig. 3.

85. In the combination, the lifter is rotated (as shown by the curved arrows, below) such that its extensions (green) engage the protrusions on the driver (blue) to cause the driver (orange) to move in a linear direction (as shown by the straight arrow) within the driver track of the guide body. Lai, Figs. 4A–D (below), 1:62–63, 2:14–25.

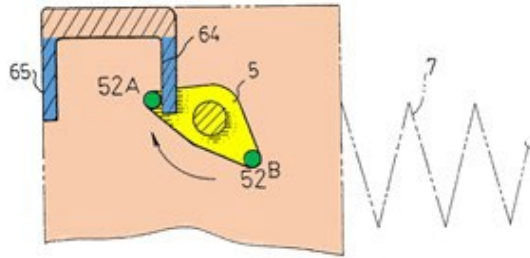


Fig. 4A.

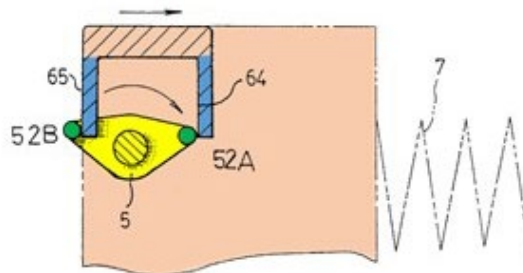


Fig. 4B.

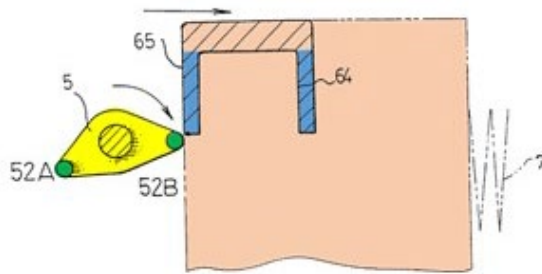


Fig. 4C.

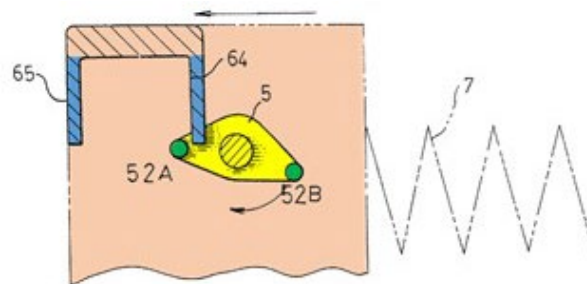
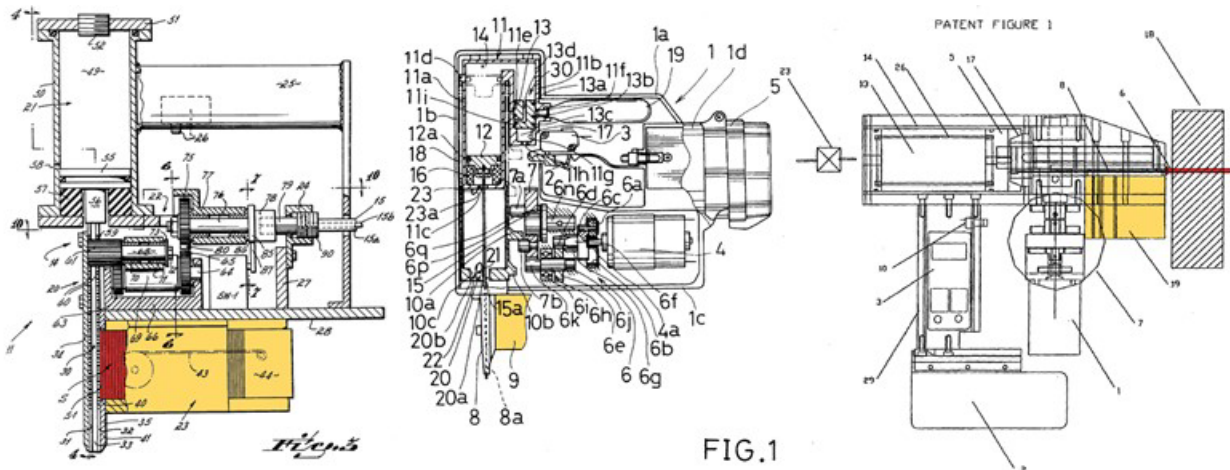


Fig. 4D.

E. Claim 5

86. While Haley does not explicitly disclose “[t]he fastener driver of claim 4, further comprising: a magazine that contains a plurality of fasteners, said magazine providing a fastener at a receiving position of said driver track of the guide body so that, during a driving stroke, said movable driver moves toward said driven position, while pushing said fastener toward an exit portion of said driver track,” it would have been obvious at the filing of the ’954 patent to include a magazine that provides nails below the driver such that they are pushed out the exit of the driver track during a drive stroke.

87. Magazines that feed fasteners (such as nails) below the driver to be pushed out the exit during a drive stroke had become a ubiquitous component of powered nailers by the time of the ’954 patent, which customers would have expected and required to be included. This is reflected by the fact that all three prior art references expressly discussed in the specification of the ’954 patent (1:48–67) included such a magazine. *See* U.S. Patent No. 4,215,808 (“Sollberger”), Fig. 3 (“magazine 23,” below left), 5:65–6:5; Kondo, Fig. 1 (“nail magazine 9,” below middle), 5:15–23; Pedicini, Fig. 1 (“fastener feeder (19),” below right), ¶[0077]. It would have been obvious for a POSITA to include such a magazine due to market forces and design incentives.



F. Claim 6

88. The combination of Haley and Lai discloses “[t]he fastener driver of claim 1, wherein: said hollow cylinder is the sole pressurized cylinder of the fastener driver.” Haley’s hollow cylinder (“cylinder extension 76”) is the sole cylinder containing pressurized gas. While Haley does have a separate cylindrical “large chamber 104,” that chamber is used as a reservoir for hydraulic fluid of Haley’s lifting mechanism. In the combination with Lai, Haley’s “large chamber 104” would be eliminated as unnecessary because the hydraulic fluid would not be needed for Lai’s lifter member.

G. Claim 7

89. As an initial matter, the language of claim 7 conflicts with the language of base claim 1. Claim 1 calls for the driver to be moved toward the “ready position” under the “first” predetermined conditions and moved toward the “driven position” under the “second” predetermined conditions. In contrast, claim 7 calls for the driver

to be moved toward the “driven position” under the “first” predetermined conditions and moved toward the “ready position” under the “second” predetermined conditions. In the event that this contradiction is held to be a correctable error, then this element is disclosed by Haley as explained below.

90. Haley discloses “[t]he fastener driving tool of claim 1, wherein said fastener driver is designed to operate in a repeatable cycle of driving events, in which each driving event includes: (a) a driving stroke under said first [second] predetermined conditions, which causes said movable driver to move toward said driven position, and (b) a return stroke under said second [first] predetermined conditions, which causes said movable driver to move toward said ready position.”

91. As discussed above in relation to claim 1, Haley discloses an “electric control circuit” in Fig 2 that controls operation of the tool based on inputs from signals from “trigger switch 47” and “switches 33 and 38,” where the operation involves a repeatable drive cycle including (a) a return stroke under first predetermined conditions (with the drive piston not yet raised to its retracted or cocked position and with the trigger actuated) and (b) a drive stroke under second predetermined conditions (with the exit end pressed against a workpiece and with the trigger actuated). *See supra*, Elements 1.5 and 1.6.

H. Claim 8

92. *Elements [8.P]–[8.4], [8.6] and [8.9]*: Elements 8.P–8.2, 8.4, 8.6 and 8.9 are identical to Elements 1.P-1.2 and 1.4–1.6, respectively, and are met as described above.

93. Element 8.3 differs from Element 1.3 only in that it recites a moveable driver that “moves with” the piston rather than being “in communication with” the piston. This element is met for the same reasons described above. *See supra*, Element 1.3.

94. *Element [8.5]*: The combination of Haley and Lai discloses “an on-board electrical energy source, with no external energy source attached to said fastener driving tool.” 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) and there is therefore no external energy source attached to the tool. Lai, Figs. 1–2 (below), Title, Abstract, 1:25–35, 1:44–54, 1:60–62, 2:2, Claim 1.

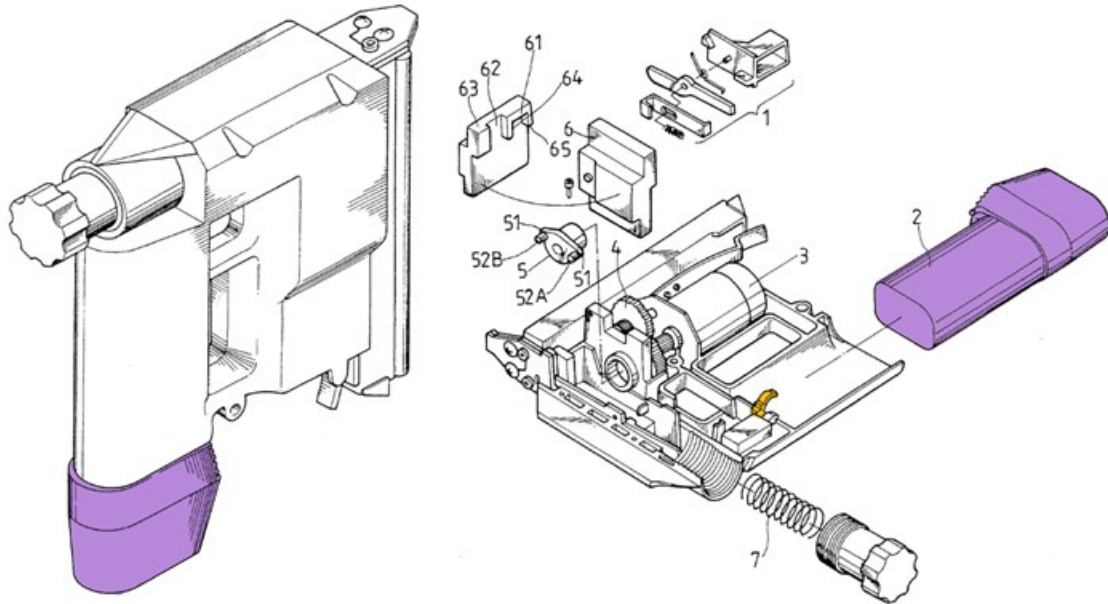


Fig. 1.

FIG. 2

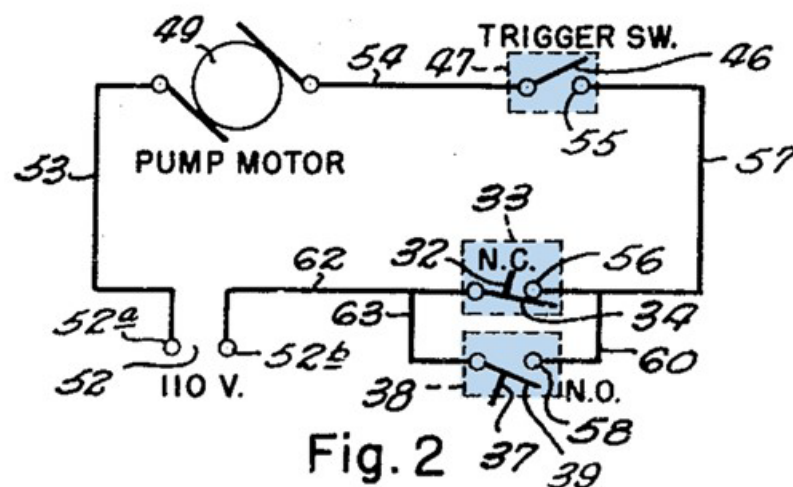
95. Although Lai does not explicitly identify element 2 in the figures above as a power supply, a POSITA reading Lai would understand that element 2 is a battery from its location and visual appearance, and by the context of Lai being an “electric stapling gun” that is ideally “energy saving.” In addition, 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). This further confirms that element 2 is a battery.

96. This 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. *See supra*, Element 1.5. Accordingly, in this combination, Haley’s electrical cable is replaced

with Lai's portable battery (Lai's battery 2), and there would be no external energy source.

97. **Element [8.7]:** The combination of Haley and Lai discloses “a prime mover that is powered by said on-board electrical energy source, said prime mover causing said lifter to move, under first predetermined conditions.” In that combination, Lai's lifter is moved by a prime mover (“motor 3”), which is powered by the on-board electrical energy source (Lai's battery 2). Lai, Figs. 1–2 (above), Title, Abstract, 1:25–35, 1:44–54, 1:60–62, 2:2, 2:14–16, Claim 1.

98. In the combination, Haley's “electric control circuit” in Fig 2 would control the connection between Lai's prime mover (“motor 3”) and its on-board electrical energy source (Lai's battery 2) according to input signals from “trigger switch 47” and “switches 33 and 38” (below in light blue). Haley, 1:70–71, 2:59–63, 3:5–8, Fig. 2 (below).



99. Haley's circuit is closed, and thus supplying power from the battery to the motor and causing the lifter to move, under the "first predetermined conditions," where the drive piston is not yet raised (so switch 33 remains "normally closed" and not yet opened, Haley, 2:39–43, 2:51–58, Figs. 1 and 3) and the trigger is actuated (so trigger switch 47 is closed, Haley, 4:47–52).

100. ***Element [8.8]:*** The combination of Haley and Lai discloses "a housing that holds said hollow cylinder, guide body, movable driver, storage chamber, on-board electrical energy source, lifter, and prime mover as a single, portable hand-operable tool." Haley's housing ("housing 40") is shown below in green. Haley, 2:47, Fig. 1 (below). Haley's housing holds, as a single, portable hand-operable tool, its hollow cylinder ("extension cylinder 76," yellow), guide body ("guide barrel 22," grey), movable driver ("drive piston 18," orange), and storage chamber ("chamber 85," blue). Haley, Fig. 1 (below). In the combination with Lai, Haley's housing will also include Lai's on-board electrical energy source (battery 2), lifter ("cam 5"), and prime mover ("motor 3").

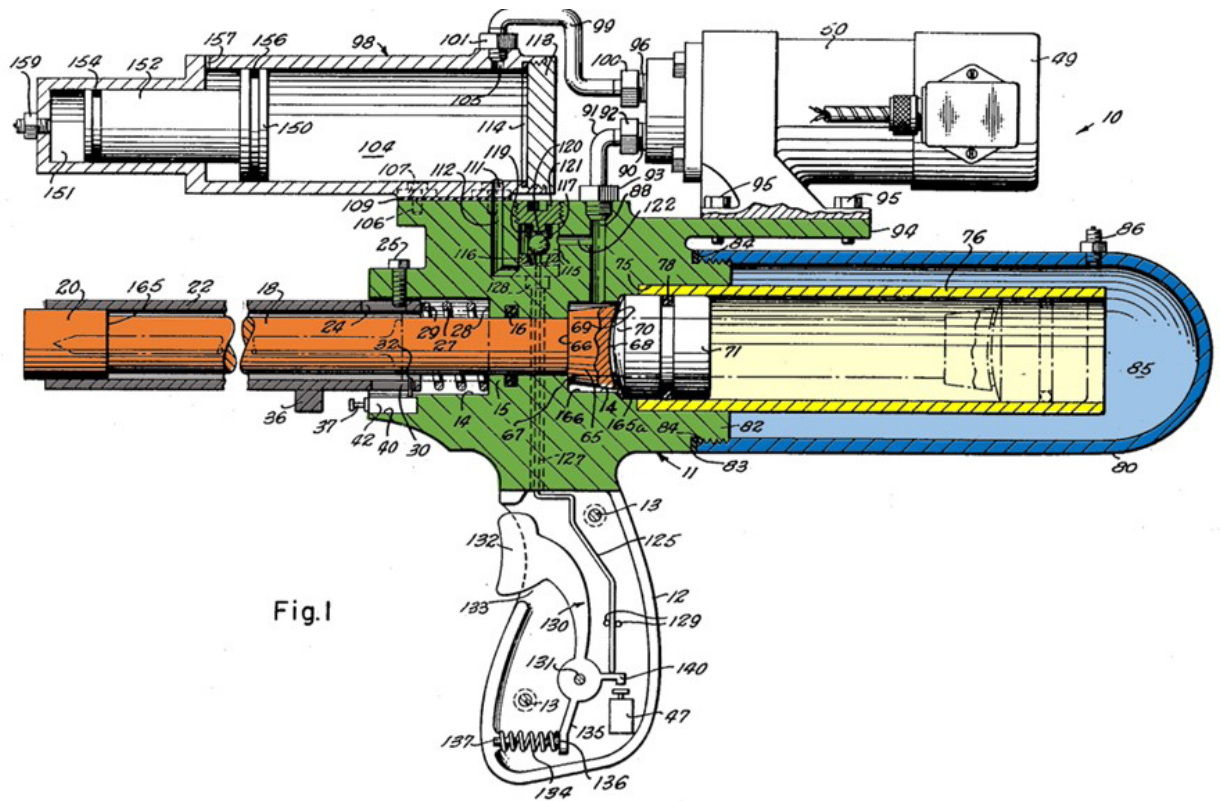


Fig.1

I. Claim 9

101. The combination of Haley and Lai discloses “[t]he fastener driving tool of claim 8, wherein said on-board electrical energy source comprises a battery.” In that combination, Lai’s on-board electrical energy source 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).

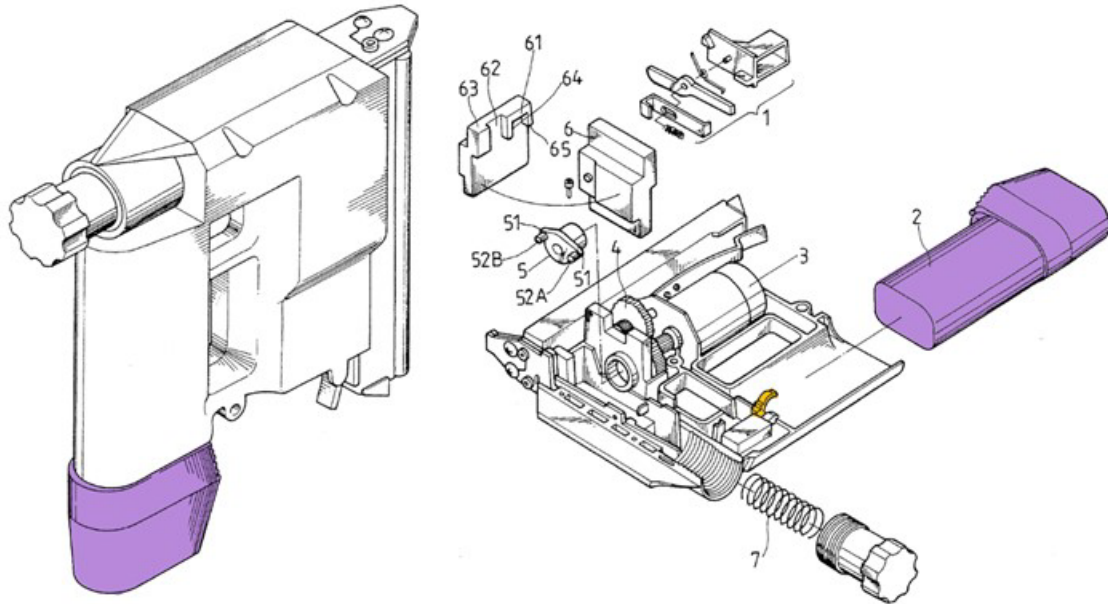


Fig. 1.

F I G . 2

J. Claim 10

102. The combination of Haley and Lai discloses “[t]he fastener driving tool of claim 8, wherein said prime mover comprises an electric motor.” Lai’s prime mover (“motor 3”) is powered by an electrical power source (battery 2) and thus is an electric motor. Lai, 1:25–35, 1:44–54, 1:60–62, 2:2, Claim 1.

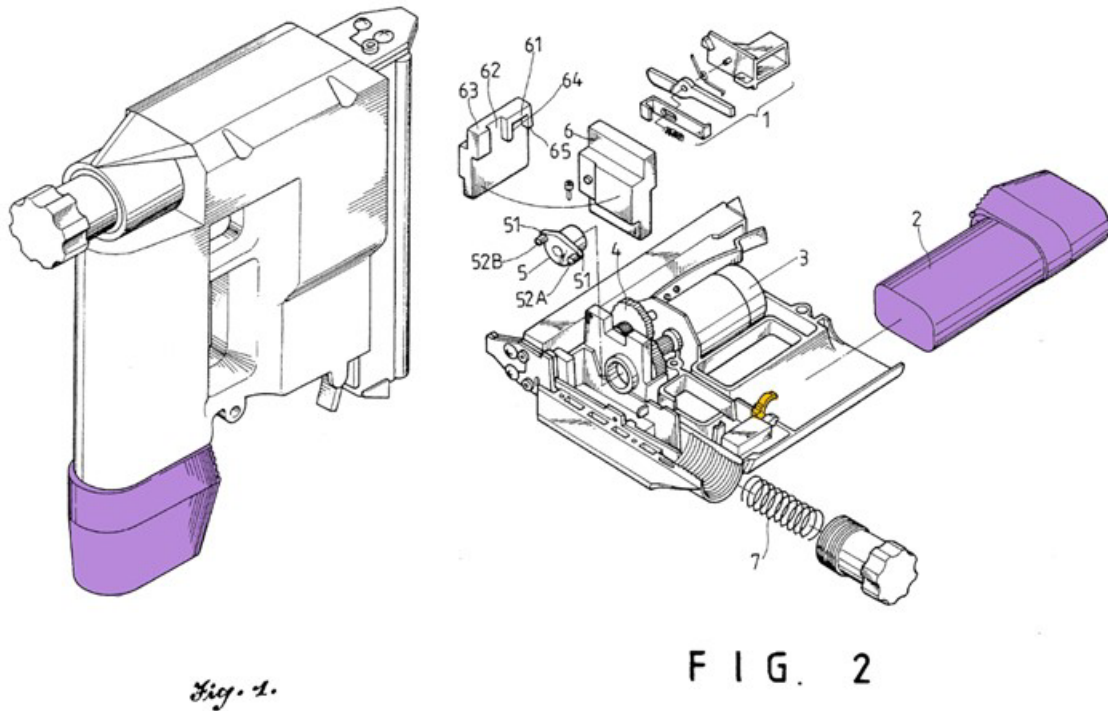
K. Claim 11

103. Claim 11 is identical to Claim 7 and is met as described above.

L. Claim 12

104. The combination of Haley and Lai discloses “[t]he fastener driving tool of claim 8: wherein said prime mover is powered by an electrical power supply that is carried on said tool.” In that combination, Lai’s on-board electrical energy source

that powers the prime mover is an electrical battery carried on the tool 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).



M. Claims 13–17

105. Claims 13–17 are identical to Claims 2–6, respectively, and are met as described above.

N. Claim 18

106. *Elements [18.P]–[18.4] and [18.6]*: Elements 18.P–18.4 and 18.6 are identical to Elements 1.P–1.4 and 1.6, respectively, and are met as described above.

107. **Element [18.5]:** Element 18.5 differs from Element 1.5 only in that it recites a “rotating lifter” rather than a “lifter” and further states that it moves the driver “using a rotary-to-linear motion.” This element is met for the same reasons described above. *See supra*, Element 1.5.

108. As discussed above in relation to claim 3, in the combination of Haley and Lai, the lifter taught by Lai includes a rotating disk (“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), thus using rotary-to-linear motion. Lai, Figs. 4A–D (below), 1:62–63, 2:14–25.

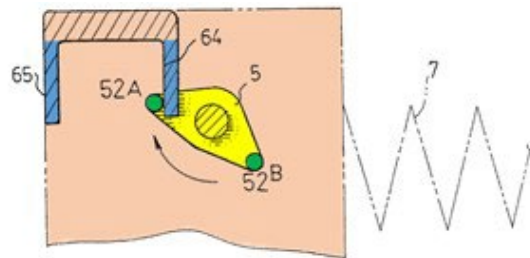


Fig. 4A.

