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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/490,715	10/19/2023	B. Scott Maxfield	P298048US03 (506318-576)	5970

153511 7590 07/15/2025

Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176

EXAMINER	
MEKHAEIL, SHIREF M	

ART UNIT	PAPER NUMBER
3634	

NOTIFICATION DATE	DELIVERY MODE
07/15/2025	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

davis.ashley@dorsey.com
ip.docket.slc@dorsey.com
mayo.samantha@dorsey.com

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	ISSUE DATE	PATENT NO.
18/490,715	15-Jul-2025	12359506

Dorsey & Whitney - SLC
111 South Main Street
Salt Lake City, UT 84111-2176

EGRANT NOTIFICATION

Your electronic patent grant (eGrant) is now available, which can be accessed via Patent Center at https://patentcenter.uspto.gov

The electronic patent grant is the official patent grant under 35 U.S.C. 153. For more information, please visit https://www.uspto.gov/electronicgrants

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/490,715	07/15/2025	12359506	P298048US03 (506318-576)	5970

153511 7590 07/02/2025

Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176

ISSUE NOTIFICATION

The projected patent number and issue date are specified above. The patent will issue electronically. The electronically issued patent is the official patent grant pursuant to 35 U.S.C. § 153. The patent may be accessed on or after the issue date through Patent Center at https://patentcenter.uspto.gov/. The patent will be available in both the public and the private sides of Patent Center. Further assistance in electronically accessing the patent, or about Patent Center, is available by calling the Patent Electronic Business Center at 1-888-217-9197.

The USPTO is implementing electronic patent issuance with a transition period, during which period the USPTO will mail a ceremonial paper copy of the electronic patent grant to the correspondence address of record. Additional copies of the patent (i.e., certified and presentation copies) may be ordered for a fee from the USPTO's Certified Copy Center at https://certifiedcopycenter.uspto.gov/index.html. The Certified Copy Center may be reached at (800)972-6382.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Center (https://patentcenter.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional inventors):

B. Scott Maxfield, Mapleton, UT;
N. Ryan Moss, Mapleton, UT;

APPLICANT(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional applicants):

LITTLE GIANT LADDER SYSTEMS, LLC, Springville, UT;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

Change(s) applied to document, /S.G.L/ 4/19/2025

AMENDMENTS TO THE SPECIFICATION

Please amend paragraph 0059 of the specification as set forth below in marked-up form:

0060

[0059] The articulating ladder 100 also includes a second rail assembly 114 that includes an inner assembly slidably coupled with an outer assembly. The inner assembly includes a pair of rails 111 coupled with a plurality of rungs and is configured similar to the inner assembly of the first rail assembly described above. Likewise, the outer assembly includes a pair of rails 113 coupled with a plurality of rungs and is configured similar to the outer assembly of the first rail assembly described hereinabove. Locking mechanisms 124 may be associated with inner and outer assemblies and to enable selective positioning of the inner assembly relative to the outer assembly as described above with respect to the first rail assembly 102. In some embodiments, the locking mechanisms 124 (or 112) may be adjustment mechanisms used to adjustably retain components to the ladder 100, such as accessories, tools, and other apparatuses. ~~Locking mechanisms 124 (or 112) can therefore be referred to as "retainers" herein.~~ Thus, the locking mechanisms may be used for purposes other than locking rails or hinges and may be used to adjust the positioning of components on the ladder.

first assembly 102 from rotating relative to the rail plates 132 associated with the second assembly 114. As shown in FIG. 3B, the hinge mechanism 126 can be laterally/axially transitioned to an unlocked position (*e.g.*, a second axial position on the axis of rotation, *e.g.*, 135) in which the locking pins 146, 148 are removed from the locking apertures 150, 152 (or at least from the locking apertures in the central rail plates 132 and the laterally outermost rail plate 134, e.g., similar to the pins in U.S. Pat. No. 4,407,045), thereby allowing rotation of the first rail plates 132 relative to the second rail plates 134 about an axis of rotation 135 (i.e., a pivot axis or hinge axis) extending centrally through the shaft of the pivot pin 128.

Change(s) applied to document, /S.G.L/ 4/19/2025

***

[0078] In some embodiments, the button plate 140 can be included on the laterally outward side 156 of the button body 138. A portion of the button plate 140 (e.g., a middle or central portion) can be spaced away from the axially-facing surface 156, as clearly shown in FIGS. 14-15 . A gap 216 between the button plate 140 and the button body 138 can receive and retain a thin item such as a spatula, paper, or an end hook portion of a tape measure. Thus, in some embodiments, a hinge mechanism 126 having a button body 138 and a button plate 140 can be referred to as a "retainer" herein, and pairs of such structures (*i.e.*, hinge mechanisms 126) can be referred to as pairs of retainers.

AMENDMENTS TO THE SPECIFICATION

Please amend paragraphs 0059, 0066, and 0078 of the specification as set forth below in marked-up form:

[0059] The articulating ladder 100 also includes a second rail assembly 114 that includes an inner assembly slidably coupled with an outer assembly. The inner assembly includes a pair of rails 111 coupled with a plurality of rungs and is configured similar to the inner assembly of the first rail assembly described above. Likewise, the outer assembly includes a pair of rails 113 coupled with a plurality of rungs and is configured similar to the outer assembly of the first rail assembly described hereinabove. Locking mechanisms 124 may be associated with inner and outer assemblies and to enable selective positioning of the inner assembly relative to the outer assembly as described above with respect to the first rail assembly 102. In some embodiments, the locking mechanisms 124 (or 112) may be adjustment mechanisms used to adjustably retain components to the ladder 100, such as accessories, tools, and other apparatuses. Locking mechanisms 124 (or 112) can therefore be referred to as "retainers" herein. Thus, the locking mechanisms may be used for purposes other than locking rails or hinges and may be used to adjust the positioning of components on the ladder.

Change(s) applied to document, /S.G.L./ 4/19/2025

***

0067

[0066] Thus, as shown in the front plan view of FIG. 3A, the hinge mechanism 126 can have a locked position (*e.g.*, a first axial position on an axis of rotation, *e.g.*, axis 135) in which the locking pins (e.g., 146, 148) extend through the locking apertures (e.g., 150, 152) and thereby prevent the rail plates 134 associated with the

Doc Code: MFEE.C.AD
Document Description: Maintenance Fee Address Change

PTO/AIA/47 (11-21)
Approved for use through 11/30/2024. OMB 0651-0016
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"FEE ADDRESS" INDICATION FORM

Address to:
Mail Stop Maintenance Fee
Director of the United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

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Fax to:
571-273-6500

INSTRUCTIONS: The issue fee must have been paid for the application(s) listed on this form. In addition, only an address represented by a Customer Number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application.

When to check the first box below: If you have a Customer Number to represent the fee address.

When to check the second box below: If you have no Customer Number representing the desired fee address, in which case a completed Request for Customer Number (PTO/SB/125) must be attached to this form. For more information on Customer Numbers, see the Manual of Patent Examining Procedure (MPEP) § 403.

For the following listed application(s), please recognize as the "Fee Address" under the provisions of 37 CFR 1.363 the address associated with:

☑ Customer Number: 000197

OR

☐ The attached Request for Customer Number form (PTO/SB/125)

PATENT NUMBER (if known)	APPLICATION NUMBER
	18/490,715

Completed by (check one):

☐ Applicant/Inventor

☑ Attorney or Agent of record 66,759 (Reg. No.)

☐ Assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(c) (Form PTO/AIA/96) is enclosed or was filed on _____ (Date)

/Richard C. Galati/
Signature

Richard C. Galati
Typed or printed name

(801) 933-4084
Requester's telephone number

2025-06-17
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. If the assignee is a juristic entity, this form must be signed by a patent practitioner (attorney or agent) of record. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0016. Public burden for this form is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS.** SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013). https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to: 1) law enforcement, in the event that the system of records indicates a violation or potential violation of law; 2) a Federal, state, local, or international agency, in response to its request; 3) a contractor of the USPTO having need for the information in order to perform a contract; 4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record; 5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record; 6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations; 7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals; 8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)); 9) the Office of Personnel Management (OPM) for personnel research purposes; and 9) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Additional Uses

Additional USPTO uses of the information in this record may include disclosure to: 1) the International Bureau of the World Intellectual Property Organization, if the record is related to an international application filed under the Patent Cooperation Treaty; 2) the public i) after publication of the application pursuant to 35 U.S.C. 122(b), ii) after issuance of a patent pursuant to 35 U.S.C. 151, iii) if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections, or an issued patent, or iv) without publication of the application or patent under the specific circumstances provided for by 37 CFR 1.14(a)(1)(v)-(vii); and/or 3) the National Archives and Records Administration, for inspection of records.
https://www.govinfo.gov/content/pkg/FR-2013-03-29pdf/2013-07341.pdf

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**06/17/2025 01:13:27 PM Z ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Molly Chappe
PATENT CENTER #	70937590	AUTHORIZED BY	Richard Galati
CUSTOMER #	153511	FILING DATE	10/19/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	B. Scott Maxfield

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 1083	**E20256GD15578803**	**Molly Chappe**

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
506181	**37 CFR 1.16 (National application filing, search, and examination fees); 37 CFR 1.17 (Patent application and reexamination processing fees); 37 CFR 1.19 (Document supply fees); 37 CFR 1.20 (Post Issuance fees); 37 CFR 1.21 (Miscellaneous fees and charges)**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1501	UTILITY ISSUE FEE	1290.00	1	1290.00
			TOTAL AMOUNT:	**$1,290.00**

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement

Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PGR2026-00044
TRICAM EX1002

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

153511 7590 04/16/2025

Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/490,715	10/19/2023	B. Scott Maxfield	P298048US03 (506318-576)	5970

TITLE OF INVENTION: MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1290	$0.00	$0.00	$1290	07/16/2025

EXAMINER	ART UNIT	CLASS-SUBCLASS
MEKHAEIL, SHREF M	3634	182-021000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☒ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Dorsey & Whitney LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: LITTLE GIANT LADDER SYSTEMS, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Springville, UT

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required)

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☒ Electronic Payment via the USPTO patent electronic filing system ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 506181

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

☐ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

☐ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Richard C. Galati/ Date 17 June 2025

Typed or printed name Richard C. Galati Registration No. 66,759

PGR2026-00044
TRICAM EX1002

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**06/17/2025 01:13:27 PM Z ET**	**P298048US03 (506318-576)**

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MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

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PATENT CENTER #	70937590	FILING DATE	10/19/2023
CUSTOMER #	153511	FIRST NAMED INVENTOR	B. Scott Maxfield
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Richard Galati

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
20250617_IssueFeeTransmittal_P298048.US.03.pdf	1	Issue Fee Payment (PTO-85B)	145 KB
20250617_FeeAddress_P298048.US.03.pdf	2	Maintenance Fee Address Change	499 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
20250617_IssueFeeTransmittal_P298048.US.03.pdf	2349E59EF29F9B127B2E89C558E630D4CA0672A2C7B8AE5C525B6B124317A97CF8167AF16FAB82E1DF814199A5BD402247F407C7BF9EE53ECDBFC3603CF7DAD9
20250617_FeeAddress_P2980	7090CD6B5A31CDC9F0ECBFD570570415AC0B41B4C9ABF651

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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United States Patent and Trademark Office
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NOTICE OF ALLOWANCE AND FEE(S) DUE

153511 7590 04/16/2025

Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176

EXAMINER	
MEKHAEIL, SHIREF M	
ART UNIT	PAPER NUMBER
3634	

DATE MAILED: 04/16/2025

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/490,715	10/19/2023	B. Scott Maxfield	P298048US03 (506318-576)	5970

TITLE OF INVENTION: MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1290	$0.00	$0.00	$1290	07/16/2025

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

153511 7590 04/16/2025

Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/490,715	10/19/2023	B. Scott Maxfield	P298048US03 (506318-576)	5970

TITLE OF INVENTION: MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1290	$0.00	$0.00	$1290	07/16/2025

EXAMINER	ART UNIT	CLASS-SUBCLASS
MEKHAEIL, SHIREF M	3634	182-021000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required)

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via the USPTO patent electronic filing system ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/490,715	10/19/2023	B. Scott Maxfield	P298048US03 (506318-576)	5970

153511 7590 04/16/2025

Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176

EXAMINER	
MEKHAEIL, SHIREF M	
ART UNIT	PAPER NUMBER
3634	

DATE MAILED: 04/16/2025

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/ owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013).
https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to:

1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;
2) a federal, state, local, or international agency, in response to its request;
3) a contractor of the USPTO having need for the information in order to perform a contract;
4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;
5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;
6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));
9) the Office of Personnel Management (OPM) for personnel research purposes; and
10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Notice of Allowability	Application No. 18/490,715	Applicant(s) Maxfield et al.	
	Examiner SHIREF M MEKHAEIL	Art Unit 3634	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to 12/18/2024.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-11 and 19-20 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☑ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/S.M.M/ Examiner, Art Unit 3634	/DANIEL P CAHN/ Supervisory Patent Examiner, Art Unit 3634

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

- Claims 12-18 have been cancelled.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

The recitation "*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*" of claim 1 and "*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"; of claim 19; reads over the prior art. Specifically, the combination of references Moss, US (2009/0229918) and Ng, US (11191373) has been withdrawn, for a combination of the following reasons:

Applicant's arguments and Declarations provided by experts in the field: Summarized in that: "Picture frame brackets usually include notches and spikes (e.g., to receive nails), and [designers] would not want to add parts to a hinge button that would apply uncomfortable pressure to the palm of your hand. It would not make sense to make a button more uncomfortable to press by adding a picture bracket such as bracket 10 of Ng to the palm pressing surface [of a ladder hinge push button]", "A designer would not have turned to any picture frame brackets for inspiration in modifying a hinge button anyway. Picture frame brackets are placed on a small object (e.g., a picture frame) to support it on a larger object (e.g., a wall)".

