

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TRICAM INDUSTRIES, LLC
Petitioner

v.

LITTLE GIANT LADDER SYSTEMS, LLC
Patent Owner

Post-Grant Review of
U.S. Patent No. 12,359,506

**DECLARATION OF JON VER HALEN, P.E. IN SUPPORT OF
PETITION FOR POST GRANT REVIEW OF U.S. PATENT NO. 12,359,506**

I, Jon Ver Halen, do hereby state and declare as follows:

I. INTRODUCTION

1. I have been retained by DeWitt LLP, counsel for Petitioner, Tricam Industries, LLC. ("Tricam"). I have been asked to provide certain background and opinions concerning ladder technology, evaluation of evidence, and construction of claim terms found in U.S. Patent 12,359,506 ("the '506 Patent").

2. I am over the age of 18 and make this Declaration based upon personal knowledge, experience, and investigation that I have conducted. I will provide testimony concerning my statements, opinions and conclusions set forth below and may amplify or add thereto through such testimony, demonstratives, or in further written declarations.

II. QUALIFICATIONS

3. I graduated from Purdue University with honors when 20 years old, with a Bachelor of Science degree in Industrial Engineering. After the state-mandated four years of practice under a professional engineer and passing the required tests, I became a registered Professional Engineer. My degree in Industrial Engineering provided a broad background in human factors engineering, safety engineering, and manufacturing engineering. Since I was working primarily with mechanical engineers at the beginning of my career, I took the Professional Engineers exam as

a mechanical engineer, and became a licensed professional engineer in the State of Illinois.

4. For the last 32 years, I have served as President of my engineering consulting firm, Ver Halen Engineering. Among other services, I consult on product design, testing, warnings, and instructions, and I also serve as an expert witness in legal proceedings.

5. I have particular expertise regarding ladders, ladder accessories, and scaffolding. I am a member of multiple American National Standards Institute (ANSI) committees dealing with ladders, and I have a complete understanding of both former and existing standards regulating ladders.

6. The National Institute for Occupational Safety and Health (NIOSH), the research arm of the Occupational Safety and Health Administration (OSHA), has asked me for assistance in improving ladder safety. The work performed resulted in a Bullard-Sherwood award for interventional safety presented by NIOSH.

7. I have extensive experience testing climbing equipment, including ladders, folding attic stairways, and fall protection devices. This included testing for compliance with ANSI standards, static testing, cyclic testing, and dynamic testing. In addition to testing ladders, I also have years of experience in accident reconstruction to determine the various types of injuries that could have resulted

from a ladder accident, as well as the ladder deformations the accident may have caused.

8. During my 48-year career, I have tested many ladder products for manufacturers, including Werner, Louisville, Keller, White Metal, Babcock, Holland, Tricam, Fakro, and others from 1982 to present, to ensure compliance with ANSI standard safety requirements, testing about 10-15 products per year. I have also tested specialty ladders for compliance with other standards for companies such as Duo Safety, the Aluminum Ladder Company, Stokes, Primal Vantage and others. In addition, I have visited the ladder manufacturing facilities of Werner, White Metal, Holland, Keller, Primal Vantage and others. On occasion, tested products failed to meet the standard's requirements. When that occurred, I have redesigned the ladder's components, enabling it to meet the standard requirements. Testing was done on the redesigned ladders to verify standards compliance. This work involved extensive communications with ladder manufacturers about various ladder components. When working on ladder litigation matters, I often review product drawings, including drawings and descriptions of individual components of various ladders. As a result of these communications, I am very familiar with the terms typically used in the industry to refer to ladder components.

9. Further details of my qualifications are presented in my curriculum vitae, which is attached to this report as Exhibit A. By my education, training, and

experience, as evidenced by my curriculum vitae, I am qualified as one skilled in the art of ladder design and testing.

III. INFORMATION RELIED UPON IN FORMING OPINIONS

10. In forming my opinions, I reviewed the following materials:

- The '506 Patent (EX1001)
- The '506 Patent file history (EX1002)
- U.S. Patent No. 8,186,481 ("Moss '481") (EX1006)
- U.S. Patent No. 7,967,111 ("Meyers '111") (EX1007)
- U.S. Provisional Patent Application No. 63/382,174 (EX1008)
- U.S. Patent No. 12,523,097 (EX1009)
- U.S. Patent No. 4,407,045 ("Boothe '045") (EX1010)
- American National Standard for Ladders – Portable Metal – Safety Requirements - ANSI-ASC A14.2-2007 (EX1011)
- U.S. Patent No. 594,303 (EX1012)
- U.S. Patent No. 3,811,151 (EX1013)
- U.S. Patent No. 4,210,224 (EX1014)
- U.S. Patent No. 4,216,844 (EX1015)
- U.S. Patent No. 4,697,305 (EX1016)
- U.S. Patent Publication No. 2018/0274296 (EX1017)
- Declaration of David Smith (EX1018)

- Declaration of N. Ryan Moss (EX1019)
- Declaration of Paul Junius (EX1020)
- Declaration of N. Ryan Moss (EX1021)
- Declaration of Paul Junius (EX1022)
- Declaration of B. Scott Maxfield (EX1023)
- Declaration of Brian Russell (EX1024)
- U.S. Design Patent No. D833,643 (EX1025)
- U.S. Patent No. 11,191,373 (EX1026)
- U.S. Patent No. 11,505,994 (EX1028)

11. In addition, my opinions are based on my years of experience in the field as described above.

IV. LEGAL STANDARDS FOR PATENTABILITY

12. My opinions are also formed by my understanding of the relevant law. I am not an attorney. For purposes of this declaration, I have been informed about certain aspects of the law as it relates to my opinions.

13. I understand that for an invention claimed in a patent to be found patentable, it must be (among other things) new and not obvious based on what was known before the invention was made.

14. I understand that the information that is used to evaluate whether an invention was new and not obvious when made is generally referred to as “prior

art.” It is my understanding that information is considered to be prior art if it was known by others before the filing date of the patent in question.

15. I understand that in this Post Grant Review proceeding, Tricam has the burden of proving that the challenged claims of the ‘506 Patent are unpatentable in light of the prior art by a preponderance of the evidence. I understand that a preponderance of the evidence is that evidence sufficient to show that a fact is more likely true than not true.

16. I have been advised and understand that, during a Post Grant Review, words in a claim are given their plain meaning, which is the meaning understood by a person of ordinary skill in the art at the time of the alleged invention after reading the entire patent and its file history. I understand, however, that a claim term will not receive its plain meaning if the patentee acted as his or her own lexicographer and clearly set forth a definition of the claim term in the specification. In such a case, the claim term will receive the definition set forth in the patent. I understand that this is the same standard that applies in district court litigation.

17. I understand that in this Post Grant Review proceeding, the information that may be evaluated includes patents and printed publications. My analysis, which is set out in detail below, compares the challenged claims of the

‘506 Patent to patents and printed publications that I understand are prior art to the challenged claims.

18. I understand that prior art can render a patent claim unpatentable where subject matter that falls within the scope of the claim would have been obvious to a person of ordinary skill in the art. Also, the prior art must be “analogous” – that is, from the same field of endeavor, regardless of the problem addressed, or if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved. The field of endeavor is determined by reference to explanations of the invention’s subject matter in the patent application, including the embodiments, function, and structure of the claimed invention – specifically whether they “have essentially the same function and structure. I understand that the following standards govern the determination of whether a patent claim is rendered “obvious” in light of this analogous prior art. I have applied these standards in my evaluation of whether the challenged claims of the ‘506 Patent are obvious in light of the prior art.

19. I understand that a claimed invention is not patentable if it would have been obvious to a person of ordinary skill in the field of the invention at the time the invention was made. The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention.

Even if all the requirements of a claim were not found in a single prior art reference, the claim is not patentable if the differences between the subject matter in the prior art and the subject matter in the claim would have been obvious to a person of ordinary skill in the art at the time the application was filed. Prior art disclosing a method or device that falls within the scope of a claim can render that claim obvious even if other, different methods or devices might also fall within the scope of the claim.

20. I understand that a determination as to whether a claim would have been obvious should be based on four factors (though not necessarily in the following order): (i) the level of ordinary skill in the art at the time the application was filed; (ii) the scope and content of the prior art; (iii) the differences between the claimed invention and the prior art; and (iv) any “objective factors” indicating obviousness or non-obviousness that may exist in a particular case.

21. I understand that an obviousness analysis should not be based on hindsight but must be done using the perspective of a person of ordinary skill in the relevant art as of the effective filing date of the patent claim.

22. I understand the objective factors indicating obviousness or non-obviousness may include: commercial success of products covered by the patent claims; a long-felt but unaddressed need for the invention; failed attempts by others to make the invention; copying of the invention by others in the field;

expressions of surprise by experts and those skilled in the art at the making of the invention; and the patentee having proceeded contrary to the accepted wisdom of the prior art. I also understand that any of this evidence must be specifically connected to the claimed invention rather than associated with the prior art or with marketing or other efforts to promote an invention. I am aware that the Patent Owner submitted certain evidence during prosecution of the '506 Patent purporting to show such objective factors suggesting the challenged claims of the '506 Patent are non-obvious. I will provide my analysis and opinions regarding that evidence herein. Should the Patent Owner submit further evidence purportedly showing such objective factors, I reserve the right to consider the evidence and respond to it.

23. I understand that the teachings of two or more prior art references may be combined in the manner disclosed in the claim if such a combination would have been obvious to one having ordinary skill in the art. In determining whether a combination would have been obvious, the following exemplary rationales may support a conclusion of obviousness:

- combining prior art elements according to known methods to yield predictable results;
- simple substitution of one known element for another to obtain predictable results;

- use of a known technique to improve similar devices (methods, or products) in the same way;
- applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- “obvious to try” – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
- some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention; and
- common sense.

24. I understand that the obviousness analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, but instead can take account of the ordinary innovation and experimentation in the relevant field that does no more than yield predictable results.

25. I understand that, in assessing whether there was an apparent reason to modify or combine known elements as claimed, it may be necessary to look to interrelated teachings of multiple patents and printed publications, the effects of commercial demands, and the background knowledge of a person of ordinary skill in the art. I further understand that any motivation that would have applied to a person of ordinary skill in the art, including motivation from common sense or derived from the problem to be solved, is sufficient to explain why references would have been combined.

26. I understand that modifications and combinations suggested by common sense are important and should be considered. Common sense suggests that familiar items can have obvious uses beyond the particular application being described in a prior art reference, that if something can be done once it would be obvious to do it multiple times, and that in many cases a person of ordinary skill in the art can fit the teachings of multiple patents together in an obvious manner to address a particular problem. Further, the prior art does not need to be directed to solving the same problem that is addressed in the patent.

27. I understand that a person of ordinary skill in the art is also a person of ordinary creativity. In many fields, it may be that there is little discussion of obvious techniques, modifications, and combinations, and it may be the case that market demand, rather than scientific research or literature, will drive a new

design. When there is market pressure or design need to solve a particular problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has a good reason to employ the known options. If this leads to the expected success, then it is likely the product of ordinary skill and common sense as opposed to patentable innovation. I understand that if a combination was obvious to try, that may show that it was obvious and therefore unpatentable. That a particular combination of prior art elements was obvious to try suggests that the combination was obvious even if no one made the combination.

28. I am informed that under U.S. patent law, an application for patent must contain a written description of the invention that is adequate to clearly allow any person skilled in the art to recognize that the inventor invented what is claimed, and was in possession of the claimed subject matter as of the filing date of the application.

29. I am further informed that under U.S. patent law, an application for patent must contain sufficient disclosure so that those skilled in the art would be enabled to make and use the claimed invention without undue experimentation.

30. I also understand that the claims of a patent must be sufficiently clear and definite so that those skilled in the art can determine the bounds of what is claimed. The primary purpose of this requirement of definiteness of claim language is to ensure that the scope of the claims is clear, so those skilled in the art

and the public are informed of the boundaries of what constitutes infringement of the patent.

V. LEVEL OF ORDINARY SKILL IN THE ART

31. I understand that the level of skill of a person of ordinary skill in the art (POSITA) at the time of the claimed invention is determined through consideration of several factors. I understand that those factors include: (1) the educational level of the inventor(s); (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field.

32. The art of the '506 Patent, as the patent states, relates to "ladders and, more particularly, components for adjusting ladders while also providing other functionality."

33. The '506 Patent lists N. Ryan Moss and B. Scott Maxfield as inventors. While I am unaware of the educational level of Mr. Ross and Mr. Maxfield, I see from their declarations submitted during prosecution of the '506 Patent that they have 15 and 8 years of experience, respectively, designing ladders and ladder accessories.

34. I am informed by Tricam that of the 8 persons employed in their product design group, all have at least a bachelor's degree in engineering, product development, or industrial design, and have product design experience ranging from

4 to 25 years with an average of about 14 years. I also understand that the general practice of Tricam is to require at least a bachelor's degree in a relevant field for an entry level position in design. Such a person is closely supervised for some time before performing independent design work.

35. After considering the factors and information mentioned above, and based on the disclosure of the '506 Patent, it is my opinion that a person of ordinary skill in the art of ladders and ladder accessories relevant to the '506 Patent at the relevant time would hold at least a Bachelor's degree in engineering, product development, industrial design or a related field, and have at least 2 years experience doing mechanical design work. A person having more education, such as a Master's degree, would require less experience, and a person not having at least a Bachelor's degree would need more experience. This is consistent with the level of expertise of engineers that I have typically worked with during the course of my work with ladder manufacturers.

VI. TECHNICAL BACKGROUND

36. Articulating combination ladders are relatively old technology. The basic form of such ladders, including the configuration of hinge mechanisms, was well-known in the ladder art at least as early as 1981, as shown by U.S. Patent No. 4,407,045 to Boothe ("Boothe '045"). EX1010. In Boothe '045, he describes a hinge mechanism including multiple plates pivotally coupled together, and that can

be locked in various positions corresponding to positions of the ladder (e.g. fully collapsed, stepladder, and straight ladder) with a spring-loaded bracket carrying locking pins that fit into apertures in the plates. *Id.*, col. 2, l. 61 – col. 3, l. 35; FIGs. 1-5. This basic hinge design has come to be commonly used in more recent ladders, such as the ladder of the ‘506 Patent. EX1001, FIG. 2.

37. The Boothe ‘045 ladder design required the user to grasp the bracket carrying the locking pins and pull it out against the bias of the spring to release the hinge so the ladder sections could be moved to different positions. EX1010, col. 6, ll. 3-19; FIGs. 4A and 4B. Later, in 1986, U.S. Patent No. 4,697,305 also to Boothe (“Boothe ‘305”) described an actuator button (“depression plate 70”) added to the mechanism to enable a user to simply press on the button from the opposite side of the bracket to release the mechanism. EX1016. This innovation has also come to be commonly used in articulating ladders today.

38. As ladders are typically used for work involving tools, a need was recognized to rest tools on the ladder to avoid a user having to repeatedly climb up and down. Accordingly, many different types of tool carriers and rests have been developed over the years for this specific purpose. These have included various types of trays, hooks, and buckets adapted for integration with, or attachment to, a ladder. For an example, U.S. Patent No. 7,967,111 by Meyers et. al. (“Meyers ‘111”) for a stepladder has an accessory hanger integrated with the hinge of the ladder.

EX1007. Other examples are the ladder top with tool hook (U.S. D833,643) and combination ladder with hinge coupled tray (U.S. Patent No. 11,505,994) developed by Tricam in 2017 and 2018, respectively. EX1025; EX1028. A Little Giant application in 2008 that led to U.S. Patent No. 8,186,481 to Moss, et. al. (“Moss ‘481”) integrated a magnetic tool hanger with a hinge actuator button as found in the earlier Boothe ‘305 patent. EX1006.

VI. THE CHALLENGED ‘506 PATENT

A. The Patent Specification

39. The ‘506 Patent is entitled “Multi-Function Button For Ladder Adjustment.” It describes an improvement to an articulating ladder in which tool-hanging functionality is added to the actuating button of the ladder’s hinge. EX1001, col. 1, l. 60 – col. 2, l. 12.

40. The overall context of the '506 Patent description is an extendable articulating ladder – an articulating ladder that functions as both a step ladder and an extension ladder through first and second rail assemblies coupled by hinge mechanisms. *Id.*, col. 5, ll. 16-55, col. 6, ll. 4-42, FIG. 1.

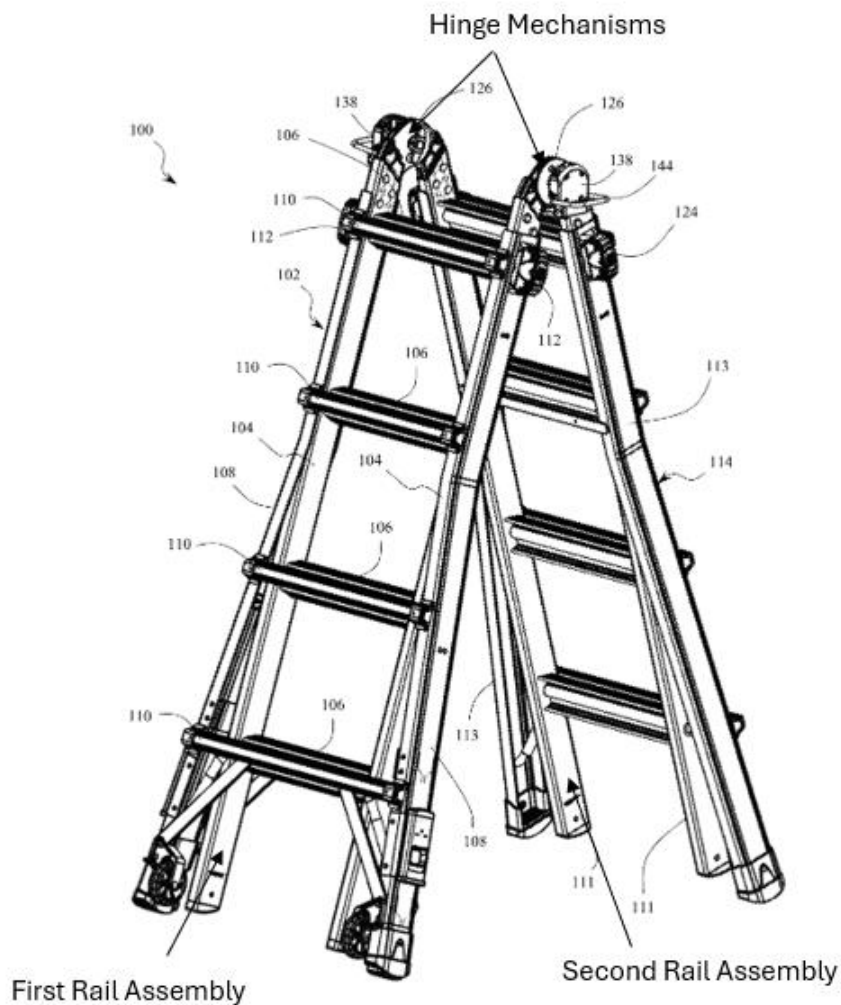
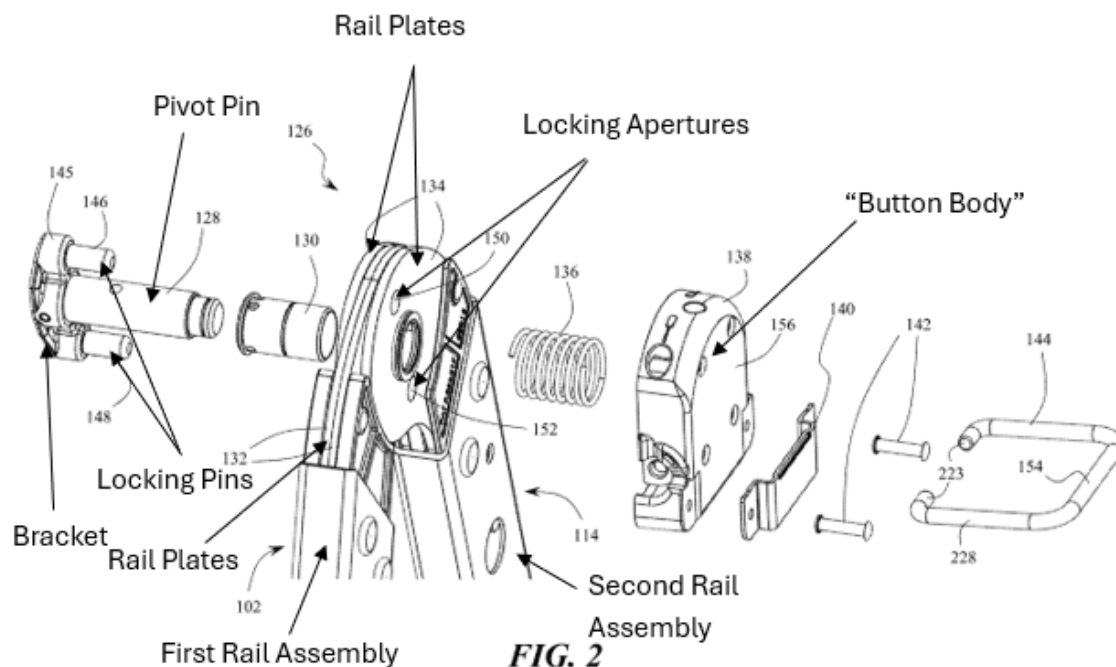