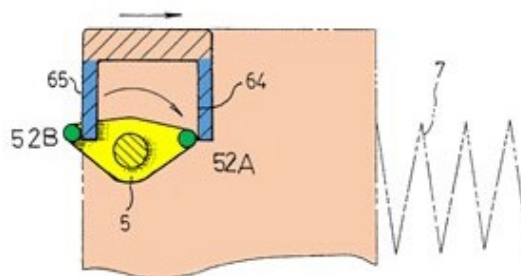


Fig. 4B.

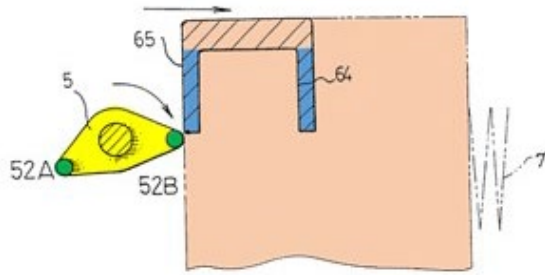


Fig. 4C.

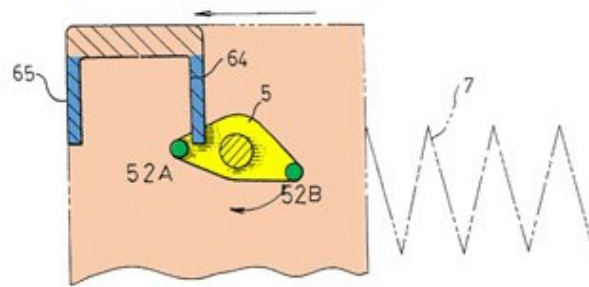


Fig. 4D.

O. Claims 19–20

109. Claim 19 is identical to Claim 2 and is met as described above. Claim 20 is nearly identical to Claim 3, but for the different antecedent to the “rotating lifter” rather than “lifter” and is met as described above.

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

110. Saari and Enstrom are closely related patents that were filed on the same day and given sequential application numbers, assigned to the same company, Illinois Tool Works, Inc., have identical titles and terminology, and contain overlapping specifications and figures. *See* Exs. 1006 [Saari], 1007 [Enstrom]. Given the close relationship between Saari and Enstrom, a POSITA would look to

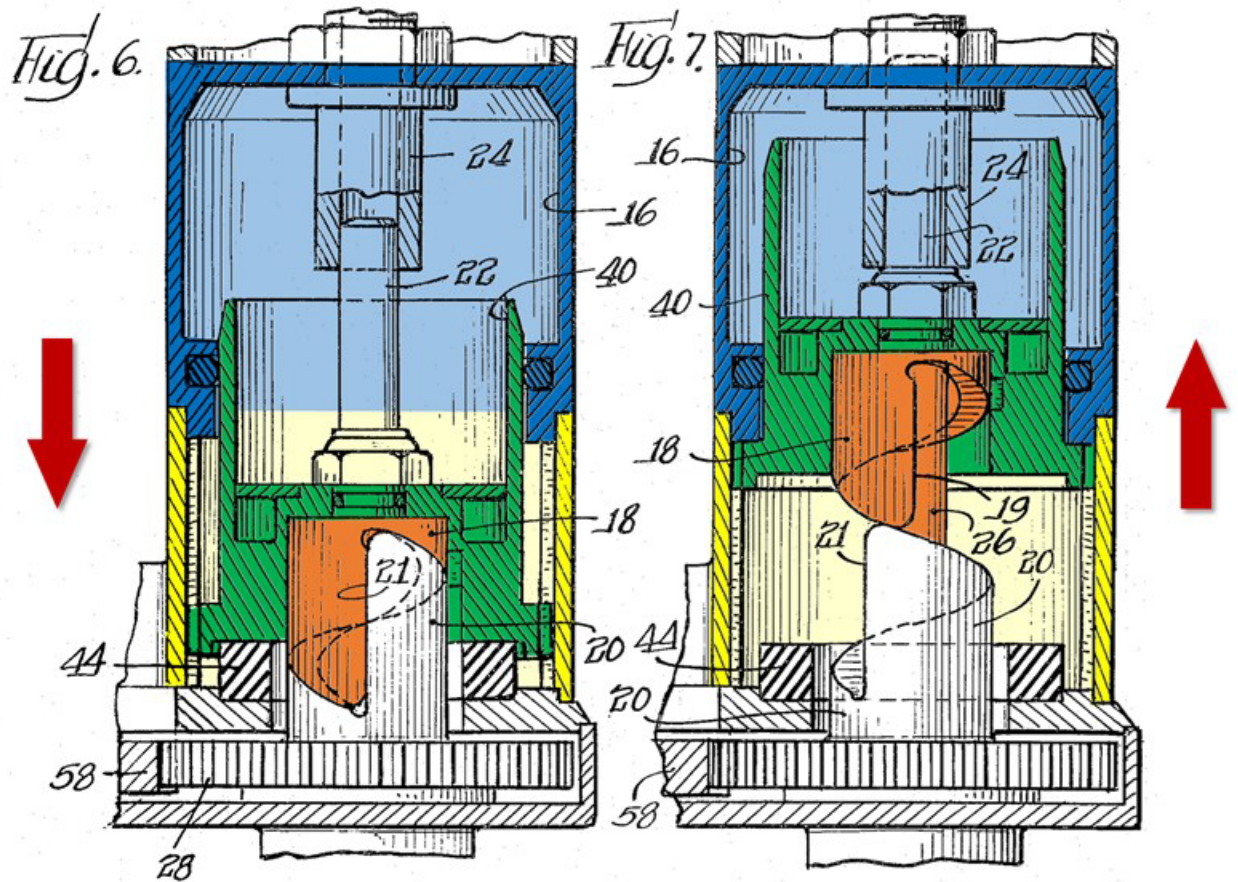
their collective teachings together and would have combined them as a matter of course. To the extent there are aspects described in only one of Enstrom or Saari, a POSITA would understand that is simply due to their separate focuses on different inventive aspects of the tool (warranting the separate patents for different inventors). For example, Saari describes the switching means for controlling the fastener driving tool (*see* Saari, 1:48–57, 3:19–68, Figs. 7–9), whereas Enstrom describes the lifting mechanism and compressed gas chamber for that tool (*see* Enstrom, 2:35–3:19, Figs. 6–7). Accordingly, a POSITA would combine the two teachings to achieve the complete tool worked on by Enstrom and Saari for Illinois Tool Works, Inc. I treat Saari and Enstrom as such below.

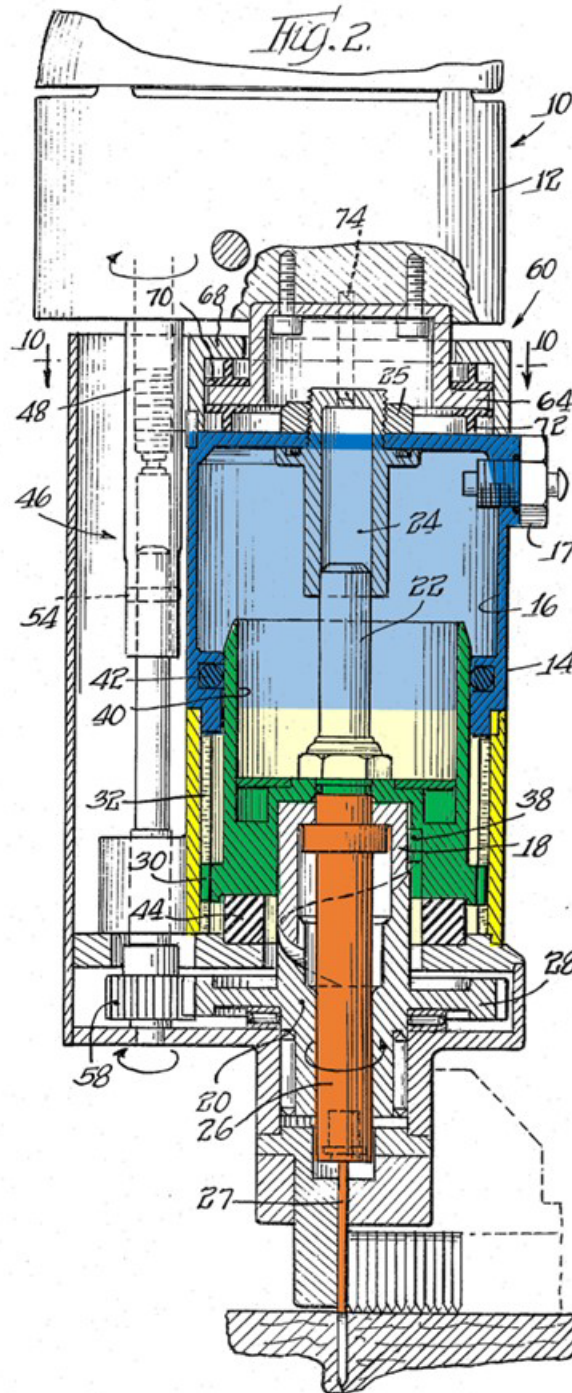
A. Claim 1

111. ***Element [1.P]***: Saari/Enstrom discloses “[a] fastener driver adapted for use in a 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.

112. ***Element [1.1]***: Saari/Enstrom discloses “a hollow cylinder having a movable piston therewithin, said hollow cylinder containing a displacement volume created by a stroke of said piston.” 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.

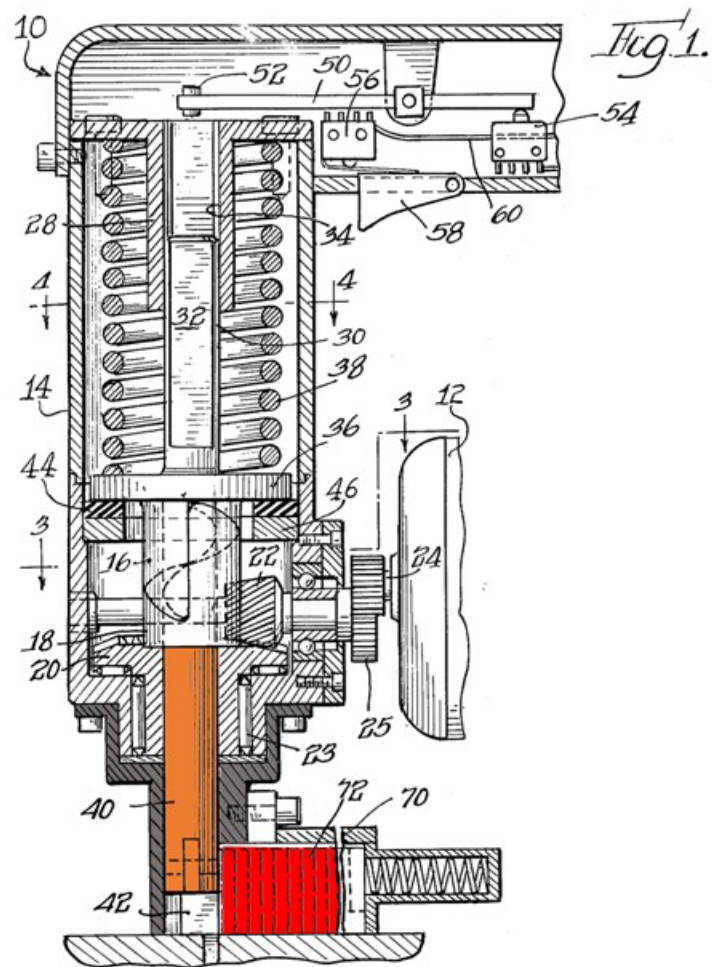
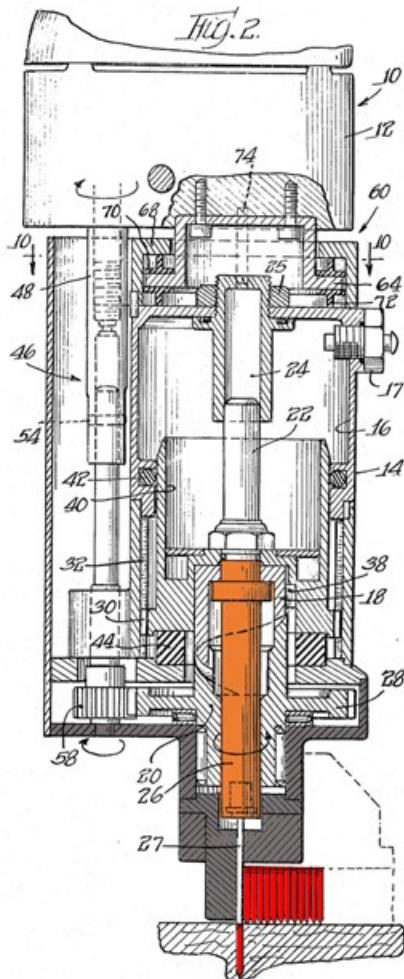




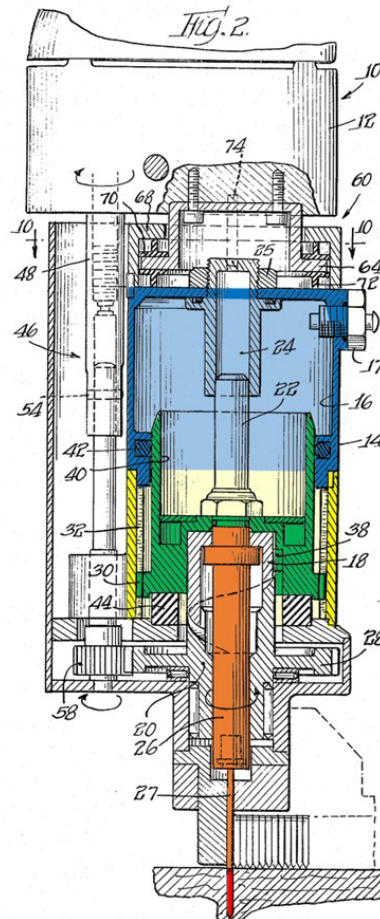
113. The hollow cylinder includes a displacement volume, which is the portion the cylinder's volume within the "cup" of the "cup-like piston 40" when it

is at its lower position (light yellow in Fig. 6, above left), which the piston moves through when it is raised to its upper position (Fig. 7, above right).

114. **Element [1.2]:** Saari/Enstrom discloses “a guide body that is sized and shaped to receive a fastener that is to be driven.” Saari/Enstrom’s guide body (grey below) has a linear passageway for the driver (26/40, orange) and is sized and shaped to receive a fastener that is to be driven (“fastener member 72,” red). Enstrom, Fig. 2 (below left); Saari, Fig. 1 (below right).

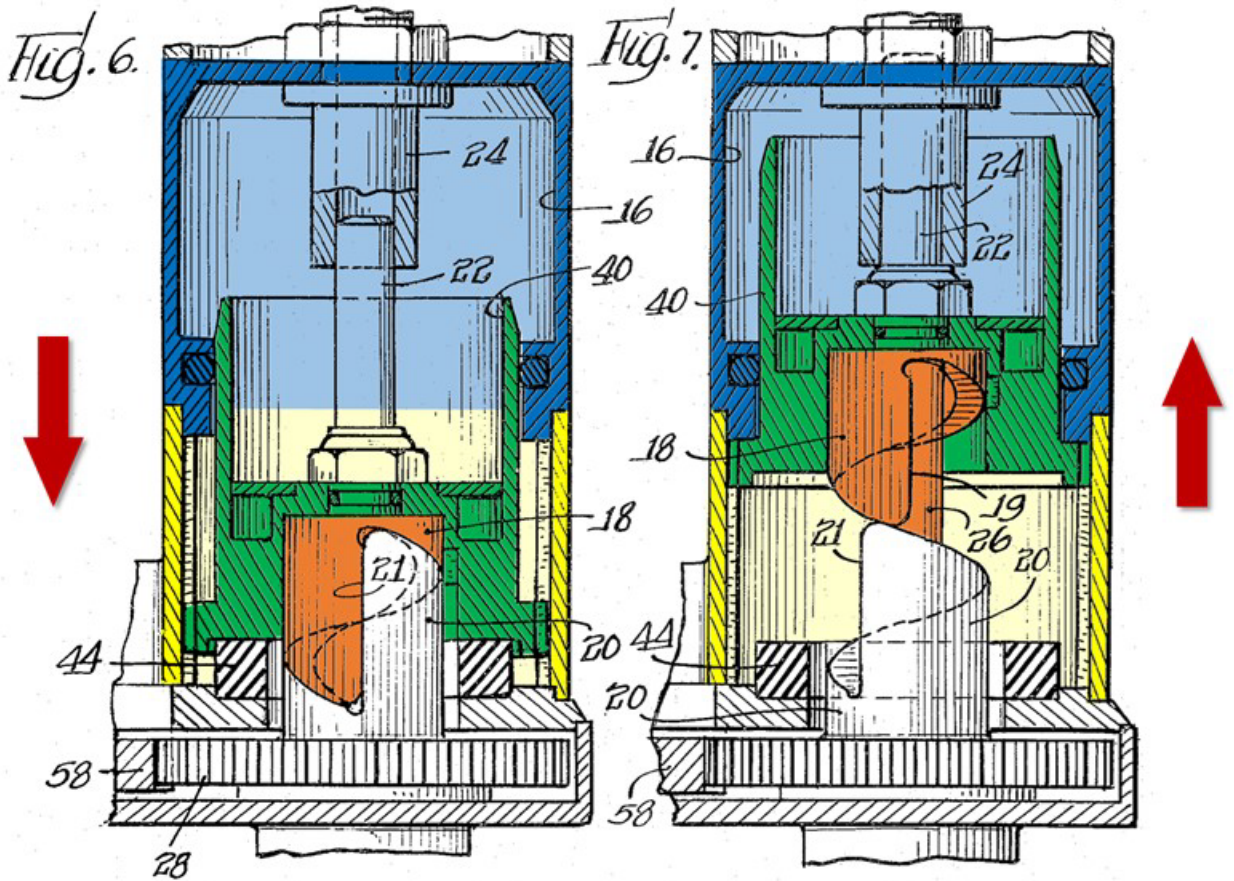


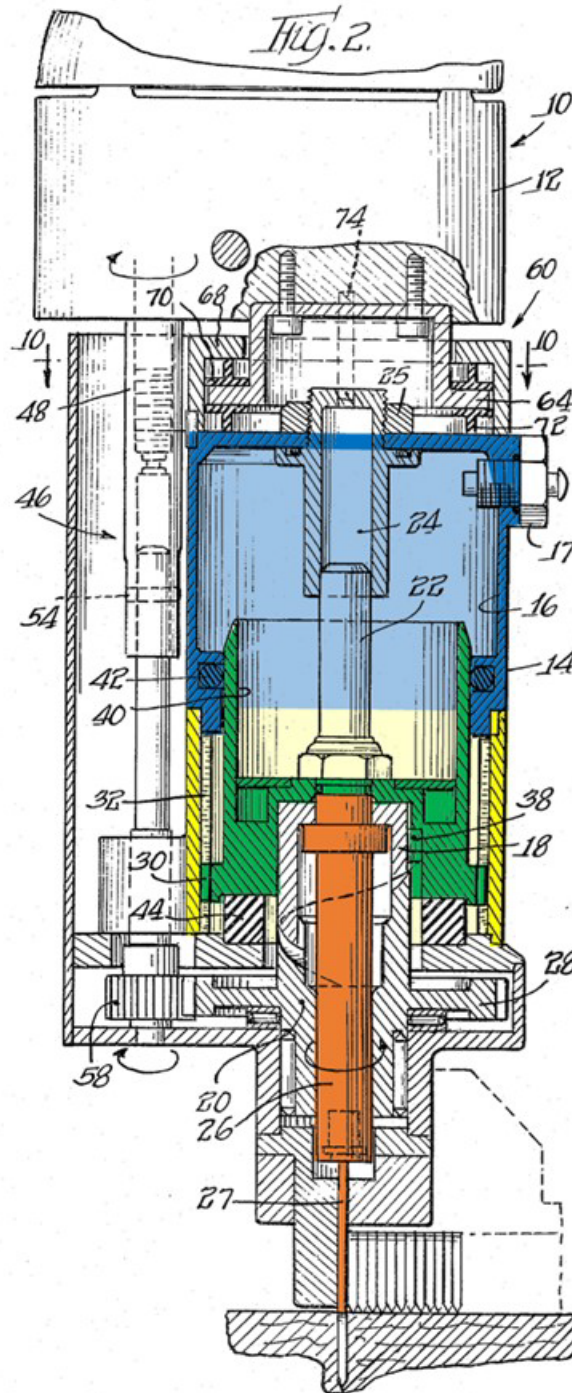
115. **Element [1.3]:** Saari/Enstrom discloses “a movable driver that is in communication with said piston, said movable driver being sized and shaped to push said fastener from said guide body.” Saari/Enstrom has a movable driver (“upper cam 18 and associated ram 26,” orange below) that is in communication with its piston (“cup-like piston 40,” green) and that is sized and shaped to push the fastener (red) from the guide body. Enstrom, 2:55–59, Figs. 2 (below) 6–7; *see also* Saari, 2:51–54, Figs. 1–2.



116. **Element [1.4]:** Saari/Enstrom discloses “a storage chamber that is in fluidic communication at all times with said displacement volume of the cylinder.”

Saari/Enstrom refers to its storage chamber, which contains pressurized gas, 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.





117. Saari/Enstrom's storage chamber and said displacement volume are "initially charged with a pressurized gas and remain above atmospheric pressure during all portions of an operating cycle, in which said pressurized gas is re-used for

more than one driving 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.

118. A POSITA would understand the disclosure of a sealed main storage chamber and a valve for “selectively charging the chamber” means that the chamber is both “initially 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 were allowed to reach atmospheric pressure. In a similar vein, a POSITA 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.

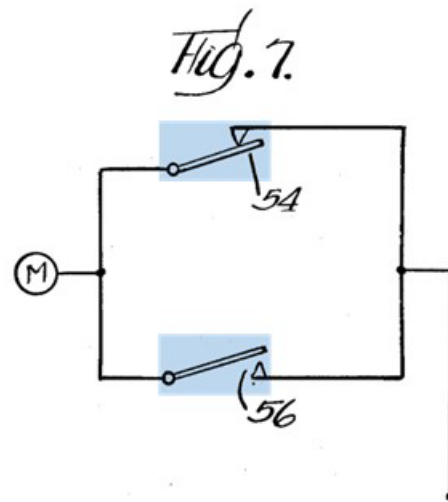
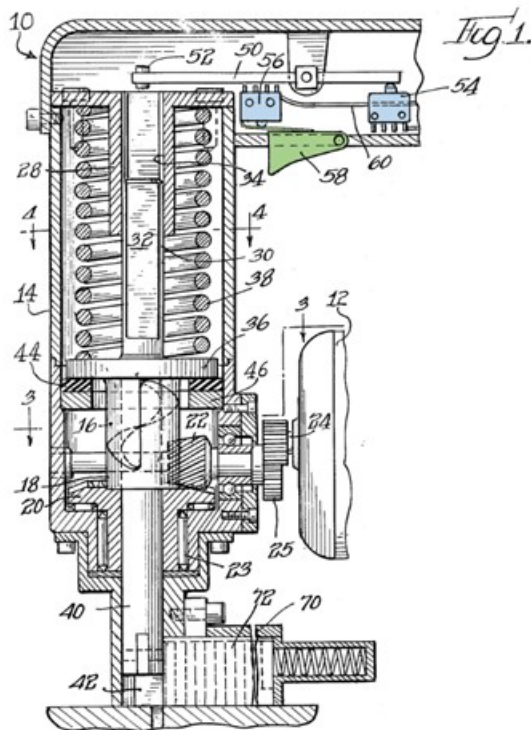
119. ***Element [1.5]***: The combination of Saari/Enstrom and Lai discloses “a lifter that, under first predetermined conditions, moves said movable driver toward

a ready position.” Saari/Entrom 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/Entrom’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. In my opinion, it was obvious at the filing of the ’954 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.

120. A POSITA at the filing of the ’954 patent would have been motivated to replace Saari/Enstrom’s helicoidal lifting mechanism with Lai’s lifter member. Saari/Entrom’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 ’954 patent, market forces and design needs favored a portable, battery-powered nailer. This is further supported by artisans who 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].