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

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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 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.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHIREF M MEKHAEIL whose telephone number is (571)270-5334. The examiner can normally be reached 10-7 Mon-Fri.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Cahn can be reached on 571-270-5616. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S.M.M/
Examiner, Art Unit 3634

/DANIEL P CAHN/
Supervisory Patent Examiner, Art Unit 3634

PGR2026-00044
TRICAM EX1002

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/490,715	Maxfield et al.
	Examiner	Art Unit
	SHIREF M MEKHAEIL	3634

CPC - Searched*		
Symbol	**Date**	**Examiner**
E06C 1/ 32, 38, 383 ; 7/ 082, 14, 50 ; 9/ 085	12/02/2023	SM

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
Inventor name search	12/02/2023	SM
Assignee name search	12/02/2023	SM
Forward and backward citation search of relevant art	12/02/2023	SM
More like Doc search	12/02/2023	SM
Consulted CAT tool and global dossier	12/02/2023	SM
Class/subclass and text search	12/02/2023	SM
Updated	03/19/2024	SM
Updated	08/23/2024	SM
Updated	04/05/2025	SM
Similarity search	04/05/2025	SM
Global dossier citation search	04/05/2025	SM

/S.M.M/ Examiner, Art Unit 3634	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/490,715	Maxfield et al.
	Examiner	Art Unit
	SHIREF M MEKHAEIL	3634

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	Text search of independent claims	04/05/2025	SM

/S.M.M/
Examiner, Art Unit 3634

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/490,715	Maxfield et al.
	Examiner	**Art Unit**
	SHIREF M MEKHAEIL	3634

CPC						
Symbol					**Type**	**Version**
E06C	/	1	/	32	F	2013-01-01
E06C	/	7	/	14	I	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

/SHIREF M MEKHAEIL/ Examiner, Art Unit 3634 (Assistant Examiner)	05 April 2025 (Date)	**Total Claims Allowed:** 13	
/DANIEL P CAHN/ Supervisory Patent Examiner, Art Unit 3634 (Primary Examiner)	08 April 2025 (Date)	O.G. Print Claim(s) Claim 1	O.G. Print Figure Figs. 1 & 3A

U.S. Patent and Trademark Office — Part of Paper No.: 20250405

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/490,715	Maxfield et al.
	Examiner	**Art Unit**
	SHIREF M MEKHAEIL	3634

INTERNATIONAL CLASSIFICATION				
CLAIMED				
E06C	/	1	/	32

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

/SHIREF M MEKHAEIL/ Examiner, Art Unit 3634 (Assistant Examiner)	05 April 2025 (Date)	**Total Claims Allowed:** 13	
/DANIEL P CAHN/ Supervisory Patent Examiner, Art Unit 3634 (Primary Examiner)	08 April 2025 (Date)	O.G. Print Claim(s) Claim 1	O.G. Print Figure Figs. 1 & 3A

U.S. Patent and Trademark Office — Part of Paper No.: 20250405

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/490,715	Maxfield et al.
	Examiner	**Art Unit**
	SHIREF M MEKHAEIL	3634

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	10	10	12	19										
2	2	11	11	13	20										
3	3		12												
4	4		13												
5	5		14												
6	6		15												
7	7		16												
8	8		17												
9	9		18												

/SHIREF M MEKHAEIL/ Examiner, Art Unit 3634	05 April 2025	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	13	
/DANIEL P CAHN/ Supervisory Patent Examiner, Art Unit 3634	08 April 2025	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	Claim 1	Figs. 1 & 3A

U.S. Patent and Trademark Office Part of Paper No.: 20250405

Bibliographic Data

Application No: 18/490,715

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /SHIREF M MEKHAEIL/ Examiner's Signature | Initials

Title: MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
10/19/2023	182	3634	P298048US03 (506318-576)
RULE			

APPLICANTS

LITTLE GIANT LADDER SYSTEMS, LLC, Springville, UT, UNITED STATES

INVENTORS

B. Scott Maxfield, Mapleton, UT, UNITED STATES

N. Ryan Moss, Mapleton, UT, UNITED STATES

CONTINUING DATA

This application is a CON of 18324971 05/27/2023

18324971 has PRO of 63346420 05/27/2022

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

10/31/2023

STATE OR COUNTRY

UNITED STATES

ADDRESS

Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176
UNITED STATES

FILING FEE RECEIVED

$6,160

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	25	((("LITTLE") near3 ("GIANT") near3 ("LADDER") near3 ("SYSTEMS") near3 ("LLC"))).AS,AANM.	(USPAT)	OR	ON	ON	2023/11/30 06:24 PM
L2	458	((("MAXFIELD") near3 ("B")) OR (("MOSS") near3 ("N")) OR (("MINER") near3 ("Steven"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2023/11/30 06:25 PM
L3	1216	E06C1/32.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:26 PM
L4	1887	E06C7/14.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:26 PM
L6	411	E06C9/085.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:56 PM
L7	1032	E06C1/383.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:56 PM
L8	764	E06C1/38.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:56 PM
L9	688	E06C7/082.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:58 PM
L10	4	("20050252721" OR "4210224" OR "4407045" OR "8186481").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/01 01:50 PM
L11	82	("3692143" | "3811151" | "3955240" | "4025109" | "4210224" | "4216844").pn. OR ("4407045").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 02:38 PM
L12	44	(Artificial Intelligence) More like doc: US-4407045-A Text:	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2023/12/01 02:39 PM

		(US-4566150-A OR US-3811151-A OR DE-2732784-C2 OR EP-1020653-A1 OR US-20170145745-A1 OR DE-2931745-A1 OR DE-3900176-A1 OR EP-1020653-B1 OR US-10731413-B2 OR US-5074377-A OR US-6220389-B1 OR US-20180274296-A1 OR WO-2017218672-A1 OR US-20210025230-A1 OR WO-9955997-A1 OR AT-E117046-T1 OR US-10718160-B2 OR US-20180252037-A1 OR CN-107178303-A OR EP-1388309-A1).did.	CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L13	81	("0130549" | "0229552" | "0493977" | "0734147" | "1100823" | "1374548" | "1894489" | "1935349" | "1936508" | "1944792" | "2144440" | "2589079" | "2647676" | "2864544" | "2896830" | "3129785" | "3692143" | "3785455" | "3866714" | "3912043" | "3955240" | "4210224" | "4216844" | "4376470" | "4407045" | "4540306" | "4566150" | "4577986" | "4666328" | "4697305" | "4719990" | "4770559" | "4890950" | "4951780" | "5022118" | "5366051" | "5954157" | "6115886" | "6220389" | "6343406" | "6711780" | "6857503" | "7047597" | "7140072" | "D553757" | "7364017" | "7424933" | "8591444" | "D767784" | "9580959" | "10233692" | "20030127288" | "20030188923" | "20050166364" | "20050268434" | "20080109994" | "20110024232" | "20140251729" | "20150315844" | "20160177625" | "20160348434" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 02:57 PM

		"20170211283" | "20170328131").pn. OR ("10718160").urpn. AND (PGPB | USPT | USOC).dbnm.					
L14	38	(Artificial Intelligence) More like doc: US-10718160-B2 Text: (CA-196181-S OR CA-187083-S OR US-20180252037-A1 OR CN-107178303-A OR US-3912043-A OR AU-734243-B3 OR AU-2013373963-B2 OR AU-2013373963-A1 OR CN-2632283-Y OR US-20190090626-A1 OR AU-2003290755-A1 OR AU-2019282832-A1 OR AU-2003290755-B2 OR CN-2339739-Y OR US-10582766-B2 OR US-20090200113-A1 OR US-11536088-B2 OR CA-1215953-A OR AU-2017202247-A1 OR CA-117047-S).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/01 02:57 PM
L15	62	("3048883" | "3731342" | "3811151" | "3879146" | "4152810" | "4216844" | "4403373" | "4407045" | "4540306" | "4566150" | "4666327" | "4666328" | "4697305" | "4770559" | "4773503" | "4890950" | "4925329" | "4928792" | "5018405" | "5022118" | "5026198" | "5058239" | "5954157" | "6086284" | "6244779" | "6330733" | "6343406" | "6688797" | "20030012595" | "20030037412" | "20040129497" | "20040216277" | "20040226773" | "20050268434").pn. OR ("7140072").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:00 PM
L16	31	("3048883" | "3731342" | "3811151" | "3879146" | "4152810" | "4216844" | "4403373" | "4407045" | "4540306" | "4566150"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:00 PM

		| "4666327" | "4666328" | "4697305" | "4925329" | "5590931" | "6112370" | "6343406" | "6711780" | "6910738" | "20040226773").pn. OR ("7093321").urpn. AND (PGPB | USPT | USOC).dbnm.					
L17	53	("1696357" | "3811151" | "4085899" | "4210224" | "4216844" | "4403373" | "4407045" | "4566150" | "4577986" | "4666327" | "4666328" | "4697305" | "4770559" | "4890950" | "D309502" | "6343406").pn. OR ("6711780").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:01 PM
L18	40	(Artificial Intelligence) More like doc: US-6711780-B2 Text: (US-20030037412-A1 OR US-5142739-A OR KR-200255403-Y1 OR WO-2021109845-A1 OR CN-211819206-U OR US-20150159414-A1 OR DE-4421284-C1 OR US-20180274296-A1 OR US-20230008962-A1 OR US-10145159-B2 OR CN-104691599-A OR EP-0931904-A2 OR DE-202014102891-U1 OR US-20140332044-A1 OR US-20100251871-A1 OR WO-2013087079-A1 OR EP-2791445-A1 OR US-10557227-B2 OR US-20180298547-A1 OR US-20180252037-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/01 03:01 PM
L19	69	("4403373" | "4407045" | "4566150" | "4697305" | "4773503" | "4890950" | "5353892" | "5620272" | "5954157" | "5992566").pn. OR ("6343406").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:02 PM

L20	67	("4290168" | "4407045" | "4602889" | "4614452" | "5219240" | "5265969" | "5353892").pn. OR ("5620272").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:02 PM
L21	71	("0470516" | "0501406" | "0697294" | "0745320" | "0796157" | "1461952" | "1633902" | "1936508" | "2210803" | "2647676" | "2880920" | "3692143" | "3811151" | "4182431" | "4210224" | "4216844" | "4371055" | "4376470" | "4403373" | "4407045" | "4566150").pn. OR ("4697305").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:04 PM
L22	58	("4152810" | "4216844" | "4377020" | "4407045" | "4543007" | "4566150").pn. OR ("4666328").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:05 PM
L23	66	("3731342" | "3924775" | "4202015" | "4666328" | "4718127" | "4718672" | "4832299" | "5428350" | "5687939" | "5713633" | "5805415" | "5813914" | "6019332" | "6068101" | "6112370" | "6128184" | "6135884" | "6164645" | "6254481" | "6266236" | "6357712" | "6475087" | "6512670" | "6532627" | "6590547" | "6623006" | "6644611" | "6665175" | "6682161" | "6711780" | "6758454" | "6997810" | "7059693" | "7147191" | "7267613" | "7283355" | "20020139822" | "20030027627" | "20040018870" | "20050056750" | "20050059496" | "20050121578" | "20060175499").pn. OR ("7540806").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:22 PM

L24	59	("0181305" | "1936508" | "3430972" | "3692143" | "3912043" | "4182431" | "4371055" | "4376470" | "4483415" | "4520896" | "4666328" | "4697305" | "4770559" | "4890950" | "4951780" | "4989692" | "5142739" | "5620272" | "5873433" | "5954157" | "5971102" | "6000497" | "6343406" | "6443261" | "6536557" | "6711780" | "6857503" | "7007344" | "7032711" | "7047597" | "7140072" | "7264082" | "7306075" | "7364017" | "7370726" | "7424933" | "8262124" | "8651259" | "10138680" | "10233692" | "10648234" | "10718160" | "20030012595" | "20030217888" | "20040129497" | "20090078503" | "20140251729" | "20150068842" | "20160153231" | "20170145745" | "20170356244" | "20190136625" | "20190145170" | "20190234144" | "20190368271" | "20190376343").pn. OR ("11505994").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:24 PM
L25	45	("1887878" | "1894489" | "2456054" | "2476427" | "2517125" | "2923565" | "3018122" | "3504569" | "3693469" | "3693770" | "3943794" | "4222473" | "4249799" | "4269422" | "4604910" | "4666328" | "4679756" | "4824278" | "5235867" | "5279387" | "5302039" | "5337869" | "5482144" | "5689999" | "5961220" | "6065897" | "6086284" | "6092778").pn. OR ("6244779").urpn. AND (PGPB | USPT |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:26 PM

		USOC).dbnm.					
L26	76	("0437936" | "3420333" | "3692143" | "3729063" | "3811151" | "3849834" | "D248777" | "4152810" | "4155422" | "4182431" | "4202428" | "4210224" | "4256200" | "4284171" | "4376470" | "4469193" | "4493392" | "4502566" | "4519478" | "4540306" | "4566150" | "4577986" | "4666328" | "4697305" | "4770559" | "4773503" | "4796727" | "4924970" | "4926964" | "4934485" | "D309502" | "4974701" | "5000289" | "5062179" | "5074377" | "5123768" | "5163532" | "5228535" | "5279387" | "5350038" | "5358352" | "5520474" | "5620272" | "5743355" | "5775460" | "5992566" | "6086284" | "6115886" | "6220389" | "6237718" | "6330733" | "6343406").pn. OR ("7424933").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:27 PM
L27	34	(Artificial Intelligence) More like doc: US-7424933-B2 Text: (US-20040129497-A1 OR US-20090200113-A1 OR US-7364017-B2 OR US-8376087-B2 OR JP-2006505726-A OR US-20120160609-A1 OR AU-2003290755-A1 OR WO-2004044365-A2 OR EP-1573166-A2 OR CA-2508885-C OR US-20040140156-A1 OR AU-2003290755-B2 OR US-8069948-B2 OR EP-1573166-B1 OR CA-2508885-A1 OR US-20080257645-A1 OR EP-1473432-A1 OR NZ-540647-A OR CA-3172553-A1 OR CA-2465252-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/01 03:27 PM
L28	20	("4645371" | "4770559" | "4805737" | "4890950"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:34 PM

		| "4925329" | "4928792" | "5022118" | "5026198" | "5058239" | "5353892").pn. OR ("6330733").urpn. AND (PGPB | USPT | USOC).dbnm.					
L29	40	(Artificial Intelligence) More like doc: US-6330733-B1 Text: (EP-1020653-B1 OR EP-1020653-A1 OR DE-19901125-C1 OR DE-3937535-C1 OR US-20040108764-A1 OR DE-1938696-A1 OR DE-19633761-A1 OR DE-19633761-C2 OR US-3955240-A OR US-4543006-A OR US-3643292-A OR KR-890003205-Y1 OR NL-2013148-A OR CN-216767249-U OR CZ-327496-A3 OR US-5197817-A OR PT-1020653-E OR US-6045189-A OR US-4612706-A OR US-20060005397-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/01 03:34 PM
L30	48	("4339844" | "4403373" | "4540306" | "4666327").pn. OR ("4890950").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:00 PM
L31	37	("2502641" | "3955240" | "4474264" | "4540306" | "4543006" | "4611945" | "4645371" | "4770559").pn. OR ("4824278").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:04 PM
L32	50	("3517965" | "4087885" | "4447033" | "4474264" | "4697305").pn. OR ("5954157").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:08 PM
L33	16248	E06C$/$.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:10 PM
L34	32	33 AND bracket WITH hold$4 WITH (clip (measuring ADJ tape)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:11 PM

		(screw ADJ drive))					
L35	5	("3029054").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:12 PM
L36	40	("0956835" | "1551243" | "2226228" | "2645443" | "2674427" | "2675982" | "2703215" | "2837306" | "2855170" | "3029054" | "3154282" | "3278148" | "3420486" | "4560127" | "4979710" | "4991808" | "5079795" | "5099952" | "5342008" | "6009976" | "6105911" | "8602365" | "8925683" | "9249003" | "10119332" | "20090147527" | "20140319297").pn. OR ("11661794").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L37	68	33 AND bracket WITH hold$4 WITH (tool)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L38	55	33 AND bracket WITH hold$4 WITH (object)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L39	9	33 AND bracket WITH hold$4 near2 (object)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L40	22	33 AND (bracket plate) WITH (protrud$4 gap) WITH hold$4	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:18 PM
L41	67	(U$2bracket (U ADJ shape$1 ADJ bracket)) WITH hold$4 WITH (clip (measuring ADJ tape) (screw ADJ drive))	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:23 PM
L42	25995	clip ADJ holder WITH (measuring ADJ tape) (screw ADJ drive)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:29 PM
L43	3	clip ADJ holder WITH (measuring ADJ tape)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:29 PM
L44	121	clip ADJ holder WITH (tool)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:29 PM
L45	5	("2003/0159304").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:30 PM
L46	7	("5388741" | "6269993" | "7117566" | "7216788" | "9173475" | "20080283563" | "20200253364").pn. OR ("11559131").urpn. AND (PGPB | USPT |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:30 PM