FIG. 1

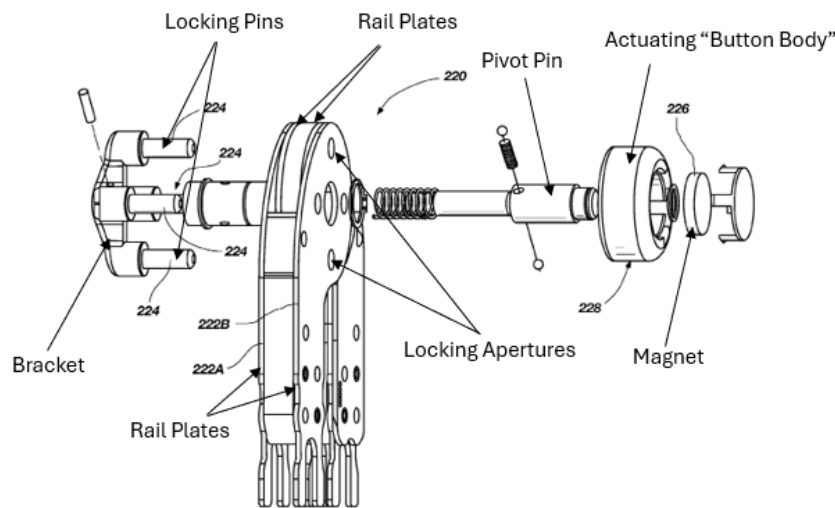
'506 Patent, FIG. 1 (annotated).

41. The hinge mechanisms include “a set of slidable/rotatable rail plates 132, 134 which are, respectively, parts of the first and second rail assemblies 102, 114.” *Id.*, col. 7, ll. 22-24. These rail plates rotate about a “pivot pin 128,” having at one end a “bracket 145” with a “pair of locking pins 146, 148.” *Id.*, col. 7, ll. 36-42. These locking pins are “extendable and (at least partially, if not entirely) withdrawable from a corresponding pair of locking apertures 150, 152” in the rail plates, which “align with each other . . . when the rail plates 132, 134 are in a set of predetermined orientations relative to each other (e.g., in the freestanding or extension ladder position).” *Id.*, col. 7, ll. 38-47, FIG. 2.



506 Patent, FIG. 2 (annotated).

42. The ladder described in the ‘506 Patent is nearly identical to the ladder disclosed in Moss ‘481. EX1006. Moss ‘481 discloses a similar locking ladder hinge mechanism:



Moss ‘481 (EX1006); FIG. 20 (annotated).

43. The ‘506 Patent states “[a]spects of the present disclosure relate to ladders and buttons attached to ladders that are configured to add functionality to the locking mechanisms of the ladders by providing a support arm (e.g., a loop, a tray, rod, hook, or similar support structure) for bearing the weight of tools, fasteners, and other objects in an elevated position while the ladder is used in a freestanding state or extension state. The support arms can be stationary parts of the buttons such as hooks, loops, cupholders, or similar structures integrated into the bodies of the buttons and not repositionable relative to the bodies. In some embodiments, the support arms can be movable between collapsed positions that

minimize the outer profile of the ladder and deployed positions that extend from the ladder (e.g., laterally away along the ladder's hinge pivot axis) and are convenient for supporting objects while in those positions. In any case, the support arms can form openings for receiving tool handles, distal ends of power tools, cups, fasteners, and other elongated shafts or tool bodies while broader parts of the objects are supported by the top surfaces of the support arm." EX1001, col. 4, ll. 42-61.

44. The embodiment described and depicted in the '506 Patent has a "button body 138" with two of these "support arm" features: (1) "support arm 144," which folds from a "storage or collapsed configuration" to a "deployed" position; and (2) "button plate 140." *Id.*, col. 9, l. 61 – col. 11, l. 45, FIGs. 5 and 6.

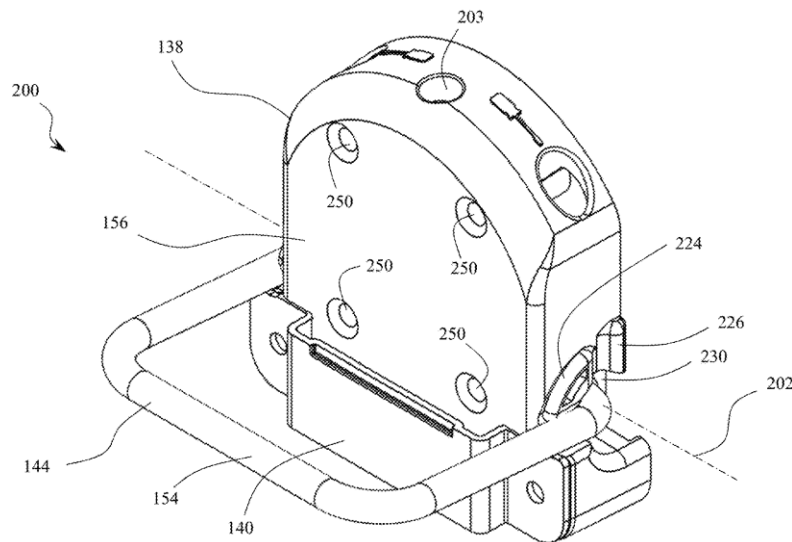


FIG. 6

B. The Prosecution History

45. The ‘506 Patent is a continuation of prior patent applications, the earliest of which was Provisional Patent Application No. 63/346,420 filed on May 27, 2022. The application leading to the ‘506 Patent was assigned Application Serial No. 18/490,715 (“the ‘715 Application”) and was filed with 20 claims. EX1002, “Claims” of October 19, 2023. There were 3 independent claims; 1, 12, and 19. *Id.* Claims 2-11 were dependent from claim 1, claims 13-18 were dependent from claim 12, and claim 20 was dependent from claim 19. *Id.* The ‘715 Application was filed with a Track One request for expedited examination. *Id.*, “Track One Request” of October 19, 2023.

46. Original claim 1 filed October 19, 2023 read:

1. A ladder, comprising:

a first assembly, including:

a first pair of rails spaced apart from each other;

a first set of rungs coupled to and extending between the first pair of rails;

a first pair of hinge portions coupled to the first pair of rails;

a second assembly, including:

a second pair of rails spaced apart from each other;

a second pair of hinge portions coupled to the second pair of rails;

wherein the first pair of hinge portions and the second pair of hinge portions are pivotally coupled to each other to form a pair of hinges rotatable about a pivot axis; and

a pair of hinge button assemblies,
wherein each hinge button assembly of the pair of hinge button assemblies
includes:
a first button body coupled with a hinge of the pair of hinges; and
a second button body coupled with the first button body and spaced
axially outward from the first button body by at least one gap
configured to receive an object.

Id., “Claims”, p. 1.

47. The Track One Request was granted, and a first non-final office action issued. *Id.*, Track One Request Granted of November 20, 2023; Office Action of December 12, 2023. This office action required restriction between Invention I consisting of claims 1-11 and 19-20 drawn to “A ladder,” and Invention II consisting of claims 12-18 drawn to “A button for a locking mechanism.” *Id.*, Office Action of December 12, 2023, p. 2. Counsel for Patent Owner had previously elected Invention I without traverse in a telephone conversation with the Examiner, and claims 12-18 were withdrawn by the Examiner. *Id.*, p. 4. Claim 1 was rejected as anticipated by U.S. Patent Publication No. 2023/0008962 by Zhu (“Zhu ‘962”). *Id.*, pp. 13-15. Claims 1-2 were rejected as anticipated by U.S. Patent Publication No. 2003/0037412 by Lee (“Lee ‘412”) or in the alternative under 35 U.S.C. § 103 (“Section 103”) as obvious over Lee ‘412 taken alone. *Id.*, pp. 16-20. Claims 1 and 3-11 were rejected under Section 103 as obvious over Lee ‘412 in view of U.S. Patent No. 11,191,373 to Ng (“Ng ‘373”). *Id.*, pp. 21-24.

Claims 1-11 were further rejected under Section 103 as obvious over Zhu ‘962 in view of Ng ‘373. *Id.*, pp. 24-30. Claims 19-20 were rejected under Section 103 as obvious over Lee ‘412 in view of Ng ‘373. *Id.*, pp. 30-35.

48. Patent Owner responded to the office action of December 12, 2023 on March 12, 2024 with claim amendments and arguments. Independent claim 1 was amended as follows:

a first button body coupled with a hinge of the pair of hinges; and
a second button body ~~coupled with~~ fixed to and movable with the first
button body in response to movement of the first button body
relative to the hinge, and the second button body being partially
spaced axially outward from the first button body by at least one
gap configured to receive an object hanging from the second
button body.

EX1002, Amendment of March 12, 2024, p. 4 [underlining and strikethrough in original]. Also, independent claim 19 was amended as follows:

wherein each retainer of the pair of retainers includes:
a body having a body surface facing axially outward from the pair of
hinges,¹ the body surface having an entirely flat portion;
a plate structure integrally formed with the body on at least two
ends of the plate structure on opposite sides of the entirely

¹ The claim appears to have been mismarked in the amendment, as “hinges” was part of the original claim.

flat portion of the body surface, wherein the plate structure is spaced axially outward from the body surface by at least one elongated gap, wherein the at least one elongated gap is parallel to the entirely flat portion of the body surface and configured to receive and support a tool hanging from the plate structure;

Id. at p. 8 [underlining and strikethrough in original]. Patent Owner’s remarks accompanying these amendments argued that Zhu ‘962 and Lee ‘412 do not teach or suggest the added limitations of claim 1. *Id.* at pp. 16-17. Regarding the combinations of Zhu ‘962 and Lee ‘412 with Ng ‘373, Patent Owner argued that the “[p]roposed combination would non-obviously change the principle of operation of [the] cited art,” the [p]roposed combination uses non-analogous art” (referring to Ng ‘373), the [p]roposed combination would not have been predictable,” the “[p]roposed combination would [make the cited references] unsuitable for their intended purposes,” and “[c]ited art does not teach or suggest each and every element of claims 1 and 19.” *Id.*, at pp. 17-22.

49. In a responsive final office action, the Examiner maintained the rejection of claims 1-2 as anticipated by Lee ‘412, claims 1, 3-11, and 19-20 as obvious over Lee ‘412 in view of Ng ‘373. *Id.*, Final Office Action of March 25, 2024, pp. 5-20. In addition, the Examiner reviewed each of Patent Owner’s arguments and found them unpersuasive. *Id.*, at pp. 20-26.

50. Patent Owner filed a Request for Continued Examination with an amendment. *Id.*, RCE and Amendment of July 25, 2024. Independent claim 1 was amended in relevant part as follows:

a second button body fixed to and movable with the first button body in response to movement of the first button body relative to the hinge, the second button body having a first axially facing surface being partially spaced axially outward from a second axially facing surface of the first button body by at least one gap configured to receive an object hanging from the second button body, wherein the first axially facing surface and the second axially facing surface face each other.

Id., at p. 3 [underlining and strikethrough in original]. Independent claim 19 was amended in relevant part as follows:

a pair of retainers, each retainer of the pair of retainers being movable between a ~~set of~~ respective first axial position[[s]] along the pivot axis and a ~~set of~~ second respective axial position[[s]] along the pivot axis;

Id., at p. 7 [underlining and strikethrough in original]. In response to the Section 102 rejection, Patent Owner argued that Lee ‘412 does not have the claimed “axially-facing” surfaces, and that there is no “gap” between the corresponding elements identified by the Examiner in the office action. *Id.* at pp. 12-13.

51. Regarding the Section 103 rejections, Patent Owner traversed the Examiner’s reliance on “apparent official notice” for the assertion that “[o]ne of

ordinary skill in the art would find that having a hanging bracket such as the one taught by Ng would be useful to a worker on a ladder where he can use it to attach small tools.” Also, Patent Owner asserted that the Examiner relied on “impermissible hindsight reasoning at least in view of objective indicia of obviousness,” and submitted three declarations from experts in the field of ladders, purportedly setting forth “objective indicia for the record rebutting the Examiner’s rationales.” According to Patent Owner:

In the appended declarations, all three ladder experts show that, based on their independent judgment, the Examiner’s assertion of the reasons for the obviousness of combining the Lee ladder and the Ng bracket are unfounded and not based on common knowledge or information well-known to persons having ordinary skill in the art at the time the invention was made. The cited art and these declarations show that a person having ordinary skill in the art would not have viewed the Ng reference as being analogous art to the field of ladders, including the ladder of Lee, so it would not have been obvious to modify the Lee ladder in view of the Ng disclosure. They also show that it would not have been obvious to a person having ordinary skill in the art to combine the teachings of Lee and Ng to arrive at claims of the present application in view of potential products liability issues, ladder industry safety standards, hinge design safety and functionality concerns, sizing of the Lee press part, and significant analysis and testing requirements for verification of any modifications that would be based on the disclosure of Ng. The declarations further establish that the non-obviousness of the claims is

apparent in view of a decades-long-felt but unmet need for the invention in the field of the invention and in view of copying (and/or near simultaneous invention) of the invention by others. Notably, the declarations of David Smith and Paul B. Junius are provided by third-party experts unaffiliated with Applicant. The Examiner's assertions of obviousness are therefore rebutted by the objective indicia evidence submitted herewith.

Id. at pp. 15-16.

52. The Examiner responded with new non-final rejections. Claims 1-11, and 19-20 were rejected under Section 103 as obvious over U.S. Patent Publication No. 2009/0229918 by Moss et al. ("Moss '918")² in view of Ng '373. *Id.*, Office Action of September 5, 2024, pp. 3-17. The Examiner reasoned that one of ordinary skill in the art would have modified Moss '918 by substituting the hanger taught by Ng '373 for the magnet taught by Moss '918 achieving a predictable result and with a reasonable likelihood of success. *Id.* at p. 15. The Examiner asserted that the arguments were "moot" in view of the new ground for rejection, and also addressed the declaration evidence in detail, asserting various reasons that the declarations were defective. *Id.* at pp. 18-20.

² This is the application that led to Moss '481 – one of the references being asserted in this Petition.

53. Patent Owner did not respond with further claim amendments. Instead, Patent Owner argued once again that “Ng [‘373] is non-analogous art to ladders, including the ladders of claims 1 and 19.” *Id.*, Amendment of December 1, 2024, pp. 10-12. Also, Patent Owner submitted additional declarations in an attempt to show that secondary considerations lead to a conclusion of non-obviousness. *Id.* at pp. 12-19; Declaration Under 37 C.F.R. §1.132 of Brian B. Russell, December 2, 2024; Declaration Under 37 C.F.R. §1.132 of N. Ryan Moss, November 25, 2024; Declaration Under 37 C.F.R. §1.132 of B. Scott Maxfield, November 27, 2024; and Declaration Under 37 C.F.R. §1.132 of Paul B. Junius, November 26, 2024. These declarations purportedly present evidence, *inter alia*, of “Long Felt But Unmet Need,” “Commercial Success,” and “Copying.” *Id.*

53. The Examiner responded with a Notice of Allowance. In the reasons for allowance, the Examiner stated:

In conclusion: It is found that: On one hand: one of ordinary skill in the art would not glean over to a wall mounting bracket, especially to introduce it onto a push activation button on a hinge of a ladder intended to be pressed for activation, where the bracket would permanently be mounted even when there are no tools hanging, and that indeed it would hinder or at least apply uncomfortable pressure to the palm of the user.

And on the other hand: The long-felt need and commercial success proven by the state of the art, and the decelerations [sic] of the

four experts in the field in combination with the copying of competitors when the current inventors developed and implemented the design.

The above, have persuaded the examiner since the closest references i.e., having Moss's magnetic tool hanger needing to be modified by the wall mounting bracket of Ng, along with the design and engineering associated with such combination and the uncomfortable push button that would result even if said combination was made; hence, it is determined that it is unlikely that one of ordinary skill in the art would find that combination obvious, and that such would be a solution to the current problem, and that the claims of the current invention read over the prior art of record.

Note that: it is the [sic] both the argument of the combination of art, as well as the state of the art, the market and signed declarations, are what resulted in examiner's conclusion.

Id., Notice of Allowance of April 16, 2025, pp. 3-4 (emphasis in original).

C. The Patent Claims

54. The '506 Patent as issued has 13 claims, with claims 1 and 12 being independent. Claims 2-11 depend from claim 1, and claim 13 depends from claim 12. EX1001, col. 14, l. 56 – col. 16, l. 58. Claim 1 appears in the patent as follows:

1. A ladder, comprising:

a first assembly, including:

a first pair of rails spaced apart from each other;

a first set of rungs coupled to and extending between the
first pair of rails;

a first pair of hinge portions coupled to the first pair of rails;

a second assembly, including:

a second pair of rails spaced apart from each other;

a second pair of hinge portions coupled to the second pair of rails;

wherein the first pair of hinge portions and the second pair of hinge portions are pivotally coupled to each other to form a pair of hinges rotatable about a pivot axis; and

a pair of hinge button assemblies, wherein each hinge button assembly of the pair of hinge button assemblies includes:

a first button body coupled with a hinge of the pair of hinges; and

a second button body fixed to and movable with the first button body in response to movement of the first button body relative to the hinge, the second button body having a first axially-facing surface being partially spaced axially outward from a second axially-facing surface of the first button body by at least one gap configured to receive an object hanging from the second button body, wherein the first axially-facing surface and the second axially-facing surface face each other.

EX1001, col. 14, l. 56 – col. 15, l. 19. Claims 2-11 depend from claim 1. *Id.*, col.

15, l. 20 – col. 16, l. 9. Claim 12 reads:

12. A ladder, comprising: a first assembly, including:

a first pair of rails spaced apart from each other;

a first set of rungs coupled to and extending between the first pair of rails;

a first pair of hinge portions coupled to the first pair of rails and defining a first opening;

a second assembly, including:

- a second pair of rails spaced apart from each other;
- a second pair of hinge portions coupled to the second pair of rails and defining a second opening;

wherein the first pair of hinge portions and the second pair of hinge portions are pivotally coupled to each other to form a pair of hinges rotatable about a pivot axis; and

a pair of retainers, each retainer of the pair of retainers being movable between a respective first axial position along the pivot axis and a respective second axial position along the pivot axis;

wherein each retainer of the pair of retainers includes:

- a body having a body surface facing axially outward from the pair of hinges, the body surface having an entirely flat portion;
- a plate structure integrally formed with the body on at least two ends of the plate structure on opposite sides of the entirely flat portion of the body surface, wherein the plate structure is spaced axially outward from the body surface by at least one elongated gap, wherein the at least one elongated gap is parallel to the entirely flat portion of the body surface and configured to receive and support a tool hanging from the plate structure;

a pivot pin coupled to the body on a side of the body opposite the plate structure;
a bracket coupled to the pivot pin; and
at least one locking pin coupled to the bracket;
wherein the first assembly is rotatable relative to the second assembly while the pair of retainers is in the first axial positions and the at least one locking pin is removed from the first opening and from the second opening; and
wherein the first assembly is prevented from rotation relative to the second assembly by the pair of retainers while the pair of retainers is in the second axial positions and the at least one locking pin is positioned in the first opening and in the second opening.