121. As I mentioned above, Lai discloses a battery-powered nailer and expressly touts that one of its benefits is 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 ’954 patent, a POSITA would have been motivated to replace 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.

122. In this combination, Lai’s lifter would “under first predetermined conditions, moves said movable driver toward a ready position.” Specifically, Saari/Entrom discloses a circuit that supplies power to the motor (“M” in Fig. 7) and receives input signals from (1) “switch 54” (below, light blue), which is opened by guide shaft 30 engaging pivot arm 50 when driving ram 40 is raised to its cocked position; and (2) “switch 56” (light blue), which is closed by actuation of trigger 58 (light green). Saari, 3:19–63, Fig. 1 (below), 7 (below), and 8–9.

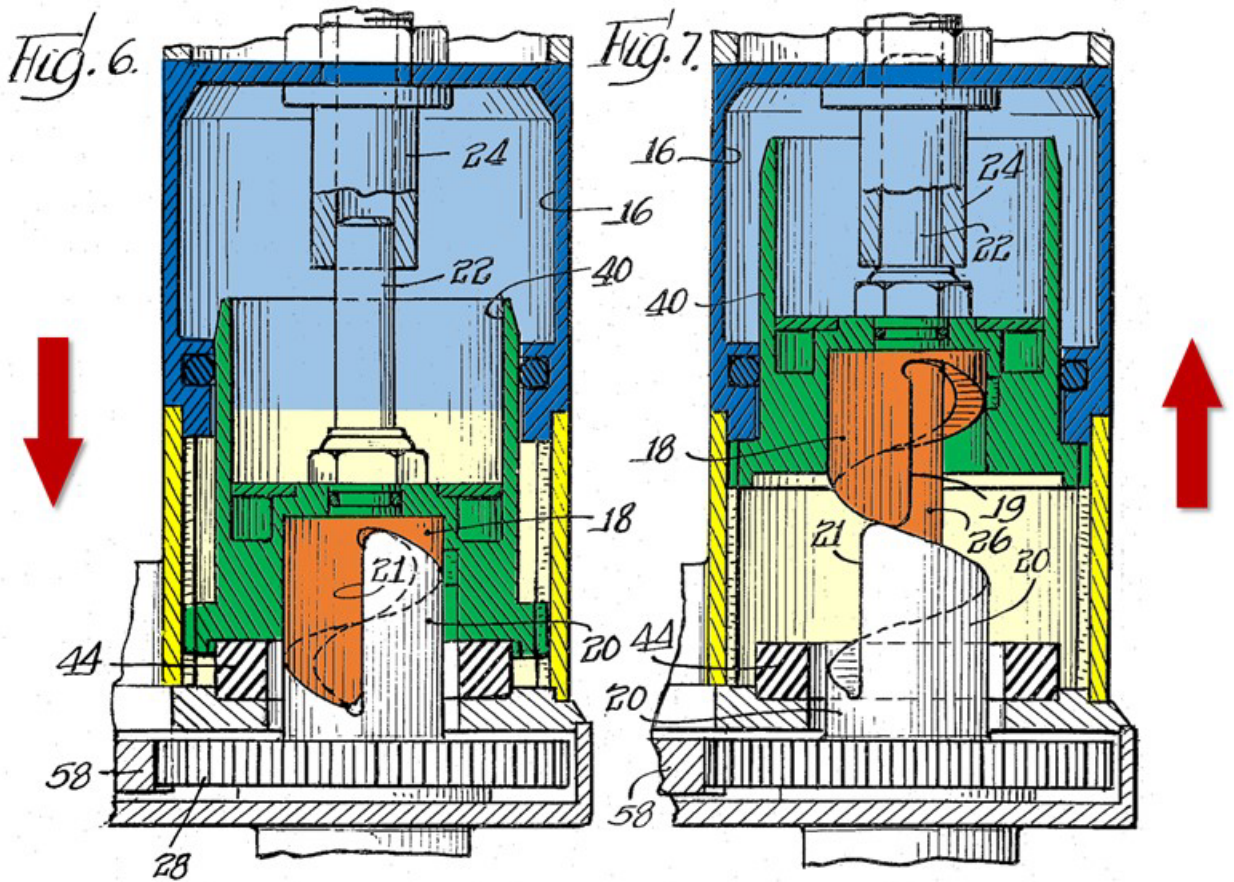


123. Thus, under first predetermined conditions—that is, with the driving ram 40 not yet raised to its cocked position and switch 54 therefore still closed—Saari/Enstrom’s circuit will provide power to the lifter to move the movable driver toward the ready position.

124. **Element [1.6]:** Saari/Enstrom discloses “wherein: said cylinder and piston act as a gas spring, under second predetermined conditions, to move said movable driver toward a driven position, using said pressurized gas of both said storage chamber and said displacement volume acting on said piston.” Under second predetermined conditions—that is, with switch 54 opened due to driving ram 40 being raised to its cocked position and switch 56 closed by actuation of trigger 58—Saari/Enstrom’s circuit will “start[] the motor to slightly rotate the lower cam 20

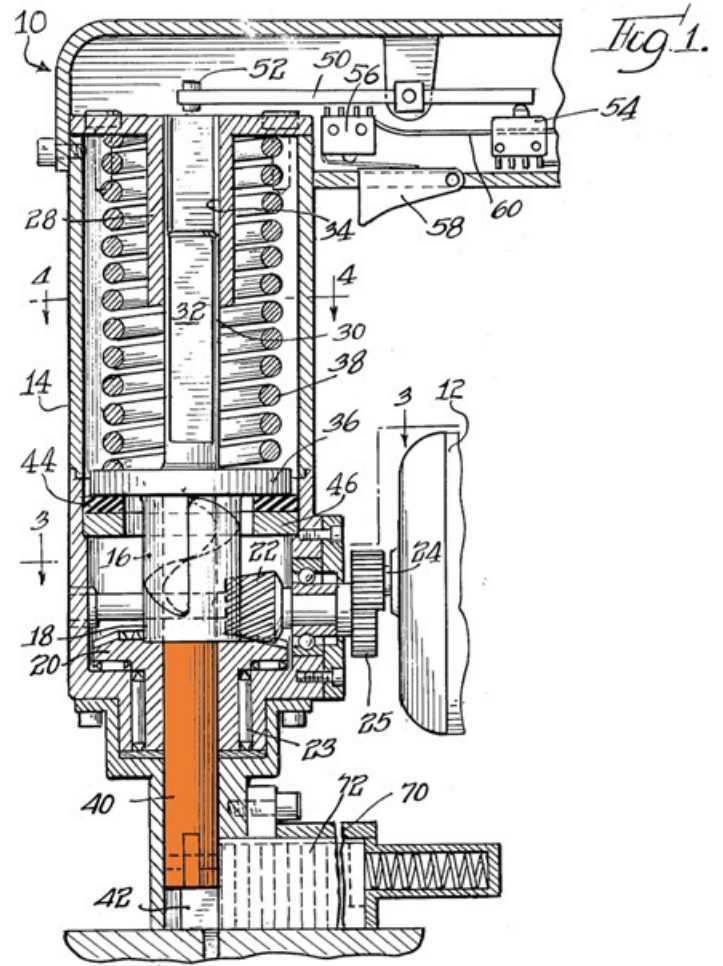
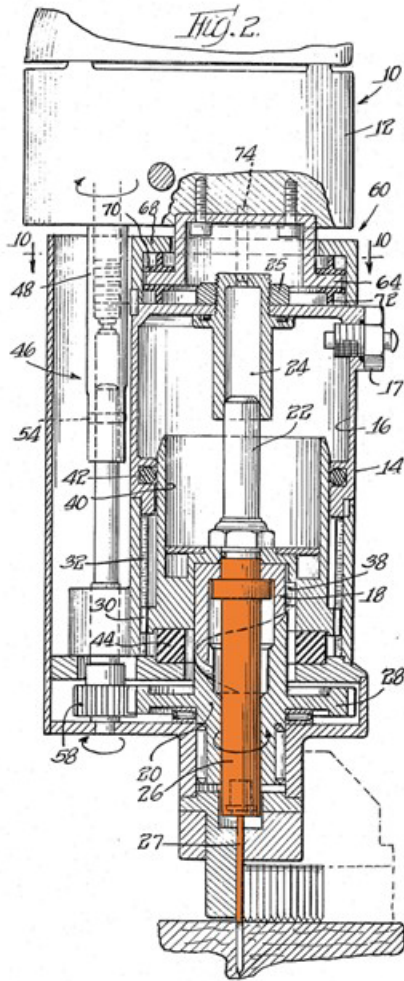
from the position shown in FIG. 2 until the drop-off portions of the cam are aligned.” Saari, 3:55–58, Fig. 9. Further rotation will then cause the driver member (“driving ram 40”) to “be driven forcefully downwardly” where it will “contact a fastener member 72 fed beneath the striker 42 on the extremity of the ram,” and thereby move the movable driver toward the driven position. Saari, 2:56–63.

125. In Saari/Enstrom, the cylinder (yellow below) and piston (“cup-like piston 40,” green) act as a gas spring during the drive stroke and the pressurized gas of both said storage chamber (blue) and the displacement volume (light yellow) act on the piston. 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.



B. Claim 2

126. The combination of Saari/Enstrom and Lai discloses “[t]he fastener driver of claim 1, wherein said movable driver comprises an elongated shape with at least one longitudinal edge, and having a plurality of protrusions that are located along said at least one longitudinal edge, said plurality of protrusions being spaced-apart from one another.” Saari/Enstrom’s movable driver (orange, below) has an elongated shape with at least one longitudinal edge. Enstrom, Fig. 2; Saari, Fig. 1.



127. In my opinion, it was obvious at the filing of the '954 patent that when replacing Saari/Enstrom's helicoidal lifting mechanism with the claimed "lifter" taught by Lai, a POSITA would modify Saari/Enstrom's driver to have protrusions so that they can be mechanically engaged by that lifter to move it through its return stroke. Specifically, as noted above, Lai teaches adding a "U-shaped member 61" with protrusions to the driver blade (as a modification to Lai's prior art of record 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 Saari/Enstrom's driver blade it could be lifted by Lai's lifter member and would have achieved the same results predicted by Lai. The particular "U-shaped member 61" that Lai teaches to add to the driver includes a plurality (two) of spaced-apart protrusions (blue, below) along a longitudinal edge. Lai, Fig. 3 (below). Thus, the combination made by a POSITA would result in a movable driver having an elongated shape and longitudinal edge, and with a plurality of protrusions located along the longitudinal edge and spaced-apart from one another.

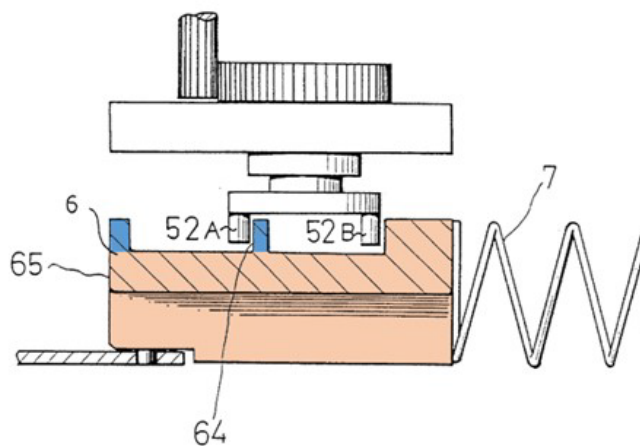


Fig. 3.

C. Claim 3

128. The combination of Saari/Enstrom and Lai discloses "[t]he fastener driver of claim 1, wherein said lifter comprises at least one disk that includes at least one extension that protrudes from its surface which, under first predetermined conditions, contacts said movable driver and forces said movable driver to move

toward its ready position, using a rotary-to-linear motion.” In the combination, the lifter taught by Lai includes a disk (“cam 5,” yellow below) with two extensions protruding from its surface (pins 52A and 52B, green), which moves the movable driver (orange) toward its ready position under first predetermined conditions (*see supra*, Element [1.5]). Lai, Fig. 3 (below), 2:13–21.

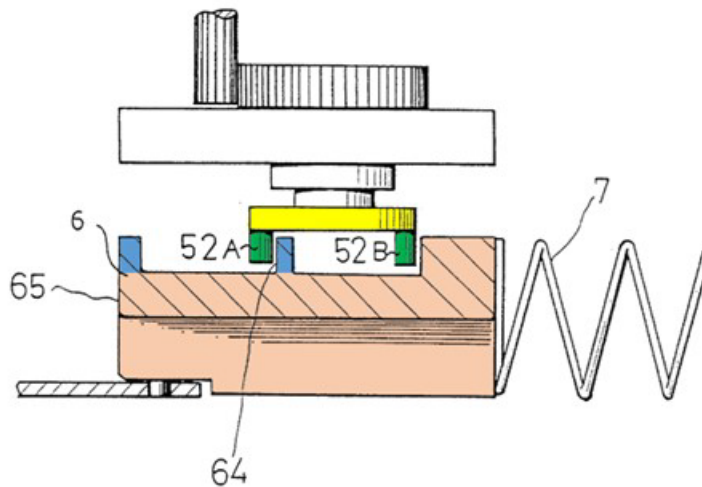


Fig. 3.

129. The lifter taught by Lai moves in rotational motion (curved arrows) to cause the driver (light orange) to move in a linear motion (straight arrow), thus using rotary-to-linear motion. Lai, Figs. 4A–D (below), 1:62–63, 2:14–25.

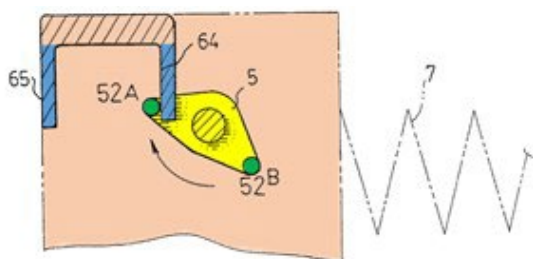


Fig. 4A.

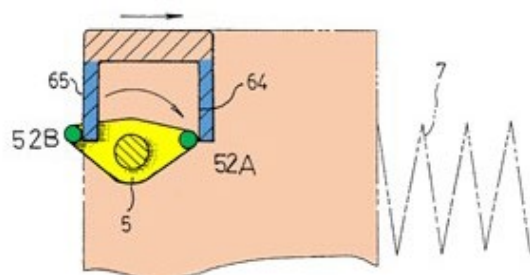


Fig. 4B.

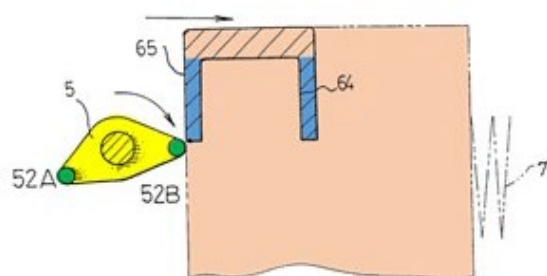


Fig. 4C.

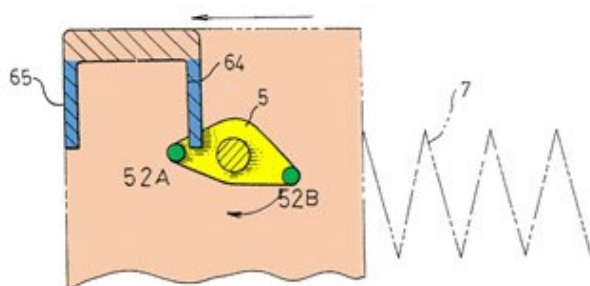


Fig. 4D.

D. Claim 4

130. *Element [4.1]*: Element 4.1 is identical to Element 2 and is met as described above.

131. *Element [4.2]*: The combination of Saari/Enstrom and Lai discloses “such that said at least one extension of said lifter fits in a space between said spaced-apart plurality of protrusions, and a rotating motion of said lifter causes said at least one extension of the lifter to engage said plurality of protrusions of the movable driver, thereby causing said movable driver to move in a substantially linear direction within a driver track of said guide body.” In the combination, the lifter taught by Lai includes extensions protruding from its surface (pins 52A and 52B, green below) that fit between the spaced-apart protrusions of the driver (blue below). Lai, Fig. 3 (below), 2:13–21.

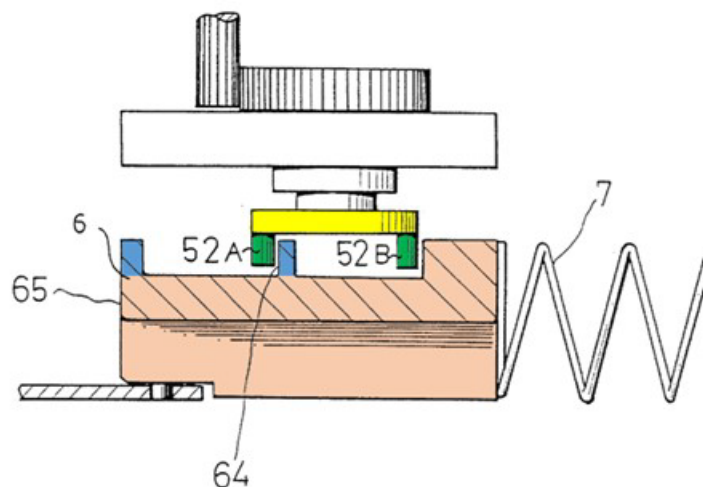


Fig. 3.

132. In the combination, the lifter is rotated (as shown by the curved arrows, below) such that its extensions (green) engage the protrusions on the driver (blue) to cause the driver (orange) to move in a linear direction (as shown by the straight arrow) within the driver track of the guide body. Lai, Figs. 4A–D (below), 1:62–63, 2:14–25.

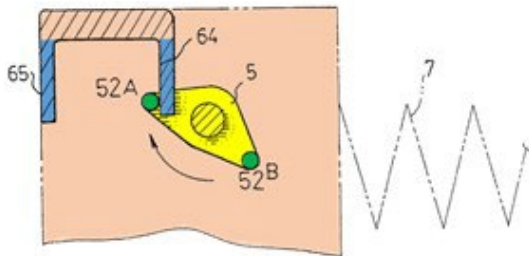


Fig. 4A.

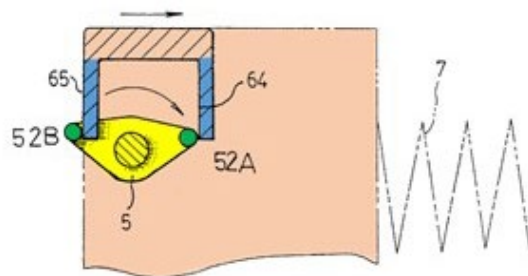


Fig. 4B.

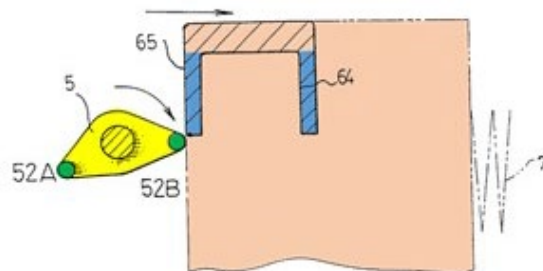


Fig. 4C.

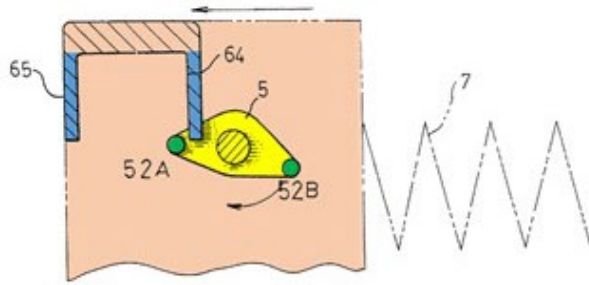
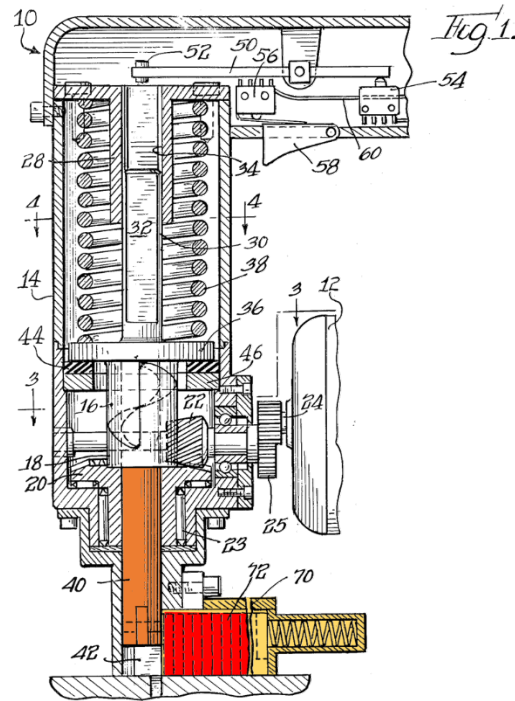
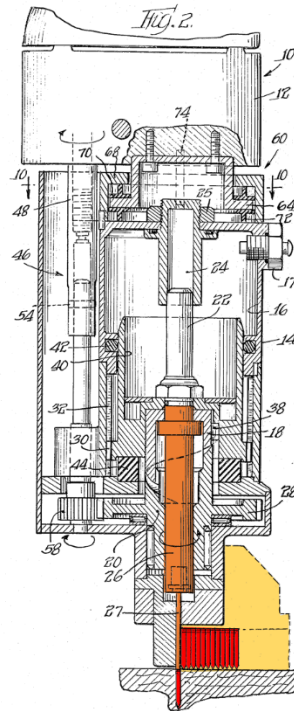


Fig. 4D.

E. Claim 5

133. Saari/Enstrom disclose “[t]he fastener driver of claim 4, further comprising: a magazine that contains a plurality of fasteners, said magazine providing a fastener at a receiving position of said driver track of the guide body so that, during a driving stroke, said movable driver moves toward said driven position, while pushing said fastener toward an exit portion of said driver track.” Saari/Enstrom’s magazine (70, light orange below) contains a plurality of fasteners (“fastener member 72,” red), and provides them at a receiving position of the driver track of the guide body so that they are pushed by the movable drive (orange) toward an exit portion and into the workpiece. Saari, Fig. 1, 2:61–63; Enstrom, Fig. 2.



F. Claim 6

134. Saari/Enstrom discloses “[t]he fastener driver of claim 1, wherein: said hollow cylinder is the sole pressurized cylinder of the fastener driver.” Saari/Enstrom’s hollow cylinder is the sole pressurized cylinder of the “fastener driving mechanism.” Saari, Fig. 10; Enstrom, Fig. 2.

G. Claim 7

135. In the event that claim 7’s contradiction with claim 1 is held to be a correctable error rather than rendering claim 7 indefinite (as I discuss above), then this element is disclosed by Saari/Enstrom as explained below.