		USOC).dbnm.					
L47	14	("1519380" | "1980678" | "2995792" | "4757927" | "5026016" | "5054170" | "5201858" | "5622296" | "6233788").pn. OR ("7117566").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:31 PM
L48	6	("2008/0283563").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:32 PM
L49	17	("D196542" | "D221123" | "4598027" | "4821933" | "5213240" | "5388741" | "9173475" | "9248565" | "10182641" | "20030074803" | "20050284909" | "20080283563" | "20120260513" | "20180184791").pn. OR ("10470556").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:33 PM
L50	3	("2018/0184791").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:34 PM
L51	138	("1519380" | "3743147" | "3797717" | "3878589" | "4419794" | "4587818" | "4605335" | "4619020" | "4676420" | "4718586" | "4754528" | "4757927" | "4821934").pn. OR ("5054170").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:36 PM
L52	102	("0D29072" | "0D31665" | "0795553" | "0895846" | "1338154" | "D139216" | "2443149" | "2639109" | "D197188" | "3300173" | "3529799" | "3878589" | "D235308" | "3912216" | "D239593" | "D243190" | "D244508" | "D246346" | "4132335" | "D252851" | "4171117" | "D262688" | "4419794" | "D272044" | "D272211" | "4458872" | "D295369" | "D298604" | "D303716" | "D310479" | "D313740" | "5014892" | "5054170"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:38 PM

		| "D324991" | "D329192" | "5398906" | "5484126" | "5549234" | "5605313" | "5687942" | "D5850954" | "D408267" | "D409079" | "D409663" | "D410032" | "D414207" | "D428058" | "6142892" | "D438536" | "D452081" | "D454591" | "D464993" | "D465147" | "D468357" | "D492187" | "6866940" | "D507959" | "D511088" | "D531223" | "D547637" | "D560221" | "D567740" | "D572117" | "D572122" | "7594632" | "D607711" | "D623046" | "D623507" | "D629293" | "8303226" | "D685991" | "8544805" | "D704035" | "D715859" | "D732929" | "9138082" | "D753982" | "9683696" | "D817152" | "D818801" | "D819428" | "D829079" | "20060186304" | "20070039907" | "20070186384" | "20080209698" | "20080237282" | "20080272257" | "20130168429" | "20130232840" | "20150204366").pn. OR ("11191373").urpn. AND (PGPB | USPT | USOC).dbnm.					
L53	55	("D236855" | "D270120" | "D280466" | "4948022" | "5014892" | "D318949" | "5054170" | "5071049" | "D398835" | "5850954" | "D404038" | "D426701" | "D438536" | "6491194").pn. OR ("D507959").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:41 PM
L54	29	("D139216" | "D244508" | "D246346" | "4132335" | "D272211" | "D295369" | "D298604"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:47 PM

		| "D310479" | "D329192" | "5549234" | "5850954" | "D409079" | "D452081" | "D454591" | "D465147" | "D492187" | "D623507" | "8544805" | "D704035" | "D753982" | "9683696").pn. OR ("D818801").urpn. AND (PGPB | USPT | USOC).dbnm.					
L55	43	("20120267197"|"6883645"|"8387753"|"2127035"|"2827216"|"20030012595"|"20030062219"|"20030127288"|"20030217888"|"20040129497"|"20060155230"|"20070067957"|"20070201943"|"20080000723"|"20080073150"|"20080109994"|"20090050407"|"20110056764"|"20120267197"|"20150315844"|"4152810"|"4376470"|"4549632"|"4566150"|"4770559"|"5058239"|"5074377"|"5142739"|"5620272"|"5738186"|"5954157"|"5992566"|"6343406"|"6993808"|"7007344"|"7047597"|"7140072"|"7306075"|"7364017"|"8348015"|"8591444"|"9126622").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:27 PM
L56	56	("20040020718"|"20100258379"|"3643292"|"7424933"|"8104580"|"8381873"|"8387753"|"20070267252"|"4989692"|"20060283664"|"20090078503"|"20150204138"|"20030012595"|"20030062219"|"20030127288"|"20030188923"|"20030217888"|"20040129497"|"20050274571"|"20060155230"|"20070067957"|"20070201943"|"20080000723"|"20080073150"|"20080109994"|"20090050407"|"20110056764"|"20120267197"|"20150315844"|"2127035"|"2827216"|"4152810"|"4182431"|"4376470"|"4	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:27 PM

		549632"|"4566150"|"4770559"|"5058239"|"5074377"|"5142739"|"5620272"|"5738186"|"5954157"|"5992566"|"6343406"|"6993808"|"7007344"|"7047597"|"7140072"|"7306075"|"7364017"|"8348015"|"8591444"|"9126622").PN.					
L57	58	("0181305"|"10138680"|"10233692"|"10648234"|"10718160"|"1936508"|"20030012595"|"20030217888"|"20040129497"|"20090078503"|"20140251729"|"20150068842"|"20160153231"|"20170145745"|"20170356244"|"20190136625"|"20190145170"|"20190234144"|"20190368271"|"20190376343"|"3430972"|"3692143"|"3912043"|"4182431"|"4371055"|"4376470"|"4483415"|"4520896"|"4666328"|"4697305"|"4770559"|"4890950"|"4951780"|"4989692"|"5142739"|"5620272"|"5873433"|"5954157"|"5971102"|"6000497"|"6343406"|"6443261"|"6536557"|"6711780"|"6857503"|"7007344"|"7032711"|"7047597"|"7140072"|"7306075"|"7364017"|"7370726"|"7424933"|"8262124"|"8651259").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:27 PM
L58	97	55 56 57	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:27 PM
L59	18	("2005/0274571").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:29 PM
L60	59	("1942210"|"0140156"|"3476211"|"3811151"|"3869901"|"4027741"|"4031981"|"4182431"|"4210224"|"4371055"|"4376470"|"4407045"|"4469193"|"4470045"|"4483415"|"4577986"|"4666328"|"3481026"|"4060150"|"4216844"|"4502566"|"4566150"|"3692143"|"40	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:29 PM

		61203"|"0317024"|"4298093"|"4666327"|"4602889"|"4697305"|"4770559"|"4773503"|"4824278"|"4890950"|"4951780"|"4974701"|"0445453"|"5026198"|"5058239"|"5074377"|"5228535"|"5353892"|"5487207"|"5620272"|"5775460"|"5930872"|"5954157"|"5992566"|"6857503"|"D309502"|"RE30020"|"20030146046"|"5163532"|"20020166727").PN.					
L61	1	("11191373").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:35 PM
L62	2	("1505994").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:39 PM
L63	1	("11505994").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:39 PM
L64	53	("1696357" | "3811151" | "4085899" | "4210224" | "4216844" | "4403373" | "4407045" | "4566150" | "4577986" | "4666327" | "4666328" | "4697305" | "4770559" | "4890950" | "D309502" | "6343406").pn. OR ("6711780").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:25 PM
L65	1	("4216844").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:27 PM
L66	1	("6343406").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:29 PM
L67	48	("4339844" | "4403373" | "4540306" | "4666327").pn. OR ("4890950").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:31 PM
L68	52	((US-20050252721-A1 OR US-20030012595-A1 OR US-20190234144-A1 OR US-20050268434-A1 OR US-20080283563-A1 OR US-20180184791-A1 OR US-20050284909-A1).did. AND PGPB.dbnm.) OR ((US-11441356-B2 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK,	OR	ON	ON	2023/12/01 07:33 PM

		10718160-B2 OR US-10487580-B2 OR US-7140072-B2 OR US-7093321-B2 OR US-6711780-B2 OR US-6343406-B1 OR US-5620272-A OR US-4697305-A OR US-4666327-A OR US-4566150-A OR US-4216844-A OR US-7047597-B2 OR US-7540806-B2 OR US-6115886-A OR US-4824278-A OR US-4085899-A OR US-4666328-A OR US-7424933-B2 OR US-5954157-A OR US-4407045-A OR US-11505994-B2 OR US-6244779-B1 OR US-6330733-B1 OR US-4890950-A OR US-11661794-B2 OR US-4560127-A OR US-11559131-B1 OR US-9173475-B2 OR US-7117566-B1 OR US-5388741-A OR US-10470556-B1 OR US-5054170-A OR US-11191373-B2 OR US-8011071-B2 OR US-7077372-B2 OR US-D507959-S OR US-D492187-S OR US-5026016-A OR US-6866940-B1 OR US-D818801-S OR US-D560221-S).did. AND USPT.dbnm.) OR ((US-3029054-A OR US-2645443-A OR US-1980854-A).did. AND USOC.dbnm.)	TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L69	1954	E06C7/50.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/12/01 07:37 PM
L70	325	E06C7/50.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:37 PM
L71	0	("2019/0383099").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:39 PM
L72	12	("20030037412"|"20040	(US-PGPUB; USPAT;	OR	ON	ON	2023/12/01

		216277"|"20150315844"|"20180274296"|"2735772"|"3315298"|"4890950"|"6343406"|"6711780"|"4566150"|"6343406"|"6711780").PN.	USOCR)				07:39 PM
L73	9	("2003/0037412").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:41 PM
L74	1	("20230008962").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/02 03:05 PM
L75	1	("11191373").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/02 03:11 PM
L76	1	("20030037412").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/02 05:44 PM
L77	102	("0D29072" | "0D31665" | "0795553" | "0895846" | "1338154" | "D139216" | "2443149" | "2639109" | "D197188" | "3300173" | "3529799" | "3878589" | "D235308" | "3912216" | "D239593" | "D243190" | "D244508" | "D246346" | "4132335" | "D252851" | "4171117" | "D262688" | "4419794" | "D272044" | "D272211" | "4458872" | "D295369" | "D298604" | "D303716" | "D310479" | "D313740" | "5014892" | "5054170" | "D324991" | "D329192" | "5398906" | "5484126" | "5549234" | "5605313" | "5687942" | "D5850954" | "D408267" | "D409079" | "D409663" | "D410032" | "D414207" | "D428058" | "6142892" | "D438536" | "D452081" | "D454591" | "D464993" | "D465147" | "D468357" | "D492187" | "6866940" | "D507959" | "D511088" | "D531223" | "D547637" | "D560221" | "D567740" | "D572117" | "D572122" | "7594632" | "D607711" | "D623046" | "D623507" | "D629293" | "8303226" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 08:05 PM

		"D685991" | "8544805" | "D704035" | "D715859" | "D732929" | "9138082" | "D753982" | "9683696" | "D817152" | "D818801" | "D819428" | "D829079" | "20060186304" | "20070039907" | "20070186384" | "20080209698" | "20080237282" | "20080272257" | "20130168429" | "20130232840" | "20150204366").pn. OR ("11191373").urpn. AND (PGPB | USPT | USOC).dbnm.					
L78	39	(Artificial Intelligence) More like doc: US-11191373-B2 Text: (US-20200085215-A1 OR WO-2018223064-A4 OR WO-2018223064-A1 OR US-20090050775-A1 OR US-3912216-A OR US-11499671-B2 OR US-20060186304-A1 OR US-5454542-A OR US-5605313-A OR US-20110290965-A1 OR CA-2578577-A1 OR US-20070186384-A1 OR WO-2011122952-A1 OR NL-2004494-C2 OR US-20170002973-A1 OR US-20140248105-A1 OR US-20060076849-A1 OR US-20150083873-A1 OR US-20070145230-A1 OR US-20200345158-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/15 08:05 PM
L79	41	("3529799").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 08:26 PM
L80	7766	wall WITH (mount$3 hold$3) WITH nail	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 08:27 PM
L81	1660	wall NEAR (mount$3 hold$3) WITH nail	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 08:28 PM
L82	32	("0999961" | "1600919" | "2262287" | "2791055"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 08:46 PM

		| "3265339" | "3791709").pn. OR ("4171117").urpn. AND (PGPB | USPT | USOC).dbnm.					
L83	33	("1968720" | "3807675" | "3878589" | "4250601" | "4458869" | "4826193" | "4929116" | "5026016" | "5035389" | "5513421" | "5524883" | "5571266" | "5651552" | "5664294" | "5664784" | "5675870" | "5816954" | "5857928" | "5902194").pn. OR ("6142892").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 09:12 PM
L84	13	("4068817" | "5524853" | "D440026" | "6640395" | "D484668").pn. OR ("6866940").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 09:13 PM
L85	101	("0910712" | "2144350" | "2144553" | "2344102" | "2409209" | "2421278" | "2469311" | "2477429" | "2875805" | "2991816" | "3020946" | "3217772" | "3219086" | "3259165" | "3356404" | "3478801" | "3700020" | "4094352" | "4193435" | "4219064" | "4695212" | "4730967" | "4755090" | "4768907" | "4863327" | "4895484" | "4929116" | "4973208" | "5022804" | "5067863" | "5154385" | "5190423" | "5193868" | "5245743" | "5324146" | "5378099" | "5489173" | "5507610" | "5630686" | "5632582" | "5716178" | "5820322" | "5928711" | "5947518" | "6142892" | "6146071" | "6474917" | "6594870" | "6715185" | "6726117" | "6854941" | "6918725" | "7044701" | "7128511" | "7165371" | "7178855" | "7192231" | "7309200" | "20040013492" | "20040165965" | "20040202523" | "20080310931" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 09:15 PM

		"20090103997" | "20090129885").pn. OR ("8353649").urpn. AND (PGPB | USPT | USOC).dbnm.					
L86	65	((US-20050252721-A1 OR US-20030012595-A1 OR US-20190234144-A1 OR US-20050268434-A1 OR US-20230228148-A1 OR US-20190383099-A1 OR US-20180274296-A1 OR US-20030037412-A1 OR US-20230008962-A1 OR US-20080283563-A1 OR US-20180184791-A1 OR US-20050284909-A1 OR US-20060186304-A1).did. AND PGPB.dbnm.) OR ((US-11441356-B2 OR US-10718160-B2 OR US-10487580-B2 OR US-7140072-B2 OR US-7093321-B2 OR US-6711780-B2 OR US-6343406-B1 OR US-5620272-A OR US-4697305-A OR US-4666327-A OR US-4566150-A OR US-4216844-A OR US-7047597-B2 OR US-7540806-B2 OR US-6115886-A OR US-4824278-A OR US-4085899-A OR US-4666328-A OR US-7424933-B2 OR US-5954157-A OR US-4407045-A OR US-11505994-B2 OR US-6244779-B1 OR US-6330733-B1 OR US-4890950-A OR US-11661794-B2 OR US-4560127-A OR US-11559131-B1 OR US-9173475-B2 OR US-7117566-B1 OR US-5388741-A OR US-10470556-B1 OR US-5054170-A OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/08/21 12:44 PM

		11191373-B2 OR US-8011071-B2 OR US-7077372-B2 OR US-D507959-S OR US-D492187-S OR US-5026016-A OR US-6866940-B1 OR US-D818801-S OR US-D560221-S OR US-4171117-A OR US-D272211-S OR US-6142892-A OR US-8353649-B2 OR US-9850936-B2 OR US-6769660-B2 OR US-D454481-S).did. AND USPT.dbnm.) OR ((US-3029054-A OR US-2645443-A OR US-1980854-A).did. AND USOC.dbnm.)					
L87	1	("20240151108").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/21 02:34 PM
L88	1	("11788351").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/21 02:36 PM
L89	1	("20210054693").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/21 02:41 PM
L90	1	("20160138335").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/22 10:03 PM
L91	160	((("Moss") near3 ("N") near3 ("Ryan"))).INV.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/23 03:42 PM
L92	1	("20090229918").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/23 03:45 PM
L93	100	((("Wing") near3 ("Enterprises") near3 ("Incorporated"))).AS,AANM.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/23 03:50 PM
L94	56	((("LITTLE") near3 ("GIANT") near3 ("LADDER") near3 ("SYSTEMS") near3 ("LLC"))).AS,AANM.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/23 04:00 PM
L95	1	("20230008962").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/23 04:07 PM
L96	1	("20190383099").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/23 04:08 PM
L97	1	("4407045").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/23 04:26 PM
L98	1	("20090229918").pn.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO;	OR	ON	ON	2024/11/05 02:19 PM

			JPO)				
L99	1	("11191373").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/11/05 02:20 PM
L100	66	((US-20050252721-A1 OR US-20030012595-A1 OR US-20190234144-A1 OR US-20050268434-A1 OR US-20230228148-A1 OR US-20190383099-A1 OR US-20180274296-A1 OR US-20030037412-A1 OR US-20230008962-A1 OR US-20080283563-A1 OR US-20180184791-A1 OR US-20050284909-A1 OR US-20090229918-A1 OR US-20060186304-A1).did. AND PGPB.dbnm.) OR ((US-11441356-B2 OR US-10718160-B2 OR US-10487580-B2 OR US-7140072-B2 OR US-7093321-B2 OR US-6711780-B2 OR US-6343406-B1 OR US-5620272-A OR US-4697305-A OR US-4666327-A OR US-4566150-A OR US-4216844-A OR US-7047597-B2 OR US-7540806-B2 OR US-6115886-A OR US-4824278-A OR US-4085899-A OR US-4666328-A OR US-7424933-B2 OR US-5954157-A OR US-4407045-A OR US-11505994-B2 OR US-6244779-B1 OR US-6330733-B1 OR US-4890950-A OR US-11661794-B2 OR US-4560127-A OR US-11559131-B1 OR US-9173475-B2 OR US-7117566-B1 OR US-5388741-A OR US-10470556-B1 OR US-5054170-A OR US-11191373-B2 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/04/05 07:42 PM