Id., col. 16, ll. 10-54. Claim 13 depends from claim 12. *Id.*, col. 16, ll. 55-58.

D. Claim Construction

55. The limitation “wherein the first pair of hinge portions and the second pair of hinge portions are pivotally coupled to each other to form a pair of hinges rotatable about a pivot axis” is contained in both independent claims 1 and 12. EX1001, col. 15, ll. 1-4; col. 16, ll. 20-24. In my opinion as a person of ordinary skill in the art, this limitation defies understanding. It literally requires that the “first pair of hinge portions” as a unit be “pivotally coupled” to the “second pair of hinge portions” as a unit to form “a pair of hinges.” Such a structure is not disclosed or even suggested in the specification of the ‘506 Patent. What is disclosed is a pair of hinges, with each hinge having a first portion pivotally

coupled to a second portion. EX1001, col. 6, ll. 6-17; FIG. 2. In no sense is the first pair of hinge portions as a single structure coupled to the second pair of hinge portions as a single structure as the claim literally reads. I cannot conclude from the specification and figures that the '506 Patent inventors had possession of such a structure at the time of the invention. Further, it seems that if the first and second pairs of hinge portions were coupled as recited, the result would be one hinge, not a pair of hinges. As such, the claim seems to require a structure that is not possible. I suspect that the Patent Owner intended the claim to require "a pair of hinges, each one of the pair of hinges including one of the pair of first hinge portions coupled to one of the pair of second hinge portions to rotate about a pivot axis." I have used that interpretation in forming my opinions relating to the prior art, even though, in my opinion, this is not how the claim reads. The claim seems to require a re-write to make sense.

56. Similarly, claim 2 requires "the pair of hinge button assemblies is movable between a first axial position along the pivot axis and a second axial position along the pivot axis." The specification describes no such operation of the hinge button assemblies. What the specification describes is two hinge button assemblies, each separately movable between its own first axial position and second axial position. EX1001, col. 7, ll. 48-65; FIGs. 1, 3A and 3B. I cannot conclude from the specification and figures that the inventors had possession of a

structure that operates as claimed at the time of invention. Also, it does not seem possible that any pair of hinge buttons, even if movable together, could occupy the same first axial position along the pivot axis and second axial position along the pivot axis. As such, the claim seems to require a condition that is not possible. I suspect that the Patent Owner intended the claim to require “each one of the pair of hinge button assemblies is movable between a separate first axial position along the pivot axis and a separate second axial position along the pivot axis.” I have used that interpretation in forming my opinions relating to the prior art. As with the prior language discussed in the preceding paragraph, this is not how the claim reads and, again, it seems the claim must be rewritten to make sense.

57. Claims 12 and 13 use the term “retainer.” EX1001, col. 16, ll. 24-58. It is my opinion that a person of ordinary skill in the art at the time of the purported invention would not understand the term “retainer” as a term of art referring to any particular structure or category of structures. The term has no common or particular structural meaning for those of ordinary skill in the ladder industry, or even in the mechanical arts, and that the term would not bring any specific structure to the mind of individuals involved in developing and designing ladders at the time. It appears from the specification, however, that the Patent Owner uses the term to generally refer to a hinge button that has features for “retaining” things. EX1001, col. 11, ll. 41-45.

VII. PRIOR ART REFERENCES

58. **Moss ‘481 (EX1006)** is a U.S. patent entitled “Ladders, Ladder Components And Related Methods” that issued September 17, 2009. Moss ‘481 constitutes prior art under at least 35 U.S.C. § 102(a). Moss ‘481 is from the same field of endeavor as the ‘506 Patent – namely ladders and ladder accessories - and therefore is “analogous art.”

59. **Boothe ‘045 (EX1010)** is a U.S. patent entitled “Ladder Hinge And Multi-Position Locking Mechanism Therefor” that issued October 4, 1983. Boothe ‘045 constitutes prior art under at least 35 U.S.C. § 102(a).³

60. **Meyers ‘111 (EX1007)** is a U.S. patent entitled “Stepladder” that issued June 28, 2011. Meyers ‘111 constitutes prior art under at least 35 U.S.C. § 102(a). Meyers ‘111 was not cited or considered during prosecution of the ‘506 Patent. Meyers ‘111 is from the same field of endeavor as the ‘506 Patent – namely ladders and ladder accessories - and therefore is “analogous art.”

³ Boothe ‘045 is not asserted separately in the Petition – rather it is considered part of Moss ‘481, since it is explicitly incorporated by reference in Moss ‘481.

VIII. CLAIMS 1-13 ARE OBVIOUS OVER MOSS ‘481 IN VIEW OF MEYERS ‘111

A. Overview of Moss ‘481

61. Moss ‘481 discloses a ladder having a pair of rail assemblies, each with a pair of spaced-apart rails and with rungs extending between the rails. EX1006, col. 4, ll. 25-30, 43-45; FIG. 1. In some embodiments, the rail assemblies are coupled with a pair of hinges that are rotatable about a pivot axis. *Id.*, col. 9, ll. 13-32; FIG. 20. The hinges have hinge buttons that are movable along the pivot axis to extend and withdraw locking pins from apertures in the hinge to prevent or enable rotation of the hinge, respectively. *Id.*; EX1010 (incorporated by reference in Moss ‘481 at col. 9, ll. 14-17), col. 6, ll. 3-44; FIGs. 4A and 4B. Hence, Moss ‘481 discloses all aspects of the invention claimed in the ‘506 Patent except for the hinge button hanger structures. Instead of a mechanical hanger for objects on the hinge button, the hinge button of Moss ‘481 has a magnet for temporarily attaching tools or other items. EX1006, col. 9, ll. 33-46; FIG. 20.

B. Overview of Meyers ‘111

62. Meyers ‘111 discloses a stepladder having a hinge pin mount with an accessory mount that includes a mount plate forming a “base receptacle” for receiving various object attachments such as a hook, paper towel holder, roll holder, power cord hook, tape measure, or utility holder. EX1007, col. 8, l. 15 – col. 9, l. 20; FIGs. 4, 11-13.

C. Claim 1

63. The preamble of claim 1 reads as follows:

1. A ladder, comprising: . . .

64. Moss ‘481 discloses *a ladder* as recited in the preamble. (I will identify claim language using italics in the following comparison between the claims and the prior art). Specifically, Moss ‘481 discloses “a ladder . . . that includes a first rail assembly, including at least one pair of rails and a plurality of rungs coupled therewith, and a second rail assembly including at least one pair of rails.” EX1006, col. 2, ll. 25-28; FIG. 1.

65. Following the preamble, claim 1 continues:

a first assembly, including: a first pair of rails spaced apart from each other; a first set of rungs coupled to and extending between the first pair of rails;

66. Moss ‘481 discloses this limitation. Moss ‘481 describes a *first assembly* (first assembly 102) that includes *a first pair of rails spaced apart from each other* and *a first set of rungs coupled to and extending between the first pair of rails* (inner rails 101 having a plurality of rungs 103 extending between). EX1006, col. 4, ll. 26-29; FIGs. 1-4. The ladder of Moss ‘481 is depicted side-by-side with the ‘506 Patent ladder in the annotated figures below, which indicate the respective features:

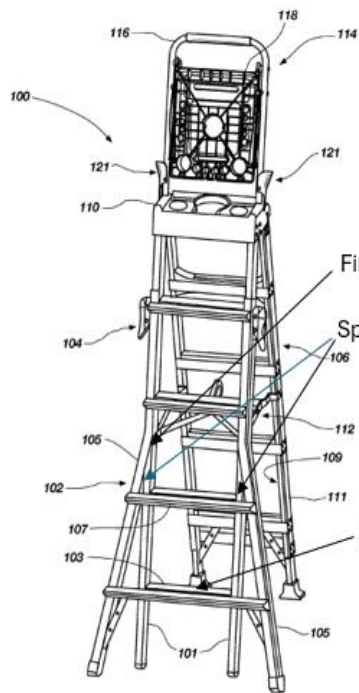


FIG. 1

EX1006, FIG. 1

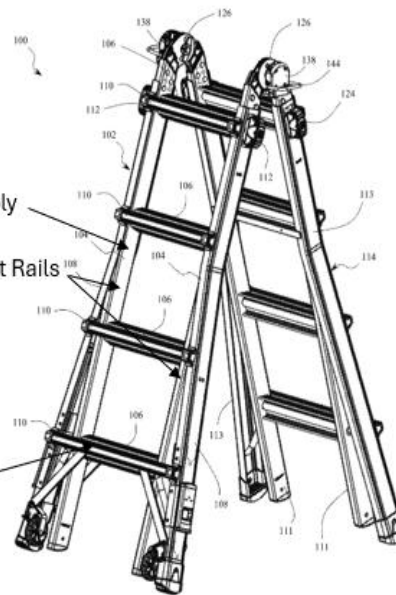


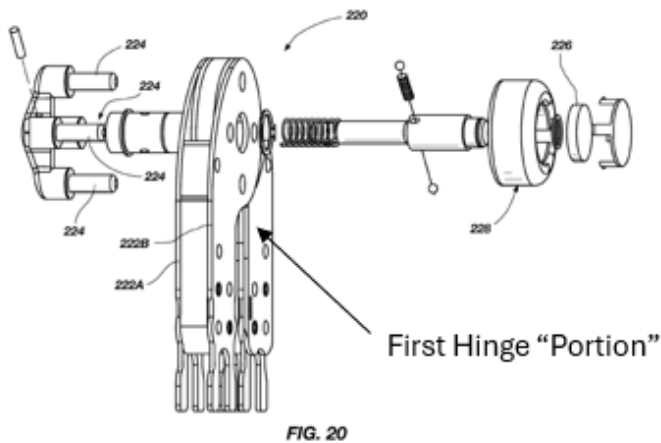
FIG. 1

EX1001, FIG. 1

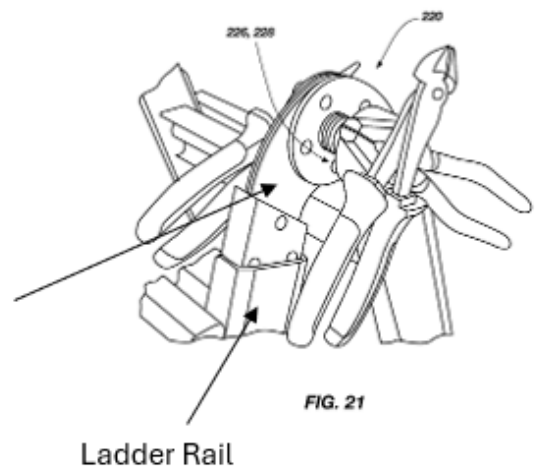
67. Next, claim 1 recites:

a first pair of hinge portions coupled to the first pair of rails;

68. Moss ‘481 discloses this limitation. FIGs. 20 and 21 of Moss ‘481 depict a hinge for an articulating ladder. EX1006, FIGs. 20-21. The hinge has a first “portion” that couples to a rail of the ladder, and a pair of such hinges would be used in a ladder so as to constitute *a first pair of hinge portions coupled to [a] first pair of rails*. EX1006, FIGs. 20-21; col. 9, ll. 13-46. FIGs. 20-21 of Moss ‘481 are presented and correspondingly annotated below:



EX1006, FIG. 20 (annotated)



EX1006, FIG. 21 (annotated)

69. Next, claim 1 recites:

a second assembly, including: a second pair of rails spaced apart from each other;

70. Moss ‘481 discloses this limitation. Moss ‘481 describes a *second assembly* (second assembly 106) that includes *a second pair of rails spaced apart from each other* (inner rails 109). EX1006, col. 4, ll. 43-45, FIGs. 1-4.

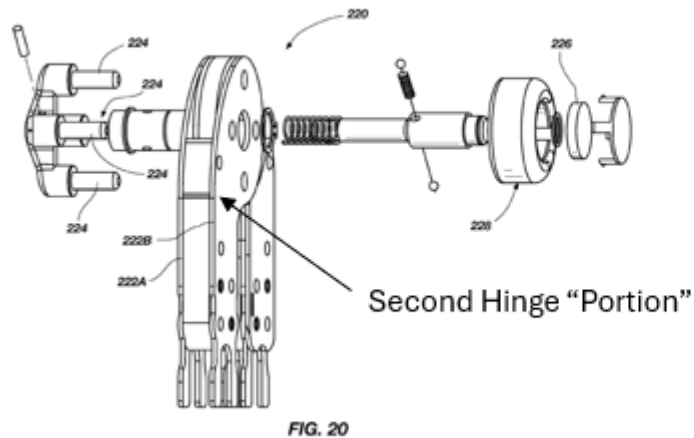
71. Next, claim 1 recites:

a second pair of hinge portions coupled to the second pair of rails;

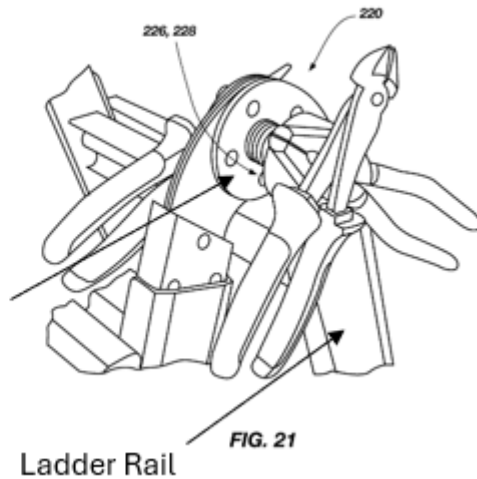
72. Moss ‘481 discloses this limitation. FIGs. 20 and 21 of Moss ‘481 depict a hinge for a combination ladder. EX1006, FIGs. 20-21. The hinge has a second “portion” that couples to a rail of the ladder, and a pair of such hinges would be used in a ladder so as to constitute *a second pair of hinge portions*

coupled to [a] second pair of rails. EX1006, FIGs. 20-21; col. 9, ll. 13-46. FIGs.

20-21 of Moss ‘481 are presented and correspondingly annotated below:



EX1006, FIG. 20 (annotated)



EX1006, FIG. 21 (annotated)

73. Next, claim 1 recites:

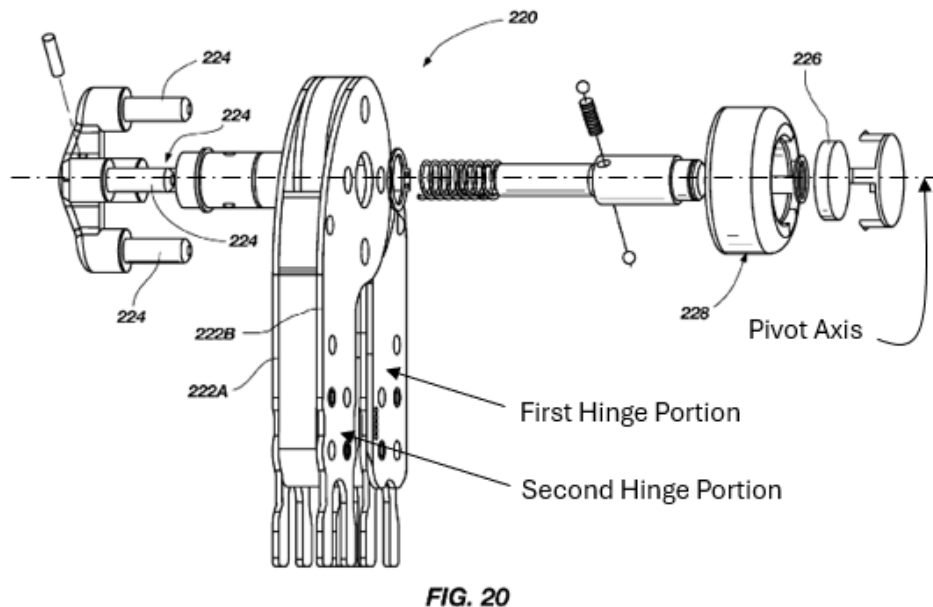
wherein the first pair of hinge portions and the second pair of hinge portions are pivotally coupled to each other to form a pair of hinges rotatable about a pivot axis; and

74. Moss ‘481 discloses this limitation. As I stated above in Paragraph 55, I interpret this limitation as requiring “a pair of hinges, each one of the pair of hinges including one of the pair of first hinge portions coupled to one of the pair of second hinge portions to rotate about a pivot axis,” since the specification does not support this limitation and the structure is not possible as recited. With that understanding, Moss ‘481 states:

The hinge assembly 220 may be used in association with, for example, combination ladders similar to the hinge described in U.S. Pat. No. 4,407,045 to Boothe, the disclosure of which is incorporated by reference herein in its entirety. Such a hinge assembly 220 may be used on other types of ladders as well as will be appreciated by those of ordinary skill in the art. In one embodiment, the hinge assembly 220 includes multiple hinge components pivotally coupled with one another, wherein the outer hinge plates 222A and 222B of a hinge component are spaced further apart from one another as compared to those of previous hinge assemblies.

EX1006, col. 9, ll. 14-26. Hence, each hinge has a first hinge portion pivotally coupled to a second hinge portion so that the hinge rotates around a pivot axis.

FIG. 20 of Moss '481 is presented and correspondingly annotated below:



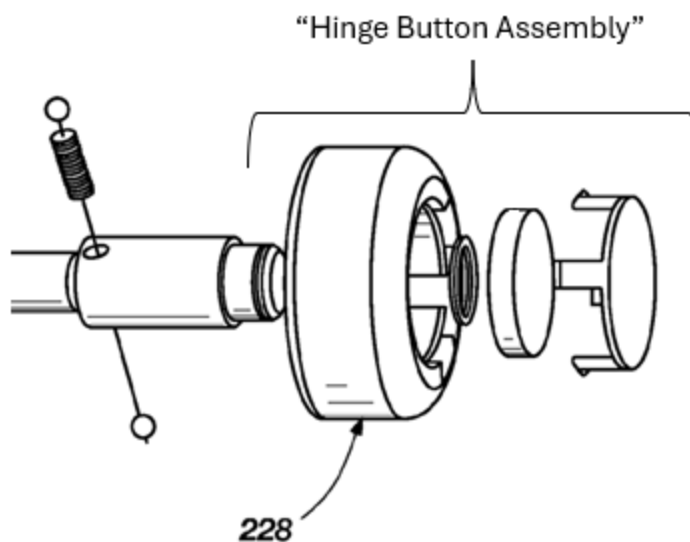
EX. 1006, FIG. 20 (annotated).

A pair of such hinges is used in a ladder. Hence, Moss ‘481 discloses *wherein the first pair of hinge portions and the second pair of hinge portions are pivotally coupled to each other to form a pair of hinges rotatable about a pivot axis* as that limitation is understood.

75. Then, claim 1 recites:

a pair of hinge button assemblies,

76. Moss ‘481 discloses this limitation. “Hinge assembly 220” of Moss ‘481 includes an “actuation button 228,” which has multiple parts and can therefore be characterized as a *hinge button assembly*. EX1006, col. 9, ll. 33-35; FIG. 20. When two of these “hinge assembl[ies]” are used on a ladder, they would form *a pair of hinge button assemblies* as claimed. FIG. 20 of Moss ‘481 is presented and correspondingly annotated below:



EX1006, FIG. 20 (annotated).