136. Saari/Enstrom discloses “[t]he fastener driving tool of claim 1, wherein said fastener driver is designed to operate in a repeatable cycle of driving events, in

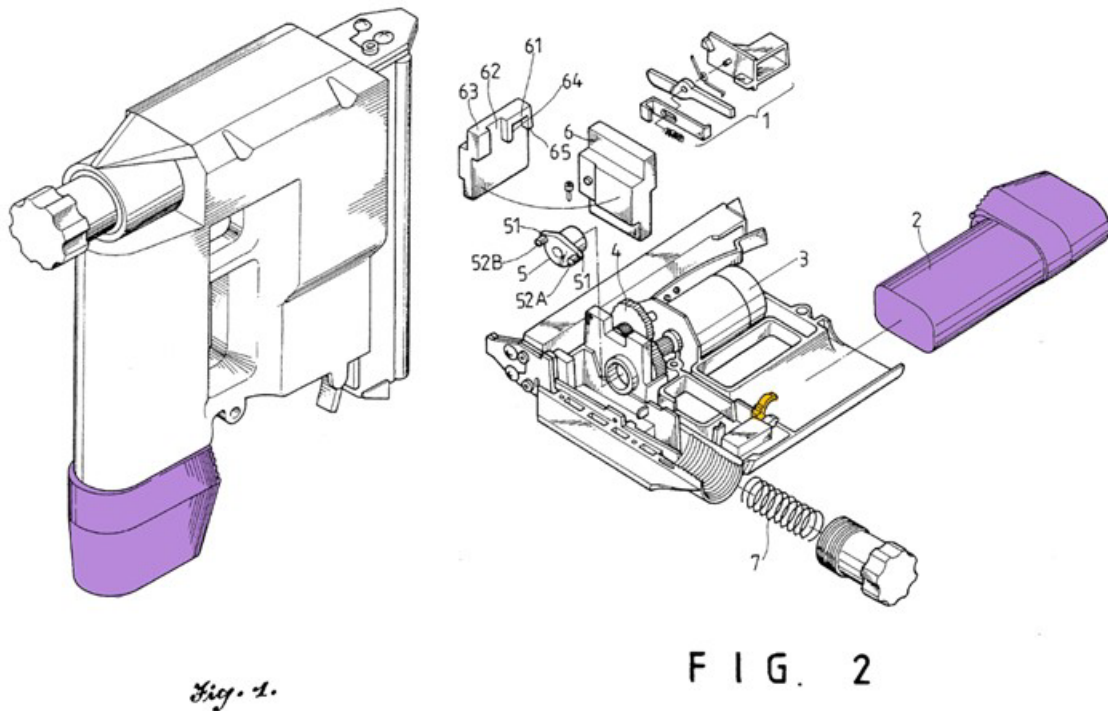
which each driving event includes: (a) a driving stroke under said first [second] predetermined conditions, which causes said movable driver to move toward said driven position, and (b) a return stroke under said second [first] predetermined conditions, which causes said movable driver to move toward said ready position.”

As discussed above in relation to claim 1, Saari/Enstrom discloses a circuit that connects the motor to the power supply, and thereby controls operation of the tool, based on inputs from signals switches 54 and 56, where the operation involves a repeatable drive cycle including (a) a return stroke under first predetermined conditions (with the driving ram 40 not yet raised to its cocked position and switch 54 therefore still closed) and (b) a drive stroke under second predetermined conditions (with switch 54 opened by due to driving ram 40 being raised to its cocked position and switch 56 closed by actuation of trigger 58). *See supra*, Elements 1.5 and 1.6.

H. Claim 8

137. *Elements [8.P]–[8.4], [8.6] and [8.9]*: Elements 8.P–8.2, 8.4, 8.6 and 8.9 are identical to Elements 1.P-1.2 and 1.4–1.6, respectively, and are met as described above. Element 8.3 differs from Element 1.3 only in that it recites a moveable driver that “moves with” the piston rather than being “in communication with” the piston. This element is met for the same reasons described above. *See supra*, Element 1.3.

138. **Element [8.5]:** The combination of Saari/Enstrom and Lai discloses “an on-board electrical energy source, with no external energy source attached to said fastener driving tool.” 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) and there is therefore no external energy source attached to the tool. Lai, Figs. 1–2 (below), Title, Abstract, 1:25–35, 1:44–54, 1:60–62, 2:2, Claim 1.

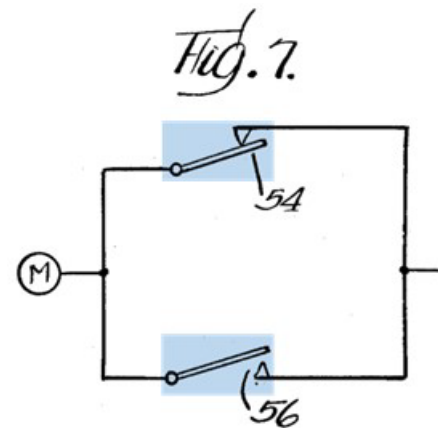
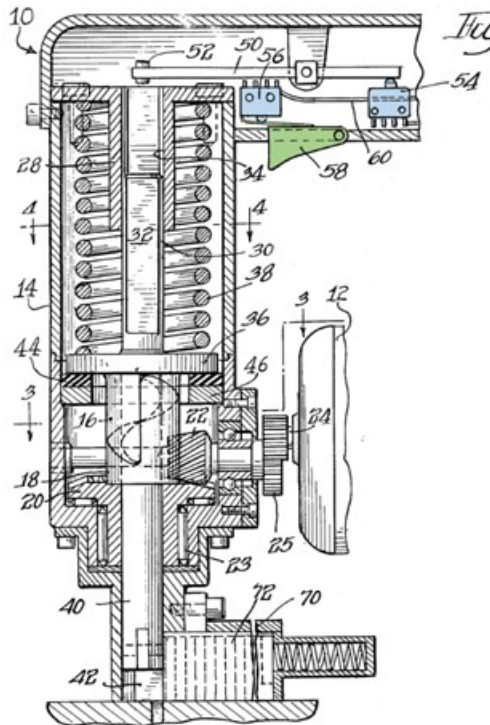


139. In particular, this combination is spurred on by the need for a portable, battery-powered nailer, and Lai both teaches and encourages its energy-efficient and compact lifting mechanism powered by its portable battery pack. *See supra*, Element 1.5. Accordingly, in this combination, Saari/Enstrom’s electrical cable is

replaced with Lai's portable battery (Lai's battery 2), and there would be no external energy source.

140. ***Element [8.7]***: The combination of Saari/Enstrom and Lai discloses “a prime mover that is powered by said on-board electrical energy source, said prime mover causing said lifter to move, under first predetermined conditions.” In the combination, Lai's lifter is moved by a prime mover (“motor 3”), which is powered by the on-board electrical energy source (Lai's battery 2). Lai, Figs. 1–2 (above), Title, Abstract, 1:25–35, 1:44–54, 1:60–62, 2:2, 2:14–16, Claim 1.

141. In the combination, Saari/Enstrom's circuit would control the connection between Lai's prime mover (“motor 3”) and its on-board electrical energy source (Lai's battery 2) according to input signals from switches 54 and 56 (below in light blue). Saari, 3:19–63, Fig. 1 (below), 7 (below), and 8–9.



142.

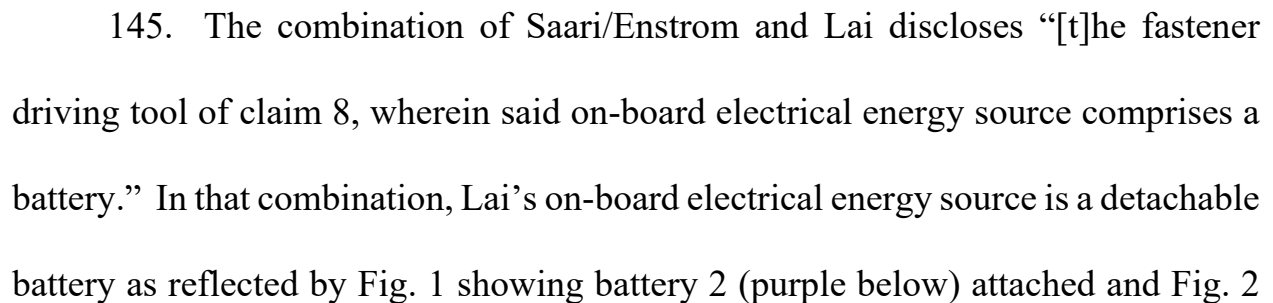
143. Saari/Enstrom's circuit is closed, and thus supplying power from the battery to the motor and causing the lifter to move, under the "first predetermined conditions," where the driving ram 40 is not yet raised to its cocked position and switch 54 is therefore still closed. Saari, 3:19–46, Fig. 7.

144. **Element [8.8]:** The combination of Saari/Enstrom and Lai discloses "a housing that holds said hollow cylinder, guide body, movable driver, storage chamber, on-board electrical energy source, lifter, and prime mover as a single, portable hand-operable tool." Saari/Enstrom's housing ("housing 40") is shown below in green. Saari, Fig. 1; Enstrom, Fig. 1 (below left). Saari/Enstrom's housing holds, as a single, portable hand-operable tool, its hollow cylinder (yellow), guide body (grey), movable driver (orange), and storage chamber (blue). Enstrom, Fig. 1

145. The combination of Saari/Enstrom and Lai discloses “[t]he fastener driving tool of claim 8, wherein said on-board electrical energy source comprises a battery.” In that combination, Lai’s on-board electrical energy source is a detachable battery as reflected by Fig. 1 showing battery 2 (purple below) attached and Fig. 2

145. The combination of Saari/Enstrom and Lai discloses “[t]he fastener
g tool of claim 8, wherein said on-board electrical energy source comprises a
y.” In that combination, Lai’s on-board electrical energy source is a detachable
y as reflected by Fig. 1 showing battery 2 (purple below) attached and Fig. 2

145. The combination of Saari/Enstrom and Lai discloses “[t]he fastener driving tool of claim 8, wherein said on-board electrical energy source comprises a battery.” In that combination, Lai’s on-board electrical energy source 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).

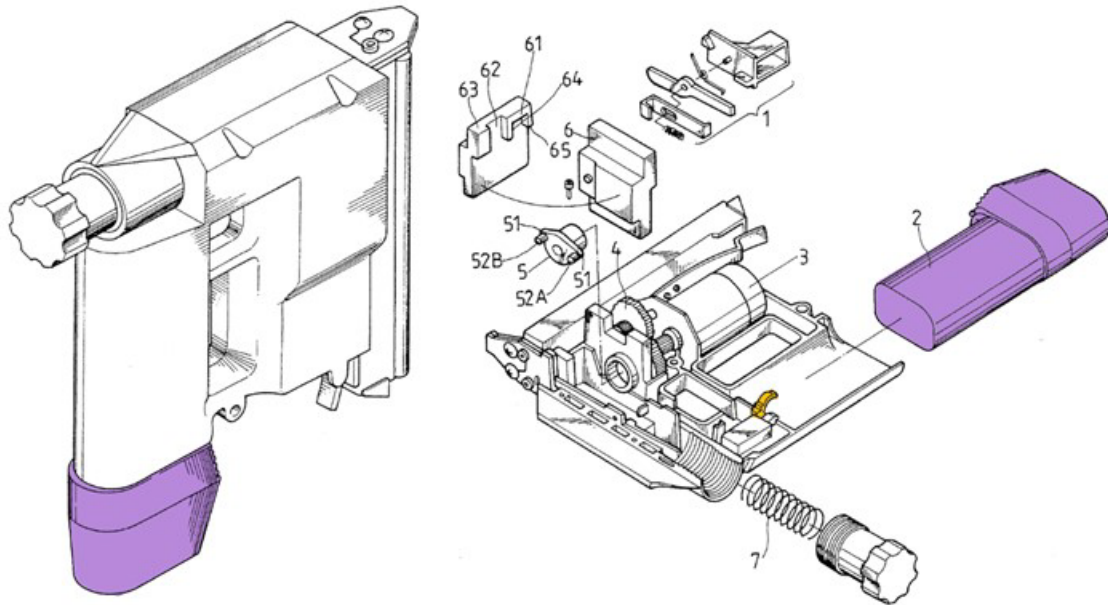


Fig. 1.

F I G . 2

J. Claim 10

146. The combination of Saari/Enstrom and Lai discloses “[t]he fastener driving tool of claim 8, wherein said prime mover comprises an electric motor.”

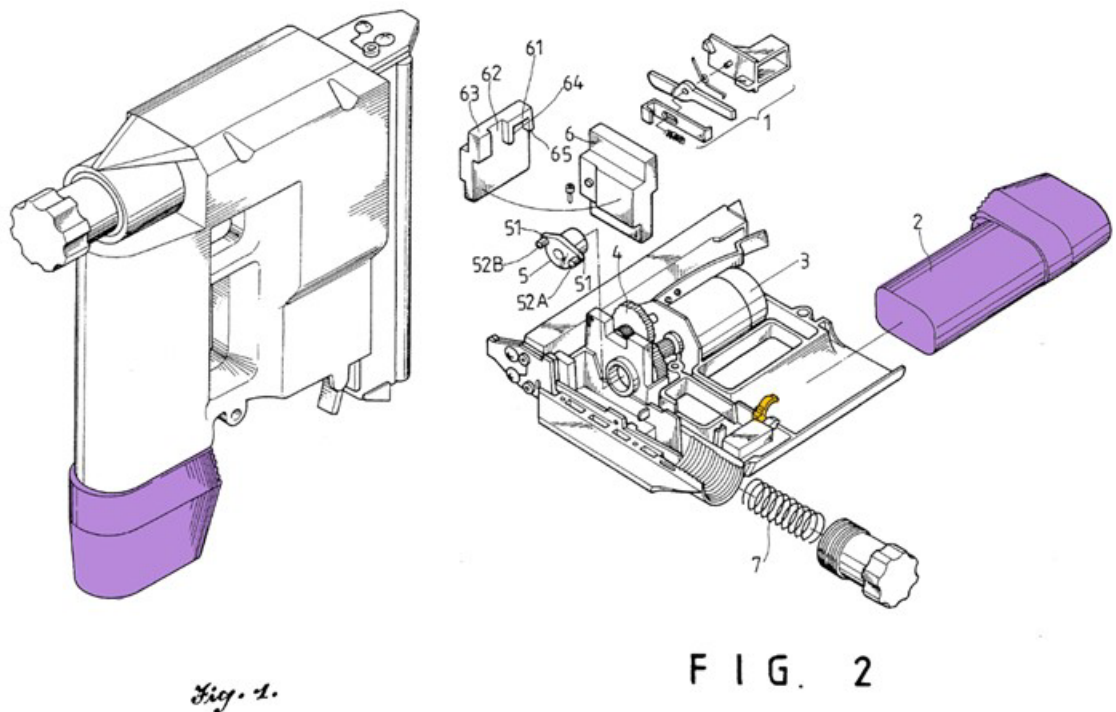
Lai’s prime mover (“motor 3”) is powered by an electrical power source (battery 2) and thus is an electric motor. Lai, 1:25–35, 1:44–54, 1:60–62, 2:2, Claim 1.

K. Claim 11

147. Claim 11 is identical to Claim 7 and is met as described above.

L. Claim 12

148. The combination of Saari/Enstrom and Lai discloses “[t]he fastener driving tool of claim 8: wherein said prime mover is powered by an electrical power supply that is carried on said tool.” In that combination, Lai’s on-board electrical energy source that powers the prime mover is an electrical battery carried on the tool 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).



M. Claims 13–17

149. Claims 13–17 are identical to Claims 2–6, respectively, and are met as described above.

N. Claim 18

150. *Elements [18.P]–[18.4] and [18.6]*: Elements 18.P–18.4 and 18.6 are identical to Elements 1.P-1.4 and 1.6, respectively, and are met as described above.

151. *Element [18.5]*: Element 18.5 differs from Element 1.5 only in that it recites a “rotating lifter” rather than a “lifter” and further states that it moves the driver “using a rotary-to-linear motion.” This element is met for the same reasons described above. *See supra*, Element 1.5.

152. As discussed above in relation to claim 3, in the combination of Saari/Enstrom and Lai, the lifter taught by Lai includes a rotating disk (“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), thus using rotary-to-linear motion. Lai, Figs. 4A–D (below), 1:62–63, 2:14–25.

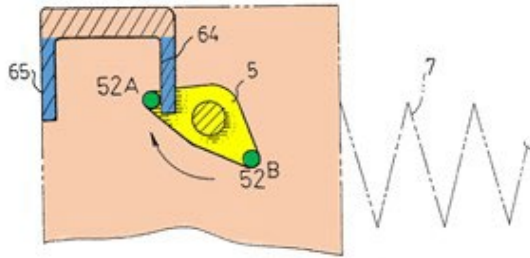


Fig. 4A.

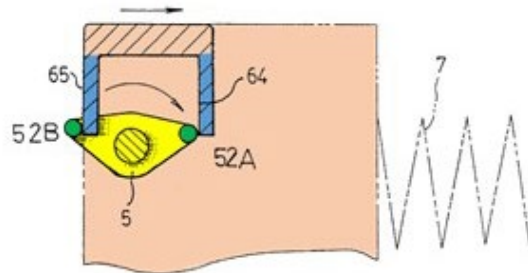


Fig. 4B.

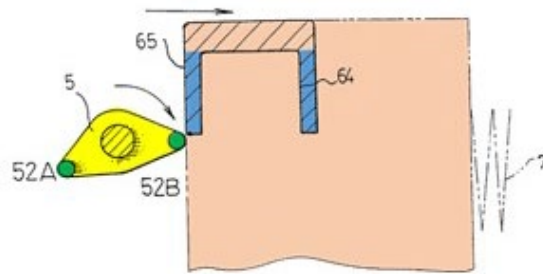


Fig. 4C.

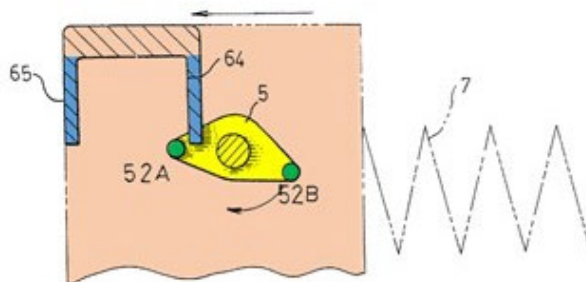


Fig. 4D.

O. Claims 19–20

153. Claim 19 is identical to Claim 2 and is met as described above. Claim 20 is nearly identical to Claim 3, but for the different antecedent to the “rotating lifter” rather than “lifter” and is met as described above.

VII. CLAIMS 1–20 ARE OBVIOUS BASED ON KONDO

A. Claim 1

154. *Element [1.P]*: U.S. Patent No. 5,720,423 (“Kondo”) discloses “[a] fastener driver adapted for use in a fastener driving tool.” Kondo “provide[s] a fastener driving tool which is operable to drive fasteners,” Kondo, 1:48–49.

155. *Element [1.1]*: Kondo discloses “a hollow cylinder having a movable piston therewithin, said hollow cylinder containing a displacement volume created by a stroke of said 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 and 2 (below).

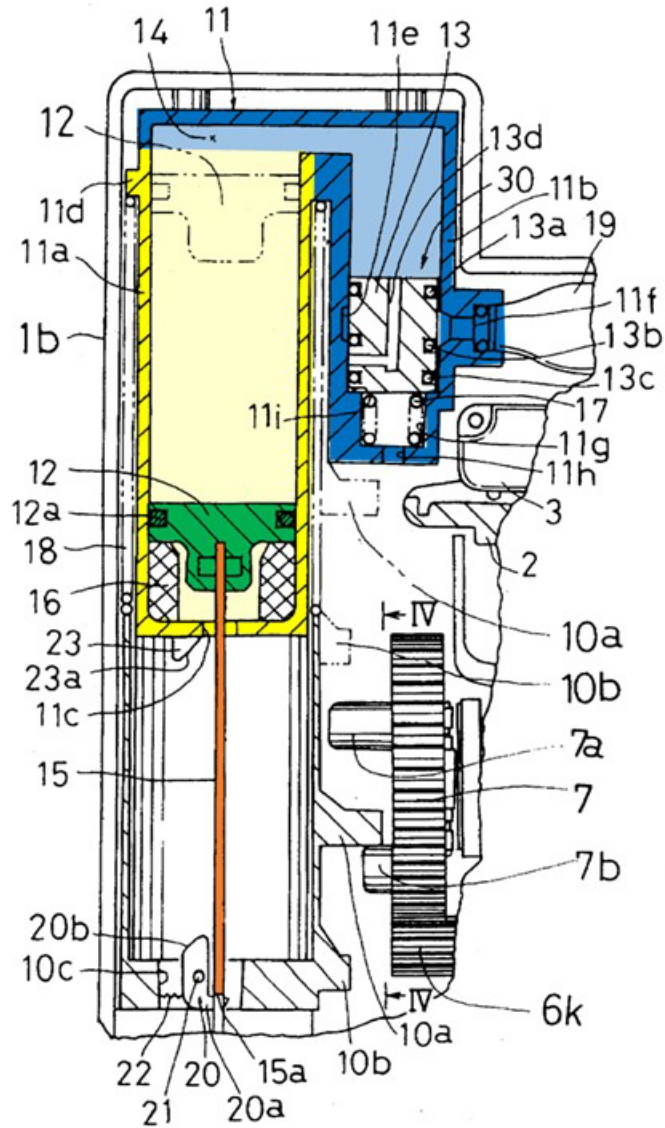
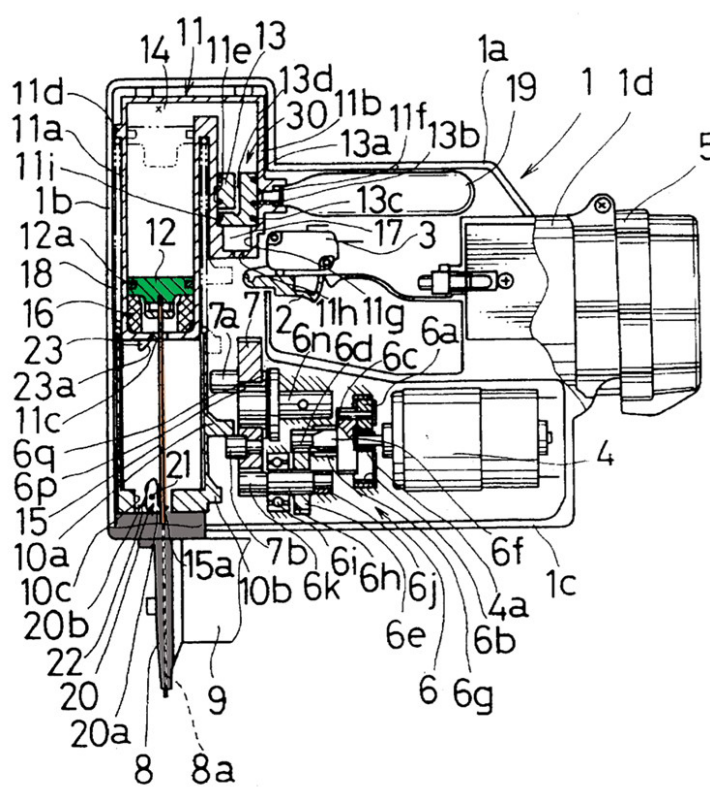


FIG. 2

156. The hollow cylinder has a displacement volume created by the stroke of the drive piston, which is indicated by the dashed-line illustration of the drive piston 12 at its raised position shown in Figures 1 and 2. Kondo, Figs. 1 and 2 (above).

157. **Element [1.2]:** Kondo discloses “a guide body that is sized and shaped to receive a fastener that is to be driven.” Kondo discloses a guide body (“driver guide 8,” grey below) with a linear passageway (“guide hole 8a”) for the driver (“driver 15,” orange) and that is sized and shaped to receive a fastener (nails from “nail magazine 9”). Kondo, 5:7–11, 5:15–23; Figs. 1–2 (below).



shaped to push a fastener from the guide body. Kondo, 4:66–67, 5:19–23, Figs. 1, 2 (below).

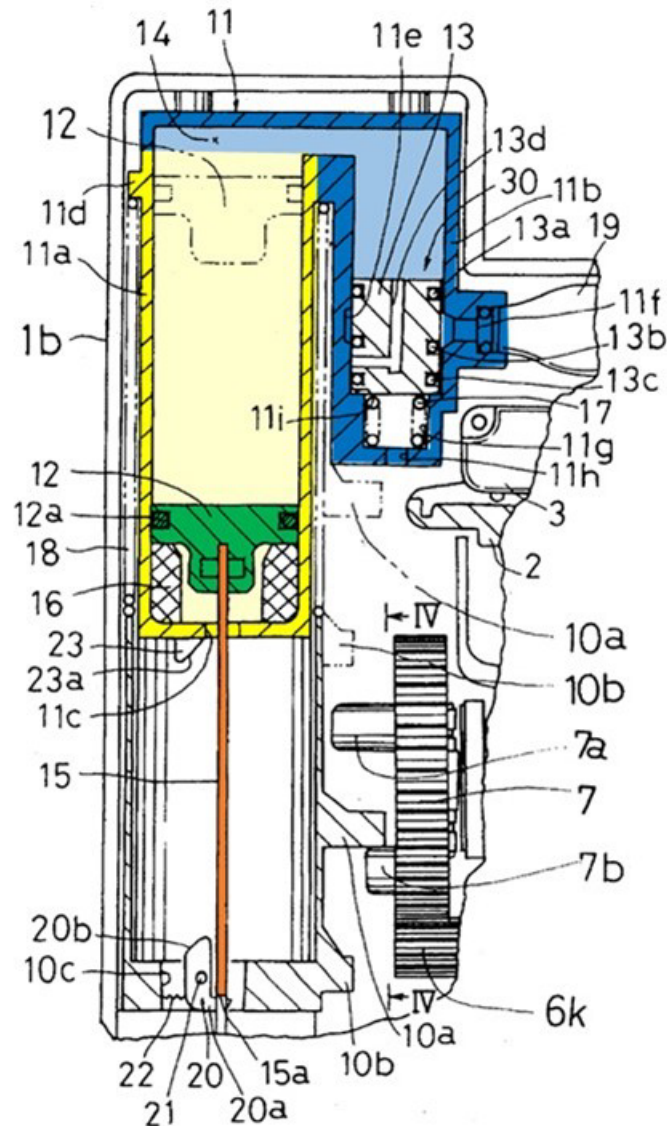


FIG. 2

159. *Element [1.4]*: Kondo discloses “a storage chamber that is in fluidic communication at all times with said displacement volume of the 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).