		8011071-B2 OR US-7077372-B2 OR US-D507959-S OR US-D492187-S OR US-5026016-A OR US-6866940-B1 OR US-D818801-S OR US-D560221-S OR US-4171117-A OR US-D272211-S OR US-6142892-A OR US-8353649-B2 OR US-9850936-B2 OR US-6769660-B2 OR US-D454481-S).did. AND USPT.dbnm.) OR ((US-3029054-A OR US-2645443-A OR US-1980854-A).did. AND USOC.dbnm.)					
L101	34	("2009/0229918").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2025/04/05 07:43 PM
L102	337	(US-2937842-A | US-3811151-A | US-20020084143-A1 | US-7140072-B2 | EP-2169175-A1 | US-4632220-A | US-7128187-B2 | US-3443784-A | US-6614337-B1 | US-4147231-A | WO-9902915-A1 | US-3786900-A | US-7293934-B1 | CN-2674056-Y | US-4968072-A | US-5203596-A | US-5232796-A | US-4723629-A | US-2409266-A | GB-2305956-A | US-7114592-B1 | US-20160023347-A1 | US-4182431-A | US-6401866-B1 | US-20170260809-A1 | US-20150108728-A1 | US-0600196-A | US-1379419-A | US-20070181369-A1 | US-20120211305-A1 | US-20070003361-A1 | NL-7614042-A | US-20170058930-A1 | US-20040238278-A1 | US-	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/04/05 07:43 PM

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		3529799-A OR US-3912216-A OR US-4171117-A OR US-5398906-A OR US-5605313-A OR US-20070186384-A1 OR NL-2004494-C2 OR US-11191373-B2 OR US-20200085215-A1 OR WO-2018223064-A1 OR WO-2018223064-A4 OR US-20250021141-A1 OR JP-2004519628-A OR US-6710325-B2 OR US-20110266405-A1 OR US-9400156-B2 OR TW-201419986-A OR US-20120037769-A1).did.	HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L108	1	("7114592").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2025/04/05 07:48 PM
L109	46	("2457421" | "2958019" | "3110847" | "3518593" | "3746992" | "4287676" | "4938728" | "5098052" | "5213240" | "5405004" | "5760668" | "6152035" | "6267277" | "6587022" | "6614337" | "6698699" | "20020070137" | "20040069916").pn. OR ("7114592").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2025/04/05 07:48 PM
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L111	35	(Artificial Intelligence) More like doc:	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2025/04/05 07:48 PM

		US-7114592-B1 Text: (DE-2146353-A1 OR US-4287676-A OR US-5213240-A OR US-5098052-A OR US-5405004-A OR US-6152035-A OR US-20020070137-A1 OR US-6698699-B1 OR US-6945503-B2 OR US-7114592-B1 OR AU-2005211620-A1 OR US-20140000083-A1 OR TW-201742719-A OR WO-2015129928-A2 OR TW-I568551-B OR DE-1875500-U OR JP-H0123127-B2 OR TW-M584244-U OR JP-S60106402-A OR DE-7810042-U1).did.	AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L112	50	(Artificial Intelligence) Similar to: 18/490,715 with 0 CPC Selections and 0 Text Selections Text: (US-20240044206-A1 OR WO-2023230368-A1 OR AU-2023276586-A1 OR US-20230383601-A1 OR CN-119183494-A OR US-9016434-B2 OR CA-2826167-A1 OR CA-2826167-C OR WO-2017218672-A1 OR CN-109154172-B OR US-20200165870-A1 OR US-20120211305-A1 OR CA-3057031-C OR US-20170356244-A1 OR US-11846137-B2 OR US-9784033-B2 OR US-20220316276-A1 OR US-20160138335-A1 OR US-12152445-B2 OR CA-2992901-C OR WO-2012115963-A2 OR AU-2009221676-B2 OR US-10801261-B2 OR US-8186481-B2 OR US-20200011133-A1 OR US-20090229918-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2025/04/05 07:50 PM

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L113	51	(Artificial Intelligence) Similar to: 18/490,715 with 4 CPC Selections and 4 Text Selections Text: (US-20240044206-A1 OR WO-2023230368-A1 OR AU-2023276586-A1 OR US-20230383601-A1 OR CN-119183494-A OR AU-2019282832-A1 OR US-12152445-B2 OR US-20220316276-A1 OR CA-3101490-A1 OR US-6533068-B1 OR CN-112368458-A OR US-20030051941-A1 OR EP-4239157-A2 OR US-20190376341-A1 OR US-20240426176-A1 OR US-12065882-B2 OR EP-3810885-B1 OR AU-2019282832-B2 OR WO-2019237077-A1 OR US-20190376342-A1 OR US-20190376343-A1 OR US-11441356-B2 OR US-20190128064-A1 OR US-11505994-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2025/04/05 07:50 PM

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L114	91	112 113	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2025/04/05 07:51 PM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	2095	"33" AND (bracket WITH (hold$4 clip) WITH tool$1)	(US-PGPUB; USPAT)	OR	ON	ON	2025/04/05 09:14 PM
N2	77	"33" AND (bracket WITH hing$3 WITH (hold$4 clip hang$3) WITH tool$1)	(US-PGPUB; USPAT)	OR	ON	ON	2025/04/05 09:14 PM

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18490715
Filing Date	2023-10-19
First Named Inventor	B. Scott Maxfield
Art Unit	3634
Examiner Name	SHIREF M MEKHAEIL
Attorney Docket Number	P298048.US.03_506318-576

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7114592	B1	2006-10-03	GIBSON, et al.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2081878	CN	U	1991-07-31	YE ZHIXIONG		☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.M.M/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18490715
	Filing Date	2023-10-19
	First Named Inventor	B. Scott Maxfield
	Art Unit	3634
	Examiner Name	SHIREF M MEKHAEIL
	Attorney Docket Number	P298048.US.03_506318-576

	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/SHIREF M MEKHAEIL/	Date Considered	04/05/2025

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.M.M/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18490715
Filing Date	2023-10-19
First Named Inventor	B. Scott Maxfield
Art Unit	3634
Examiner Name	SHIREF M MEKHAEIL
Attorney Docket Number	P298048.US.03_506318-576

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Signature	/Richard C. Galati/	Date (YYYY-MM-DD)	2025-01-29
Name/Print	Richard C. Galati	Registration Number	66759

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**01/29/2025 06:22:32 PM Z ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Molly Chappe
PATENT CENTER #	68976195	AUTHORIZED BY	Richard Galati
CUSTOMER #	153511	FILING DATE	10/19/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	B. Scott Maxfield

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 1083	**E20251SI23357804**	**Molly Chappe**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	280.00	1	280.00
			TOTAL AMOUNT:	**$280.00**

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Documents

TOTAL DOCUMENTS: 3

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
20240129_SIDS_P298048.US.03.pdf	4	Information Disclosure Statement (IDS) Form (SB08)	327 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
20240129_IDS_Size_Statement_P298048.US.03.pdf	1	Assertion regarding Information Disclosure Statement (IDS) Size Fee (SB/08C)	239 KB
FOR_CN2081878.pdf	22	Foreign Reference	5551 KB

Digest

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DOCUMENT	MESSAGE DIGEST(SHA-512)
20240129_SIDS_P298048.US.03.pdf	236E4003606DD52FF4DC68C61AD5EA3ECF7AE9AAF91713A81450EB5AAF95AC424A60594DF41D7C346C3EB151D12A7C09D3231C752B9827E1612E59496D853A05
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FOR_CN2081878.pdf	091E047D6278E1103374E9F0EDB96CEEBF2125B5D9732D3BAA13FD9F4E2685CB085FD1A8B5A7AB83D159F82324AD49E821C804989ADB72343B2A577D2C61A8FA

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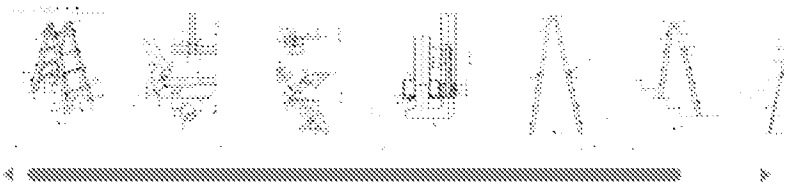
Multifunctional working ladder

Abstract

The utility model relates to a multifunctional working ladder being composed of a few main components, such as a main ladder, an auxiliary ladder, a shift axis device, a positioning regulation device, etc. The position regulating device and the shift axis device reaches the action to enforce the elevating height of an elastic regulation by the components orderly combined. The multifunctional working ladder can be turned into a step ladder use.

Images (7)



Landscapes

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Other languages: Chinese

Inventor: [redacted]

Current Assignee : Individual

Worldwide applications

1991 CN

Application CN 91200966 events

1991-01-07 Application filed by Individual

1991-01-07 Priority to CN 91200966

1991-07-31 Publication of CN2081878U

Status Withdrawn

Info: Cited by (4), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (1)

Hide Dependent

1, a kind of multifunctional working ladder is characterized in that this working stand includes main members such as main ladder, secondary ladder, exchanging shaft device and positioning adjustment device;

One main ladder becomes corresponding institute to form by forward and backward main backstop respectively; Should being by one respectively by preceding main backstop | two of the left and right main support columns of word shape become the corresponding setting in the left and right sides, and left and right main support column then is the corresponding left and right framework of [illegible] shape by two respectively and forms, edge tail is established protruding grain on the framework of a left side, and following edge tail is established concave arc, edge tail is established concave arc on the left framework in addition, and edge tail is established protruding grain down, and the two mat concaveconvex structure forms a track, and can piece together one mutually, and constitute a ducted body in the centre; Moreover left and right main support column become corresponding within side surface be provided with the quantity hole that is equidistant, place the cover endless tube that is hollow form in the hole; This cover endless tube end-rings is established flange, with the engaging hole, and establish screw and cooperate the two ends of main spreader to be arranged in left and right main brace post respectively in the cover endless tube, and mat screw and nut passes the screw that overlaps endless tube and main spreader in regular turn and fixes it; The element structure and the compound mode of back main backstop are identical with the combining structure of preceding main backstop in addition;

One secondary ladder is to put up corresponding institute by forward and backward secondary support respectively to form, and secondary bracing frame is by one respectively before this Two of the left and right secondary support columns of shape become) < the corresponding setting of type, and side surface is equipped with groove within the left and right secondary support column; Moreover end surfaces is provided with equidistant quantity screw before the left and right secondary support column, and the matching pair spreader is across on this left and right secondary support column, and the mat stator is fixed on it; The element structure and the compound mode of this secondary bracing frame in back are identical with the combining structure of preceding secondary main backstop;

One exchanging shaft device is that spiral shell is located at the top of forward and backward main backstop respectively; It includes critical elements such as guide bar, left and right bonding pad, rotating shaft and handle base;

Guide bar is a body of rod shape, and its end is established flange, and establishes chase apart from flange inner surface ring, and establishes two apart from the chase inner surface and be corresponding chamfered edge plane, establishes through hole in plane inner surface appropriate location again, and this guide bar surface is equipped with spring;

Left side bonding pad, groove is established at its edge, and the surface is equipped with the cavity, and is connected with otch at empty appropriate location, establishes two small holes in empty appropriate location again;

Right bonding pad, pivot closes in the groove of left bonding pad, and its bonding pad position, surface engagement left side is equipped with that the cavity is connected with otch and appropriate location is established two rectangular openings, and this rectangular opening also is connected with otch and becomes corresponding setting with the otch of another rectangular opening;

Rotating shaft is installed in the cavity of left and right bonding pad, wears through hole in it, and running through guide bar, and the surface is provided with prominent grain, and establishes bead in the rotating shaft end, and flange surface wears notch, to run through inserted sheet is set;

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Handle base, its two are respectively set up separately projection, and are equipped with shrinkage pool in the inner surface centre, and the handle base side establishes small holes, and after above-mentioned each elements combination of exchanging shaft device, the mat latch runs through the through hole of small holes and guide bar in regular turn to be fixed up again;

Positioning adjustment device is to be installed in respectively in the secondary spreader of each both sides of secondary bracing frame of secondary ladder, and its position fixing knob appropriate location is provided with fixed bar and motion bar; This fixed bar is equipped with clamping block, spring, the packing ring of tool screw in regular turn, and cooperate one can pass the screw of stator and spiral shell is solid in the screw of clamping block, and can be arranged in the secondary spreader of secondary ladder, and motion bar then is placed through the aperture of secondary ladder in regular turn respectively and leads in the main spreader of ladder.

Description

Multifunctional working ladder

The relevant a kind of multifunctional working ladder of the utility model especially refers to a kind ofly can promote effect and have the working stand of advanced character on the function scope of application.

Working stand commonly used owing to adopt the level altitude design, is not made the suitably elastic telescopic ability of height, it is one of drawback, and it uses only for simple function again, can't reach the principle of economic benefit, it is two of a drawback, and in addition, working stand can't be used for the place as the stair step shape, so it uses the place object to be restricted, it is three of a drawback, moreover, dismounting difficulty (all dead) with the rivet nail, the position so its volume quite takes up space, it is four of a drawback.

The purpose of this utility model is to promote the working stand scope of application, makes working stand also can make ladder and uses.

Another purpose of the present utility model is to make working stand can have the flexible ability of suitable elasticity adjustment height.

Working stand of the present utility model can be transformed into ladder to be used, adopting the exchanging shaft device, make two pairs of positioning of rotating that are main backstop work 180 degree of correspondence on the body frame, cooperate two pairs of secondary bracing frames that are correspondence of subframe to do upper and lower extension and landing action respectively again, and reach the step shape ladder of a suitable height.

The bracing frame of working stand of the present utility model, can make suitable Height Adjustment, be on main ladder, to cooperate one group of subframe of assembling again, its secondary bracing frame then depends on the main backstop respectively, track on the mat body frame makes subframe do lifting and slides, and through positioning adjustment device, makes secondary ladder be adjusted to one suitably during height, energy mat positioning adjustment device is main terraced and secondary terraced in conjunction with fixing, and reaches lift adjustment and firm effect.

The utility model is used as secondary ladder location during lifting action on main ladder with positioning adjustment device, even also main ladder is terraced in conjunction with pair, the anxiety of avoiding secondary ladder to drop, the element of its use is under the structure that cooperates mechanics principle, it is respond well really in conjunction with crystallized ability, and has safety.

A kind of multifunctional working ladder that the utility model provides:

(1) utilizes positioning adjustment device, make working stand under the cooperation of major and minor ladder, need not to use any instrument can reach single one or both sides purpose of adjustable height simultaneously, break through the fraud that the work on hand ladder adopts the height Fixed Design.

(2) utilize the exchanging shaft device, make working stand can be transformed into ladder and use, and can need height, and made suitable Height Adjustment, reach the purpose of multi-functional, improve the fraud of work on hand ladder simple function according to it.

(3) demolition combination function easily makes such working stand save the time of combination during fabrication, stores and transports also comparatively simple and conveniently, can save a large amount of expenses and cost.

(4) with the customer, when no matter when and where using, not only carry light, and the unexpected restriction that is subjected to the place, this structure all is to use screw and fixed by nut to finish, and except that the folding dress was convenient, this structure met the mechanical structure principle more fully, so the unexpected situation that the screw loose or dislocation is arranged is used safer.