77. Next, claim 1 recites:

wherein each hinge button assembly of the pair of hinge button assemblies includes: a first button body coupled with a hinge of the pair of hinges; a second button body fixed to and movable with the first button body in response to movement of the first button body relative to the hinge,

78. Moss '481 discloses these limitations. The “actuation button 228” has a main body (without reference numeral) coupled to the “hinge assembly 220” through a pivot pin (without reference numeral), thus disclosing *a first button body coupled with a hinge of the pair of hinges*. A cap (without reference numeral) is fitted onto the main body and would be movable with the main body relative to the hinge. Hence, Moss '481 discloses *a second button body fixed to and movable with*

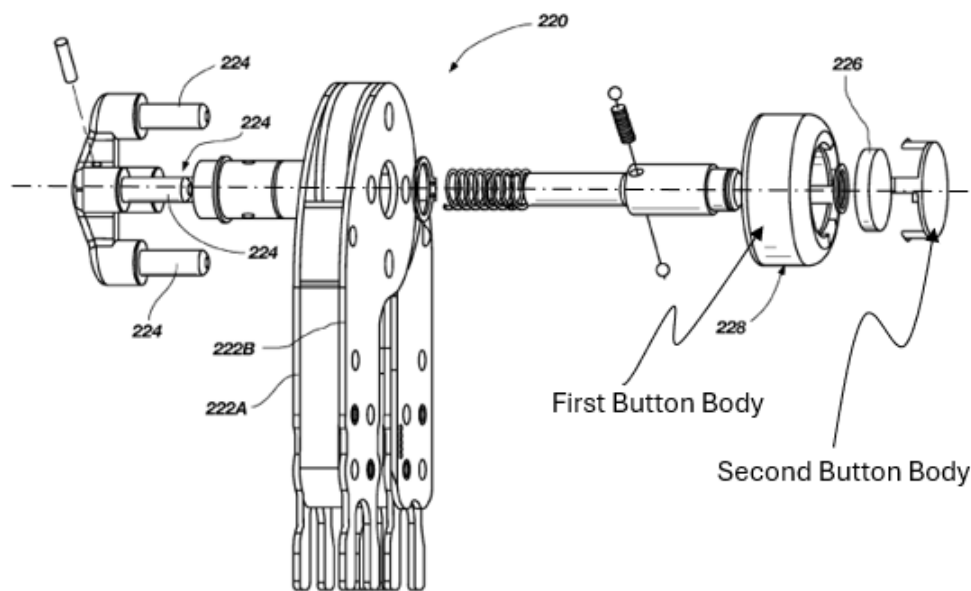


FIG. 20

EX1006, FIG. 20 (annotated).

the first button body in response to movement of the first button body relative to the hinge as claimed. FIG. 20 of Moss ‘481 is presented and correspondingly annotated below:

79. Finally, claim 1 recites:

the second button body having a first axially-facing surface being partially spaced axially outward from a second axially-facing surface of the first button body by at least one gap⁴ configured to receive an object hanging from the second button body, wherein the first axially-facing surface and the second axially-facing surface face each other.

80. The cap (*second button body*) of the actuation button (*hinge button assembly*) of Moss ‘481 is not depicted as being *partially spaced axially outward from a second axially-facing surface of the first button body by at least one gap configured to receive an object hanging from the second button body* as claimed.

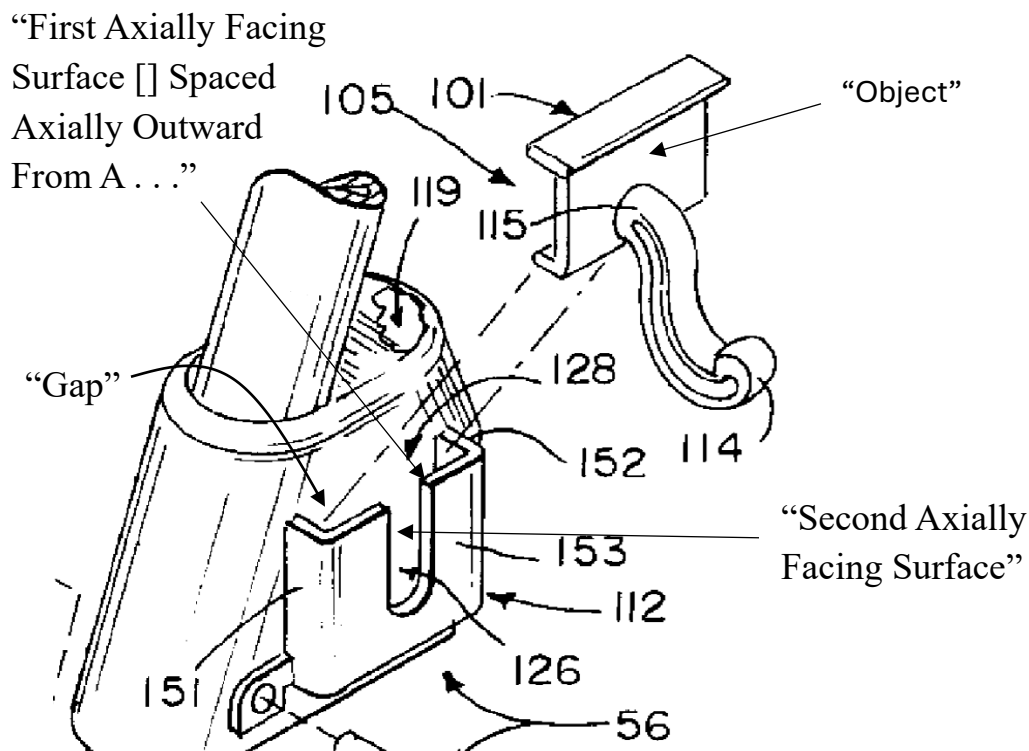
81. Meyers ‘111, however, is analogous prior art, and discloses a “stepladder 10” with a “hinge pin mount 110” having “accessory mount 112,”

⁴ The plain and ordinary meaning of “gap” is “an empty space or opening in the middle of something or between two things.” “Gap,” *Cambridge Dictionary*, <https://dictionary.cambridge.org/us/dictionary/english/gap> (last visited Mar. 12, 2026).

FIG. 12

stepladder accessories included in accessory kit 150.” *Id.* This structure is depicted in FIG. 12 of Meyers ‘111:

82. The “mount plate” of the Meyers ‘111 hinge assembly has *a first axially facing surface being partially spaced axially outward from a second axially-facing surface . . . by at least one gap configured to receive an object*:



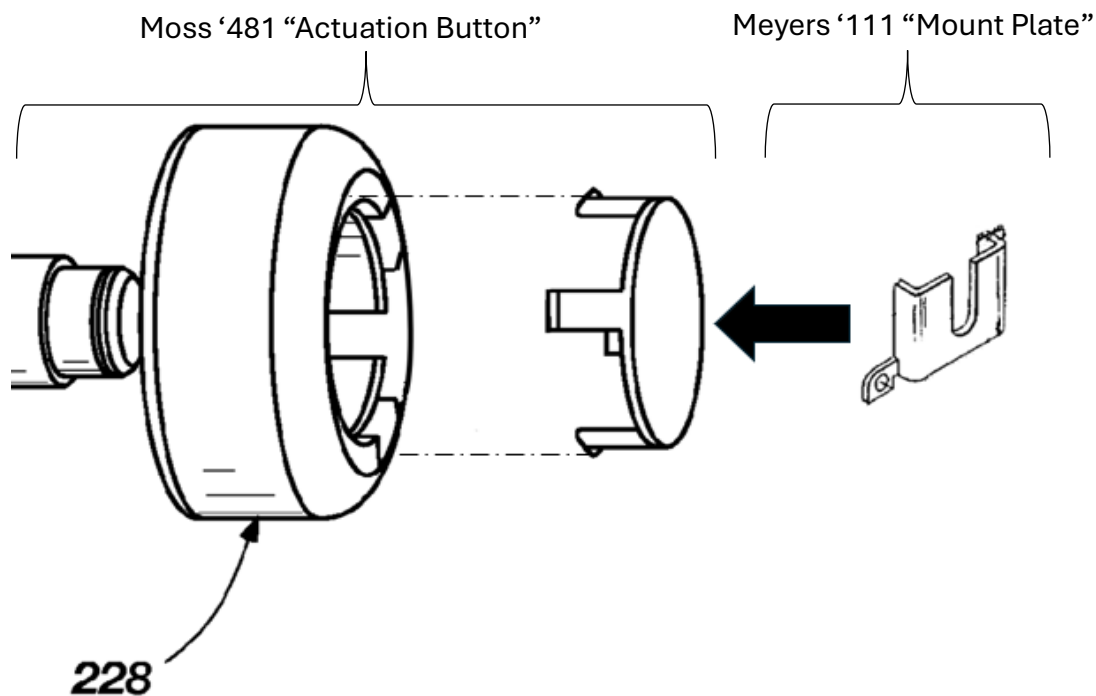
EX 1007, FIG. 20 (annotated).

83. In his declaration of November 27, 2024, submitted during prosecution of the ‘506 Patent, B. Scott Maxfield stated that he had “received reports that users of the magnetic hinge button ladder [as disclosed in Moss ‘481]

were dissatisfied with the utility of the magnetic button, its ability to hold heavier objects, and its ability to attract unwanted objects to it.” EX1023, ¶ 4.

84. In my opinion, a person of ordinary skill in the art, faced with these drawbacks of the Moss ‘481 magnetic hinge button, would have been motivated to consider non-magnetic alternatives for hanging items from a hinge button to accomplish the same function.

85. Meyers ‘111 offers such an alternative. The Moss ‘481 hinge button could be modified by simply omitting the magnet, and affixing the Meyers ‘111 mount plate or similar structure to the hinge button of Moss ‘481, adapting the cap fitted onto the main button body to receive it and be suitably secured. This modification is depicted below:



EX1006, FIG. 20 (modified with Meyers ‘111 “mount plate” and annotated).

86. This modification would involve only the routine engineering tasks of designing the modified assembly to be of sufficient size and strength to fulfill functional and load bearing requirements, and softening of the edges of the mount plate to allow pressure to be applied to release the lock without undue discomfort to the user's hand. The cap could be molded in a single piece with the button, or fastened to the button by appropriate means such as adhesive, screws, rivets, etc., and the method of securing the pivot pin to the button appropriately adapted so that access under the cap is not needed. The assembly would then be tested to ensure durability and that it will hold the expected load that will be applied with a tool or other object hanging from the button without failing or interfering with operation of the hinge. ANSI A14.2-2007 Section 7.4.2., the Cyclic Joint Test, would be used to help evaluate the durability of the button assembly. These are ordinary and routine engineering tasks that could be accomplished by any person of ordinary skill in the art.

87. A person of ordinary skill in the art would have a reasonable expectation of success in carrying out this modification because the combination has a predictable result (a hinge button that can be used for hanging tools and other items) and the modification requires no special engineering knowledge or skill beyond that of a person of ordinary skill in the art.

88. The substitution of the mount plate of Meyers ‘111 for the magnet of Moss ‘481 fits with the rationale of “combining prior art elements according to known methods to yield predictable results.” The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination yielded nothing more than predictable results to one of ordinary skill in the art.

89. Ladder hinge button tool-hanging functionality was known from the Moss ‘481 disclosure, which uses a magnet. A mechanical object-hanging structure provided by a plate attached to a ladder hinge was known at the time of the invention from the Meyers ‘111 disclosure. Additionally, slots for hanging various tools have been used on ladder top caps or pail shelves by Werner, Louisville, Tricam, and Little Giant. *See e.g.*, EX1019, ¶¶ 9-13. This is a common feature, as common tools, such as screw guns, come equipped with belt clips that can also hang from ladders when appropriate slots are provided. The function of these devices – object-hanging – is the same. Substituting the mechanical object-hanging structure of Meyers ‘111 for the magnetic tool-hanging structure of Moss ‘481 yields a device with the same object-hanging ability, but without the drawbacks of a magnet, such as attracting unwanted objects, and with the benefit of holding

heavier loads and non-ferrous metal objects, a result that would have been predictable to a person of ordinary skill in the art.

90. The substitution of the mount plate of Meyers ‘111 for the magnet of Moss ‘481 also fits with the “simple substitution of one known element for another to obtain predictable results” rationale. Moss ‘481 disclosed a ladder hinge button with a magnetic tool hanger. Meyers ‘111 disclosed a ladder hinge assembly with a mechanical tool hanger. The proposed modification of Moss ‘481 involves the simple substitution of the mechanical tool hanger (mount plate) of Meyers ‘111 for the magnet of Moss ‘481. A person of ordinary skill in the art could have substituted the mount plate of Meyers ‘111 on the exterior of the hinge button of Moss ‘481 for the magnet of Moss ‘481, thereby achieving the predictable result of a ladder with a hinge button having tool-hanging ability without the drawbacks of magnets and the benefit of holding heavier objects and objects not containing ferrous metal.

91. The Moss ‘481 hinge button, so modified with the Meyers ‘111 “mount plate,” would have all features of the subject limitation. *The second button body* (the Meyers ‘111 mount plate) would have *a first axially-facing surface* (the inside surface of the mount plate as depicted above) *partially spaced axially outward* (via the “first and second stand-off plates”) *from a second axially-facing surface of the first button body* (the outer surface of the cap on the main body) *by*

at least one gap (the space defined by the mount plate on the outside of the cap) *configured to receive an object hanging from the second button body* (the gap would inherently be capable of receiving a suitably sized “object” e.g. the “accessories” in “accessory kit 150” of Meyers ‘111), *wherein the first axially-facing surface and the second axially-facing surface face each other* (the inside surface of the mount plate would directly face the outside surface of the cap on the main body).

D. Claim 2

92. Claim 2 adds several limitations to claim. I analyze each one below.

93. First, claim 2 recites:

The ladder of claim 1, wherein: the pair of hinge button assemblies is movable between a first axial position along the pivot axis and a second axial position along the pivot axis;

94. As I stated above in Paragraph 56, I am interpreting this limitation to require “each one of the pair of hinge button assemblies is movable between a separate first axial position along the pivot axis and a separate second axial position along the pivot axis,” because the specification does not describe any structure that functions as literally recited, and such functioning is not possible.

95. With that understanding, the ladder of Moss ‘481 discloses this limitation. The specification passages of Moss ‘481 describing the hinge button assembly depicted in FIGs. 20 and 21 do not contain an extensive description of its

operation and structure, but instead state that “[t]he hinge assembly 220 may be used in association with, for example, combination ladders similar to the hinge described in U.S. Pat. No. 4,407,045 to Boothe, the disclosure of which is incorporated by reference herein in its entirety.” EX1006, col. 9, ll. 14-17.

96. Boothe ‘045 in turn is directed to a “Ladder Hinge And Multi-Position Locking Mechanism Therefor.” EX1010. Boothe ‘045 discloses a hinge mechanism, in which a handle carrying locking pins can be shifted axially to insert and withdraw the locking pins from apertures in hinge plates. EX1010, col. 6, ll. 3-19; FIGs. 4A and 4B. Moss ‘481 appears to add an “actuation button 228” to the same or similar hinge mechanism, so that rather than a user grasping and pulling the “locking handle 52” to withdraw the locking pins as in Boothe ‘045, the user presses on actuation button 228, which is coupled to a structure similar to “locking handle 52” through a solid shaft, translating it axially to withdraw the locking pins. EX1006, FIG. 20. Hence, Moss ‘481 discloses *hinge button assemblies* (actuation button 228) *[/] movable between a first axial position along the pivot axis and a second axial position along the pivot axis as claimed.*

97. Next, claim 2 recites:

the first assembly is rotatable relative to the second assembly while the pair of hinge button assemblies is in the first axial position;

98. The ladder of Moss '481 exhibits this limitation. When locking pins 224 are disengaged from the apertures in the hinge plates, the hinge portions (plates 228A and 228B) coupled to the first and second assemblies would be rotatable relative to each other. Therefore, the *first assembly* [would be] *rotatable relative to the second assembly while the pair of hinge button assemblies is in the first axial position* as claimed.

99. Next, claim 2 recites:

the first assembly is prevented from rotation relative to the second assembly while the pair of hinge button assemblies is in the second axial position;

100. The ladder of Moss '481 exhibits this limitation. When locking pins 224 are engaged in the apertures in the hinge plates, the hinge portions (plates 228A and 228B) coupled to the first and second assemblies would not be rotatable relative to each other because rotation is prevented by the locking pins 224. Therefore, the *first assembly* [would be] *prevented from rotation relative to the second assembly while the pair of hinge button assemblies is in the second axial position* as claimed.

101. Next, claim 2 recites:

each hinge button assembly further comprises a pivot pin coupled to the first button body, a bracket coupled to the pivot pin, and at least one locking pin coupled to the bracket;

102. The ladder of Moss '481 exhibits this limitation. As depicted in FIG. 20 of Moss '481, the *hinge button assembly* has a *pivot pin coupled to the first button body*, a *bracket coupled to the pivot pin*, and *at least one locking pin coupled to the bracket*. FIG. 20 of Moss '481 is presented and correspondingly annotated below:

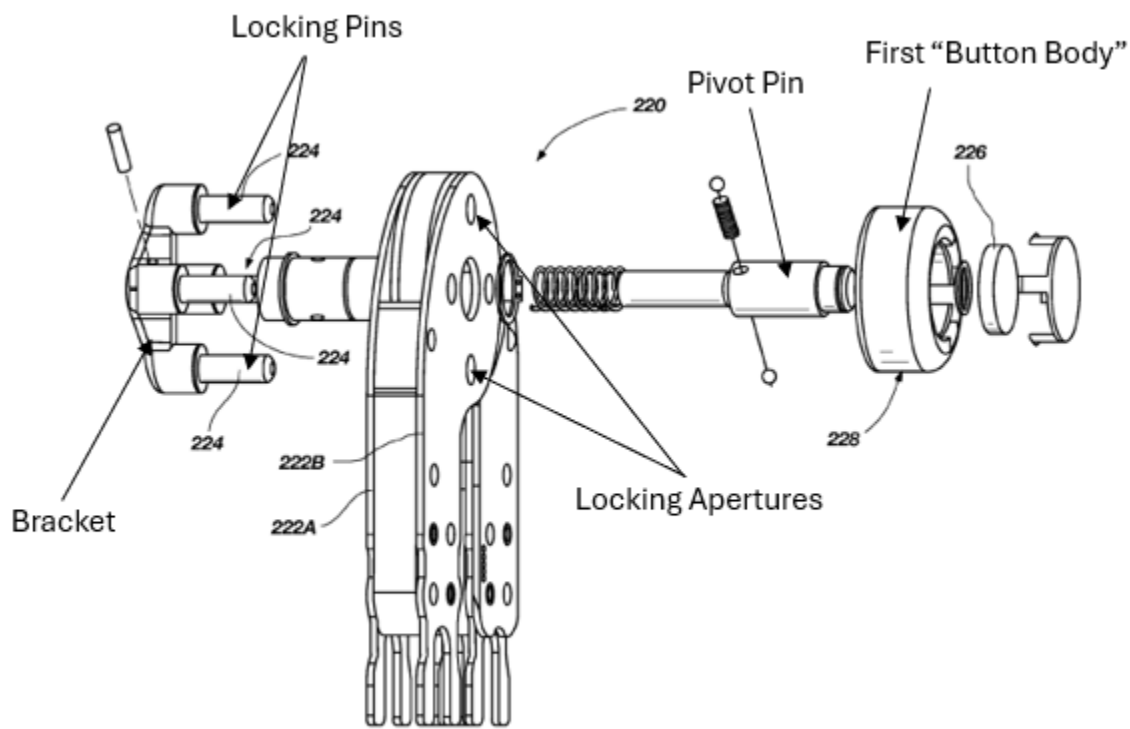


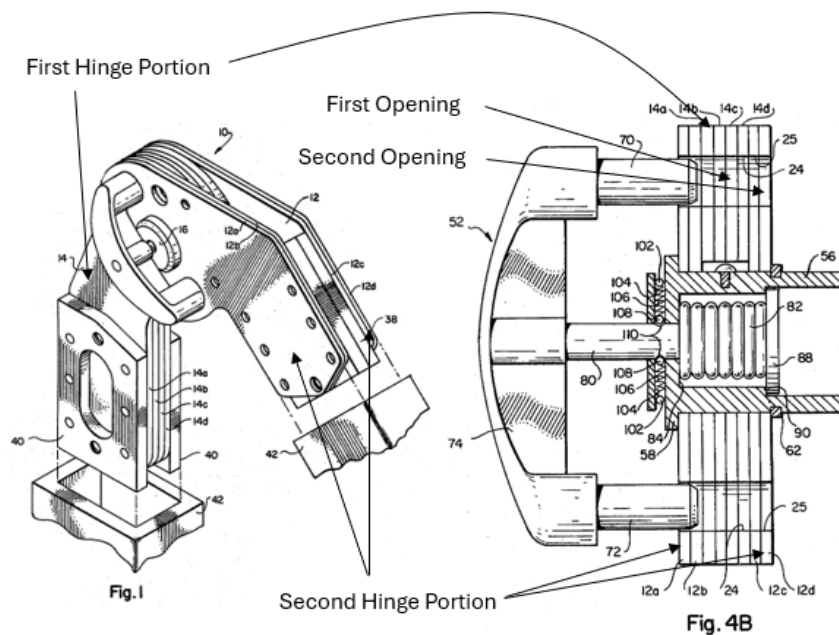
FIG. 20

EX1006, FIG. 20 (annotated).