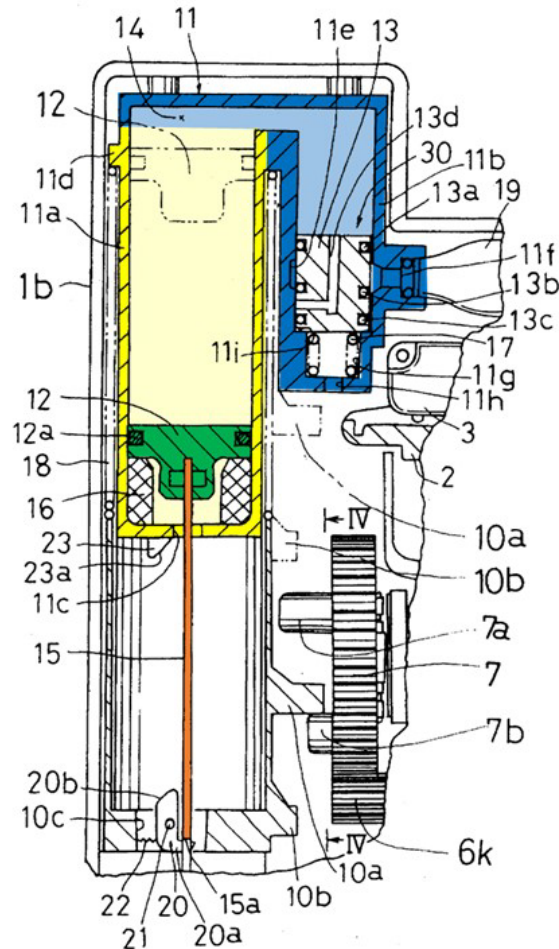


FIG. 2

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

Kondo, 4:35–40. In my opinion, 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.

161. Kondo’s main storage chamber is “initially charged with a pressurized gas and remain above atmospheric pressure during all portions of an operating cycle, in which said pressurized gas is re-used for more than one driving cycle.” The design of the “auxiliary piston 13” shows that Kondo’s main storage chamber is both initially charged and remains above atmospheric pressure during all portions of the 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.” This will be, definition, higher than atmospheric pressure alone. 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.

162. **Element [1.5]:** Kondo discloses “a lifter that, under first predetermined conditions, moves said movable driver toward a ready position.” Kondo discloses an electrically-powered, mechanical lifting mechanism with a structure that is nearly identical (with only insignificant differences) to that of the “lifter member” disclosed by the ’954 patent. *Compare* ’954 patent, Fig. 12 with Kondo, Figs. 1–3 and 4A–E. In particular, the “lifter member” of the ’954 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). ’954 patent, 9:25–41, 16:32–46, Fig. 12. The ’954 patent also discloses two-pin variants: lifter members 465 and 480 in Figs. 31 and 33. ’954 patent, 32:12–27, 32:45–60. 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.¹

'954 Patent Lifter Member	Kondo Lifter Member
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¹ 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.

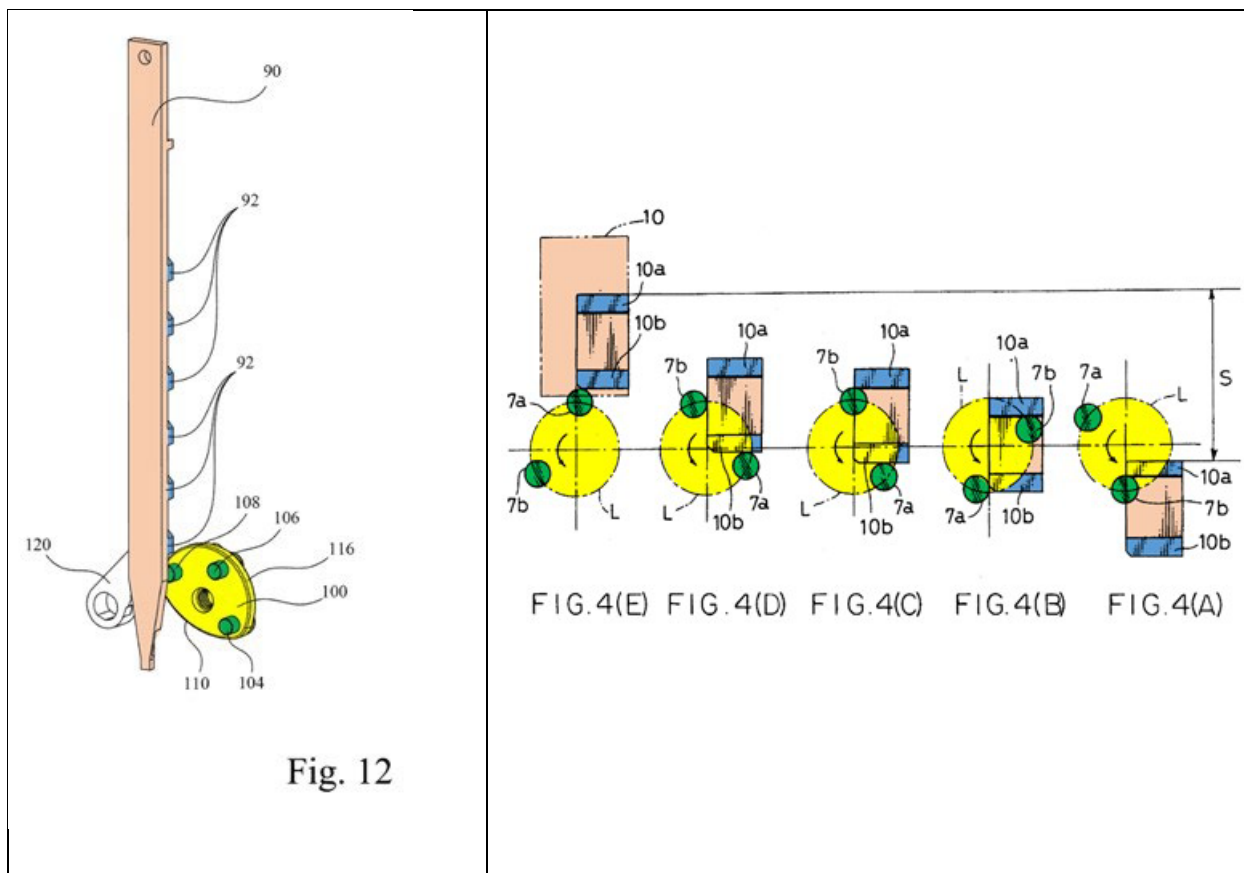


Fig. 12

163. Kondo differs slightly from the '954 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 '954 patent and the intermediate member simply channels the lifting force from that lifter member to the driver blade 15.

164. Kondo discloses an electrical circuit that by which "battery 5, the microswitch 3 and the motor 4 are connected to each other." Kondo, 2:65-67. The

microswitch 3 is turned on by operation of the trigger 2. Kondo, 2:57–61. Accordingly, “[w]hen the operator pulls the trigger 2 to start the motor 4, the actuation device 6 is actuated, so that the intermediate member 10 is moved upwardly as the drive gear 7 is rotated” and “[t]he driver 15 is moved upwardly together with the intermediate member 10 by means of the engaging member 20, so that the drive piston 12 moves upwardly within the main body 11a of the cylinder 11.” Kondo, 6:63–7:2. Thus, under first predetermined conditions—that is, with the trigger actuated and the driver not yet raised to its upper dead center position—Kondo’s circuit will provide power to the lifter to move the movable driver toward the ready position.

165. *Element [1.6]*: Kondo discloses “wherein: said cylinder and piston act as a gas spring, under second predetermined conditions, to move said movable driver toward a driven position, using said pressurized gas of both said storage chamber and said displacement volume acting on said piston.” Kondo explains that, “[w]hen the crankpin 7a of the drive gear 7 reaches its upper dead center (State (E) in F.G. 4), the intermediate member 10 as well as the drive piston 12 reaches its uppermost position (indicated by chain lines in FIG. 2), so that the air within the air chamber 14 is compressed to a predetermined pressure.” Kondo, 7:6–11. As that point, “the engaging member 20 is pivoted against the biasing force of the spring 22 to disengage its claws 2a from the driver 15” and “the drive piston 12 is moved

downwardly by the pressure of the compressed air within the air chamber 14, so that the driver 15 is moved downwardly to drive the nail supplied to the driver guide 8 so as to eject the nail from the lower end of the driver guide 8.” Kondo, 7:14–25. Thus, under second predetermined conditions—that is, when the driver and driver gear are in “State (E)” and the air chamber reaches the “predetermined pressure”—the pressurized gas of the storage chamber (“air chamber 14”) and the cylinder (“cylinder 11”) will act on the piston (“drive piston 12”) to form a gas spring to move the movable driver toward a driven position and thus 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.

166. 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”) act on the piston (“drive piston 12”). Kondo, 4:58–62, 7, 20–26, Figs. 1 and 2 (below).

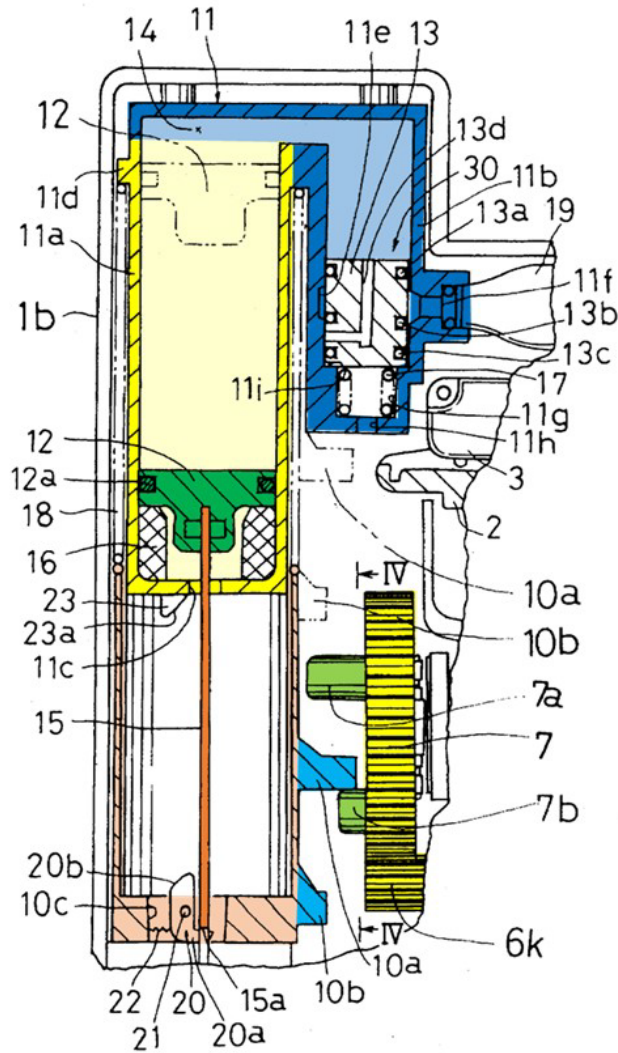


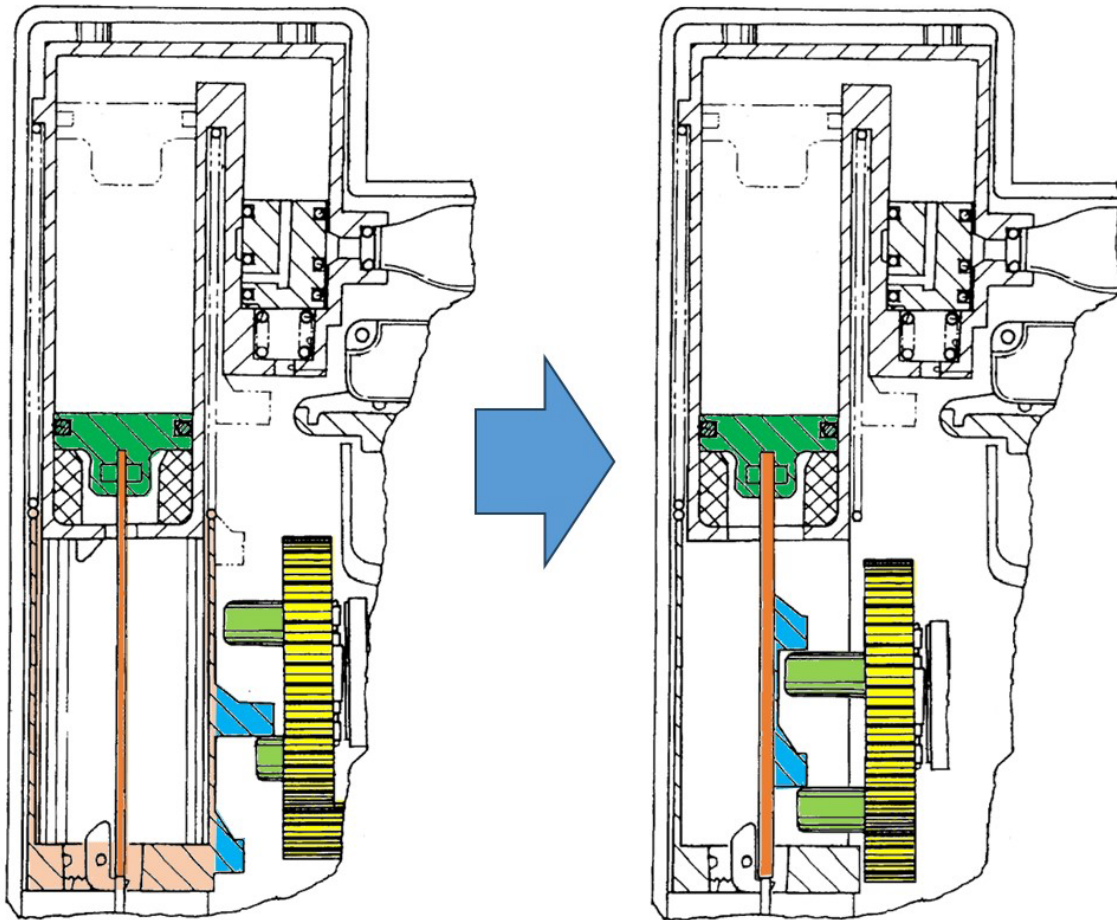
FIG.2

168. As I noted above, Kondo's movable driver 15 is lifted via spaced-apart protrusions 10a and 10b (light blue) on intermediate member 10 (light orange), Kondo, 3:39-52, Figs. 2, 4A-4E, and thus does not literally disclose "having a plurality of protrusions that are located along said at least one longitudinal edge, said plurality of protrusions being spaced-apart from one another." However, it would have been obvious to a POSITA to modify Kondo to have protrusions 10a and 10b

be located along a longitudinal edge of the driver 15. Indeed, 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 a simple design choice as to whether or not to have the protrusions be 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 protrusions be located along a longitudinal edge of 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.

169. 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

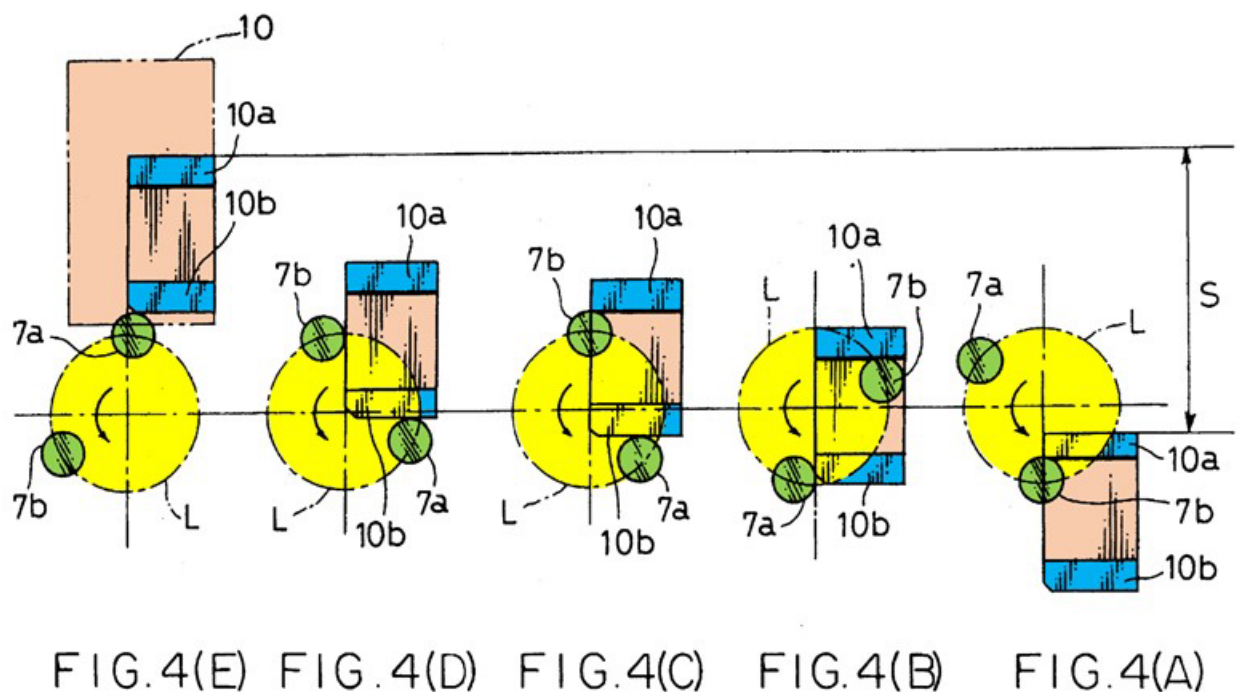
technologies improved, higher powered nailers were made possible, thereby leading to this obvious design.



C. Claim 3

170. Kondo discloses “[t]he fastener driver of claim 1, wherein said lifter comprises at least one disk that includes at least one extension that protrudes from its surface which, under first predetermined conditions, contacts said movable driver and forces said movable driver to move toward its ready position, using a rotary-to-

linear motion.” Kondo’s lifter includes a disk (“drive gear,” yellow below) with two extensions protruding from its surface (“crank pins 7a and 7b,” green), which moves the movable driver (via “intermediate member 10,” light orange) toward its ready position under first predetermined conditions (*see supra*, Element [1.5]). Kondo, 3:1–4:32, Figs. 1–3 and 4A–E.



171. The lifter taught by Kondo moves in rotational motion (curved arrows) to cause the driver (via intermediate member 10, light orange) to move in a linear motion (straight arrow), thus using rotary-to-linear motion. Kondo, Figs. 4A–E (above), 3:57–67.

D. Claim 4

172. *Element [4.1]*: Element 4.1 is identical to Element 2 and is met as described above.

173. *Element [4.2]*: The obvious modification of Kondo discussed above with respect to claim 2 where the protrusions 10a and 10b are located on the driver 15, discloses “such that said at least one extension of said lifter fits in a space between said spaced-apart plurality of protrusions, and a rotating motion of said lifter causes said at least one extension of the lifter to engage said plurality of protrusions of the movable driver, thereby causing said movable driver to move in a substantially linear direction within a driver track of said guide body.” Kondo’s lifter includes extensions protruding from its surface (“crank pins 7a and 7b,” light green below), that fit between the spaced-apart protrusions (“protrusions 10a and 10b,” light blue). Kondo, Figs. 2 and 4A–E (below), 3:41–57.

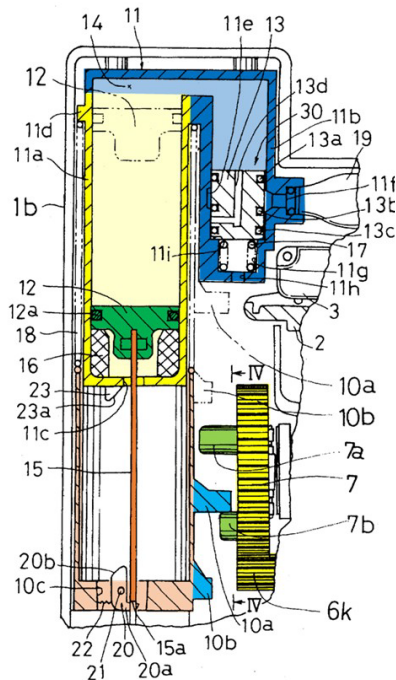


FIG.

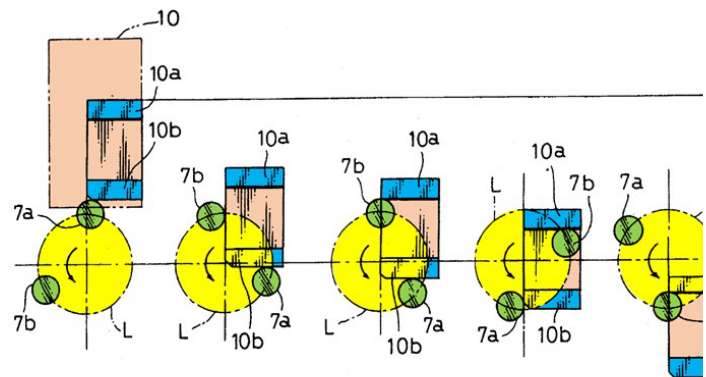


FIG. 4(E) FIG. 4(D) FIG. 4(C) FIG. 4(B) FIG. 4(A)

174. Kondo's lifter is rotated (as shown by the curved arrows in Figs. 4A–E, above) such that its extensions (light green) engage the protrusions on the driver (light blue) to cause the driver (orange) to move in a linear direction (as shown by the straight arrow) within the driver track of the guide body. Kondo, Figs. 2 and 4A–E (above), 3:41–57.

E. Claim 5

175. Kondo discloses “[t]he fastener driver of claim 4, further comprising: a magazine that contains a plurality of fasteners, said magazine providing a fastener at a receiving position of said driver track of the guide body so that, during a driving stroke, said movable driver moves toward said driven position, while pushing said fastener toward an exit portion of said driver track.” Kondo's magazine (“nail

magazine 9," light orange below) contains a plurality of fasteners ("a nail stick consisting of a series of nails bonded to each other"), and provides them at a receiving position of the driver track of the guide body (grey) so that they are pushed by the movable driver (orange) toward an exit portion and into the workpiece. Kondo, Fig. 1 (below), 5:15–23.