About the structure of the utility model, be described as follows with the possible embodiments conjunction with figs. now:

Fig. 1 is the utility model stereo appearance figure;

Fig. 2 ~ 1 is the main backstop and the main crossbearer assembling three-dimensional exploded view of the utility model;

Fig. 2 ~ 2 are the main backstop and the main crossbearer combination dissected figure of the utility model;

Fig. 3 ~ 1 is the exchanging shaft device three-dimensional exploded view of the utility model;

Fig. 3 ~ 2 are the internal construction cut-away view of the utility model exchanging shaft device embodiment;

Fig. 4 is the positioning adjustment device three-dimensional exploded view of the utility model;

Fig. 4 ~ 1 is the assembled sectional view of the positioning adjustment device of the utility model;

Fig. 5 is the lift in height embodiment outside drawing of the utility model;

Fig. 6 is for being implemented on the enforcement illustration of staircase;

Fig. 7 becomes the enforcement illustration of ladder for the utility model;

Outward appearance of the present utility model sees also Fig. 1, includes main ladder (1), secondary ladder (2), exchanging shaft device (3) and positioning adjustment device main members such as (4);

Main ladder (1) (1B) becomes corresponding institute to form by forward and backward main backstop (1A) respectively; Should before main backstop (1A) respectively by a left side that is the I font, right main support column (11-A) (11-B) prop up into about corresponding setting, an and left side, right main support column (11-A) (11-B) then is a corresponding Contraband shape left side by two respectively, right framework (111) (112) is formed (seeing also shown in Fig. 2 ~ 1), left side framework (111) goes up edge tail and establishes protruding grain (111-A), and following edge tail is established concave arc (111-B), left framework (112) goes up edge tail and

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establishes concave arc (112-A) in addition, and following edge tail is established protruding grain (112-B), the two mat concaveconvex structure becomes a rail mounted and can piece together one mutually, and constitute a ducted body (113) in the centre, a moreover left side, right main brace post (11-A) (11-B) become corresponding within side surface be provided with and place the cover endless tube (12) that is hollow form in the quantity hole (113) that is equidistant; This cover endless tube (12) end-rings is established flange (121); With engaging hole (114), and establish screw (122), the two ends that cooperate main spreader (13), wear left and right main brace post (11-A) respectively (11-B) in cover endless tube (12), and mat screw (14) is fixed it with the screw (122) (131) that nut (15) passes cover endless tube and main spreader (13) in regular turn, please cooperate and consult shown in Fig. 2 ~ 1 and Fig. 2 ~ 2; The member and the compound mode of back main backstop (1B) are identical with the combining structure of preceding main backstop in addition, so do not repeat them here;

Secondary ladder (2) is (2B) to become corresponding institute to form by forward and backward secondary bracing frame (2A) respectively; Secondary bracing frame (2A) before being somebody's turn to do is by one respectively

The left and right secondary support column (21-A) of shape (21-B) two become

The corresponding setting of type, and left and right secondary support column (21-A) (21-B) within side surface be equipped with groove (22), can make forward and backward main backstop (1A) left and right main support column (11-A) half one (11-B) (1B) of main ladder (1) be placed through inside; Moreover left and right secondary support column (21-A) (21-B) within side surface be equipped with groove (22), can make forward and backward main backstop (1A) left and right main support column (11-A) half one (11-B) (1B) of main ladder (1) be placed through inside, Moreover left and right secondary support column (21-A) (21-B) before end surfaces be provided with equidistant quantity screw (23), matching pair spreader (24) be across this left and right secondary support column (21-A) (21-B) on, mat stator (25) is fixed on it again, sees also shown in Figure 1; In addition, the element structure and the compound mode of this secondary bracing frame in back (2B) are identical with the combining structure of preceding secondary main backstop (2A), so do not repeat them here;

Exchanging shaft device (3) (see also Fig. 3 ~ 1 and cooperate shown in Fig. 3 ~ 2) spiral shell respectively is located at forward and backward main backstop (1A) top (1B); It includes guide bar (31), left and right sides bonding pad (32) (33), rotating shaft (34) and handle base main members such as (35).

Guide bar (31), it is a body of rod shape, its end is established flange (311), and establish chase (312) apart from flange (311) inner surface ring, and establish two apart from chase (312) inner surface and be corresponding chamfered edge plane (313), (313) inner surface appropriate location is established through hole (314) in the plane again, and this guide bar (31) surface is equipped with spring (37);

Left side bonding pad (32), groove (321) is established at its edge, and the surface is equipped with cavity (322), and is connected with otch (323) at cavity (322) appropriate location, establishes two small holes (324) in cavity (322) appropriate location again;

Right bonding pad (33), be in the groove (321) that is matched with left bonding pad (32), can do spinning movement, its bonding pad (32) position, surface engagement left side is equipped with cavity (331), be connected with otch (332) and appropriate location and establish two rectangular openings (333), this rectangular opening (333) also is connected with otch (334) and becomes corresponding setting with the otch (334) of another rectangular opening (333);

Rotating shaft (34), be installed in (322) (331), the cavity of left and right bonding pad (32) (33), wear through hole (341) in it to run through guide bar (31), and the surface is provided with prominent grain (not indicating among the figure) to be sticked in left and right bonding pad (32) (33) cavity (322) (331) otch (323) (332), slide when preventing to locate, and establish bead (342) in rotating shaft (34) end, bead (342) surface wears notch (343), to run through inserted sheet (38) is set;

Handle base (35), its both sides are respectively set up projection (351) separately, in the hole (324) and rectangular opening (333) that are placed through left and right bonding pad (32) (33), and be equipped with sirinkage pool (352) in the inner surface centre, hold before with clamping guide bar (31), and handle base (35) side is established small holes (353), after each elements combination of above-mentioned exchanging shaft device (3), mat pin (39) runs through the through hole (314) of small holes (353) and guide bar (31) in regular turn to be fixed up again;

Positioning adjustment device (4) (seeing also shown in Figure 4), the secondary bracing frame (2A) that system is installed in secondary ladder (2) respectively is (2B) in the secondary spreader (24) of each both sides, in order to adjust the working stand height and to give reaching firm fixed effect in conjunction with main ladder (1) and secondary ladder (2), its position fixing knob (41) appropriate location is provided with fixed bar (42) and motion bar (43); This fixed bar (42) is equipped with the clamping block (44) of tool screw (441) in regular turn, spring (45) and packing ring (46), and wear in regular turn finish after, and fixed bar (42) end flattened (as Fig. 4 ~ 1), and be placed through in the secondary spreader (24) of secondary ladder (2), the hole (441) of this clamping block this moment (44) is relative connected state with the hole (251) of stator (25), mat screw (A) is when the spiral shell hole (251) of being located at stator (25) and the hole (441) of clamping block (44) are gone up (please cooperate and consult shown in Fig. 4 ~ 1) this positioning adjustment device (4) and implemented in regular turn again, its fixed bar (42) can be positioned in secondary spreader (24) hole, in addition motion bar (43) then is placed through respectively in the main spreader (13) of the aperture (24) of secondary ladder (2) and main ladder (1) in regular turn, make main ladder (1) and secondary ladder (2) be able to the fixed bar (42) and motion bar (43) of mat positioning adjustment device (4), and reach the purpose of positioning combination.

The working stand of the new structure of forming by said modules, it is implemented to regulate the high action situation and (sees also Fig. 4, Fig. 4 ~ 1, shown in Figure 5), at first position fixing knob (41) application of force of positioning adjustment device (4) is extracted out outward, hereat the spring (45) gone up of fixed bar (42) under the compressing of packing ring (46) (because the fixed bar end is the pressing shape, its pressing diameter area is bigger than the hole diameter of packing ring, so cause the end of fixed bar (42) can packing ring forced to move forward), make spring (45) be forced to tighten in one of clamping block (44) side, right its motion bar this moment (43) but breaks away from the main spreader (13) of main ladder (1) interior (because of the length of motion bar (43) shorter than fixed bar (42)), the application of force is under drop-down situation again, can make secondary ladder (2) make lifting action along main ladder (1), when adjusting to the suitable height place of desire, toward interior pressure motion bar (43) and fixed bar (42) are penetrated with in main cross bar (13) and the secondary cross bar (24) once again respectively positioning adjustment device (4) application of force again, to reach the purpose of adjusting the location.

The utility model more may be implemented in the surface state that staircase is step shape, any side that as long as it adjust highly rise to appropriate location after, give positioning adjustment device (4) is done the action of location fastening again, its operation sequence as mentioned above, do not repeat them here, and reach purpose (as shown in Figure 6) stably.

The utility model can be made general ladder and use, its operation sequence, at first must be with the left side of exchanging shaft device, right bonding pad is launched respectively, down behind 180 degree, the Height Adjustment of being made positioning adjustment device again (sees also Fig. 3 ~ 1, and cooperate shown in Fig. 3 ~ 2), at first handle base (35) application of force is pulled out outward, make flange (311) pressuring spring (37) of guide bar (31) tighten inserted sheet (38) in rotating shaft (34) in a side, and the chase (312) that this guide bar (31) is gone up just in time is sticked on the two end centres of inserted sheet (38), hereat, two projections (351)

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that handle base (35) is gone up break away from a left side respectively, the hole (324) and the rectangular opening (333) of right bonding pad (32) (33), do not rotate at guide bar (31) then, and under the situation of rotating shaft (34) rotation, rise up to pair ladder (2) secondary bracing frame (2A) of establishing with right bonding pad (33) spiral shell and to rotate to when secondary bracing frame (2B) with another corresponding limit is 180 degree, this spring (37) is subjected to chamfered edge plane (313) influence on guide bar (31) surface, and under unresisted situation, automatically rebound backward, and drive handle base (35) springs into toward in, make the projection (351) at these two ends just in time be arranged in respectively in two otch (334) of right bonding pad (33), and reach left, right bonding pad (32) (33) is 180 degree and launches fixing action, moreover be exactly on pair ladder (2) work that main ladder (1) is gone up, the action of following lifting, its operation is implemented as above-mentioned positioning adjustment device (4) moves identical, so do not repeat them here, embodiment sees also shown in Figure 7.

By structure that above embodiment disclosed as can be known, positioning adjustment device of the utility model and exchanging shaft device, really can make general working stand do highly flexible and convert ladder to use, two kinds of effects roll into one, and are easy to use and increased the utilization rate of ladder.

Cited By (4)

Publication number	Priority date	Publication date	Assignee	Title
CN101960084B *	2008-03-07	2013-11-20	伟英企业有限公司	Ladders, ladder components and related methods
CN107035313A *	2016-12-09	2017-08-11	国网山东省电力公司微山县供电公司	A kind of emergency staircase and apparatus for examination and repair
CN107869303A *	2017-12-07	2018-04-03	信宜市汇美电器有限公司	A kind of Novel herring bone shape dress repaires ladder
US10487576B2	2016-03-04	2019-11-26	Wing Enterprises, Incorporated	Adjustment mechanisms, ladders incorporating same and related methods

Family To Family Citations

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
CN2081878U	1991-07-31	Multifunctional working ladder
CN113647998B	2024-11-08	Steel structure supporting frame
CN211900432U	2020-11-10	Herringbone ladder
CN213477869U	2021-06-18	Construction safety barrier
CN218970651U	2023-05-05	Building templates assists assembly and disassembly tools
CN215159726U	2021-12-14	Stacking type paper stacking and tidying equipment
CN213038586U	2021-04-23	Steel construction combination formula temporary support
CN212866991U	2021-04-02	Building walking type translation device
CN208479537U	2019-02-05	A kind of height-adjustable photovoltaic board mount
CN212661357U	2021-03-09	Foldable storage table
CN210797783U	2020-06-19	Zero energy consumption lifting toilet
CN218241128U	2023-01-06	Temporary traffic indicating lamp
CN111969495A	2020-11-20	High-voltage electric equipment high-altitude safety operation frame
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CN218716920U	2023-03-24	Colliery hydraulic support auxiliary installation device
CN212154631U	2020-12-15	Folding ladder with foldable handrail
CN113940868B	2021-11-09	Supporting device for pile driver
CN219623916U	2023-09-01	Mobile searchlight
CN217760104U	2022-11-08	Prestress tension frame
CN216890466U	2022-06-07	Building structure's reinforcement connecting device
CN220621062U	2024-03-19	Building templates link for civil engineering with height-adjusting function
CN217006746U	2022-07-19	Tensile test equipment of reinforcing bar production

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CN221391044U	2024-07-23	Quick assembly disassembly base structure of arm
CN213779500U	2021-07-23	Bearing pressure detection mechanism
CN217982641U	2022-12-06	Simulated dinosaur head rotating structure

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
CN 91200966	1991-01-07	1991-01-07	Multifunctional working ladder

Applications Claiming Priority (1)

Application	Filing date	Title
CN 91200966	1991-01-07	Multifunctional working ladder

Legal Events

Date	Code	Title	Description
1991-07-31	C06	Publication	
1991-07-31	PB01	Publication	
1992-04-22	C14	Grant of patent or utility model	
1992-04-22	GR01	Patent grant	
1995-03-08	C19	Lapse of patent right due to non-payment of the annual fee	
1995-03-08	CF01	Termination of patent right due to non-payment of annual fee	

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〔19〕中华人民共和国专利局

〔11〕公告号 CN 2081878U

〔12〕实用新型专利申请说明书

〔21〕申请号 91200966.7

〔51〕Int.Cl⁵
E06C 1/32

〔43〕公告日 1991年7月31日

〔22〕申请日 91.1.7
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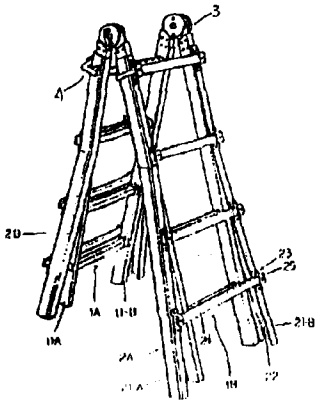
说明书页数: 6 附图页数: 8

〔54〕实用新型名称 多功能工作梯

〔57〕摘要

本实用新型关于一种多功能工作梯，主要由主梯、副梯、变换轴装置及定位调整装置等主要构件组成；利用上述组件依序组合后，由定位调整装置，达到可实施弹性调整高度升降之动作并藉由变换轴装置，而可将工作梯转变成阶梯使用。



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权 利 要 求 书

1．一种多功能工作梯，其特征在于该工作梯包含有主梯、副梯、变换轴装置及定位调整装置等主要构件；

一主梯，分别由前、后主支撑架成相对应所组成；该前主支撑架分别由一呈丨字形状之左、右主支撑柱两支成左右相对应设置，且左、右主支撑柱则分别由两只呈相对应之匚形左、右框体组成，左框体上边末端设凸粒，且下边末端设凹弧，另左框体上边末端设凹弧，且下边末端设凸粒，二者藉凹凸结构而成一轨道，而可相互拼合成一体，且在中间构成一中空体；再者左、右主支撑柱成相对应之内侧表面设有呈等间距之数量孔洞，孔洞内穿置呈中空状之套环管；该套环管末端环设凸缘，以卡合孔洞，并设螺孔配合主横柱之两端分别穿设于左、右主撑柱于套环管内，且藉螺丝与螺帽依序穿过套环管与主横柱之螺孔固定之；另外后主支撑架之构件结构及组合方式与前主支撑架之组合结构相同；

一副梯，系分别由前、后副支撑架成相对应所组成，该前副支撑架分别由一呈〉形状之左、右副支撑柱两支成〉〈型相对应设置，且左、右副支撑柱之内侧表面均设有凹槽；再者左、右副支撑柱之前端表面设有等间距之数量螺孔，配合副横柱横跨于该左、右副支撑柱上，藉固定片螺固于其上；该后副支撑架之构件结构及组合方式与前副主支撑架之组合结构相同；