103. Next, claim 2 recites:

the first pair of hinge portions includes a first opening and the second pair of hinge portions includes a second opening;

104. Moss '481 discloses this additional limitation through incorporation of Boothe '045. Moss '481 does not directly describe or depicted a “first opening” and a “second opening” in its hinge portions, but explicitly incorporates Boothe '045 by reference “in its entirety.” EX1006, col. 9, ll. 14-17. Boothe '045 describes a ladder hinge that has pivotally coupled first and second hinge portions (plates 12 and 14) with openings in each (locking apertures 24-27) for receiving locking pins (locking pins 70 and 72). EX1010, col. 4, l. 48 – col. 5, l. 10; col. 5, ll. 28-40, FIGs. 1-5. FIGs. 1 and 4B of Boothe '045 are presented and correspondingly annotated below:



EX 1010, FIGs. 1 and 4B (annotated).

Hence, Moss '481 discloses *the first pair of hinge portions [including] a first opening and the second pair of hinge portions [including] a second opening* as claimed.

105. Finally, claim 2 recites:

the first assembly is prevented from rotation relative to the second assembly by the at least one locking pin being positioned in the first opening and in the second opening; and the first assembly is rotatable relative to the second assembly while the at least one locking pin is removed from the first opening and from the second opening.

106. Moss '481 discloses this additional limitation through incorporation of Boothe '045. EX1006, col. 9, ll. 14-16. As described in Boothe '045:

[P]lates 12 and 14 can be rotated relative to one another about aperture 22. As plates 12, 14 are rotated relative to one another, it will be appreciated that at least one pair of locking apertures 24-27 of plates 14 come into exact alignment with at least one pair of the locking apertures 24-27 of plates 12 at a plurality of positions which correspond to the various ladder configurations (e.g. folded for storage, folded for step ladder, or unfolded for extension ladder).

EX 1010, col. 5, ll. 1-10. Plates 12 and 14 are locked into a fixed rotative or angular position relative to one another so long as pins 70 and 72 engage the aligned apertures 24-27. *Id.*, col. 6, ll. 3-6; FIG. 4B. Since claim 1 provides that the first pair of rails of the first assembly is coupled to the first pair of hinge portions, and the second pair of rails of the second assembly is coupled to the second pair of

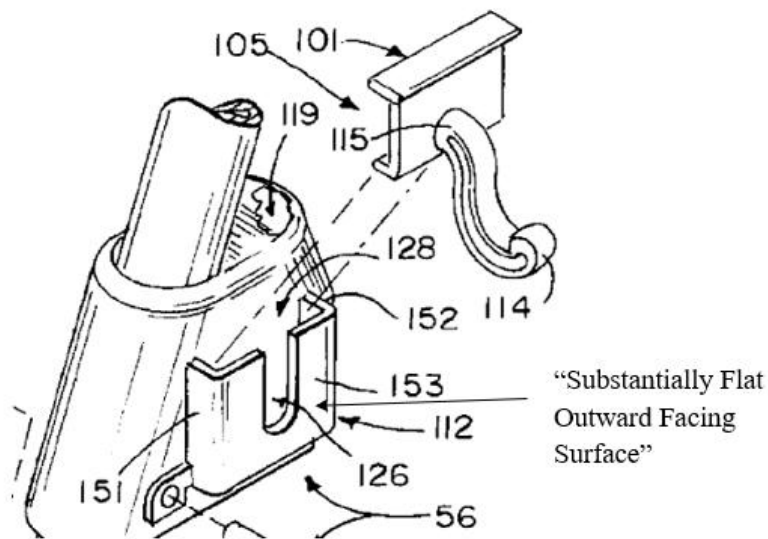
hinge portions, *the first assembly [would be] prevented from rotation relative to the second assembly by the at least one locking pin being positioned in the first opening and in the second opening* as claimed. Conversely, “[t]o rotate ladder hinge 10 from one locked position to another, pins 70 and 72 are withdrawn from the aligned locking apertures 24-27.” *Id.*, col. 7, ll. 31-33. Again, claim 1 provides that the first pair of rails of the first assembly is coupled to the first pair of hinge portions, and the second pair of rails of the second assembly is coupled to the second pair of hinge portions, *the first assembly[would be]rotatable relative to the second assembly while the at least one locking pin is removed from the first opening and from the second opening* as claimed.

E. Claim 3

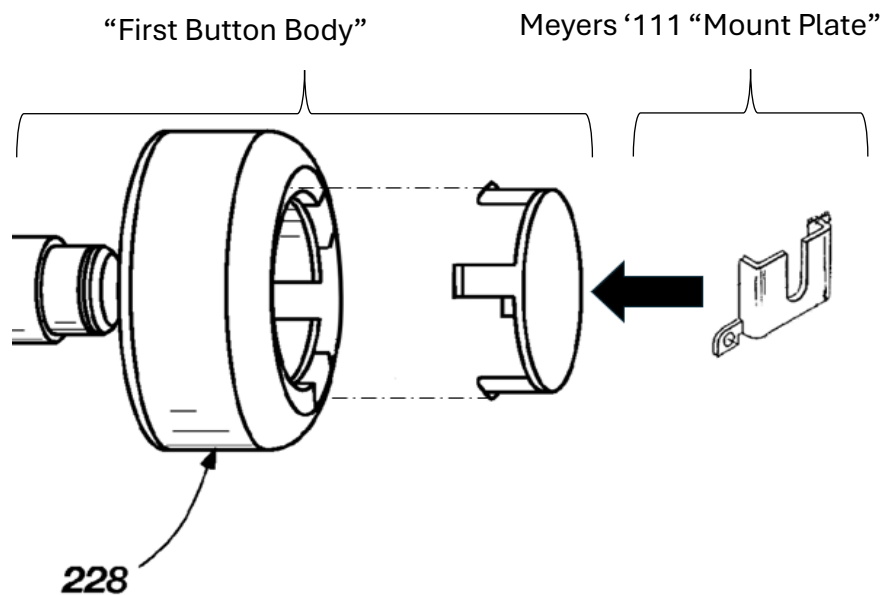
107. Claim 3 reads as follows:

The ladder of claim 1, wherein the second button body comprises a substantially flat outward-facing surface parallel to the first button body.

108. The proposed combination of Moss ‘481 and Meyers ‘111 would exhibit this additional limitation. Meyers ‘111 depicts its “mount plate 153” as having “a substantially flat outward facing surface”:



EX1007, FIG. 12 (annotated). If “mount plate 153” of Meyers ‘111 is attached to the “actuation button 226” of Moss ‘481 as proposed, the result would be *the second button body [with a]a substantially flat outward-facing surface parallel to the first button body.*



EX1006, FIG. 20 (modified with Meyers ‘111 “mount plate.”)

F. Claim 4

109. Claim 4 reads as follows:

The ladder of claim 1, wherein the second button body is integrally formed with the first button body.

110. The proposed combination of Moss ‘481 and Meyers ‘111 would exhibit this limitation. Meyers ‘111 discloses “[i]n an illustrative embodiment, hinge-pin mount 110 and accessory mount 112 cooperate to form a monolithic component made of a molded plastics material.” EX1007, col. 8, ll. 11-14. Based on this suggestion, a person of ordinary skill in the art would have made the combined assembly of the main button body, cap, and mount plate, in a single piece, motivated by reducing the number of parts and improving durability. This would be a simple engineering task requiring no more than ordinary engineering skill. Therefore, a person of ordinary skill in the art would have a reasonable expectation of success in performing this task. The result would be *the second button body* [being] *integrally formed with the first button body*.

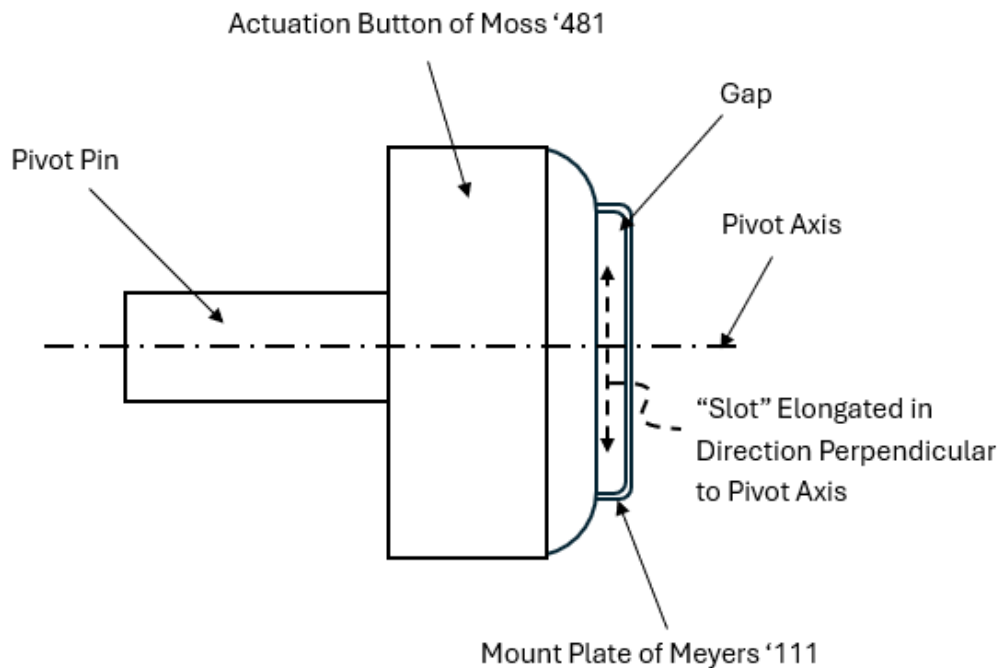
G. Claim 5

111. Claim 5 reads as follows:

The ladder of claim 1, wherein the at least one gap forms a slot elongated along a direction perpendicular to the pivot axis.

112. The proposed combination of Moss ‘481 and Meyers ‘111 would exhibit this additional limitation. Depicted below is a projected top view of the

hinge button assembly resulting from a combination of the “actuation button 226” of Moss ‘481 and the “mount plate 153” of Meyers ‘111 as proposed for claim 1 above:



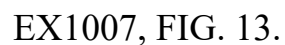
Projected Top View of Actuation Button of Moss ‘481 and
Mount Plate of Meyers ‘111

As depicted, the combination of Moss ‘481 and Meyers ‘111 would result in *the at least one gap forms a slot elongated along a direction perpendicular to the pivot axis* as claimed.

H. Claim 6

113. Claim 6 reads as follows:

114. Meyers '111 shows that "mount plate 153" has "base receptacle 128" with an open top end, but is silent as to whether the bottom end is open. EX1007, FIGs. 11-13. In my opinion, the bottom end of "base receptacle 128" would not need to be closed, since all of the accessories in "accessory kit 150" have a "(common) base 101" which would make a bottom wall for "base receptacle 128" unnecessary.



In my opinion as one of ordinary skill in the art, it would have been obvious to one of ordinary skill in the art at the time of invention to make “mount plate 153” with an open bottom end to accommodate items passing through the “gap.” Such a part would be simpler and easier to make, and be more similar to the slots in use on other ladder designs. Accordingly, the proposed combination of Moss ‘481 and Meyers ‘111 would exhibit the limitation *wherein the at least one gap includes two open ends*.

I. Claim 7

115. Claim 7 reads as follows:

The ladder of claim 1, wherein the at least one gap at least opens upward while the pair of hinges is positioned over the first pair of rails and the second pair of rails.

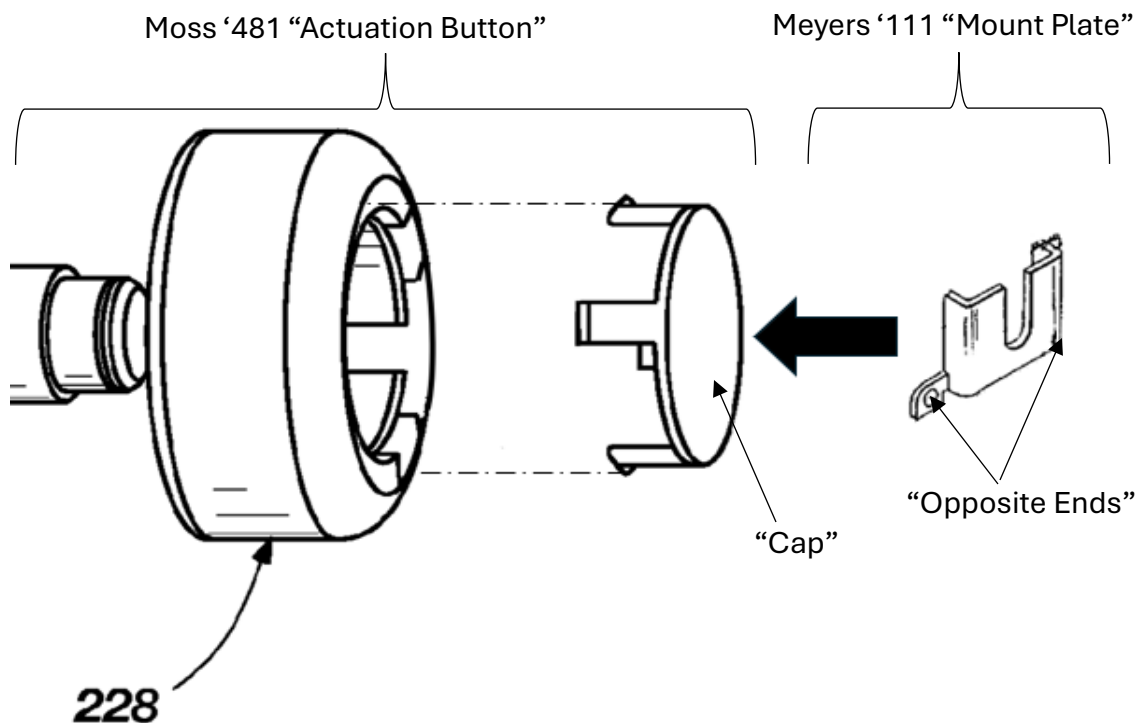
116. The proposed combination of Moss ‘481 and Meyers ‘111 would exhibit this limitation. In my understanding, the pair of hinges is always positioned over the first pair of rails and the second pair of rails whenever the ladder is upright. The “gap” formed by “mount plate 153” at least opens upward in Meyers ‘111. EX1007, FIGs. 11-13. Therefore, if the “mount plate 153” of Meyers ‘111 were attached to the “actuation button 228” of Moss 481 as proposed, the result would necessarily be that *the at least one gap at least opens upward while the pair of hinges is positioned over the first pair of rails and the second pair of rails as claimed*.

J. Claim 8

117. Claim 8 reads as follows:

The ladder of claim 1, wherein the second button body is directly coupled to the first button body at opposite ends of the second button body.

118. The proposed combination of Moss '481 and Meyers '111 would exhibit this limitation. In the proposed combination, “mount plate 153” is affixed to the “cap” of “actuation button 228” of Moss '481.



EX1006, FIG. 20 (modified with Meyers '111 “mount plate” and annotated).

The “mount plate” of Meyers '111 is identified as *the second button body* and the “actuation button” of Moss '481 including the “cap” is identified as *the first button body*. When attached, the “mount plate” of Meyers '111 would be attached at

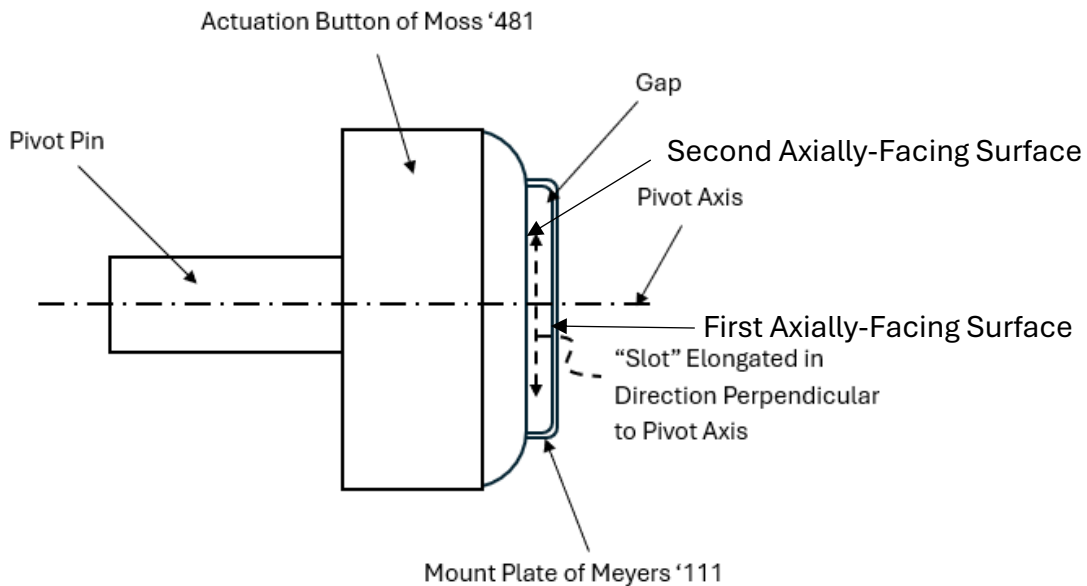
opposite ends as depicted above. Therefore, in the proposed combination of Moss ‘481 and Meyers ‘111, *the second button body is directly coupled to the first button body at opposite ends of the second button body* as claimed.

K. Claim 9

119. Claim 9 recites:

The ladder of claim 1, wherein the first axially-facing surface is substantially parallel to the second axially-facing surface.

120. The proposed combination of Moss ‘481 and Meyers ‘111 would exhibit this additional limitation. The “second axially-facing surface” is on the “first button body,” which in the proposed combination is “actuation button 228” of Moss ‘481, and the surface of “actuation button 228” where “mount plate 153” of Meyers ‘111 would be affixed is flat. Since the face of “mount plate 153” identified as the “first axially-facing surface” is also flat, these structures would naturally be parallel:



Projected Top View of Actuation Button of Moss '481
and Mount Plate of Meyers '111

Consequently, in the proposed combination of Moss '481 and Meyers '111, *the first axially-facing surface is substantially parallel to the second axially-facing surface as claimed.*

L. Claim 10

121. Claim 10 recites:

The ladder of claim 1, wherein the second button body is configured to support the object when the object is hanging on the second button body and at least partially positioned in the at least one gap.