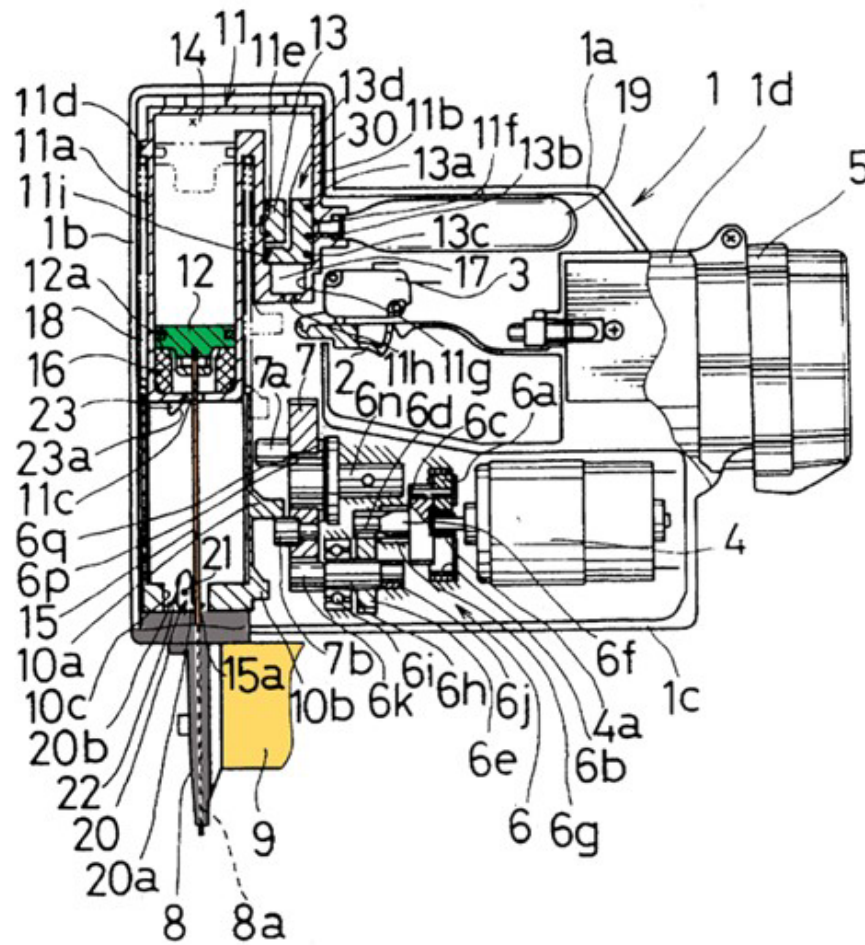


FIG.1

F. Claim 6

176. Kondo discloses an “air replenishing tank 19” that is used to replenish gas by way of an “air replenishing piston 13 disposed within the auxiliary cylinder portion 11b,” Kondo, 4:50–51, and thus does not expressly meet the requirement of “[t]he fastener driver of claim 1, wherein: said hollow cylinder is the sole pressurized cylinder of the fastener driver.” However, it would have been obvious at the filing of the ’954 patent to omit Kondo’s gas replenishment system and therefore satisfy this claim limitation.

177. 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. 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.

178. 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. A POSITA would in fact have been motivated at the filing of the ’954 patent to not include Kondo’s gas

replenishment system due to market and design pressures favoring compact, lightweight, and less expensive tools. See *e.g.*, Lai, 1:9–10 (“As we know, the ideal electric stapling gun should be energy saving, strong in hitting force and compact in size.”). With Kondo’s gas replenishment system not included, the “cylindrical main body 11a” would be the sole pressurized cylinder of the fastener driving mechanism. Accordingly, this claim limitation is rendered obvious by Kondo alone.

G. Claim 7

179. In the event that claim 7’s contradiction with claim 1 is held to be a correctable error rather than rendering claim 7 indefinite then this element is disclosed by Kondo. Kondo discloses “[t]he fastener driving tool of claim 1, wherein said fastener driver is designed to operate in a repeatable cycle of driving events, in which each driving event includes: (a) a driving stroke under said first [second] predetermined conditions, which causes said movable driver to move toward said driven position, and (b) a return stroke under said second [first] predetermined conditions, which causes said movable driver to move toward said ready position.”

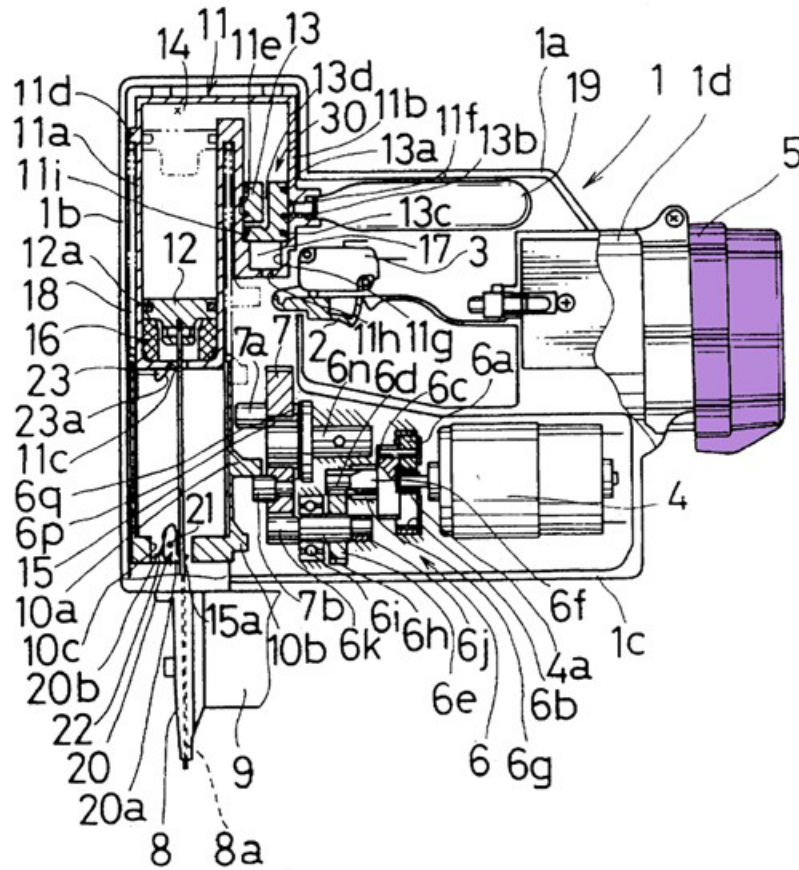
180. As discussed above in relation to claim 1, Kondo discloses an electrical circuit by which “battery 5, the microswitch 3 and the motor 4 are connected to each other.” Kondo, 2:65–67; *see supra*, Element 1.5. Thus, Kondo’s operation involves a repeatable drive cycle including (a) a return stroke under first predetermined conditions (with the trigger actuated and the driver not yet raised to its upper dead

center position) and (b) a drive stroke under second predetermined conditions (when the driver and driver gear are in “State (E)” and the air chamber reaches the “predetermined pressure”). *See supra*, Elements 1.5 and 1.6.

H. Claim 8

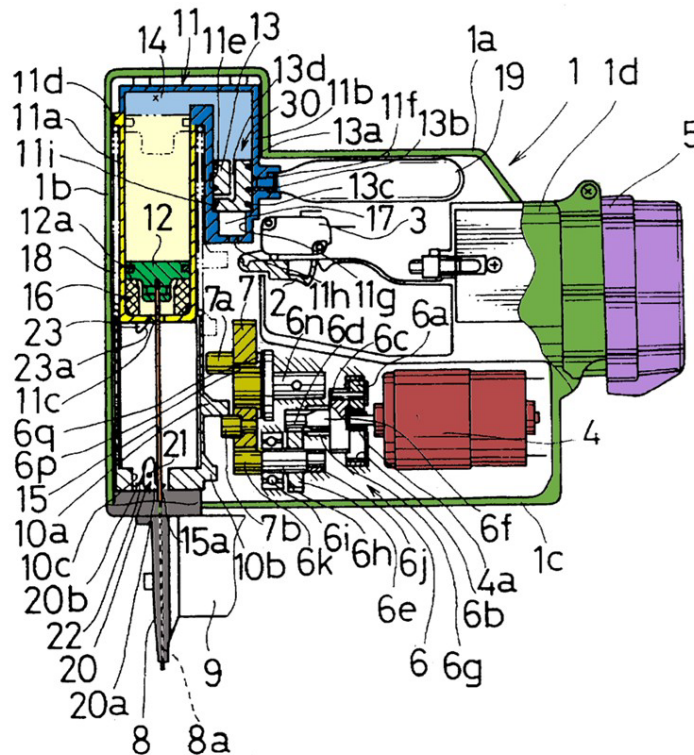
181. **Elements [8.P]–[8.4], [8.6] and [8.9]:** Elements 8.P–8.2, 8.4, 8.6 and 8.9 are identical to Elements 1.P–1.2 and 1.4–1.6, respectively, and are met as described above. Element 8.3 differs from Element 1.3 only in that it recites a moveable driver that “moves with” the piston rather than being “in communication with” the piston. This element is met for the same reasons described above. *See supra*, Element 1.3.

182. **Element [8.5]:** Kondo discloses “an on-board electrical energy source, with no external energy source attached to said fastener driving tool.” Kondo discloses an on-board electrical power source (“battery 5,” purple below) 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 (below). Kondo notes that “[t]his means that the nailer of this embodiment is hoseless and cordless.” Kondo, 7:54–55.



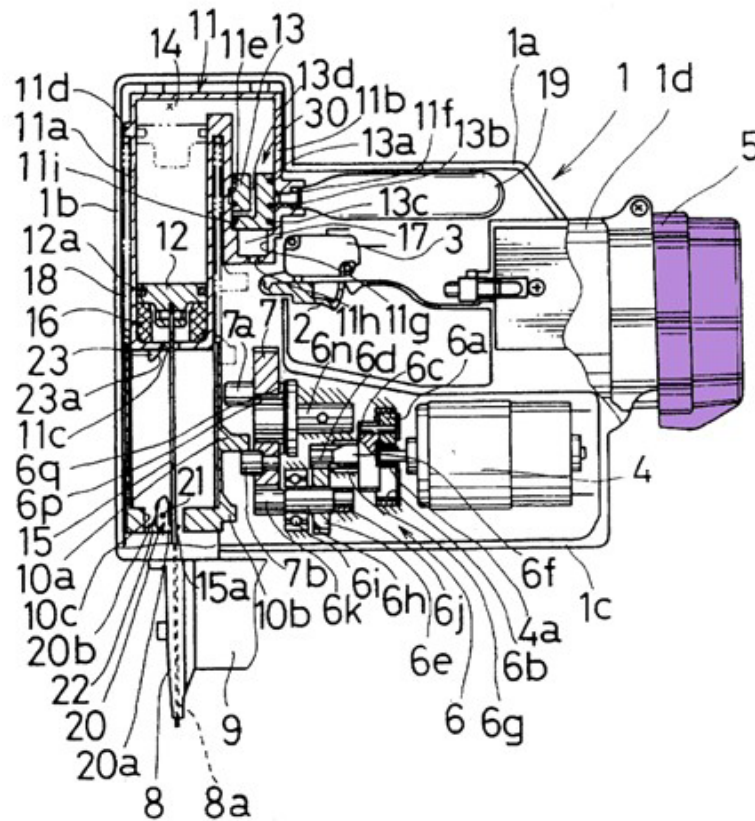
183. ***Element [8.7]***: Kondo discloses “a prime mover that is powered by said on-board electrical energy source, said prime mover causing said lifter to move, under first predetermined conditions.” Kondo’s prime mover (“motor 4”) causes its lifter (“drive gear 7”) to move, under the first predetermined conditions discussed above. Kondo, Fig. 1–2, 4A–E, 3:39–4:32, 4:66–5:14. Kondo’s prime mover (“motor 4”) is powered by the on-board electrical energy source (“battery 5”). Kondo, 7:51–55, Fig. 1.

184. **Element [8.8]:** Kondo discloses “a housing that holds said hollow cylinder, guide body, movable driver, storage chamber, on-board electrical energy source, lifter, and prime mover as a single, portable hand-operable tool.” Kondo’s housing (“housing 1”) is shown below in dark green. Kondo, 2:50–53, Fig. 1 (below). Kondo’s housing holds, as a single, portable hand-operable tool, its hollow cylinder (“cylindrical main body 11a,” yellow), guide body (“driver guide 8,” grey), movable driver (“driver 15,” orange), storage chamber (“air chamber 14,” light blue), on-board electrical energy source (“battery 5,” purple), lifter (“drive gear 7,” dark yellow), and prime mover (“motor 4,” dark red).



I. Claim 9

185. Kondo discloses “[t]he fastener driving tool of claim 8, wherein said on-board electrical energy source comprises a battery.” Kondo’s on-board electrical power source is a battery (“battery 5,” purple below). Kondo, 2:61–63, 7:51–55, Fig. 1.



K. Claim 11

187. Claim 11 is identical to Claim 7 and is met as described above.

L. Claim 12

188. Kondo discloses “[t]he fastener driving tool of claim 8: wherein said prime mover is powered by an electrical power supply that is carried on said tool.” Kondo discloses an electrical power supply carried on the tool (“battery 5,” purple below) that is 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 (below). Kondo notes that “[t]his means that the nailer of this embodiment is hoseless and cordless.” Kondo, 7:54–55.

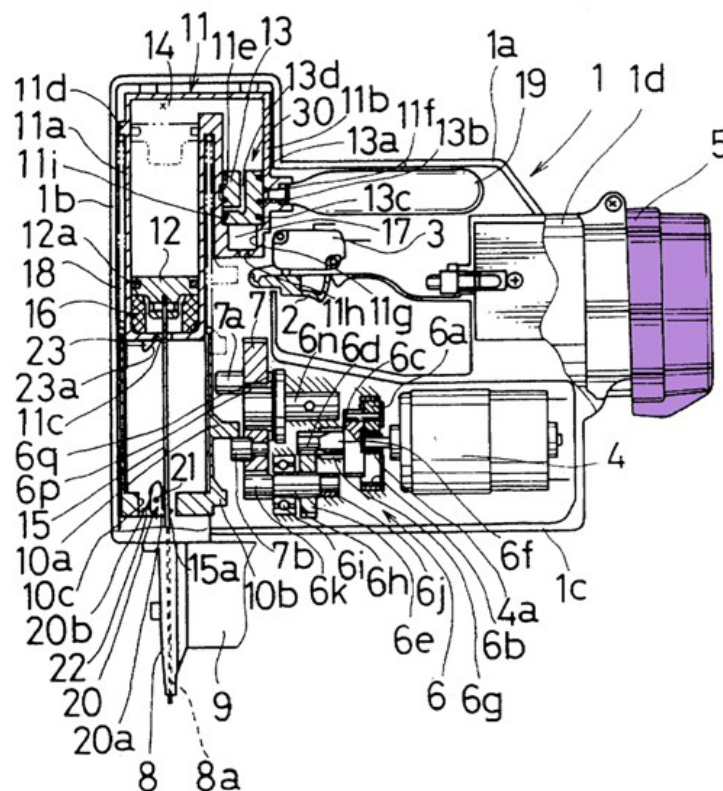


FIG.1

M. Claims 13–17

189. Claims 13–17 are identical to Claims 2–6, respectively, and are met as described above.

N. Claim 18

190. *Elements [18.P]–[18.4] and [18.6]*: Elements 18.P–18.4 and 18.6 are identical to Elements 1.P–1.4 and 1.6, respectively, and are met as described above.

191. *Element [18.5]*: Element 18.5 differs from Element 1.5 only in that it recites a “rotating lifter” rather than a “lifter” and further states that it moves the driver “using a rotary-to-linear motion.” This element is met for the same reasons described above. *See supra*, Element 1.5.

192. As discussed above in relation to claim 3, Kondo’s lifter includes a rotating disk (“drive gear 7,” yellow below) that moves in rotational motion (curved arrows) to cause the driver (light orange) to move in a linear motion (straight arrow), thus using rotary-to-linear motion. Kondo, Figs. 4A–E (below), 3:41–57.

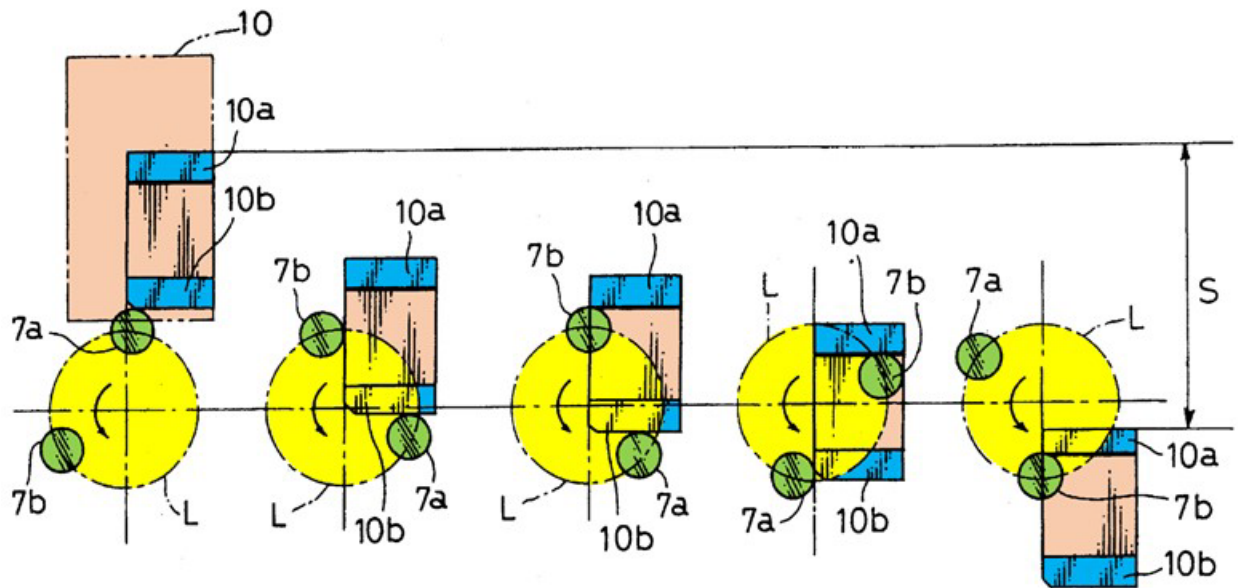


FIG. 4(E) FIG. 4(D) FIG. 4(C) FIG. 4(B) FIG. 4(A)

O. Claims 19–20

193. Claim 19 is identical to Claim 2 and is met as described above. Claim 20 is nearly identical to Claim 3, but for the different antecedent to the “rotating lifter” rather than “lifter” and is met as described above.

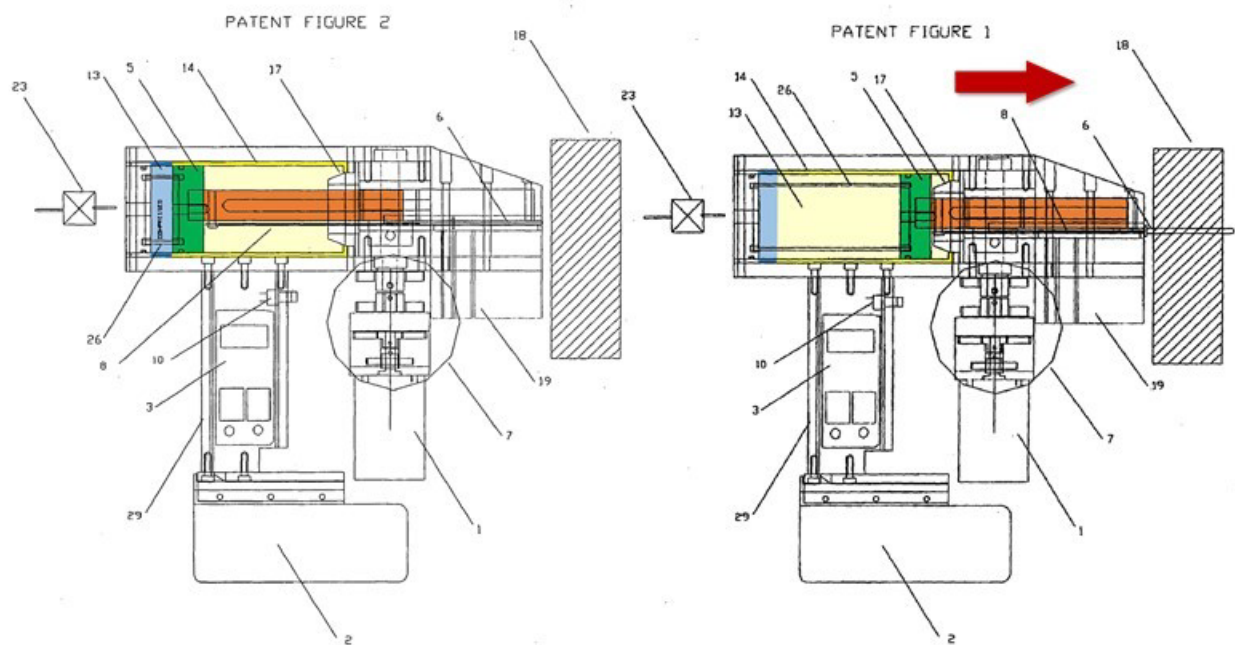
VIII. CLAIMS 1–20 ARE OBVIOUS BASED ON PEDICINI

A. Claim 1

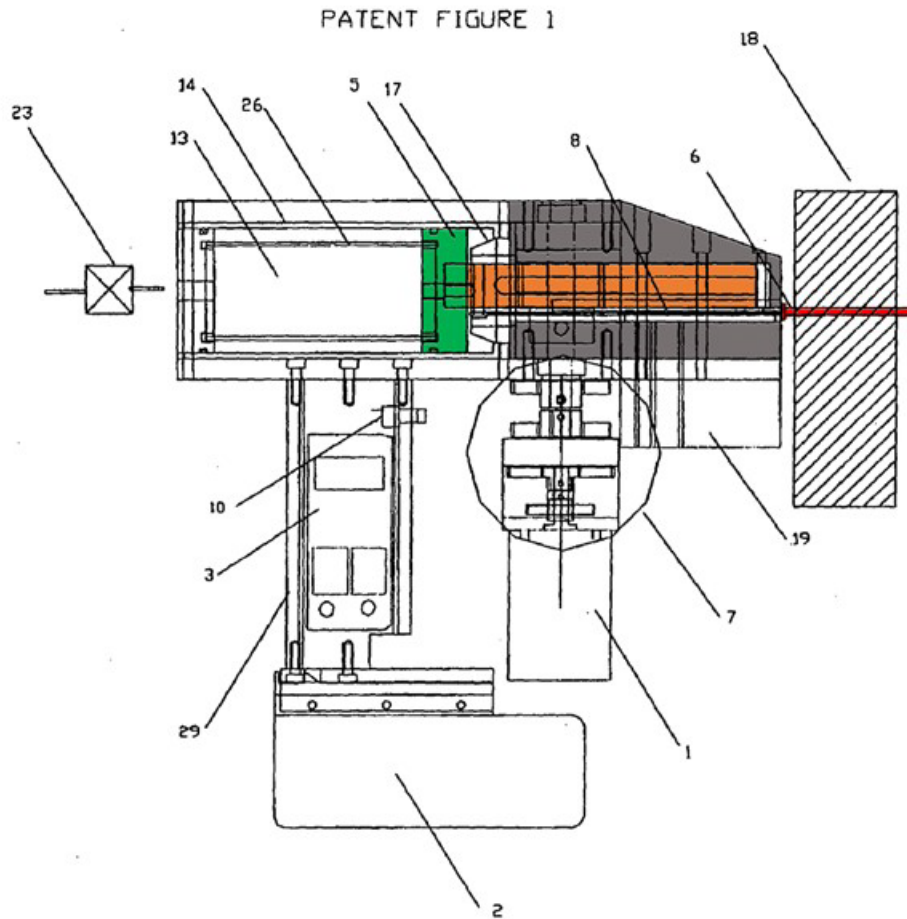
194. **Element [1.P]:** Pedicini discloses “[a] fastener driver adapted for use in a fastener driving tool.” Pedicini discloses a fastener driving tool (“fastener device 100”). Pedicini, Figs. 1–4; ¶ [0077].