一变换轴装置，系分别螺设于前、后主支撑架之顶端；其包含有导引杆、左、右结合片、转轴及把手座等主要元件；

导引杆，为一杆体状，其末端设凸缘，且距离凸缘内侧表面环设凹沟，并距离凹沟内侧表面设两呈相应之削边平面，又于平面内侧表面适当处设通孔，该导引杆表面穿设有弹簧；

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左结合片，其边缘设沟槽，且表面穿设有空洞，并在空洞适当处连设切口，又于空洞适当处设二小孔洞;

右结合片，枢合于左结合片之沟槽内，其表面配合左结合片位置处均设有空洞连设切口及适当处设二矩形孔，该矩形孔亦连设切口而与另一矩形孔之切口成相对应设置;

转轴，装设于左、右结合片之空洞内，其内穿设通孔，以贯穿导引杆，且表面设置突粒，并于转轴末端设突缘，突缘表面穿设槽口，以贯穿设置插片;

把手座，其两则各分设凸柱，并在内侧表面中央处置有凹孔，且把手座侧边设小孔洞，用以上述变换轴装置各元件组合后，再藉插销依序贯穿小孔洞及导引杆之通孔以固定起来;

定位调整装置，系分别装设于副梯之副支撑架各两侧之副横柱内，其定位把手适当处设有固定杆及活动杆；该固定杆依序穿设有一内具螺孔之卡合块、弹簧、垫圈，并配合一可穿过固定片之螺丝而螺固在卡合块之螺孔内，而可设置于副梯之副横柱内，且活动杆则依序分别穿置于副梯之小孔及主梯之主横柱内。

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多 功 能 工 作 梯

本实用新型有关一种多功能工作梯，尤其指一种在功能使用范围上能增进功效而具有进步特征的工作梯。

常用的工作梯，由于采用固定高度设计，没有作适当高度之弹性伸缩能力，其为弊端之一，再其仅限单一功能使用，无法达到经济效益之原则，其为弊端之二，另外，工作梯无法用于如楼梯阶级状之场地上，故其使用场地对象受到限制，其为弊端之三，再者，拆卸困难（皆用铆钉钉死），故其体积颇占空间位置，其为弊端之四。

本实用新型的目的，在于增进工作梯使用范围，使工作梯亦能作阶梯使用。

本实用新型的另一目的，在于使工作梯能具有适当弹性调整高度的伸缩能力。

本实用新型的工作梯能转变成阶梯使用，在采用变换轴装置，使主架上之两对呈对应之主支撑架作 180 度之旋转定位，再配合副架之两对呈对应之副支撑架分别作上、下之延伸与滑落动作，而达到一适当高度之阶级状阶梯。

本实用新型的工作梯之支撑架，能作适当高度调整，乃在主梯上又配合装配一组副架，其副支撑架则分别依附于主支撑架上，藉主架上之轨道使副架作升降滑动，并藉着定位调整装置，使副梯调整至一适当高度时，能藉定位调整装置结合固定主梯与副梯，而达到升降调整和稳固的效果。

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本实用新型以定位调整装置来作为副梯在主梯上升降动作时之定位，亦即使主梯结合副梯，避免副梯掉落之虞，其使用之元件在配合力学原理之结构下，其结合固定能力效果良好确实，且具有安全性。

本实用新型提供的一种多功能工作梯：

（一）利用定位调整装置，使工作梯在主、副梯的配合下无需使用任何工具即可达成单一侧或两侧同时升降高度之目的，突破现有工作梯采用高度固定设计之弊。

（二）利用变换轴装置，使工作梯能转变成阶梯使用，并可依其需之高度，而予以作适当的高度调整，达到多重功能的目的，改进现有工作梯单一功能之弊。

（三）方便的折卸组合功能，使该类工作梯在制造时节省组合之时间，贮运亦较为简单方便，可节省大量费用及成本。

（四）以消费者而言，无论何时何地使用时，不但携带轻便，且不虞受到场地之限制，该结构均系使用螺丝与螺帽固定完成，除折装方便外，该结构更完全符合力学结构原理，故不虞有螺丝松动脱落之情况，使用更为安全。

关于本实用新型之构造，兹以可行实施例配合附图说明如下：

图1 为本实用新型立体外观图；

图2 ～1 为本实用新型之主支撑架与主横架装配立体分解图；

图2 ～2 为本实用新型之主支撑架与主横架组合剖示图；

图3 ～1 为本实用新型之变换轴装置立体分解图；

图3 ～2 为本实用新型变换轴装置实施例之内部结构剖示图；

图4 为本实用新型之定位调整装置立体分解图；

图4 ～1 为本实用新型之定位调整装置之组合剖视图；

图5 为本实用新型之高度升降实施例外观图；

图6 为实施于楼梯间之实施例图；

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图7 为本实用新型变成阶梯之实施例图;

本实用新型的外观请参阅图1，包含有主梯(1)、副梯(2)、变换轴装置(3)及定位调整装置(4)等主要构件;

主梯(1)，分别由前、后主支撑架(1A)(1B)成相对应所组成;该前主支撑架(1A)分别由一呈| 字形之左、右主支撑柱(11-A)(11-B)支成左右对应设置，且左、右主支撑柱(11-A)(11-B)则分别由二只呈相对应之[形左、右框体(111)(112)组成（请参阅图2 ～1 所示)，左框体(111)上边末端设凸粒(111-A)，且下边末端设凹弧(111-B)，另左框体(112)上边末端设凹弧(112-A)，且下边末端设凸粒(112-B)，二者藉凹凸结构成一轨道式而可相互拼合成一体，且在中间构成一中空体(113)，再者左、右主支撑柱(11-A)(11-B)成相对应之内侧表面设有呈等间距之数量孔洞(113)内穿置呈中空状之套环管(12);该套环管(12)末端环设凸缘(121)；以卡合孔洞(114)，并设螺孔(122)，配合主横柱(13)之两端，分别穿设左、右主撑柱(11-A)(11-B)于套环管(12)内，且藉螺丝(14)与螺帽(15)依序穿过套环管与主横柱(13)之螺孔(122)(131)固定之，请配合参阅图2 ～1 及图2 ～2 所示;另外后主支撑架(1B)之构件及组合方式与前主支撑架之组合结构相同，故在此不再赘述;

副梯(2)，系分别由前、后副支撑架(2A)(2B)成相对应所组成;该前副支撑架(2A)，分别由一呈》形状之左、右副支撑柱(21-A)(21-B)二支成》《型相对应设置，且左、右副支撑柱(21-A)(21-B)之内侧表面均设有凹槽(22)，可使主梯(1)之前、后主支撑架(1A)(1B)之左、右主支撑柱(11-A)(11-B)之半部穿置于内部;再者左、右副支撑柱(21-A)(21-B)之内侧表面均设有凹槽(22)，可使主梯(1)之前、后主支撑架(1A)(1B)之左、右主支撑柱(11-A)(11-B)之半部穿置于内部;再者左、右副支撑柱(21-A)(21-B)之前端表面设有等间距之数量螺孔(23)，配合副横柱(24)横跨于该左、右副支撑柱(21-A)(21-B)上，再藉固定片(25)螺固于

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其上，请参阅图1 所示；另外，该后副支撑架(2B)之构件结构及组合方式与前副主支撑架(2A)之组合结构相同，故在此不再赘述；

变换轴装置(3)(请参阅图3 ～1 并配合图3 ～2 所示) 分别螺设于前、后主支撑架(1A)(1B)之顶端；其包含有导引杆(31)、左右结合片(32)(33)、转轴(34)及把手座(35)等主要构件。

导引杆(31)，为一杆体状，其末端设凸缘(311)，且距离凸缘(311)内侧表面环设凹沟(312)，并距离凹沟(312)内侧表面设两呈相应之削边平面(313)，又于平面(313)内侧表面适当处设通孔(314)，该导引杆(31)表面穿设有弹簧(37)；

左结合片(32)，其边缘设沟槽(321)，且表面穿设有空洞(322)，并在空洞(322)适当处连设切口(323)，又于空洞(322)适当处设二小孔洞(324)；

右结合片(33)，是配合于左结合片(32)之沟槽(321)内，可作旋转动作，其表面配合左结合片(32)位置处均设有空洞(331)，连设切口(332)及适当处设二矩形孔(333)，该矩形孔(333)亦连设切口(334)而与另一矩形孔(333)之切口(334)成相对应设置；

转轴(34)，装设于左、右结合片(32)(33)之空洞(322)(331)内，其内穿设通孔(341)以贯穿导引杆(31)，且表面设置突粒(图中未标示)以卡合于左、右结合片(32)(33)之空洞(322)(331)切口(323)(332)内，防止定位时滑动，并于转轴(34)末端设突缘(342)，突缘(342)表面穿设槽口(343)，以贯穿设置插片(38)；

把手座(35)，其两侧各分设凸柱(351)，用以穿置于左、右结合片(32)(33)之孔洞(324)及矩形孔(333)内，并在内侧表面中央处置有凹孔(352)，以卡接导引杆(31)之前端，且把手座(35)侧边设小孔洞(353)，用以上述变换轴装置(3)各元件组合后，再藉插梢(39)依序贯穿小孔洞(353)及导引杆(31)之通孔(314)以固定起来；

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定位调整装置(4)(请参阅图4 所示),系分别装设于副梯(2) 之副支撑架(2A)(2B)各两侧之副横柱(24)内, 用以调整工作梯高度并予以结合主梯(1) 与副梯(2) 达到稳固定之效果; 其定位把手(41)适当处设有固定杆(42)及活动杆(43); 该固定杆(42)依序穿设有一内具螺孔(441) 之卡合块(44)、弹簧(45)及垫圈(46), 且在依序穿设完成后, 并将固定杆(42)末端予以压平(如图4 ～1),且穿置于副梯(2) 之副横柱(24)内, 此时该卡合块(44)之孔洞(441) 与固定片(25)之孔洞(251) 呈相对连通状, 再藉螺丝(A) 依序螺设于固定片(25)之孔洞(251) 与卡合块(44)之孔洞(441) 上(请配合参阅图4 ～1 所示) 该定位调整装置(4) 实施时, 其固定杆(42)可定位于副横柱(24)孔洞内, 另活动杆(43)则依序分别穿置于副梯(2) 之小孔(24)及主梯(1) 之主横柱(13)内, 使主梯(1)与副梯(2) 得以藉定位调整装置(4) 之固定杆(42)与活动杆(43), 而达到定位结合之目的。

由上述组件所组成之新型结构的工作梯, 其实施调节高度动作情形(请参阅图4 、图4 ～1 、图5 所示), 首先将定位调整装置(4) 之定位把手(41)施力往外抽出, 此际固定杆(42)上之弹簧(45)在垫圈(46)之压迫下(由于固定杆末端呈压平状, 其压平直径面积比垫圈之孔洞直径大, 故导致固定杆(42)之末端可迫动垫圈向前), 使弹簧(45)被迫紧缩于卡合块(44)之一侧, 然此时其活动杆(43)却脱离主梯(1) 之主横柱(13)内(因活动杆(43)之长度比固定杆(42)短), 再施力往下拉的情况下, 即可使副梯(2) 沿主梯(1) 作升降动作, 直到调整到欲适当的高度处时, 再将定位调整装置(4) 施力往内压使活动杆(43)与固定杆(42)分别再度深入于主横杆(13)及副横杆(24)内, 以达到调整定位之目的。

本实用新型更可实施于楼梯间呈阶级状之地面情况, 其只要调整任何一侧之高度升至适当处后, 再予以将定位调整装置(4) 作定位扣合之动作, 其操作程序如上所述, 在此不再赘述, 而达到平稳的目的(如图

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6 所示）。

本实用新型可作一般阶梯使用，其操作程序，首先必需将变换轴装置之左、右结合片分别予以展开上、下 180度后，再予以作定位调整装置之高度调整（请参阅图3 ～1 ，并配合图3 ～2 所示），首先将把手座(35)施力往外拉出，使导引杆(31)之凸缘(311) 压迫弹簧(37)紧缩于转轴(34)内之插片(38)于一侧，且该导引杆(31)上之凹沟(312) 正好卡合于插片(38)之二端中间上，此际，把手座(35)上之二凸柱(351) 已分别脱离左、右结合片(32)(33)之孔洞(324) 及矩形孔(333)，然后在导引杆(31)不转动、而转轴(34)旋转之情况下，直到与右结合片(33)螺设之副梯(2) 副支撑架(2A)上升旋转至与另一相对应边之副支撑架(2B)呈 180度之际，该弹簧(37)受导引杆(31)表面上之削边平面(313) 影响，而在无阻力的情况下，自动向后弹回，并带动把手座(35)往内弹入，使得该两端之凸柱(351) 正好分别穿设于右结合片(33)之两切口(334) 内，而达到左、右结合片(32)(33)呈 180度展开固定之动作，再则就是在主梯(1) 上之副梯(2) 作上、下升降的动作，其操作实施如上述之定位调整装置(4) 动作相同，故在此不再赘述，其实施例请参阅图7 所示。

由以上实施例所揭露之构造可知，本实用新型之定位调整装置及变换轴装置，的确可以使一般的工作梯作高度伸缩及转换成阶梯使用，两种功效集于一身，使用方便并增加了梯子的利用率。

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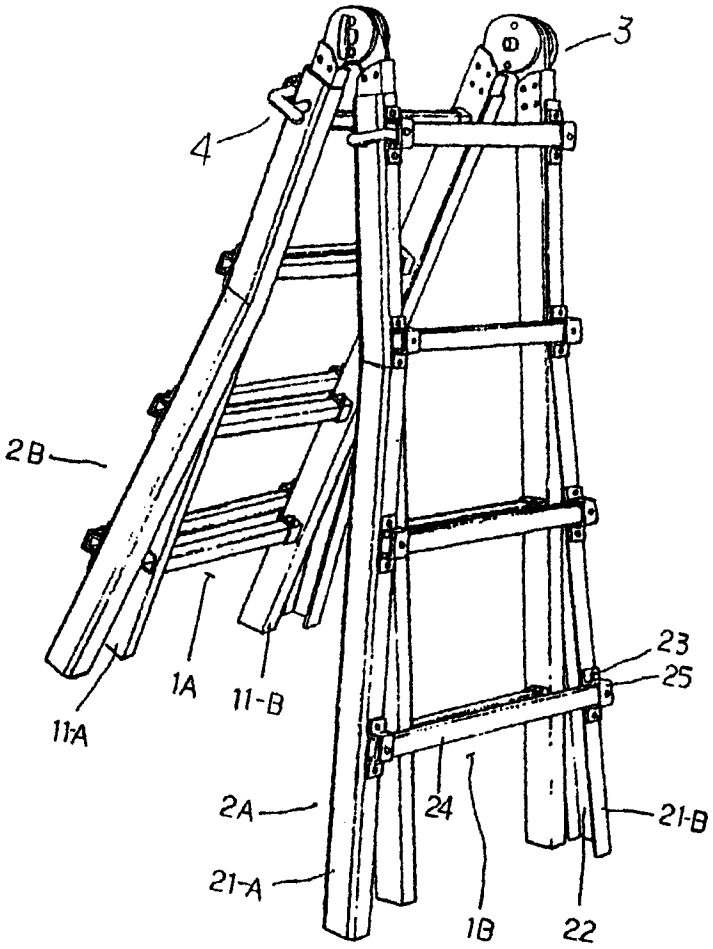