122. The proposed combination of Moss '481 and Meyers '111 would exhibit this additional limitation. Meyers '111 discloses that "base receptacle 128" can receive a variety of accessories in "accessory kit 150." EX1007, col. 8, l. 50 –

col. 9, l. 20; FIGs. 11-13. Each of these accessories would qualify as an “object” within the ordinary meaning of the word, and “mount plate 153” supports them when they are positioned in the “gap.” When “mount plate 153” of Meyers ‘111 is affixed to “actuation button 228” of Moss ‘481 as in the proposed combination, these accessories could be supported just the same. Consequently, in the proposed combination of Moss ‘481 and Meyers ‘111, *the second button body is configured to support the object when the object is hanging on the second button body and at least partially positioned in the at least one gap* as claimed.

M. Claim 11

123. Claim 11 recites:

The ladder of claim 1, wherein the second button body comprises a plate.

124. The proposed combination of Moss ‘481 and Meyers ‘111 would exhibit this additional limitation. In the proposed combination, “mount plate 153” of Meyers ‘111 is identified as the second button body, and it is a plate. Therefore, in the proposed combination of Moss ‘481 and Meyers ‘111, *the second button body comprises a plate* as claimed.

N. Claim 12

125. The preamble of claim 12 reads as follows:

A ladder, comprising: . . .

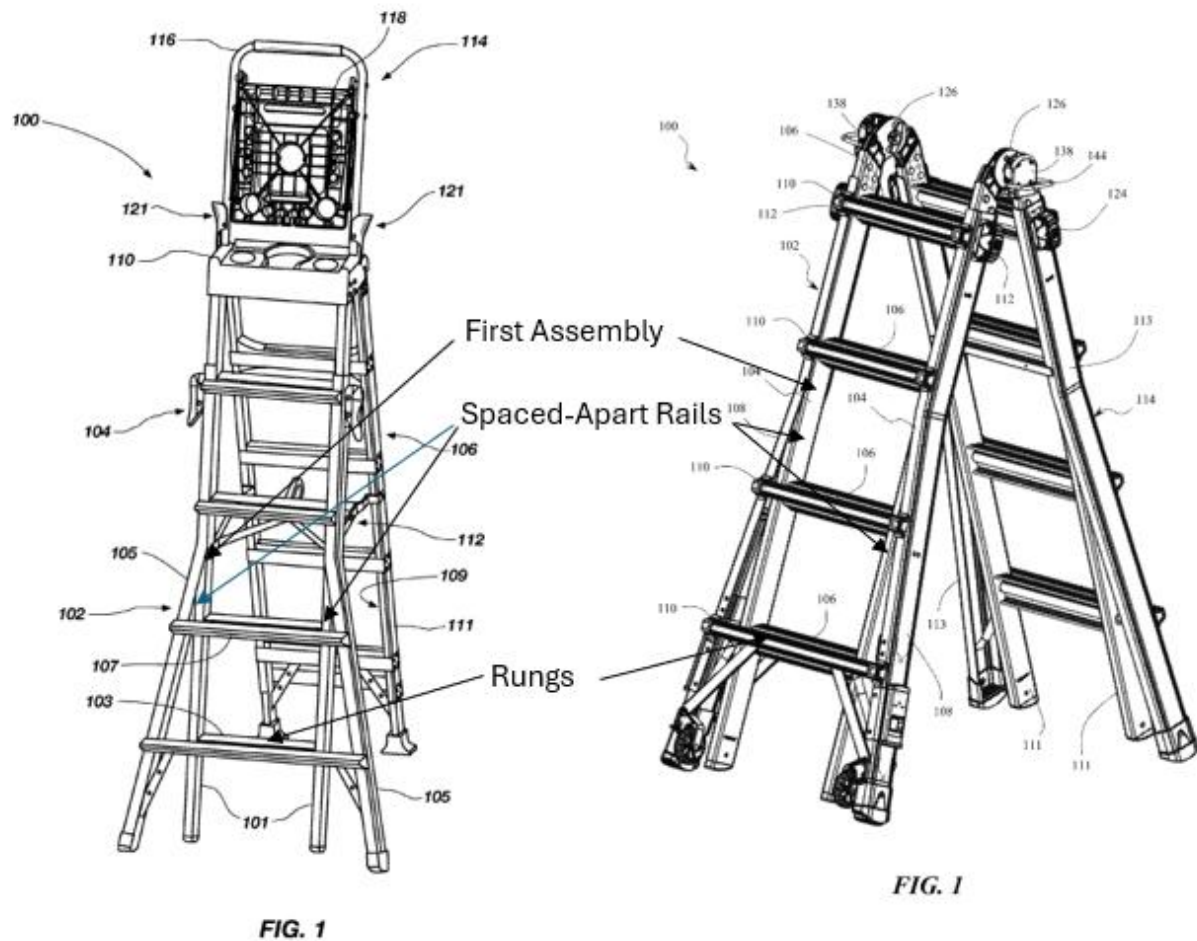
126. Moss ‘481 discloses *a ladder* as recited in the preamble. Specifically, Moss ‘481 discloses “a ladder . . . that includes a first rail assembly, including at least one pair of rails and a plurality of rungs coupled therewith, and a second rail assembly including at least one pair of rails.” EX1006, col. 2, ll. 25-28; FIG. 1.

127. Claim 12 continues by reciting:

a first assembly, including: a first pair of rails spaced apart from each other; a first set of rungs coupled to and extending between the first pair of rails;

128. Moss ‘481 discloses this limitation. Moss ‘481 describes a first assembly 102 that includes *a first pair of rails spaced apart from each other* and *a first set of rungs coupled to and extending between the first pair of rails* (inner rails 101 having a plurality of rungs 103 extending between). EX1006, col. 4, ll. 26-29;

FIGs. 1-4. The ladder of Moss '481 is depicted side-by-side with the '506 Patent ladder in the annotated figures below, which indicate the respective features:



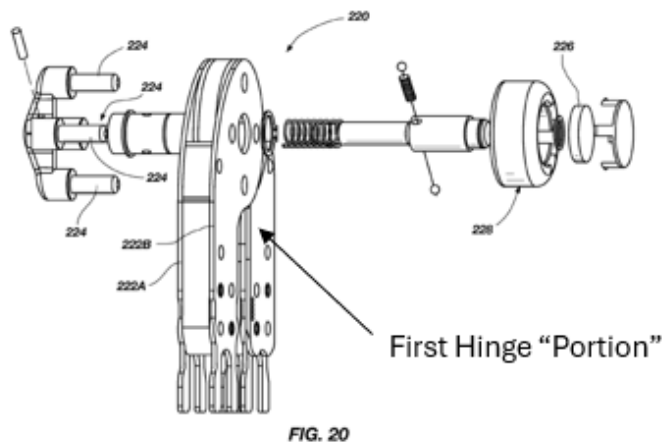
EX1006, FIG. 1 (annotated)

EX1001, FIG. 1 (annotated)

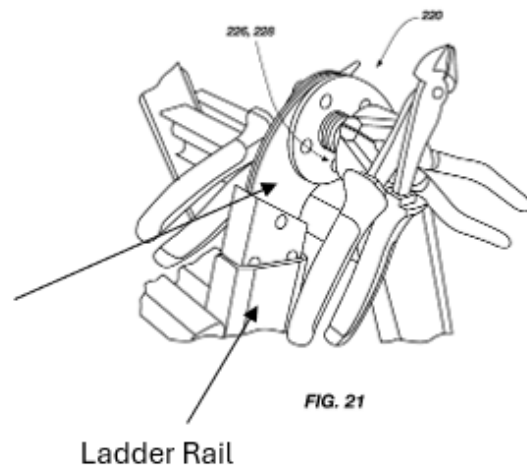
129. Then, claim 12 recites:

**a first pair of hinge portions coupled to the first pair of rails and
defining a first opening;**

130. Moss ‘481 discloses this limitation. FIGs. 20 and 21 of Moss ‘481 depict a hinge for a combination ladder. EX1006, FIGs. 20-21. The hinge has a first “portion” that couples to a rail of the ladder, and a pair of such hinges would be used in a ladder so as to constitute *a first pair of hinge portions coupled to [a] first pair of rails*. EX1006, FIGs. 20-21; col. 9, ll. 13-46. FIGs. 20-21 of Moss ‘481 are presented and annotated below:



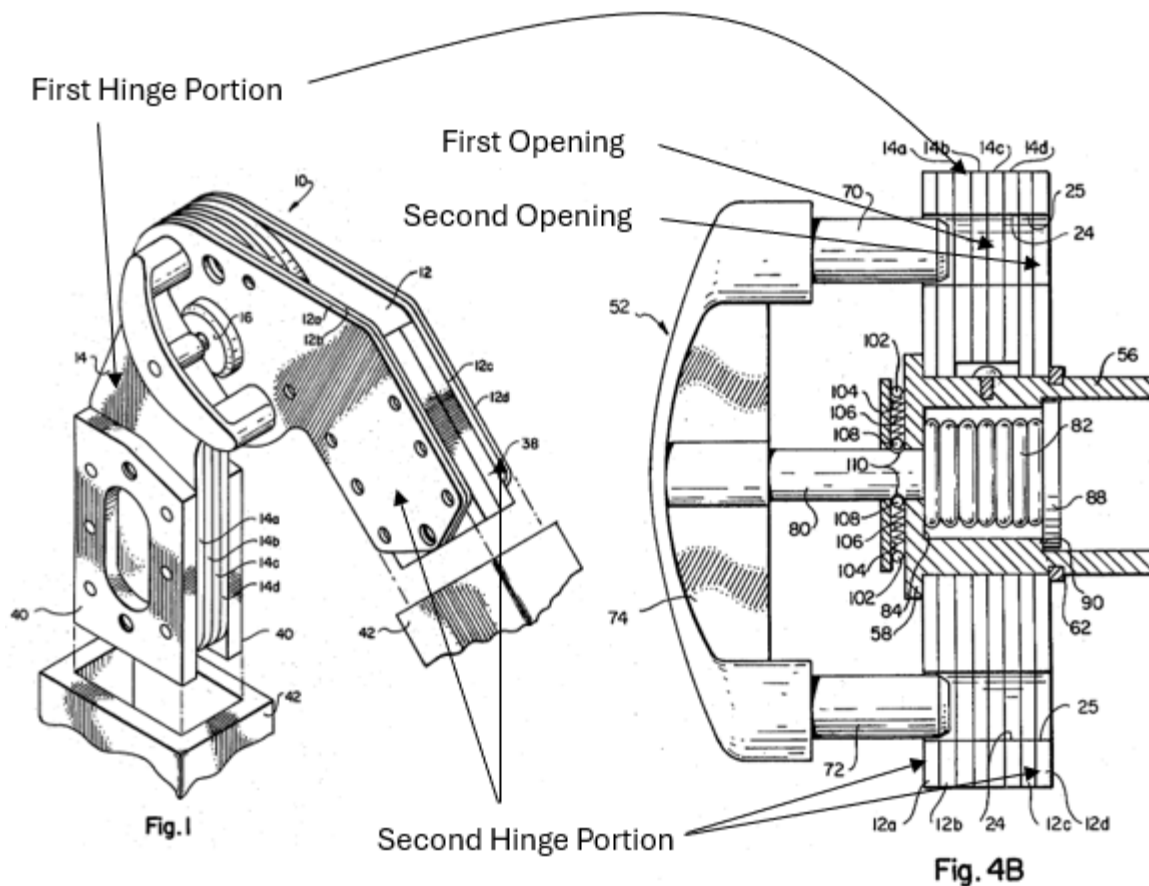
EX1006, FIG. 20 (annotated)



EX1006, FIG. 21 (annotated)

Moss ‘481 does not directly describe a “first opening” in the first hinge portion, but nevertheless discloses this feature through incorporation of Boothe ‘045. EX1006, col. 9, ll. 14-17. Boothe ‘045 describes a ladder hinge that has pivotally coupled first and second hinge portions (plates 12 and 14) with openings in each (locking apertures 24-27) for receiving locking pins (locking pins 70 and 72). EX1010, col.

4, l. 48 – col. 5, l. 10; col. 5, ll. 28-40; FIGs. 1-5. FIGs. 1 and 4B of Boothe '045 are presented and correspondingly annotated below:



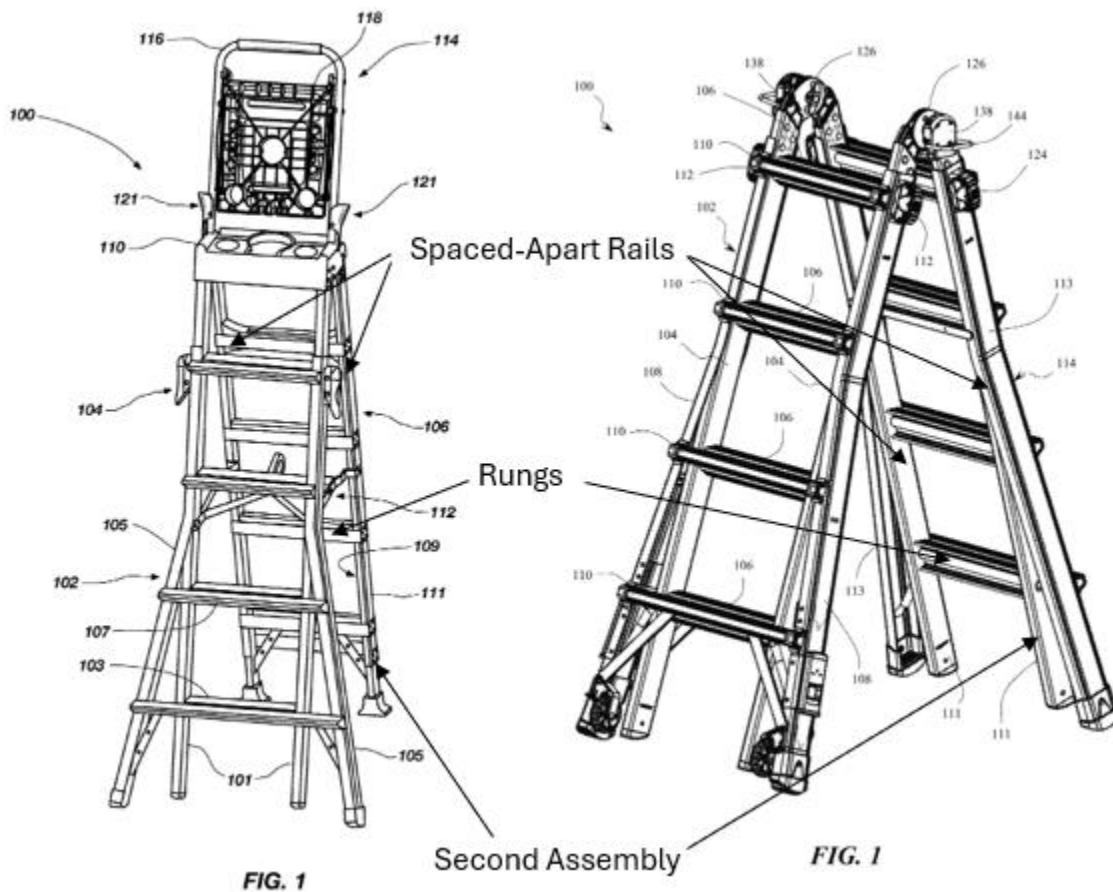
EX 1010, FIGs. 1 and 4B (annotated).

Based on the foregoing, Moss '481 discloses *a first pair of hinge portions coupled to the first pair of rails and defining a first opening* as claimed.

131. Then, claim 12 recites:

a second assembly, including: a second pair of rails spaced apart from each other;

132. Moss ‘481 discloses this limitation. It describes a *second assembly* (second assembly 106) that includes *a second pair of rails spaced apart from each other* (inner rails 109). EX1006, col. 4, ll. 43-45; FIGs. 1-4. The ladder of Moss ‘481 is depicted side-by-side with the ‘506 Patent ladder in the annotated figures below, which indicate the respective features:



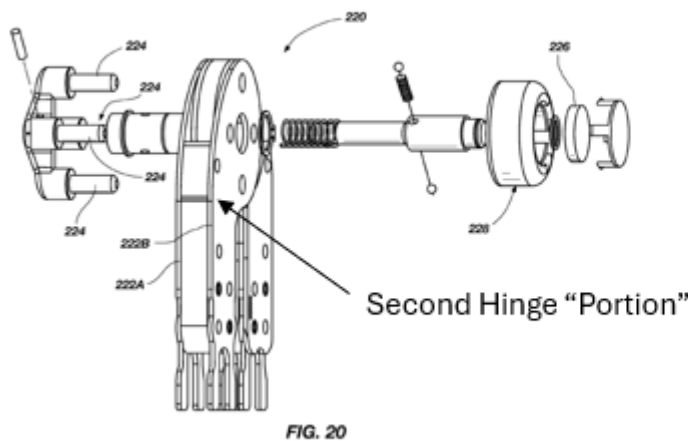
EX1006, FIG. 1 (annotated).

EX1001, FIG. 1 (annotated).