195. **Element [1.1]:** Pedicini discloses “a hollow cylinder having a movable piston therewithin, said hollow cylinder containing a displacement volume created

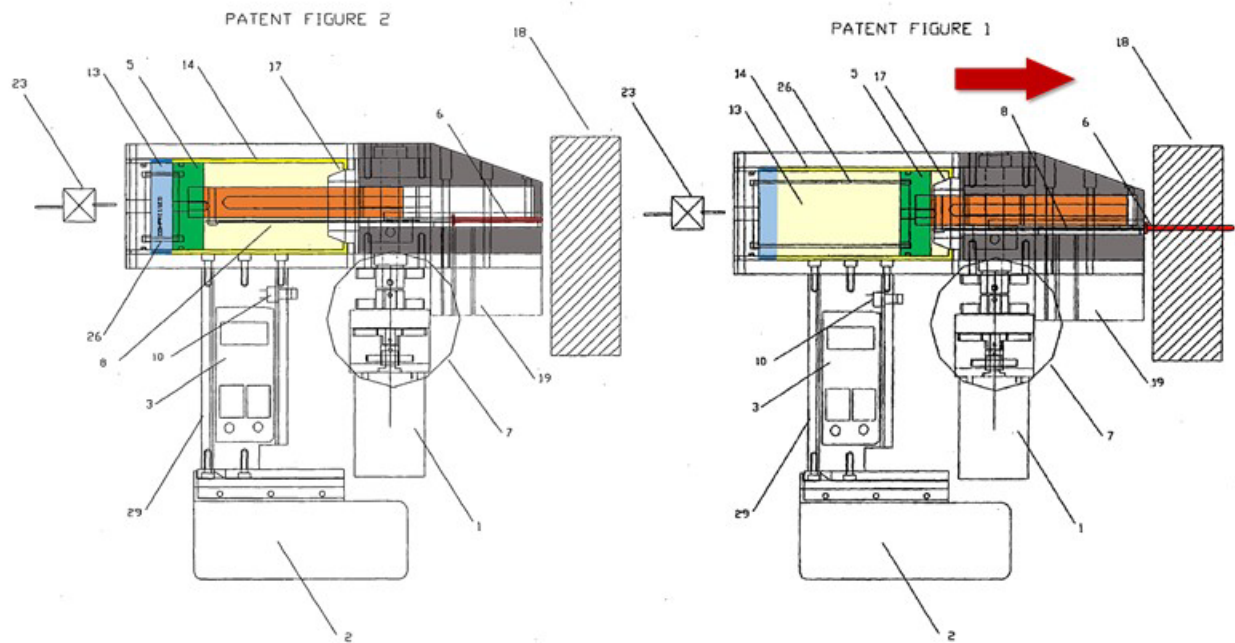
by a stroke of said piston.” Pedicini’s hollow cylinder (“cylinder (14),” yellow below) includes a piston (“piston (5),” green) that can “move within the cylinder (14).” Pedicini, ¶¶[0077]–[0078], Figs. 1–4. The hollow cylinder has a displacement volume created by the stroke of the piston (yellow below), 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.



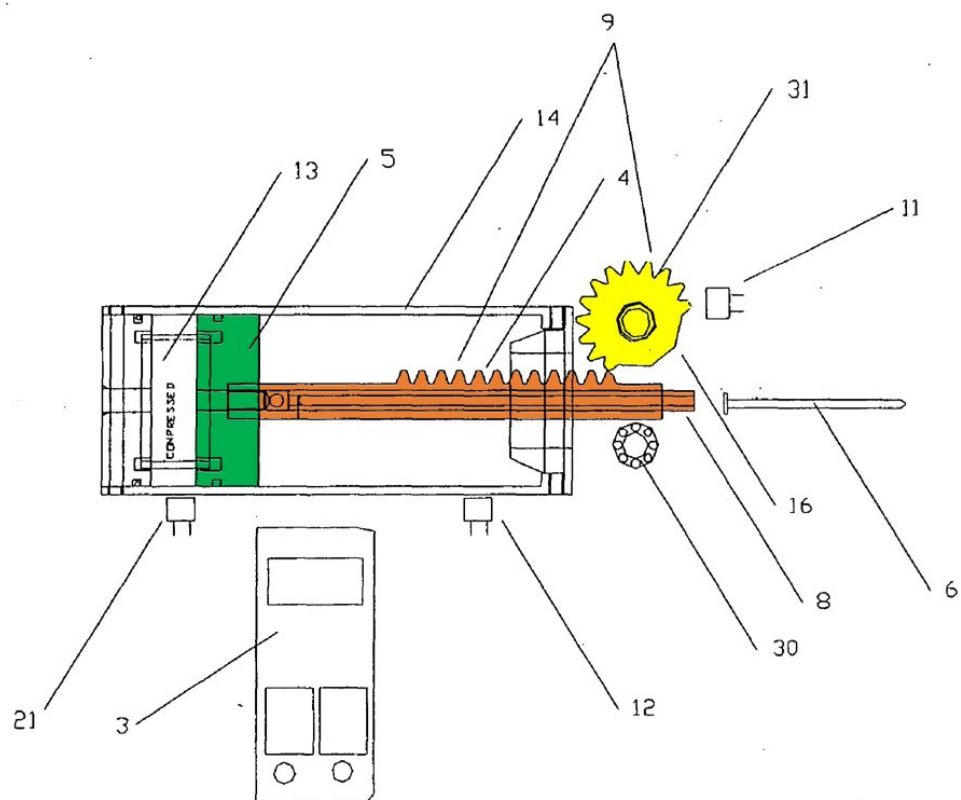
196. **Element [1.2]:** Pedicini discloses “a guide body that is sized and shaped to receive a fastener that is to be driven.” Pedicini discloses a guide body (grey below) that is sized and shaped to receive a fastener (“fastener (6),” red) that is to be driven by the driver (“rack (4),” orange). Pedicini, ¶[0078], Fig. 1 (below).



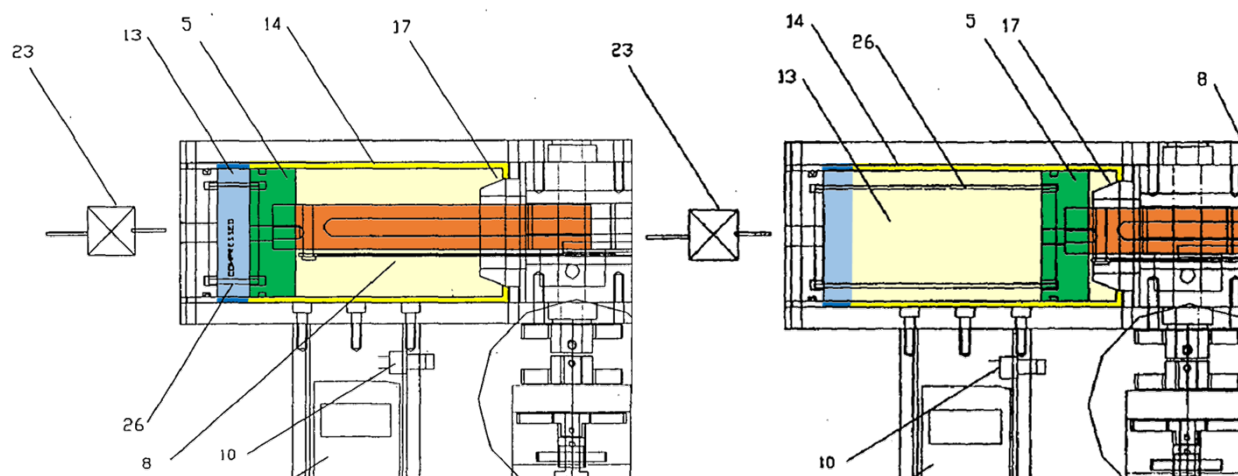
197. *Element [1.3]*: Pedicini discloses “a movable driver that is in communication with said piston, said movable driver being sized and shaped to push said fastener from said guide body.” Pedicini’s movable driver (“rack (4)” orange below, which also includes an “anvil (8)”) is in communication with the piston (“piston (5),” green) and that is sized and shaped to push the fastener (“fastener (6),” red) from the guide body (grey). Pedicini, Figs. 1–2 (below), ¶¶[0077]–[0078].



PATENT FIGURE 3



198. **Element [1.4]:** Pedicini discloses “a storage chamber that is in fluidic communication at all times with said displacement volume of the 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. I understand that that ITC’s decision regarding “main storage chamber” was based on Patent Owner’s post-agreement argument that the agreed construction required the “main storage chamber” to be distinct from *any* region within the “hollow cylinder,” and not—as Petitioner understood the agreement—distinct from the “displacement volume” recited in the claims, which is the region “created by a stroke of said

piston.” ’954 patent, 10:12–15. In my opinion, 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’s storage chamber and displacement volume are “initially charged with a pressurized gas and remain above atmospheric pressure during all portions of an operating cycle, in which said pressurized gas is re-used for more than one driving cycle.” 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.

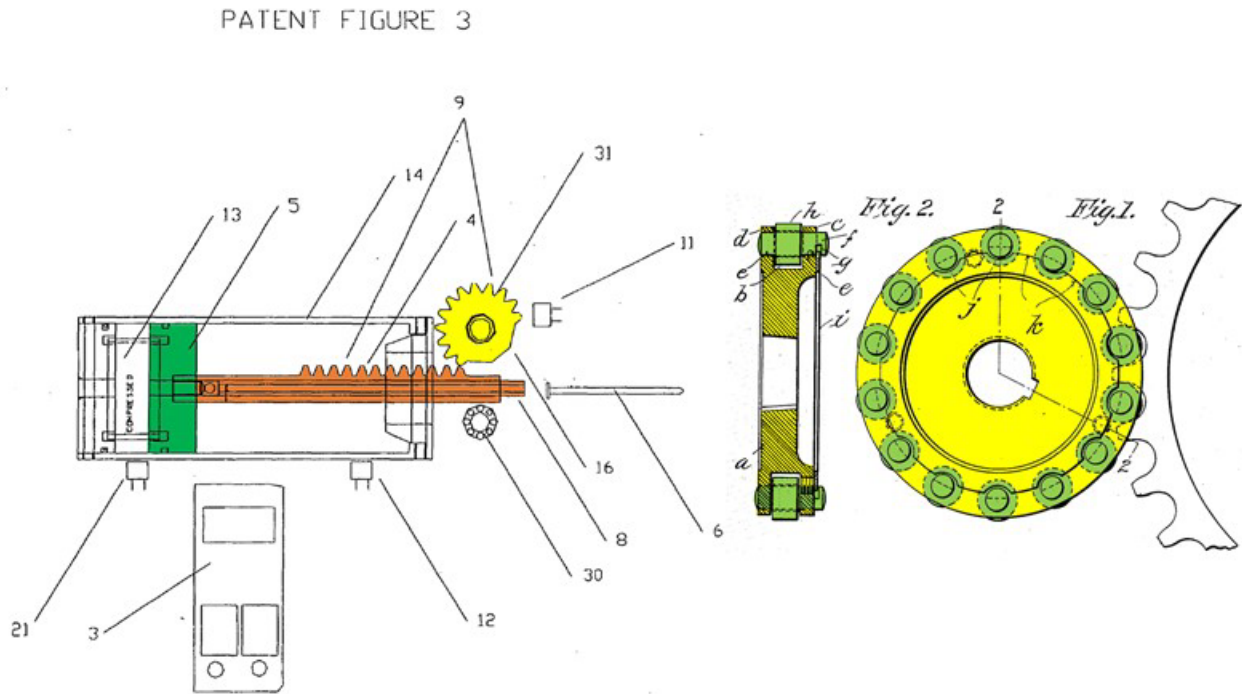
201. A POSITA would understand the disclosure of a sealed main storage chamber and a release valve for “replenishing the air” means that the chamber is “initially charged with a pressurized gas” that “is re-used for more than one driving cycle,” and that it will “remain above atmospheric pressure during all portions of an operating cycle,” since a charging valve would have no use if the chamber is allowed

to reach atmospheric pressure. Likewise, 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 [1.5]:** 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.

203. 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). In the ITC, 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” (as advanced by the Patent Owner), 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 Element 1.5: “a lifter

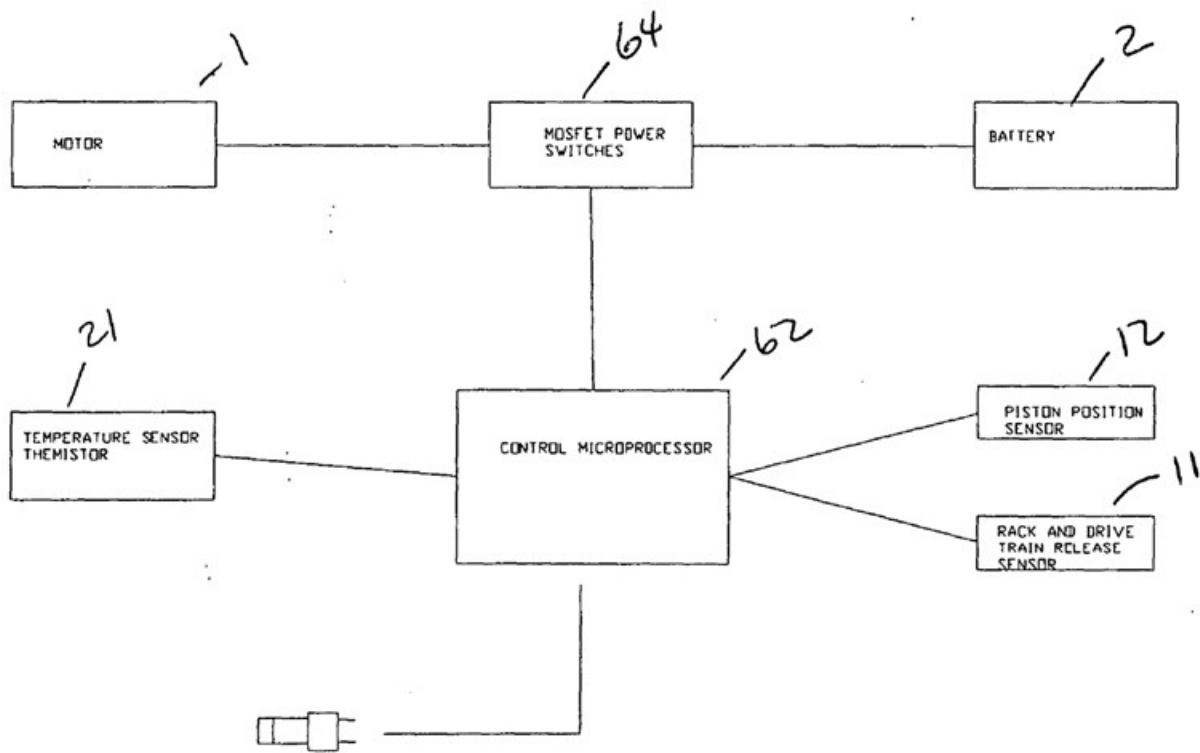
that, under first predetermined conditions, moves said movable driver toward a ready position.”



204. Pedicini discloses a “control circuit (3)” that “includes a microprocessor (62), high power switching elements (64) to drive the motor (1) and at least two control circuit inputs which include a piston position sensor (12) and a rack and drive train release sensor (11).” Pedicini, Fig. 6 (below), ¶[0083]. Specifically, “sensor (12) may be used to determine the position of the anvil (8), piston (5) and rack (4) in the forward position to notify the control circuit (3) that the fastener device (100) is ready for another cycle.” Pedicini, ¶[0078]. Thus, under first predetermined conditions—that is, with the piston in the forward position after a drive cycle as detected by piston position sensor (12)—Pedicini’s control circuit

(3) will direct the high power switching elements (64) to connect battery (2) to the motor (1) to power the lifter to move the movable driver toward the ready position.

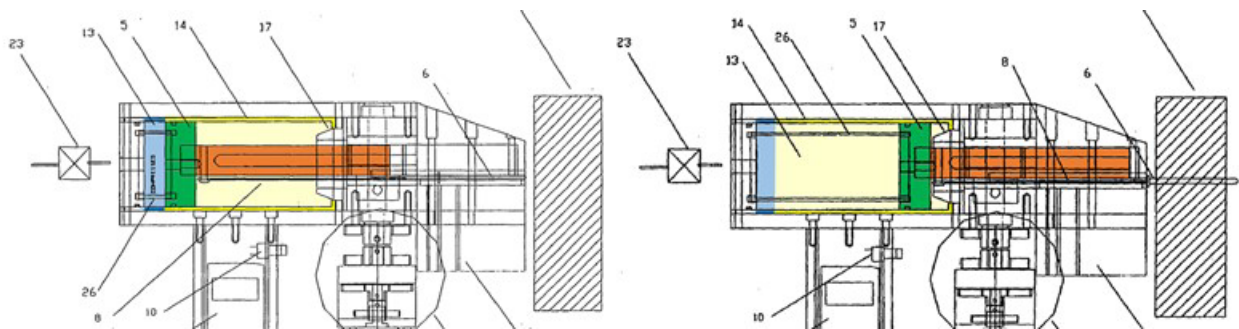
PATENT FIGURE 6



205. *Element [1.6]*: Pedicini discloses “wherein: said cylinder and piston act as a gas spring, under second predetermined conditions, to move said movable driver toward a driven position, using said pressurized gas of both said storage chamber and said displacement volume acting on said piston.” Pedicini discloses “a sear pin or lever (28) which maintains the rack (4), piston (5) and anvil (80) in the energized state” such that “[u]pon actuation of the trigger (32) of the sear lever, the mechanism

is released and energetically pushes the fastener into the substrate.” Pedicini, ¶[0080], Fig. 4. Thus, under second predetermined conditions—that is, with the piston at its upper position and sear pin or lever (28) actuated—the movable driver will be moved toward a driven position using the pressurized gas of the storage chamber and displacement volume.

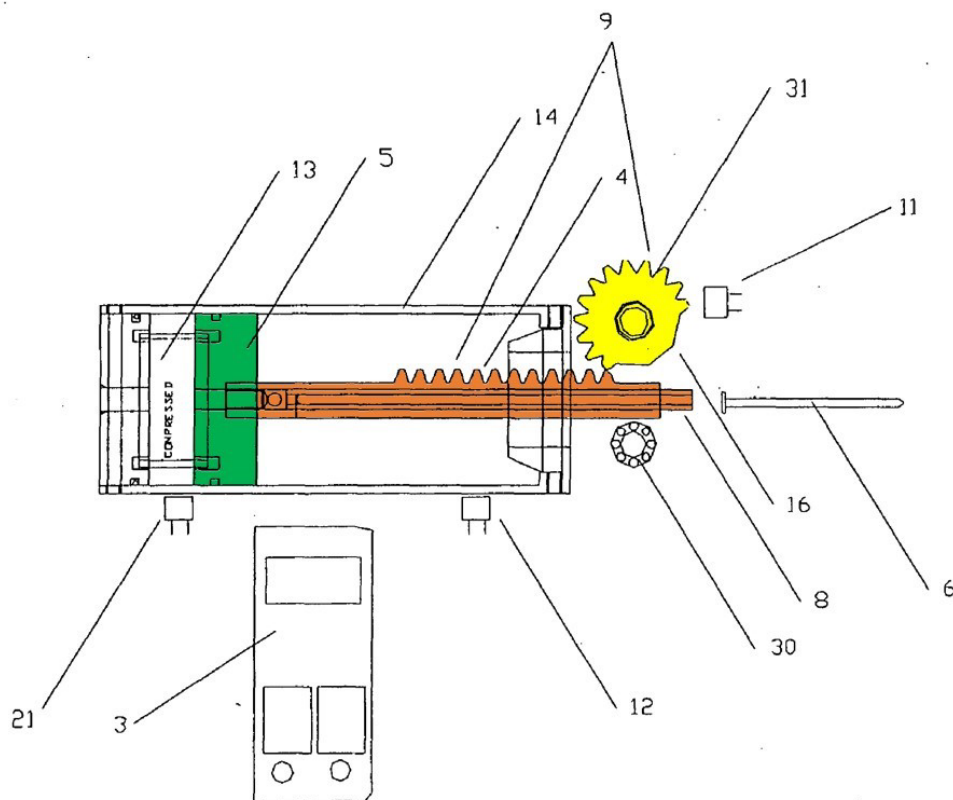
206. In Pedicini, the pressurized gas of the storage chamber (blue below, the portion of “chamber (13)” above the piston) and the displacement volume in the cylinder (yellow below, the portion of “chamber (13)” within “cylinder (14)” through which the piston moves) act as a gas spring to move the movable driver (“piston (5)”) toward a driven position. 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.



B. Claim 2

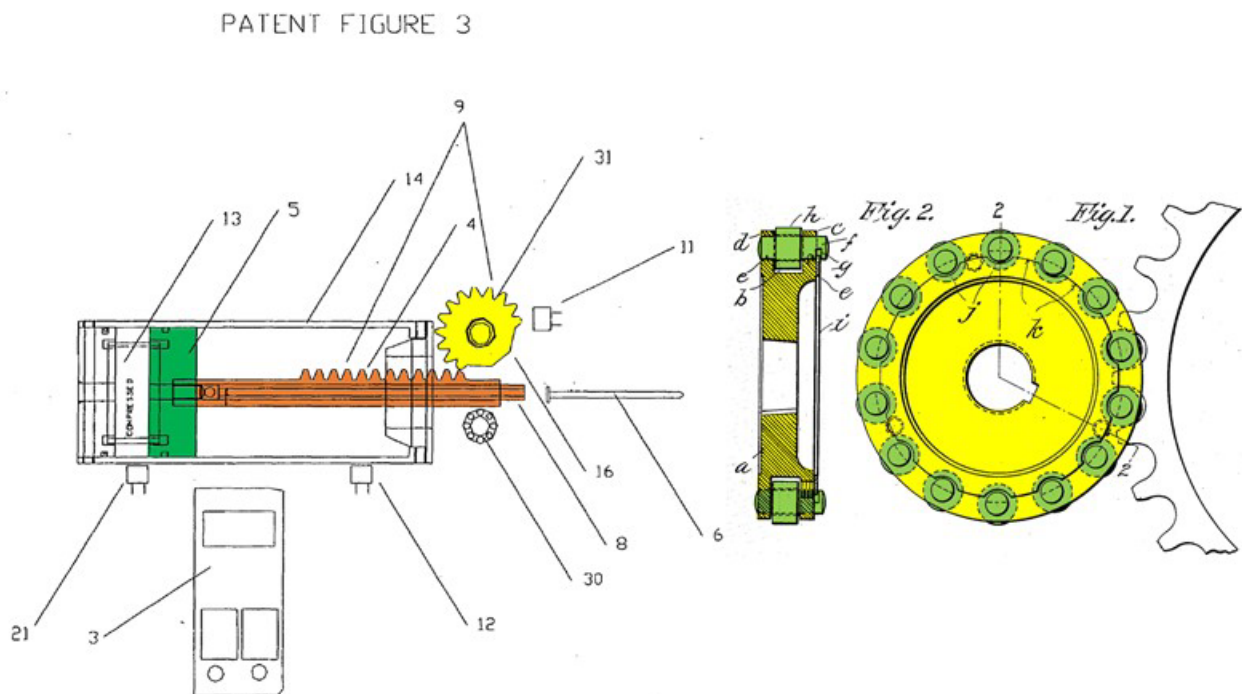
207. Pedicini discloses “[t]he fastener driver of claim 1, wherein said movable driver comprises an elongated shape with at least one longitudinal edge, and having a plurality of protrusions that are located along said at least one longitudinal edge, said plurality of protrusions being spaced-apart from one another.” Pedicini’s movable driver has an elongated shape and numerous (and thus “at least one”) protrusions located along its longitudinal edge, which are the gear teeth shown below in Fig. 3. Pedicini, Fig. 3 (below), ¶[0078].

PATENT FIGURE 3



C. Claim 3

208. Pedicini's lifting mechanism modified with the roller pinion of Ellingham discloses "[t]he fastener driver of claim 1, wherein said lifter comprises at least one disk that includes at least one extension that protrudes from its surface which, under first predetermined conditions, contacts said movable driver and forces said movable driver to move toward its ready position, using a rotary-to-linear motion." Pedicini's modified lifter includes a disk (yellow, below right) with multiple extensions protruding from its surface (roller pinions, light green), which moves the movable driver (orange, below left) toward its ready position under first predetermined conditions (*see supra*, Element [1.5]). Pedicini, Fig. 3 (below left); Ellingham, Figs. 1–2 (below right).