图 1

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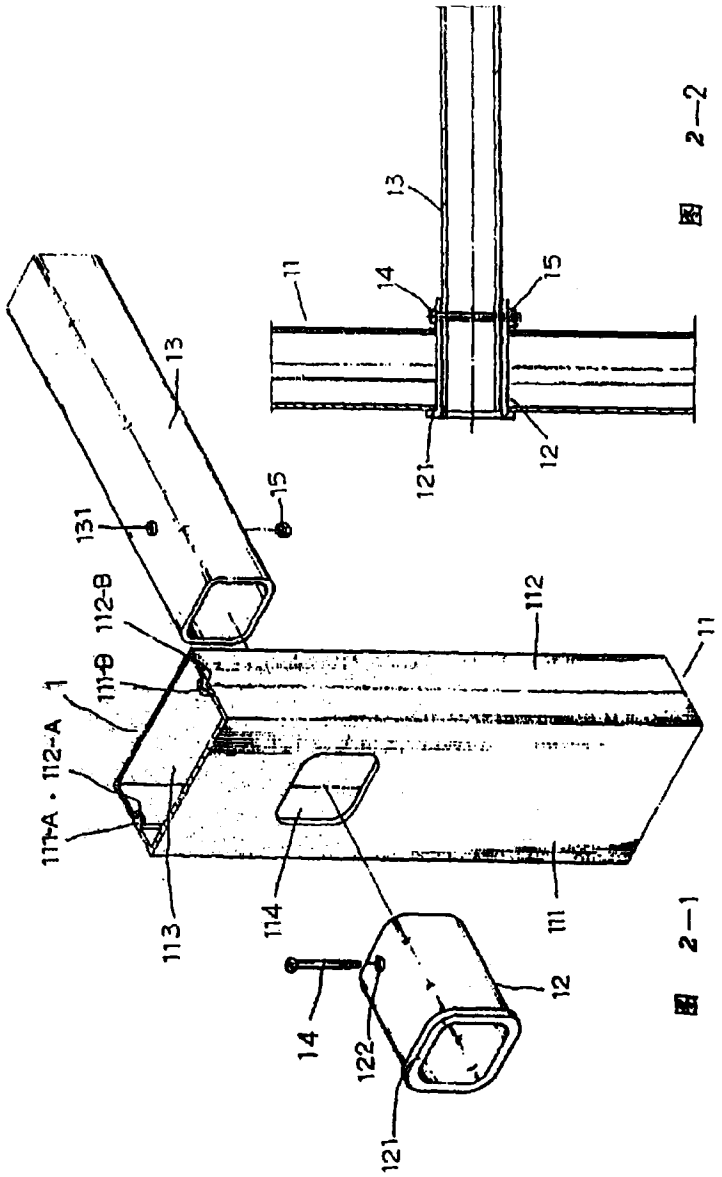

图 2—2

图 2—1

11

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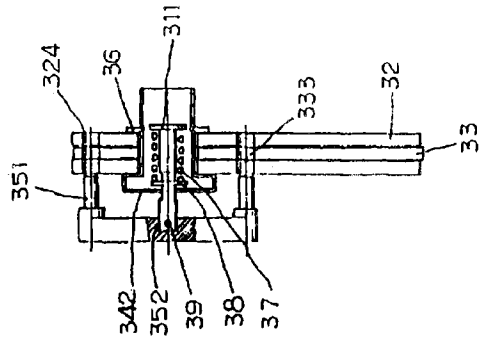

图 3—2

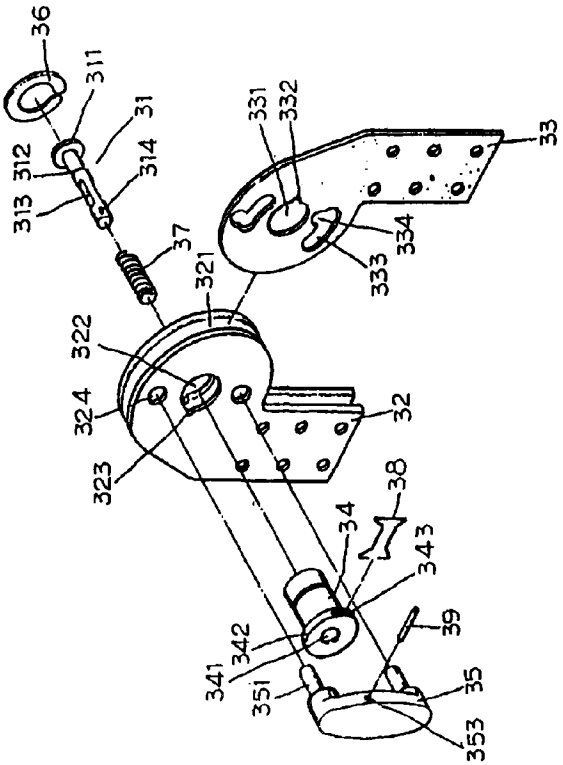

图 3—1

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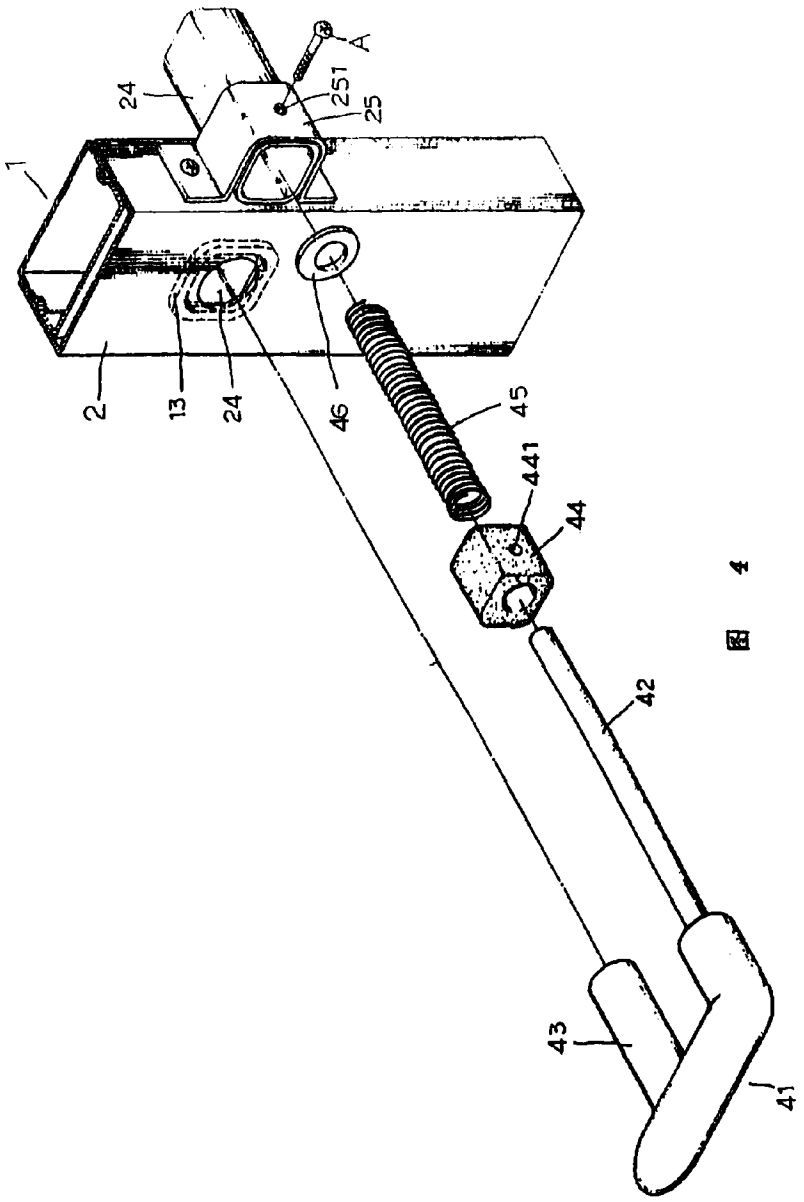

图 4

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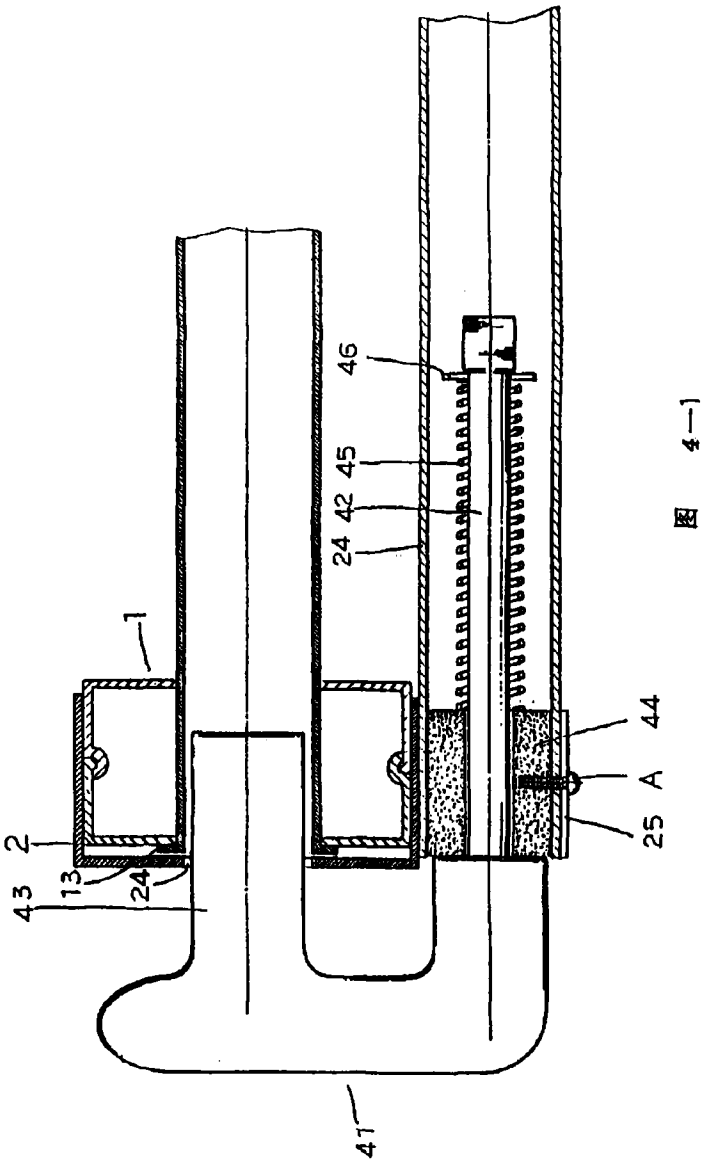

図 4—1

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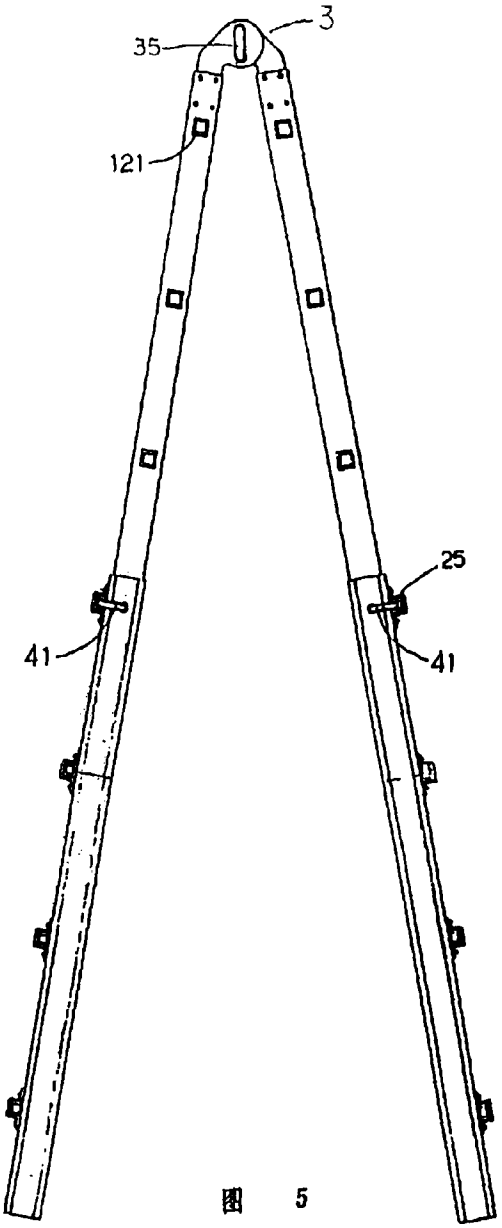

图 5

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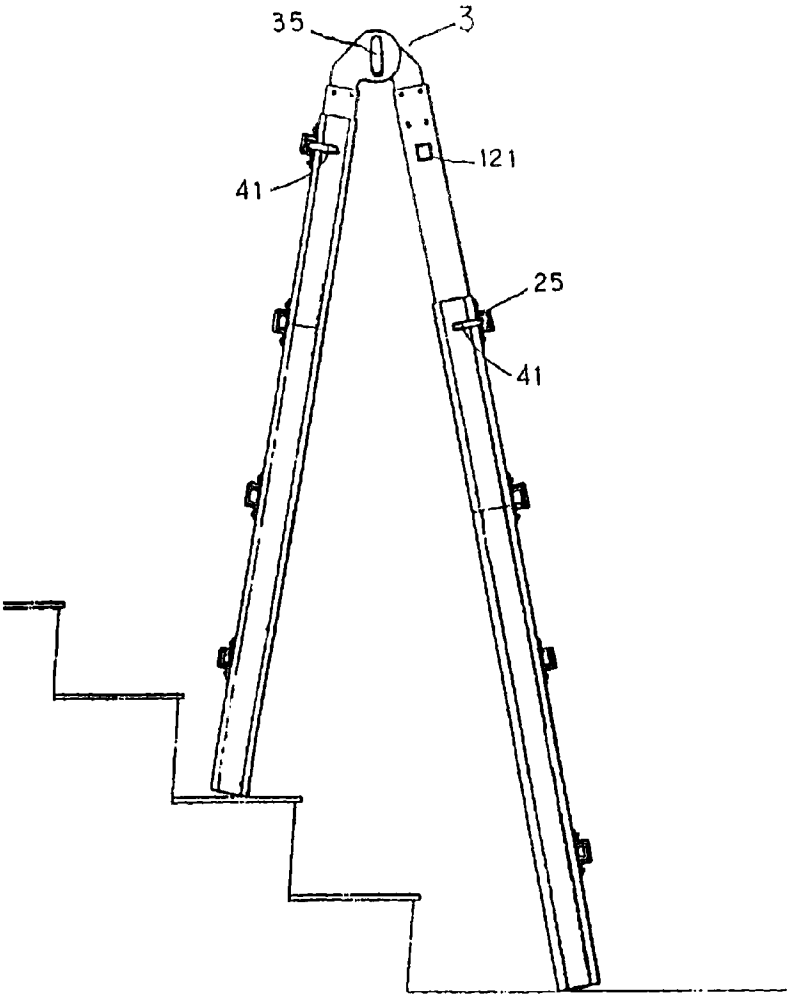

图 6

16

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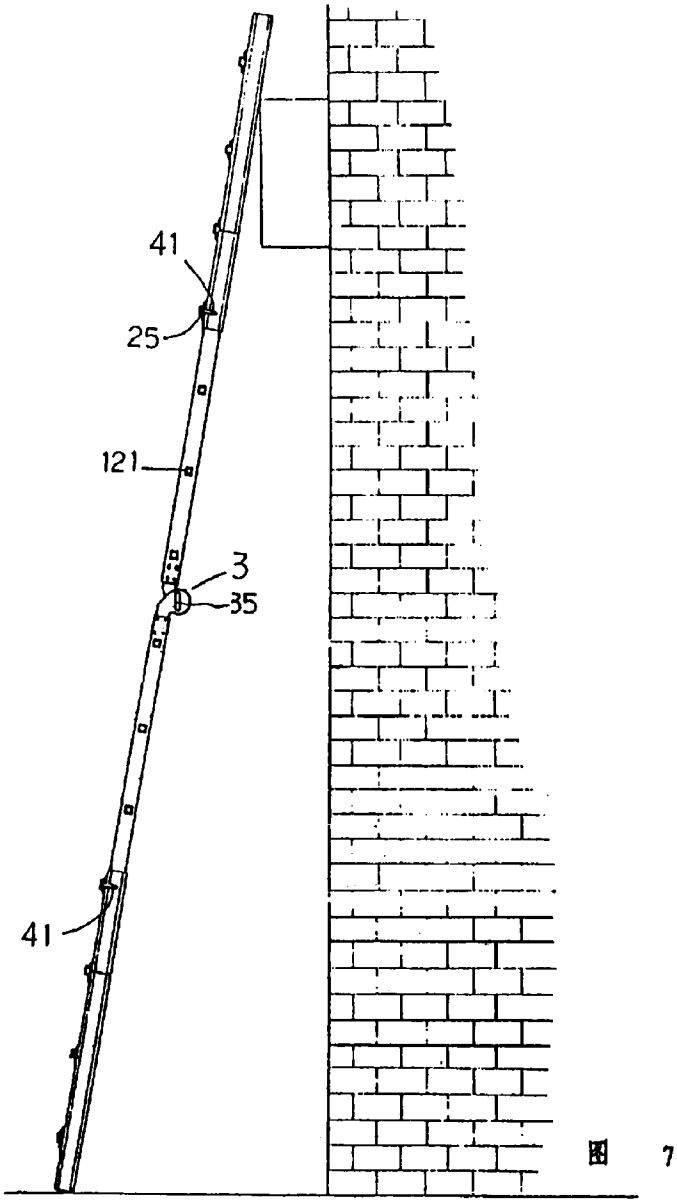

図 7

17

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	: 18490715	Confirmation No.	: 5970
First Inventor	: B. Scott Maxfield	Art Unit	: 3634
Filed	: 2023-10-19	Examiner	: SHIREF M MEKHAIL
Title	: MULTIFUNCTION BUTTON FOR LADDER		
Docket No.	: P298048.US.03_506318-576		
Customer No.	: 153511		

INFORMATION DISCLOSURE STATEMENT
SIZE FEE ASSERTION PURSUANT TO 37 C.F.R. § 1.98(a)

Commissioner:

Applicant hereby makes the following size fee assertion pursuant to 37 C.F.R. § 1.98(a):

☐ The fee set forth in 37 CFR 1.17 (v)(1) has been submitted herewith (cumulative reference count exceeds 50 but does not exceed 100).