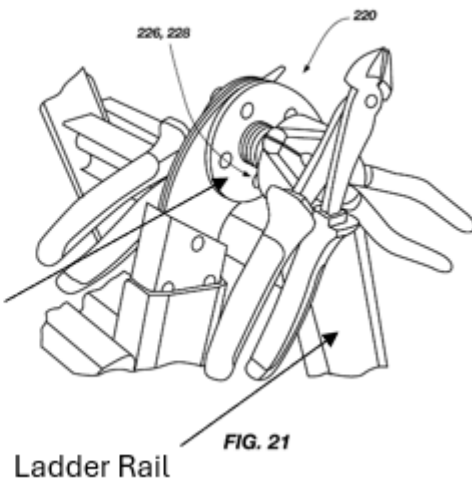
133. Then, claim 12 recites:

a second pair of hinge portions coupled to the second pair of rails and defining a second opening;

134. Moss ‘481 discloses this limitation. Again, FIGs. 20 and 21 of Moss ‘481 depict a hinge for a combination ladder. EX1006, FIGs. 20-21. The hinge has a second “portion” that couples to a rail of the ladder, and a pair of such hinges would be used in a ladder so as to constitute *a second pair of hinge portions coupled to [a] second pair of rails*. EX1006, FIGs. 20-21; col. 9, ll. 13-46. FIGs. 20-21 of Moss ‘481 are presented and correspondingly annotated below:



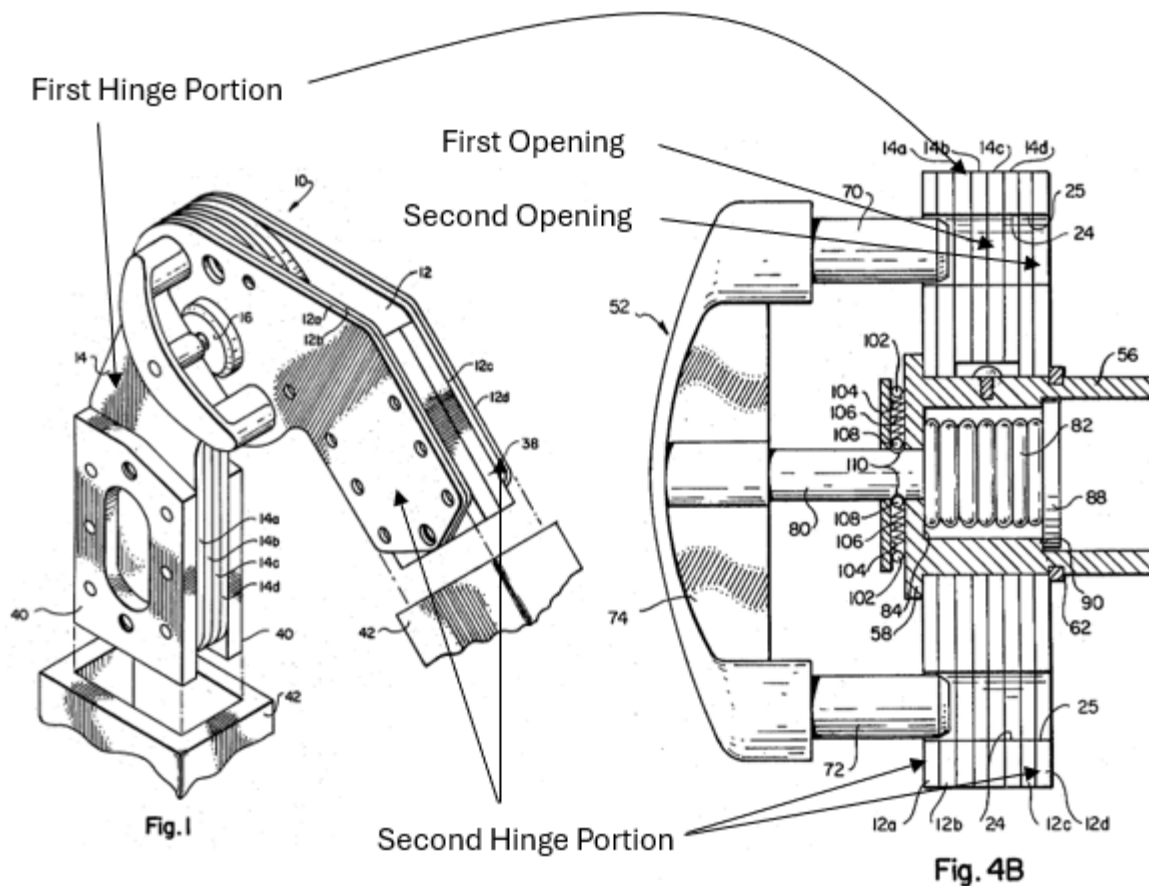
EX1006, FIG. 20 (annotated)



EX1006, FIG. 21 (annotated)

Moss ‘481 does not directly describe a “second opening” in the second hinge portion, but nevertheless discloses this feature through incorporation of Boothe ‘045. EX1006, col. 9, ll. 14-17. Boothe ‘045 describes a ladder hinge that has pivotally coupled first and second hinge portions (plates 12 and 14) with openings in each (locking apertures 24-27) for receiving locking pins (locking pins 70 and

72). EX1010, col. 4, l. 48 – col. 5, l. 10, col. 5, ll. 28-40, FIGs. 1-5. FIGs. 1 and 4B of Boothe '045 are presented and correspondingly annotated below:



EX 1010, FIGs. 1 and 4B (annotated).

Based on the foregoing, Moss '481 discloses *a second pair of hinge portions coupled to the second pair of rails and defining a second opening* as claimed.

135. Then, claim 12 recites:

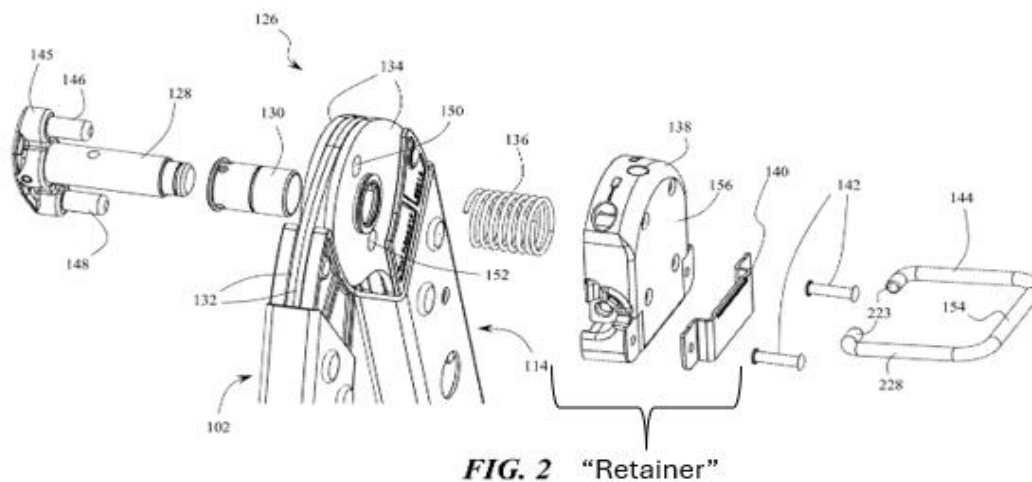
wherein the first pair of hinge portions and the second pair of hinge portions are pivotally coupled to each other to form a pair of hinges rotatable about a pivot axis; and

Hence, based on the foregoing, Moss '481 discloses *wherein the first pair of hinge portions and the second pair of hinge portions are pivotally coupled to each other to form a pair of hinges rotatable about a pivot axis* as the limitation is understood.

137. Then, claim 12 recites:

a pair of retainers . . .

138. Patent Owner appears to use the term “retainer” to refer to a hinge button that has features for “retaining” things. This structure of the ‘506 Patent is depicted in the annotated figure below:



EX1001, FIG. 2 (annotated)

Moss '481 has an “actuation button 228” that occupies the same position as the “retainer” of the '506 Patent in its hinge mechanism, and has a magnet for “retaining” things:

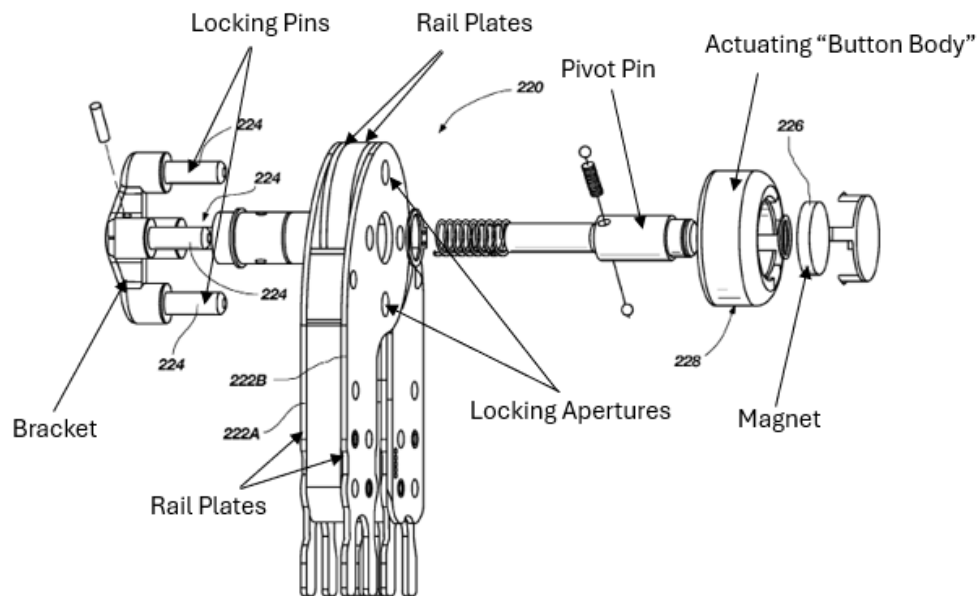


FIG. 20

Moss '481 (EX1006); FIG. 20 (annotated).

139. In the '506 Patent, the “button body 138” is part of the “retainer.” EX1001, col. 11, ll. 41-45. And “button body 138” performs the same hinge-actuating function as “actuating button 228” in Moss '481. Consequently, “actuating button 228” of Moss '481 can be considered to correspond with the claimed “retainer.”

140. A ladder using the Moss '481 hinge would have two “actuation button 228” structures - one for each side of the ladder. Therefore, Moss '481 has structure equivalent to *a pair of retainers*.

141. Claim 12 continues by reciting:

each retainer of the pair of retainers being movable between a respective first axial position along the pivot axis and a respective second axial position along the pivot axis . . .

142. The ladder of Moss ‘481 exhibits this limitation. The specification passages of Moss ‘481 describing the hinge button assembly depicted in FIGs. 20 and 21 do not contain an extensive description of its operation and structure, but instead state that “[t]he hinge assembly 220 may be used in association with, for example, combination ladders similar to the hinge described in U.S. Pat. No. 4,407,045 to Boothe, the disclosure of which is incorporated by reference herein in its entirety.” EX1006, col. 9, ll. 14-17.

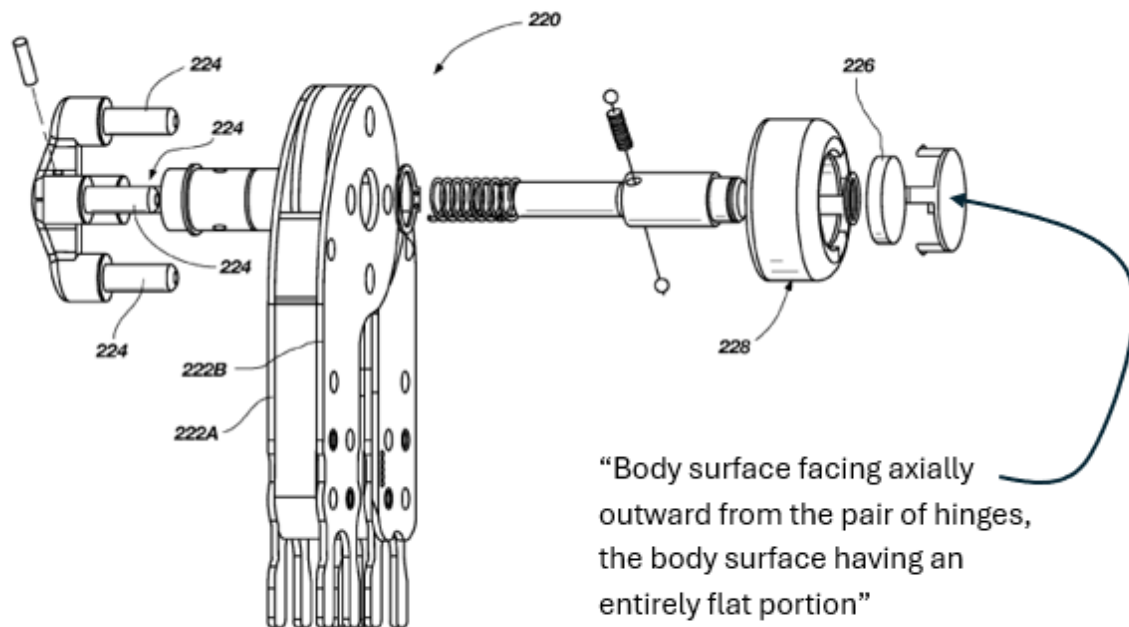
143. Boothe ‘045 in turn is directed to a “Ladder Hinge And Multi-Position Locking Mechanism Therefor.” EX1010. Boothe ‘045 discloses a hinge mechanism, in which a handle carrying locking pins can be shifted axially to insert and withdraw the locking pins from apertures in hinge plates. EX1010, col. 6, ll. 3-19; FIGs. 4A and 4B. Moss ‘481 appears to add an “actuation button 228” to the same or similar hinge mechanism, so that rather than a user grasping and pulling the “locking handle 52” to withdraw the locking pins as in Boothe ‘045, the user presses on actuation button 228, which is coupled to a structure similar to “locking handle 52” through a solid shaft, translating it axially to withdraw the locking pins.

EX1006, FIG. 20. Hence, Moss '481 discloses *each retainer [actuation button 228] of the pair of retainers being movable between a respective first axial position along the pivot axis and a respective second axial position along the pivot axis.*

144. Claim 12 continues:

wherein each retainer of the pair of retainers includes: a body having a body surface facing axially outward from the pair of hinges, the body surface having an entirely flat portion . . .

145. Actuating button 228 of Moss '481 has *a body having a body surface facing axially outward from the pair of hinges, the body surface having an entirely flat portion* as depicted in the annotated figure below:



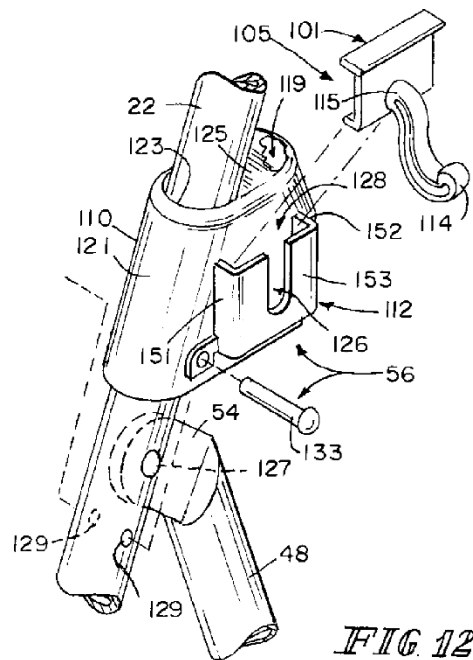
EX1006, FIG. 20 (annotated).

146. Claim 12 continues:

a plate structure integrally formed with the body on at least two ends of the plate structure on opposite sides of the entirely flat portion of the body surface, wherein the plate structure is spaced axially outward from the body surface by at least one elongated gap, wherein the at least one elongated gap is parallel to the entirely flat portion of the body surface and configured to receive and support a tool hanging from the plate structure;

147. Actuating button 228 of Moss '481 does not have *a plate structure integrally formed with the body on at least two ends of the plate structure on opposite sides of the entirely flat portion of the body surface, wherein the plate structure is spaced axially outward from the body surface by at least one elongated gap, wherein the at least one elongated gap is parallel to the entirely flat portion of the body surface and configured to receive and support a tool hanging from the plate structure.*

148. Meyers ‘111, however, is analogous prior art, and discloses a “stepladder 10” with a “hinge pin mount 110” having “accessory mount 112,” which includes “mount plate 153 formed to include . . . first and second stand off plates 151, 152.” EX. 1007, col. 8, ll. 15-61. “First stand-off plate 151 is rooted on funnel-shaped side wall 121 of hinge-pin mount 110 and coupled to one edge of mount plate 153 while second stand-off plate 152 is rooted on funnel-shaped side wall 121 and coupled to another edge of mount plate 153 to cause side wall 121, mount plate 153, and first and second stand-off plates 151/152 to cooperate to form a base receptacle 128 sized to receive a (common) base 101 included in each of the stepladder accessories included in accessory kit 150.” *Id.* This structure is depicted in FIG. 12 of Meyers ‘111:

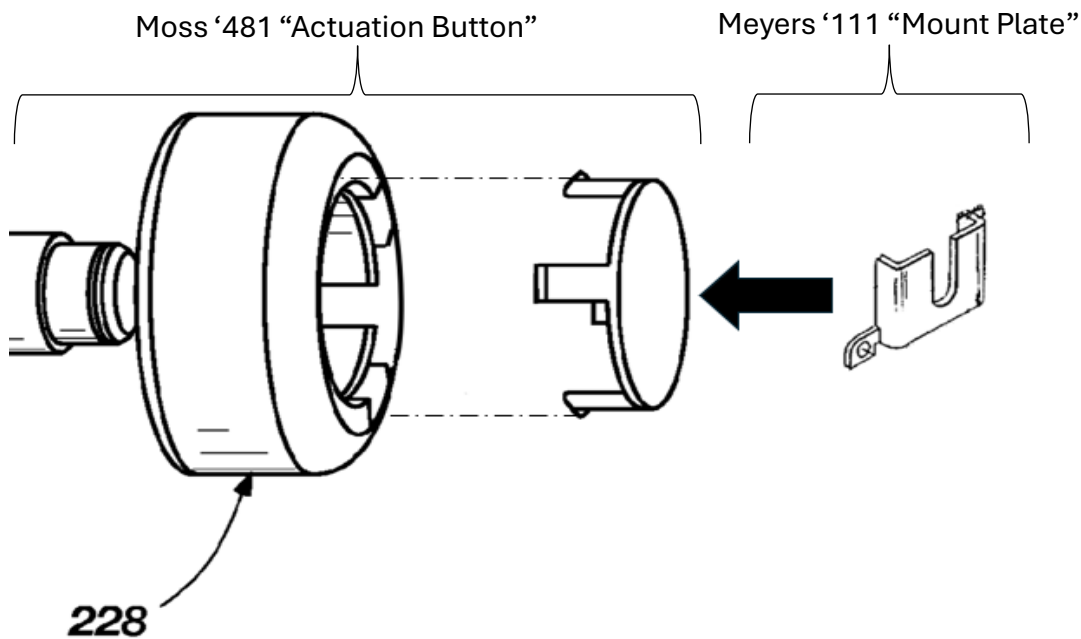


EX1007, FIG. 12.

149. In his declaration of November 27, 2024, submitted during prosecution of the ‘506 Patent, B. Scott Maxfield stated that he had “received reports that users of the magnetic hinge button ladder [as disclosed in Moss ‘481] were dissatisfied with the utility of the magnetic button, its ability to hold heavier objects, and its ability to attract unwanted objects to it.” EX1023, ¶ 4.

150. In my opinion, a person of ordinary skill in the art, faced with the drawbacks of the Moss ‘481 magnetic hinge button, would have been motivated to consider non-magnetic alternatives for hanging items from a hinge button to accomplish the same function.

151. Meyers ‘111 offers such an alternative. The Moss ‘481 hinge button could be modified by simply omitting the magnet, and affixing the Meyers ‘111 mount plate or similar structure to the hinge button of Moss ‘481, adapting the cap fitted onto the main button body to receive it and be suitably secured. This modification is depicted below:



EX1006, FIG. 20 (modified with Meyers '111 "mount plate" and annotated).

152. This modification would involve only the routine engineering tasks of designing the modified assembly to be of sufficient size and strength to fulfill functional and load bearing requirements, and softening of the edges of the mount plate to allow pressure to be applied to release the lock without undue discomfort to the user's hand. The cap could be molded in a single piece with the button, or fastened to the button with adhesive, and the method of securing the pivot pin to the button appropriately adapted so that access under the cap is not needed. Alternatively, the cap could be fastened to the button with screws or other fasteners. The assembly would then be tested to ensure durability and that it will hold the expected load that will be applied with a tool or other object hanging from the button without failing or interfering with operation of the hinge. These are

ordinary and routine engineering tasks that could be accomplished by any person of ordinary skill in the art.

153. A person of ordinary skill in the art would have a reasonable expectation of success in carrying out this modification because the combination has a predictable result (a hinge button that can be used for hanging tools and other items) and the modification requires no special engineering knowledge or skill beyond that of a person of ordinary skill in the art.

154. The substitution of the mount plate of Meyers ‘111 for the magnet of Moss ‘481 is according to the rationale of “combining prior art elements according to known methods to yield predictable results.” The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination yielded nothing more than predictable results to one of ordinary skill in the art.

155. Ladder hinge button tool-hanging functionality was known from the Moss ‘481 disclosure, which uses a magnet. A mechanical object-hanging structure provided by a plate attached to a ladder hinge was known at the time of the invention from the Meyers ‘111 disclosure. Additionally, slots for hanging various tools have been used on ladder top caps or pail shelves by Werner, Louisville,

Tricam, and Little Giant. *See e.g.*, EX1019, ¶¶ 9-13. This is a common feature, as common tools, such as screw guns, come equipped with belt clips that can also hang from ladders when appropriate slots are provided. The function of these devices – object-hanging – is the same. Substituting the mechanical object-hanging structure of Meyers ‘111 for the magnetic tool-hanging structure of Moss ‘481 yields a device with the same object-hanging capability, but without the drawbacks of a magnet, such as attracting unwanted objects, and with the benefit of holding heavier loads and non-ferrous metal objects, a result that would have been predictable to a person of ordinary skill in the art.