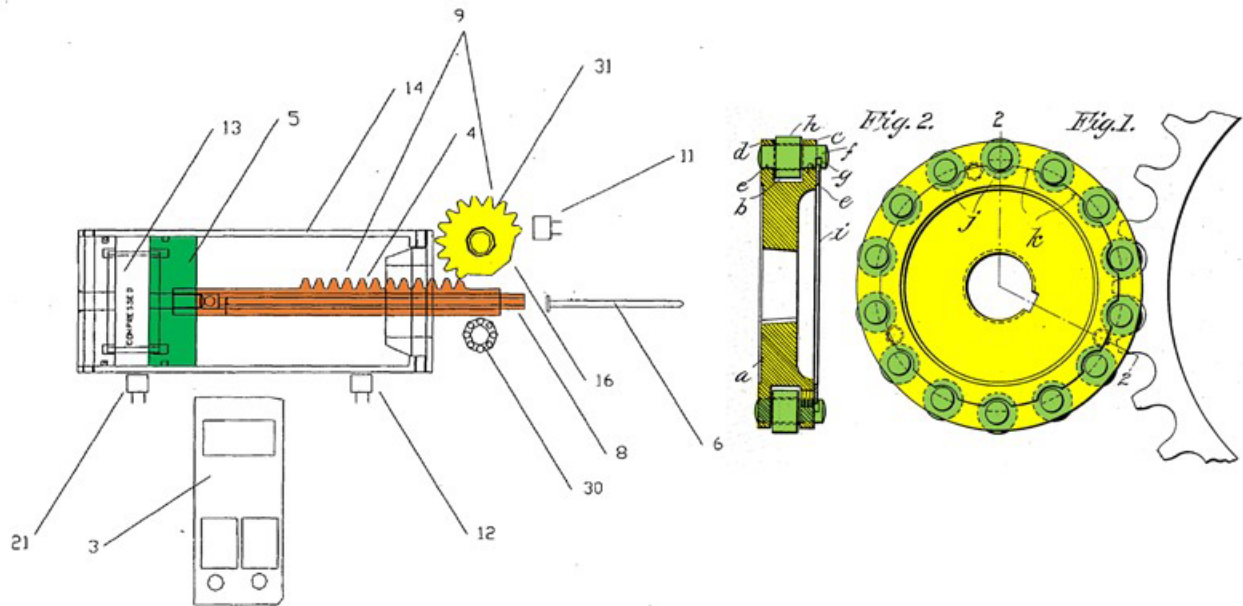
209. Pedicini’s lifting mechanism is a rotatable pinion (“rack pinion (31),” above left) that moves in rotational motion (clockwise in Fig. 3) to cause the driver (orange) to move in a linear motion (leftward in Fig. 3). Pedicini, Fig. 3 (above left), ¶[0078]. This is not altered by the roller pinion modification. See Ellingham, Fig. 1 (above right).

D. Claim 4

210. *Element [4.1]*: Element 4.1 is identical to Element 2 and is met as described above.

211. *Element [4.2]*: Pedicini discloses “such that said at least one extension of said lifter fits in a space between said spaced-apart plurality of protrusions, and a rotating motion of said lifter causes said at least one extension of the lifter to engage said plurality of protrusions of the movable driver, thereby causing said movable driver to move in a substantially linear direction within a driver track of said guide body.” Pedicini’s modified lifter includes extensions protruding from its surface (roller pinions, light green) that fit between the spaced-apart protrusions of the driver (gear teeth on driver, orange). Pedicini, Fig. 3 (below left); Ellingham, Figs. 1–2 (below right).

PATENT FIGURE 3

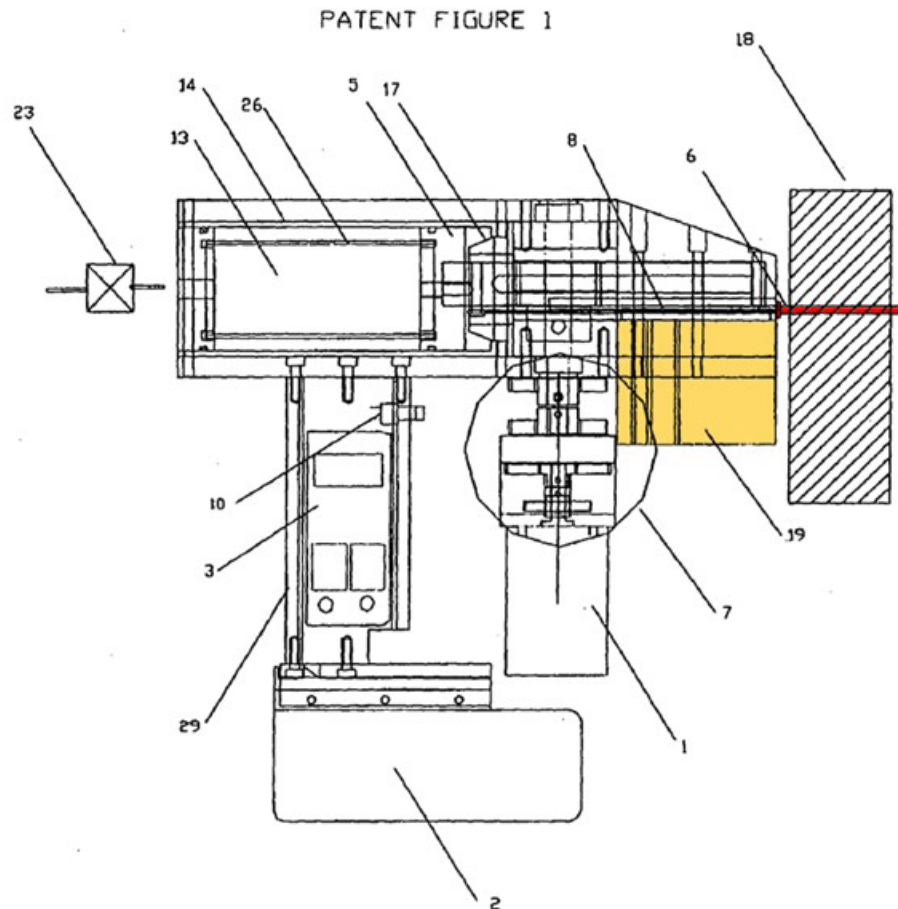


212. Thus, the lifter is rotated (clockwise in Fig. 3) such that its extensions (light green) engage the protrusions on the driver to cause the driver (orange) to move in a linear direction (leftward in Fig. 3) within the driver track of the guide body. Pedicini, Fig. 3 (below left); Ellingham, Figs. 1–2 (below right).

E. Claim 5

213. Pedicini discloses “[t]he fastener driver of claim 4, further comprising: a magazine that contains a plurality of fasteners, said magazine providing a fastener at a receiving position of said driver track of the guide body so that, during a driving stroke, said movable driver moves toward said driven position, while pushing said fastener toward an exit portion of said driver track.” Pedicini’s magazine (“fastener feeder (19),” light orange below) contains a plurality of fasteners (“fasteners (6),”

red), and provides them at a receiving position of the driver track of the guide body so that they are pushed by the movable driver toward an exit portion and into the workpiece. Pedicini, ¶[0077], Fig. 1 (below).



F. Claim 6

214. Pedicini discloses “[t]he fastener driver of claim 1, wherein: said hollow cylinder is the sole pressurized cylinder of the fastener driver.” Pedicini’s hollow cylinder is the sole pressurized cylinder. Pedicini, Figs. 1–4.

G. Claim 7

215. In the event that claim 7's contradiction with claim 1 is held to be a correctable error rather than rendering claim 7 indefinite, then this element is disclosed by Pedicini.

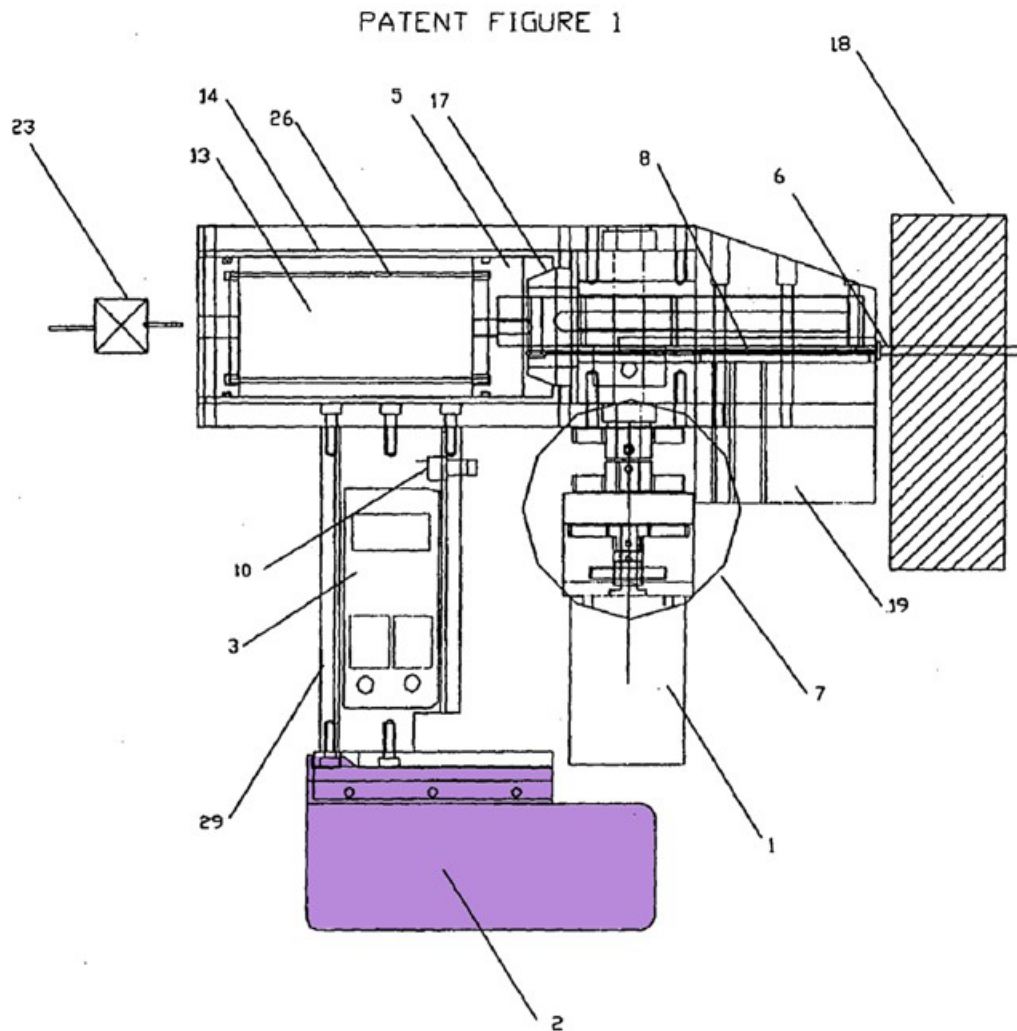
216. Pedicini discloses "[t]he fastener driving tool of claim 1, wherein said fastener driver is designed to operate in a repeatable cycle of driving events, in which each driving event includes: (a) a driving stroke under said first [second] predetermined conditions, which causes said movable driver to move toward said driven position, and (b) a return stroke under said second [first] predetermined conditions, which causes said movable driver to move toward said ready position."

217. As discussed above in relation to claim 1, Pedicini discloses a trigger (32) to release the driver, and a control circuit (3) that connects the motor to the power supply and thereby controls operation of the tool, based on inputs from a piston position sensor (12) and a rack and drive train release sensor (11), where the operation involves a repeatable drive cycle including (a) a return stroke under first predetermined conditions (with the piston in the forward position after a drive cycle as detected by piston position sensor (12)) and (b) a drive stroke under second predetermined conditions (with the piston at its upper position and sear pin or lever (28) actuated). *See supra*, Elements 1.5 and 1.6.

H. Claim 8

218. *Elements [8.P]–[8.4], [8.6] and [8.9]*: Elements 8.P–8.2, 8.4, 8.6 and 8.9 are identical to Elements 1.P-1.2 and 1.4–1.6, respectively, and are met as described above. Element 8.3 differs from Element 1.3 only in that it recites a moveable driver that “moves with” the piston rather than being “in communication with” the piston. This element is met for the same reasons described above. *See supra*, Element 1.3.

219. *Element [8.5]*: Pedicini discloses “an on-board electrical energy source, with no external energy source attached to said fastener driving tool.” 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),” and thus has no external energy source attached. Pedicini, ¶[0077], Fig. 1 (below).

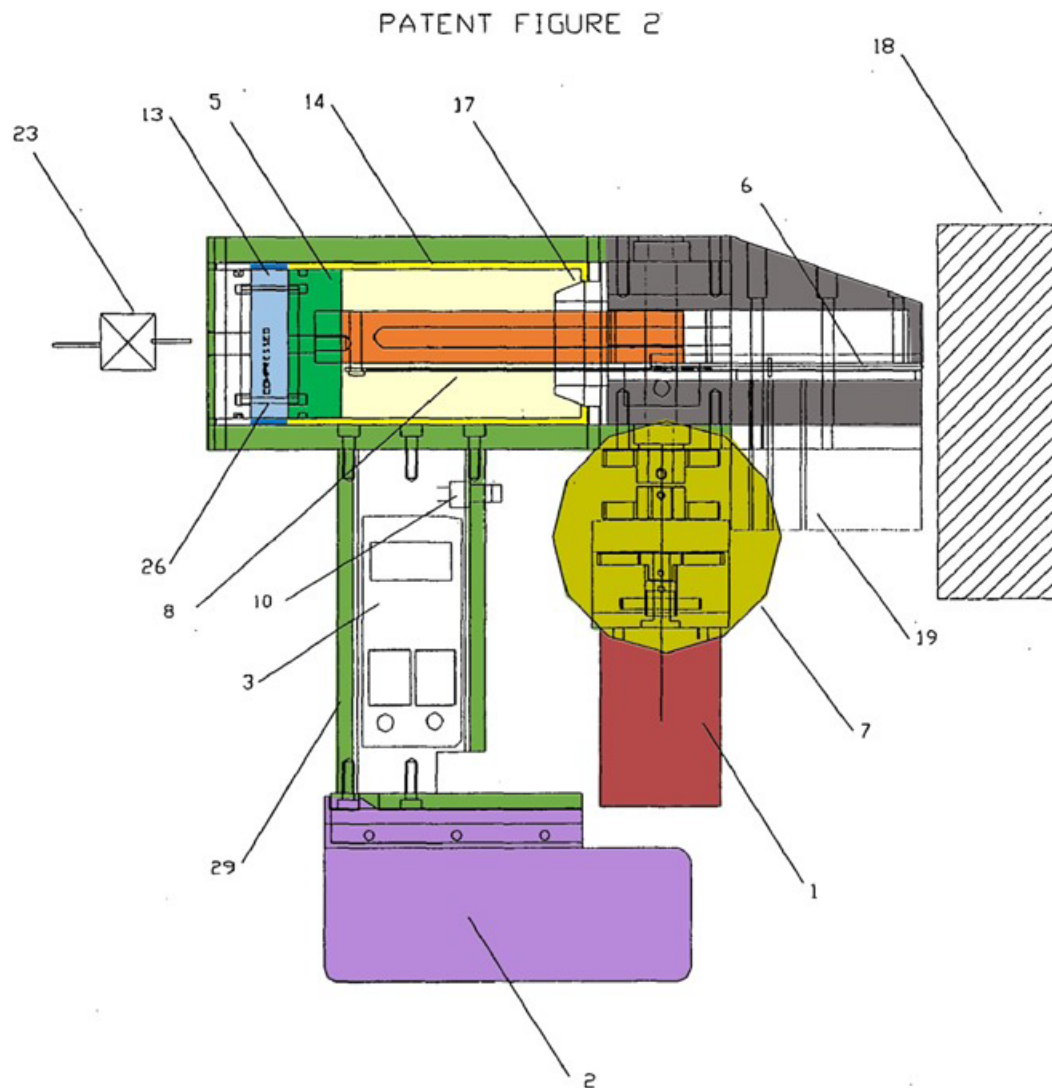


220. ***Element [8.7]:*** Pedicini discloses “a prime mover that is powered by said on-board electrical energy source, said prime mover causing said lifter to move, under first predetermined conditions.” Pedicini’s prime mover (“motor (1)”) is referred to as “electric motor,” is powered by the on-board electrical energy source (“power source (2)”), and causes the lifting gear (“rack pinion (31)”) to mechanically engage the driver (“rack (4)”) under the first predetermined conditions. Pedicini,

Title, Abstract, ¶¶[0033]–[0034], [0077]–[0078], Figs. 3–4; *see supra* Element 1.5.

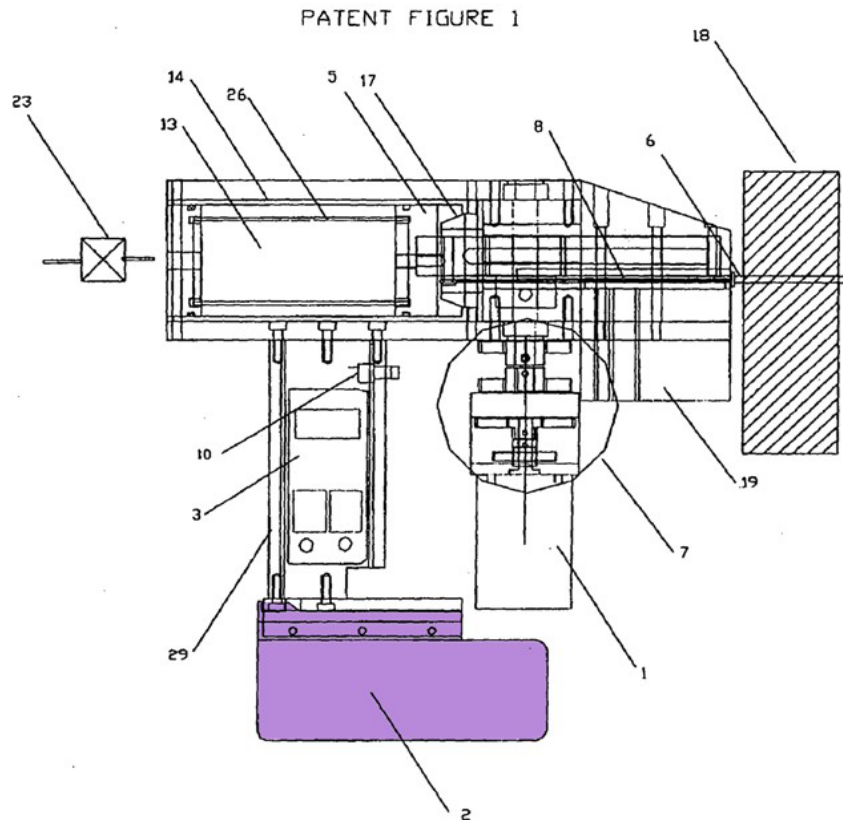
This is not altered by the roller pinion modification. *See* Ellingham, Fig. 1.

221. ***Element [8.8]***: Pedicini discloses “a housing that holds said hollow cylinder, guide body, movable driver, storage chamber, on-board electrical energy source, lifter, and prime mover as a single, portable hand-operable tool.” Pedicini’s housing is shown below in dark green and holds, as a single, portable hand-operable tool, its hollow cylinder (yellow), guide body (grey), movable driver (orange), storage chamber (blue), on-board electrical energy source (purple), lifter (dark yellow), and prime mover (dark red). Pedicini, Fig. 2.



I. Claim 9

222. Pedicini discloses “[t]he fastener driving tool of claim 8, wherein said on-board electrical energy source comprises a battery.” Pedicini states that its on-board electrical power source (“power source (2), purple below) “may be a rechargeable battery to provide power to the motor (1).” Pedicini, ¶[0077], Fig. 1 (below).



J. Claim 10

223. Pedicini discloses “[t]he fastener driving tool of claim 8, wherein said prime mover comprises an electric motor.” 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].

K. Claim 11

224. Claim 11 is identical to Claim 7 and is met as described above.

L. Claim 12

225. Pedicini discloses “[t]he fastener driving tool of claim 8: wherein said prime mover is powered by an electrical power supply that is carried on said tool.”

Pedicini's prime mover ("motor (1)") is referred to as "electric motor" and is powered by the on-board electrical power supply ("power source (2)"). Pedicini, Title, Abstract, ¶¶[0033]–[0034], [0077]–[0078], Figs. 3–4.

M. Claims 13–17

226. Claims 13–17 are identical to Claims 2–6, respectively, and are met as described above.

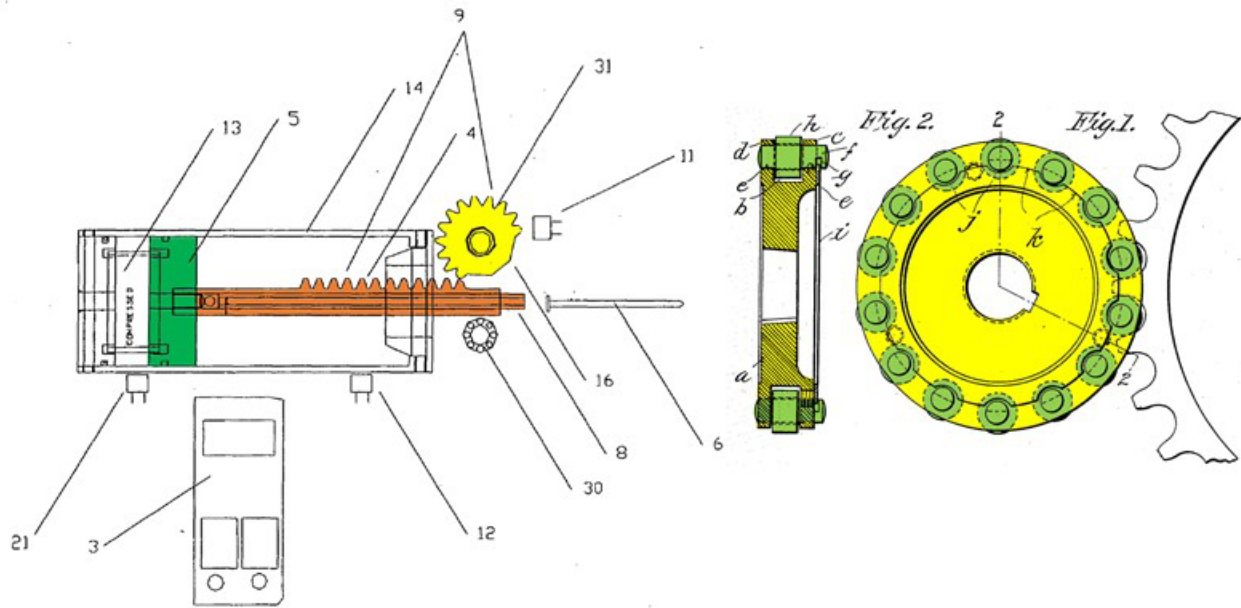
N. Claim 18

227. *Elements [18.P]–[18.4] and [18.6]*: Elements 18.P–18.4 and 18.6 are identical to Elements 1.P–1.4 and 1.6, respectively, and are met as described above.

228. *Element [18.5]*: Element 18.5 differs from Element 1.5 only in that it recites a "rotating lifter" rather than a "lifter" and further states that it moves the driver "using a rotary-to-linear motion." This element is met for the same reasons described above. *See supra*, Element 1.5.

229. As discussed above in relation to claim 3, Pedicini's modified lifter includes a rotating disk (yellow, below right) that moves in rotational motion (clockwise in Fig. 3) to cause the driver (orange) to move in a linear motion (leftward in Fig. 3), thus using rotary-to-linear motion. Pedicini, Fig. 3 (below left); Ellingham, Figs. 1–2 (below right). This is not altered by the roller pinion modification. *See* Ellingham, Fig. 1 (above right).

PATENT FIGURE 3



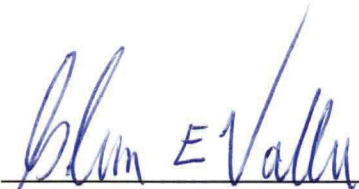
O. Claims 19–20

230. Claim 19 is identical to Claim 2 and is met as described above. Claim 20 is nearly identical to Claim 3, but for the different antecedent to the “rotating lifter” rather than “lifter” and is met as described above.

IX. CONCLUSION

231. 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.