156. The substitution of the mount plate of Meyers ‘111 for the magnet of Moss ‘481 is also according to the rationale of “simple substitution of one known element for another to obtain predictable results.” Moss ‘481 disclosed a ladder hinge button with a magnetic tool hanger. Meyers ‘111 disclosed a ladder hinge assembly with a mechanical tool hanger. The proposed modification of Moss ‘481 involves the simple substitution of the mechanical tool hanger (mount plate) of Meyers ‘111 for the magnet of Moss ‘481. A person of ordinary skill in the art could have substituted the mount plate of Meyers ‘111 on the exterior of the hinge button of Moss ‘481 for the magnet of Moss ‘481, thereby achieving the predictable result of a ladder with a hinge button having tool-hanging capability

without the drawbacks of magnets and the benefit of holding heavier objects and objects not containing ferrous metal.

157. When the “mount plate 153” of Meyers ‘111 is affixed to the flat surface of the “cap” of the “actuation button 228” of Moss ‘481, the result would be that the *plate structure is spaced axially outward from the body surface by at least one elongated gap, wherein the at least one elongated gap is parallel to the entirely flat portion of the body surface and configured to receive and support a tool hanging from the plate structure.* Indeed, the “mount plate 153” of Meyers ‘111 is spaced axially outward from the body surface of the hinge by an elongated gap parallel to a flat surface, and would be so on the flat surface of the “cap” of the Moss ‘481 hinge button. The Meyers ‘111 structure is “configured to receive and support a tool hanging from the plate structure.” A tape measure is a tool, and Meyers ‘111 discloses that a tape measure is one of the accessories supportable from “plate structure 153. EX1007, col. 9, ll.15-17. An annotated figure from Meyers ‘111 is provided below designating the remaining limitations:

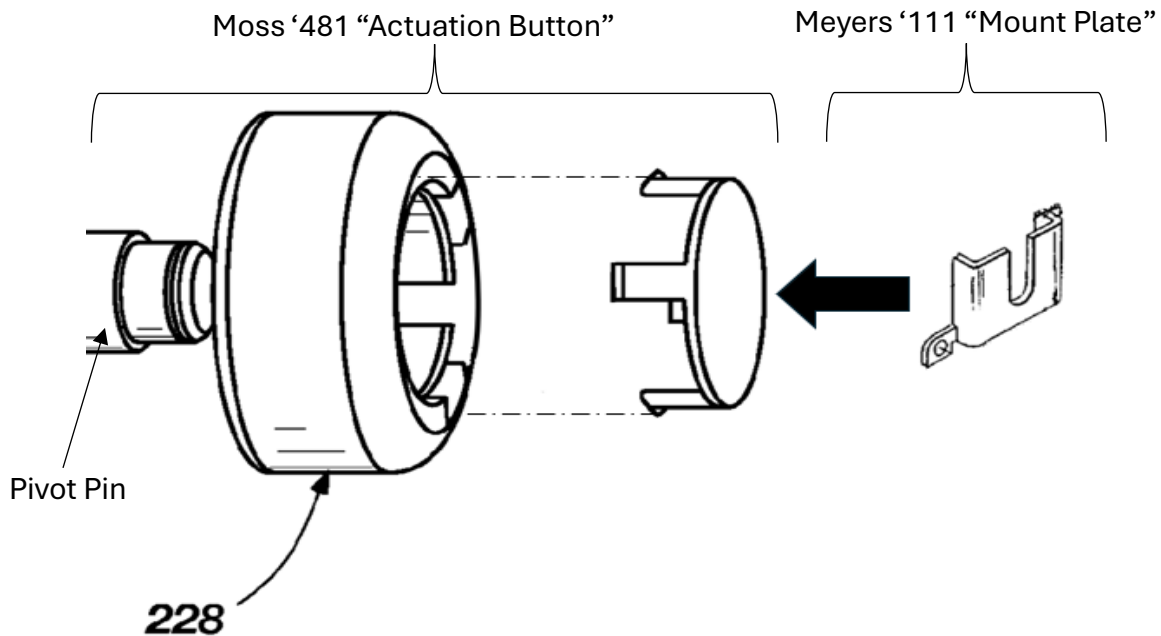
material.” EX1007, col. 8, ll. 11-14. Based on this suggestion, a person of ordinary skill in the art would have made the combined assembly of the main button body, cap, and mount plate, in a single piece, motivated by reducing the number of parts and improving durability. This would be a simple engineering task requiring no more than ordinary engineering skill. Therefore, a person of ordinary skill in the art would have a reasonable expectation of success in performing this task.

159. The result of the proposed modification described above would be *a plate structure integrally formed with the body on at least two ends of the plate structure on opposite sides of the entirely flat portion of the body surface, wherein the plate structure is spaced axially outward from the body surface by at least one elongated gap, wherein the at least one elongated gap is parallel to the entirely flat portion of the body surface and configured to receive and support a tool hanging from the plate structure* as claimed.

160. Claim 12 continues:

a pivot pin coupled to the body on a side of the body opposite the plate structure;

161. The proposed combination of Moss ‘481 and Meyers ’111 would exhibit this limitation. As depicted in FIG. 20 of Moss ‘481, the hinge has *a pivot pin coupled to the body* which would be *on a side of the body opposite the plate structure*:



EX1006, FIG. 20 (modified with Meyers '111 "mount plate" and annotated).

162. Claim 12 continues:

a bracket coupled to the pivot pin; and at least one locking pin coupled to the bracket;

163. The proposed combination of Moss '481 and Meyers '111 would exhibit this limitation. Moss '481 discloses a *bracket coupled to the pivot pin; and at least one locking pin coupled to the bracket*. Annotated FIG. 20 is provided below showing these features:

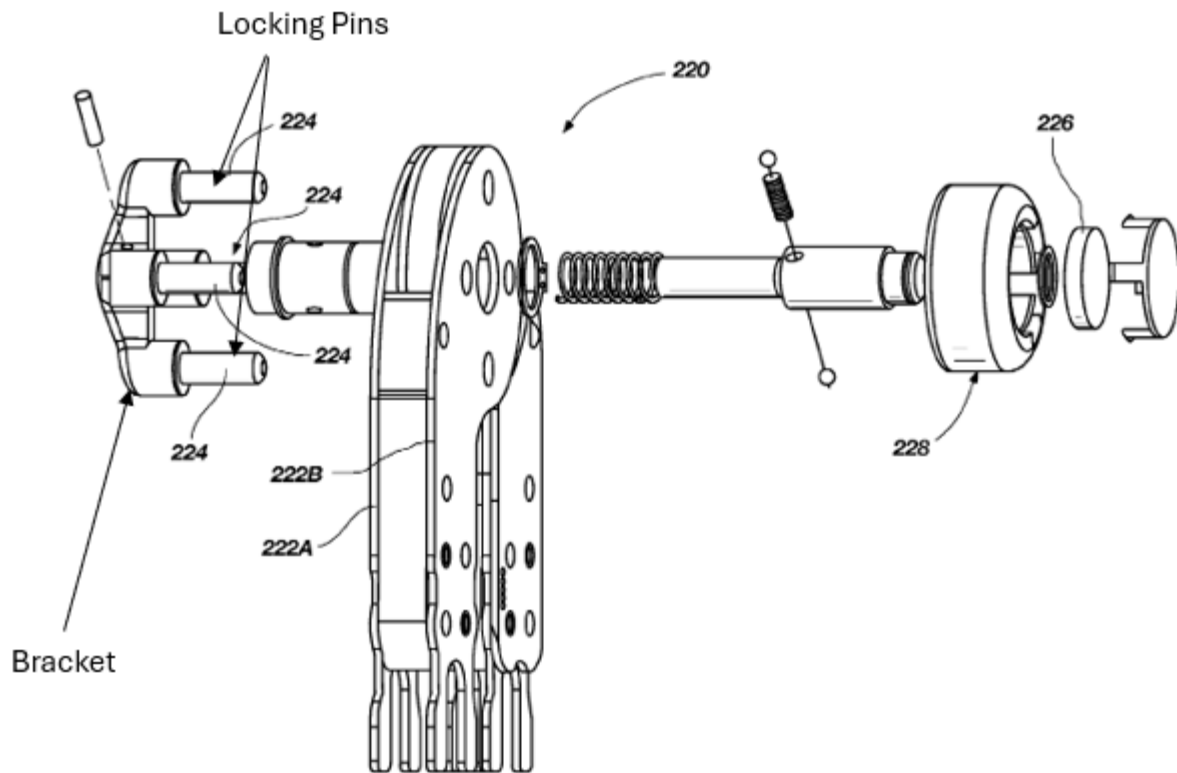


FIG. 20

EX1006, FIG. 20 (annotated).

164. Finally, claim 12 recites:

wherein the first assembly is rotatable relative to the second assembly while the pair of retainers is in the first axial positions and the at least one locking pin is removed from the first opening and from the second opening; and wherein the first assembly is prevented from rotation relative to the second assembly by the pair of retainers while the pair of retainers is in the second axial positions and the at least one locking pin is positioned in the first opening and in the second opening.

165. Moss ‘481 discloses this additional limitation through incorporation of Boothe ‘045. EX1006, col. 9, ll. 14-16. As described in Boothe ‘045:

[P]lates 12 and 14 can be rotated relative to one another about aperture 22. As plates 12, 14 are rotated relative to one another, it will be appreciated that at least one pair of locking apertures 24-27 of plates 14 come into exact alignment with at least one pair of the locking apertures 24-27 of plates 12 at a plurality of positions which correspond to the various ladder configurations (e.g. folded for storage, folded for step ladder, or unfolded for extension ladder).

EX 1010, col. 5, ll. 1-10. Plates 12 and 14 are locked into a fixed rotative or angular position relative to one another so long as pins 70 and 72 engage the aligned apertures 24-27. *Id.*, col. 6, ll. 3-6; FIG. 4B. Since claim 1 provides that the first pair of rails of the first assembly is coupled to the first pair of hinge portions, and the second pair of rails of the second assembly is coupled to the second pair of hinge portions, *the first assembly [would be] prevented from rotation relative to the second assembly by the at least one locking pin being positioned in the first opening and in the second opening* as claimed. Conversely, “[t]o rotate ladder hinge 10 from one locked position to another, pins 70 and 72 are withdrawn from the aligned locking apertures 24-27.” *Id.*, col. 7, ll. 31-33. Again, claim 1 provides that the first pair of rails of the first assembly is coupled to the first pair of hinge portions, and the second pair of rails of the second assembly is coupled to the second pair of hinge portions, *the first assembly [would be] rotatable relative to the*

second assembly while the at least one locking pin is removed from the first opening and from the second opening as claimed.

O. Claim 13

166. Claim 13 recites:

The ladder of claim 12, wherein the first pair of rails and the second pair of rails are lockable relative to each other, via the at least one retainer, in a substantially coplanar orientation.

167. Moss ‘481 discloses this limitation. This limitation appears to claim the ladder in the straight or extension ladder position. EX1001, FIG. 4. Moss ‘481 incorporates Boothe ‘045 by reference as previously mentioned, and Boothe ‘045 discloses that its hinge enables the ladder to be positioned in “a plurality of positions which correspond to the various ladder configurations (e.g. folded for storage, folded for step ladder, or unfolded for extension ladder).” EX1007, col. 5, ll. 7-10. Consequently, the proposed combination of Moss ‘481 and Meyers ‘111 would exhibit the limitation *wherein the first pair of rails and the second pair of rails are lockable relative to each other, via the at least one retainer, in a substantially coplanar orientation* as claimed.

IX. SECONDARY CONSIDERATION EVIDENCE

168. I reviewed the secondary consideration evidence submitted by Little Giant during prosecution of the ‘506 Patent. To the extent these declarations may

bear upon obviousness of the ‘506 Patent claims in view of the combination of Moss ‘481 and Meyers ‘111, I have the following comments.

A. Declaration of David Smith of June 17, 2024 (EX1018)

169. Mr. Smith opines that “[p]ersons having ordinary skill in the art of ladders, would not generally design hinges to bear surplus or irregular loads, particularly those that would induce bending in the hinge components since doing so would affect safety and functionality of the hinge.” EX1018, ¶ 10. While it is true that surplus loads can induce bending in hinge components, it is an overstatement to say that persons of skill in the art would not design hinges to bear excess loads. With attention to the geometry of the hinge, considering the portions of it that will bear various loads, and ordinary engineering skill, it is not a difficult task to design a hinge that can serve to bear loads imposed by tools or other objects hanging from the hinge.

170. Mr. Smith further opines that “[e]ven if there were a motivation to combine Lee with the teachings of Ng, simply putting the bracket onto the hinge would violate basic engineering safety principles which a POSITA would understand.” EX1018, ¶ 11. Mr. Smith is referring to the bracket of Ng ‘373, but it is incorrect to say generally that putting a bracket onto a hinge would “violate basic safety principles.” While Mr. Smith goes on to refer to ANSI-ASC A14.2, that is just a basic standard that a person of ordinary skill in the art of ladders

would be familiar with. And all ladder components must be designed with a load rating – that is simply a matter of ordinary engineering that a person of ordinary skill in the art as defined about would be competent to undertake. Mr. Smith seems to confuse the suggestive role of prior art references with a mere literal combination of components without modification. With the combination of Moss ‘481 and Meyers ‘111 proposed above, little modification would be necessary but certainly one of ordinary skill in the art would make the necessary checks and any changes to ensure safety.

171. Mr. Smith also opines regarding the relative size of components between the Lee and Ng references he is discussing, stating “[a] skilled person viewing the apparent width of the outer circular surface of the press part 508 of Lee would not find the press part 508 conducive to adding a bracket of sufficient size for holding tools.” EX1018, ¶ 12. Once again, this confuses the suggestive role of prior art references with a mere literal combination of components without modification. Once a modification is suggested to one of ordinary skill in the art, that person can be expected to carry out whatever changes, such as size of components, that are necessary to effect the modification. For example, with the combination of Moss ‘481 and Meyers ‘111 proposed above, one of ordinary skill in the art would appreciate that the actuation button of Moss ‘481 could be made

whatever size is necessary to accommodate the mount plate of Meyers '111 or similar structure to hang tools or other objects.

172. I should also address Mr. Smith's remarks on the moment arm induced by hanging components from a hinge. EX1018, ¶ 13. The concern presented by such loads necessarily varies according to the magnitude of the moment arm. The magnitude of an applied moment is calculated by simple formula. The formula for the moment of a force (M) is the product of the force (F) and the perpendicular distance (d) from the axis of rotation to the line of action of the force: $M = F(d)$. Hence, for a ladder hinge tool hanger, the further the distance from the hinge pin the load is applied, the greater the applied moment. The '506 Patent device has two "support arms": (1) support arm 144; and (2) button plate 140. Of these two, support arm 144 presents the greater concern because when the arm is folded down and a load is applied on the outer end, a larger moment will be applied due to the greater distance between the line of action of the force imposed by the weight of the tool or object and the pivot where the moment will be applied. Conversely, the button plate 140 alone presents relatively little concern because the distance between the axis of rotation and the line of action of the force is relatively small. Adding the mount plate of Meyers '111 to the actuation button of Moss '481 as proposed would present a similarly small concern. Any concerns that do exist can be easily addressed through proper engineering design and testing.

B. Declaration of N. Ryan Moss of June 24, 2024 (EX1019)

173. Regarding development of the ‘506 Patent invention, Mr. Moss states that “[w]e had to identify a broad list of relevant use cases, develop project goals, iterate on the design, test five prototypes, and consult with manufacturing partners multiple times.” EX1019, ¶ 17. I would point out that these are just ordinary and necessary steps in the development of any ladder or ladder component. There is nothing that indicates any special effort that was needed in development of this particular component.

C. Declaration of Paul Junius of June 25, 2024 (EX1020)

174. Mr. Junius opines that “the claims of the present application would not have been obvious to a person having ordinary skill in the art at the time the invention was made.” EX1020, ¶ 5. I note that the declaration provides no evidence that Mr. Junius has the technical education or design experience to qualify as a person of ordinary skill in the art. *Compare Id.*, ¶¶ 1-3 with Section V, ¶ 35, *supra*. Consequently, his opinion on the matter should be accorded little weight.

D. Declaration of B. Scott Maxfield of November 27, 2024 (EX1023)

175. Mr. Maxfield attests regarding the Moss ‘481 magnetic hinge button design that “I received reports that users of the magnetic hinge button ladder were dissatisfied with the utility of the magnetic button, its ability to hold heavier

objects, and its ability to attract unwanted objects to it.” Also that “the bill of materials was too expensive relative to the benefits it provided.” EX1023, ¶ 4. He also states that “although there was an unmet need for hanging objects for articulating ladders, the magnetic button had enough drawbacks to drive us away from further development of such technology.” *Id.*

176. It occurs to me that these statements are in contradiction. In my opinion, the drawbacks of the magnetic hinge button would have inspired a person of ordinary skill in the art to eliminate the expensive and problematic magnet while retaining its tool hanging benefit, absent any other reasons for not pursuing the matter. That would lead one of ordinary skill in the art to explore mechanical hangers such as Meyers ‘111 in conjunction with the Moss ‘481 ladder and hinge button.

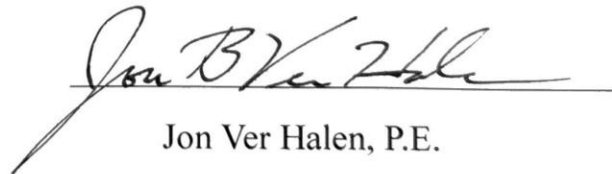
177. Mr. Maxfield also attests that “[t]he failures of the Moss magnetic button led to circumstances where such a significant investment in time [50 to 80 hours of engineer time] and other resources to investigate alternatives had low priority. The lack of appeal would have been recognized at the time by any person having ordinary skill in the art.” *Id.*, ¶ 5. I disagree. 50 to 80 hours of engineer time is not out of the ordinary for ladder improvements, and would not lead one of ordinary skill in the art away from investigating improvements to the magnetic hinge button of Moss ‘481. The lack of priority given to the project is not

attributable to all those of ordinary skill in the art, and flies in the face of there being a “long-felt but unmet need.”

VIII. Declaration

This declaration represents my opinions and my testimony in this matter. For all the opinions expressed in this report I have relied upon the information listed above in Section III, and my own personal knowledge and experience. I reserve the right to amend or supplement my analysis and conclusions should new information become available. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: April 14, 2026



Jon Ver Halen, P.E.

EXHIBIT A

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PROFESSIONAL QUALIFICATIONS OF JON B. VER HALEN

EDUCATION

Bachelor of Science, Industrial Engineering
Purdue University, 1976
Post-Graduate Studies in Industrial Engineering
Purdue University, 1976-1977
Registered Professional Engineer – State of Illinois

ORGANIZATIONS

Institute of Industrial and Systems Engineers
National Society of Professional Engineers
Illinois Society of Professional Engineers
Alpha Phi Mu – Industrial Engineering Honorary Organization

WORK HISTORY

1976-1977 – Purdue University
Teacher's assistant, assistant to department head
1977-1991 – Richard T. Ver Halen, Consulting Engineers
Project Engineer
1992 – Present – Ver Halen Engineering, P.C.
President

AREAS OF EXPERTISE

Design of factories, production lines & production efficiency improvement
Product design and industrial design, including warnings & instructions
Machine guarding
Analysis of safety codes and requirements
Ladder design & construction, ladder accident reconstruction
Construction workplace safety, Construction Management
Human factors
Failure analysis and accident reconstruction
Expert witness testimony

STANDARDS COMMITTEES

ANSI A14.1 Subcommittee Chairman (Portable Wood Ladders)
ANSI A14.9 Subcommittee Chairman (Folding Attic Stairways/Ladders)
ANSI A14.10 Past Subcommittee Chairman (Special Duty Ladders)
ANSI A14.11 Subcommittee Member (Stepstools)
ANSI A14 Steering Committee Member
ANSI A14 Labeling Task Force Chairman
ANSI A14 Committee Member