☐ The fee set forth in 37 CFR 1.17 (v)(2), less any amount previously paid, has been submitted herewith (cumulative reference count exceeds 100 but does not exceed 200).

☐ The fee set forth in 37 CFR 1.17 (v)(3), less any amount previously paid, has been submitted herewith (cumulative reference count exceeds 200).

☒ No fees set forth in 37 CFR 1.17 (v)(1) – v(3) are due in accompaniment with the concurrently filed information disclosure statement.

Respectfully submitted,

DORSEY & WHITNEY LLP
Customer Number 153511

Date: / 01/29/25

by: / Richard C. Galati/

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PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18490715
Filing Date	2023-10-19
First Named Inventor	B. Scott Maxfield
Art Unit	3634
Examiner Name	SHIREF M MEKHAEIL
Attorney Docket Number	P298048.US.03_506318-576

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7114592	B1	2006-10-03	GIBSON, et al.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2081878	CN	U	1991-07-31	YE ZHIXIONG		☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18490715
	Filing Date	2023-10-19
	First Named Inventor	B. Scott Maxfield
	Art Unit	3634
	Examiner Name	SHIREF M MEKHAEIL
	Attorney Docket Number	P298048.US.03_506318-576

	1		☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18490715
	Filing Date	2023-10-19
	First Named Inventor	B. Scott Maxfield
	Art Unit	3634
	Examiner Name	SHIREF M MEKHAEIL
	Attorney Docket Number	P298048.US.03_506318-576

CERTIFICATION STATEMENT

Please see 37 CFR 1.97(e) to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ A certification statement is not submitted herewith.

FEE

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

COPIES

☐ An identification of an earlier application pursuant to 37 CFR 1.98 (d) (1) is attached.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Richard C. Galati/	Date (YYYY-MM-DD)	2025-01-29
Name/Print	Richard C. Galati	Registration Number	66759

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**12/18/2024 06:41:39 PM Z ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Molly Chappe
PATENT CENTER #	68420070	AUTHORIZED BY	Richard Galati
CUSTOMER #	153511	FILING DATE	10/19/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	B. Scott Maxfield

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 1083	**E2024BHI42339196**	**Molly Chappe**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1251	EXTENSION FOR RESPONSE WITHIN FIRST MONTH	220.00	1	220.00
			TOTAL AMOUNT:	**$220.00**

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage

submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**12/18/2024 06:41:39 PM Z ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

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CUSTOMER #	153511	FIRST NAMED INVENTOR	B. Scott Maxfield
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Richard Galati

Documents

TOTAL DOCUMENTS: 8

DOCUMENT		PAGES	DESCRIPTION	SIZE (KB)
20241218_Response_NFOA_P298048.US.03.pdf		22	-	211 KB
20241218_Response_NFOA_P298048.US.03-A....pdf	(1-1)	1	Amendment/Request for Reconsideration-After Non-Final Rejection	78 KB
20241218_Response_NFOA_P298048.US.03-CLM.pdf	(2-7)	6	Claims	107 KB
20241218_Response_NFOA_P298048.US.03-REM.pdf	(8-21)	14	Applicant Arguments/Remarks Made in an Amendment	171 KB
20241218_Response_NFOA_P298048.US.03-LET..pdf	(22-22)	1	Miscellaneous Incoming Letter	68 KB
20241218_Appendix_I_Maxfi		5	Affidavit-traversing rejections	402 KB

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eld_P298048.US.03.pdf		or objections rule 132	
20241218_Appendix_II_Russell_P298048.US.03.pdf	5	Affidavit-traversing rejections or objections rule 132	417 KB
20241218_Appendix_III_Junius_P298048.US.03.pdf	2	Affidavit-traversing rejections or objections rule 132	508 KB
20241218_Appendix_IV_Moss_P298048.US.03.pdf	3	Affidavit-traversing rejections or objections rule 132	263 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
20241218_Response_NFOA_P298048.US.03.pdf	40FA5157E6E92E1A78E6E399EFF0A6FD6065420EE213CE8AC2E54F0D0EAA6FC898A479235C46A654422A27AD95615D292772008F281156F1DAC8603CC17ABEAE
20241218_Response_NFOA_P298048.US.03-A....pdf	56C06EF460C70910287EF0804A7D276B3FEECCD3F1AE78657A350444E5A3E3C0B62C48244CB25D2ABB6DA37ACF7BA803B958BA0EF47FAF1CF2CB0FF804AEA78F
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20241218_Response_NFOA_P298048.US.03-REM.pdf	590C84F98842E3245EDCF0F78E772EA0F526FE0CC9515B428D8CD822439FAD9E68D49E72346D6DD1858B433D9F3A726C7107C328EE0D6E21822BB467B03036FC
20241218_Response_NFOA_P298048.US.03-LET..pdf	CBC1276D758CD9BC4CD1F1C72DEAFC9396B89C7C5A8AFC5059CABFDDE34671AACE81646FEB4FA8A341FA95B9537BB60E5A7F47387FE4D79A55A3AE689BB0A6FE
20241218_Appendix_I_Maxfield_P298048.US.03.pdf	D9B52945491DBDE91E6BFE249D75E6A88C81350599E41FF4DFEC7C1CD60208D132128A8FAD3BF77AAB5A314638279A2C22F2BC40543B29902267459BDFDEC62B
20241218_Appendix_II_Russell_P298048.US.03.pdf	A383A746C6E76E72DE3D859491FB2F82926DDE7EB05F5B11F7A0319832D844D9D2FDBC9B570C036EBAD4207D2BB3CDDF242F94F03E725DB6EC9C17E09CC0BE9A
20241218_Appendix_III_Junius_P298048.US.03.pdf	EDA72822C28276C0C3059F748B1A976D70FCCC2A0DAE9ED05A4683C8CB5B48D07805B52D15969D5B48A364E2510A3064B94457A3FD302F9BA5CEB33E4298E45D
20241218_Appendix_IV_Moss_P298048.US.03.pdf	4E3099B4628613324A362ACBE06664556960008066 21D044C1E8DAB88C870107F7E0FD612A4C6C7C8167ED4BCD9854DC4CFFE46F8C9F842DB8D74B2AFC9FBBE6

PGR2026-00044
TRICAM EX1002

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	B. Scott Maxfield		
Appln. No.:	18/490,715	Confirmation No.:	5970
Filing Date:	19 October 2023	Examiner:	Shiref M Mekhaeil
Title:	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	Group Art Unit:	3634

DECLARATION UNDER 37 C.F.R. §1.132

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

I, B. Scott Maxfield, declare that:

1. I have extensive experience in the ladder industry, including over 8 years doing new product design. I have designed many ladders and ladder accessories that are currently being used in the industry. I am currently a Mechanical Engineer at Little Giant Ladder Systems, LLC. I have been listed as an inventor on more than 10 patents for ladders and related equipment, with other patents pending.

2. I am familiar with the disclosure of the present application (U.S. Patent Application 18/490,715) and its relationship to other ladder products in the current marketplace and marketplaces of the past.

3. Based on my years of experience in this field, I respectfully submit 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. First, prior to the invention of the

devices of the current application, there was a long-unmet need for object hanging abilities for ladders. Over the course of my career in the ladder industry, the prevailing wisdom in the marketplace was that an adjustment button for a hinge of an articulating ladder was only for your hand and that the general area of the hinge of the ladder was not open and available for holding or storing objects. You would not put a top cap, tray, or other traditional storage devices in the hinge area of an articulating ladder because they would interfere with a user's ability to climb and stand on the ladder while the ladder is in a straight configuration. This conventional wisdom extended to the button area of the hinge since that area is so critical to the functionality and safety of the ladder.

4. I am familiar with the hinge button of U.S. Patent Application Publication No. 2009/0229918 to Moss that has a magnet (226) for attracting tools. Although this design provided some assistance to a user while in an elevated position on a ladder, it came with significant drawbacks that led our engineers away from pursuing hinge button hanging features for many years. 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. Beyond these issues, its bill of materials was too expensive relative to the benefits it provided, primarily due to its inclusion of a large, strong magnet. As a result, the magnetic button product was discontinued after its initial design and sales. Accordingly, I am familiar with the marketplace at the time the Moss device was produced and sold, and I affirm that although there was an unmet need for hanging objects for articulating ladders, the magnetic button implementation had enough drawbacks to drive us away from further development of such technology.

5. Additionally, a person having the magnetic button of Moss would not have been inspired to modify the Moss button to include other kinds of hanging functions. As explained above, the Moss button was unsatisfactory in multiple ways, so there was no institutional will to further explore concepts of other ways for hanging objects from a button, and even if there was interest, the process of modifying a hinge button is not a trivial undertaking. A weight rating is given to any features intended to hold objects on a ladder, and materials and safety tests must be performed when something like the hinge button is changed. It would take at least 50-80 hours of engineer and technician time to design and verify changes to a hinge button designed to support objects. However, the failures of the Moss magnetic button led to circumstances where such a significant investment in 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. Therefore, in my view, the existence of the Moss patent application is merely evidence of an attempt and failure to adequately serve the long-felt, unmet need for hanging objects from articulating ladders rather than disclosure that would inspire a person having ordinary skill in the art to obtain the devices of the present application.

6. I further affirm that the Examiner's proposed combination of the Moss button with the bracket of U.S. Patent No. 11,191,373 to Ng would not have been obvious. In view of the significant resources required to make a change to a hinge button, an engineer in our position would not have found it obvious to "simply" add a picture hanging bracket to the side of a hinge button to replace the Moss magnet.

7. A designer would not have turned to any picture frame brackets for inspiration in modifying a hinge button anyway. Picture frame brackets are placed on a

small object (*e.g.*, a picture frame) to support it on a *larger* object (*e.g.*, a wall), but the Examiner is arguing it would be obvious to use the Ng bracket to do the opposite – to place a bracket on a *large* object (*e.g.*, ladder) so that it can support a *smaller* object (*e.g.*, a tool). This would have been unconventional thinking prior to our invention of the hinge button assemblies of the present application. Additionally, picture frame brackets usually include notches and spikes (*e.g.*, to receive nails), and we would not want to add parts to a hinge button that would apply uncomfortable pressure to the palm of your hand. It would not make sense to make a button more uncomfortable to press by adding a picture bracket such as bracket 10 of Ng to the palm pressing surface.

8. Furthermore, the development of the hinge button assemblies of the present application led to unexpected results. Adding weight to the outer lateral sides/rails of a ladder is conventionally considered undesirable since the added weight shifts the center of gravity upward and laterally outward (toward where the weight is added) and therefore would make the ladder more unstable when it is impacted from a lateral side. It was thought that as more weight is added, the instability increases. Heavy objects cannot be held in place by the Moss magnets, so this stability issue would not have been as prominent for the Moss buttons. It was much more prominent of an issue for hinge buttons of the present application since they would support greater weight. Despite this, after testing our hinge button assembly design, we found that hanging objects from our hinge buttons *increased* the stability of the ladder. The added weight was positioned between the feet at the base of the rails and therefore increased the force necessary to tip the ladder. The hinge hanging functionality added by the present application therefore

was not obvious to us because it led to the unexpected result of increasing a ladder's stability rather than decreasing it.

9. I further 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, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

Date: Nov 27, 2024

B. Scott Maxfield

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	B. Scott Maxfield		
Appln. No.:	18/490,715	Confirmation No.:	5970
Filing Date:	19 October 2023	Examiner:	Shiref M Mekhaeil
Title:	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	Group Art Unit:	3634

DECLARATION UNDER 37 C.F.R. §1.132

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

I, Paul B. Junius, declare that:

1. I reaffirm and reincorporate my previous declaration filed 25 July 2024 in the present application. It would not have been obvious to modify ladder hinge buttons to include tool hanging functionality in the manner recited by the current claims, at least because doing so would potentially increase a ladder manufacturer's exposure to product liability lawsuits. The disclosure of U.S. Patent Application Publication No. 2009/0229918 to Moss, which I have reviewed, does not change my professional opinion on this subject.

2. I attest that the ladder industry abstained from making accessories or usable top caps of any kind for standard stepladders for many years due to consumer safety concerns. At the time the present application was filed, there was skepticism in the field by experts, including myself, that tool hanging functionality could be viably and safely

incorporated into ladder hinge assemblies. Ladders incorporating the magnetic hinge button assemblies of the Moss reference affirmed that tool hanging functionality was not a readily solved problem for the industry. Accordingly, there was a disincentive in the field to modify hinge buttons to include tool hanging features, and a person having ordinary skill in the art would not have found it obvious to do so.

3. Additionally, I submit that I am not aware of any prior art ladder designs or products that added tool hanging functionality to ladder hinge assemblies in the manner described in the present application at or before the time the invention was made. This includes U.S. Patent Application Publication No. 2009/0229918 to Moss since it does not add tool hanging functionality to ladder hinge assemblies in the manner described in the present application.

4. I further 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, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

Date: 11/26/2024

Paul B. Junius

4868-2415-6157\1

PGR2026-00044
TRICAM EX1002

Docket No.: P298048.US.03_506318-576

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	B. Scott Maxfield		
Appln. No.:	18/490,715	Confirmation No.:	5970
Filing Date:	19 October 2023	Examiner:	Shiref M MEKHAEIL
Title:	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	Group Art Unit:	3634

RESPONSE AFTER NON-FINAL OFFICE ACTION

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

This responds to the Office Action dated 5 September 2024. Please enter the following amendments and remarks:

Amendments to the Claims are shown in the Listing of Claims beginning on page 2 of this document.

Remarks begin on page 7 of this document.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Previously Presented) 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.

2. (Original) 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;

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

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;

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;

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

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.

3. (Previously Presented) The ladder of claim 1, wherein

the second button body comprises a substantially flat outward-facing surface parallel to the first button body.

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

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

6. (Original) The ladder of claim 1, wherein the at least one gap includes two open ends.

7. (Original) 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.

8. (Original) 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.

9. (Currently Amended) The ladder of claim 1, wherein the ~~second button body defines a surface~~ first axially-facing ~~axially inward~~ surface ~~toward the pair of hinges and~~ is substantially parallel to the ~~first button body~~second axially-facing surface.

10. (Currently Amended) The ladder of claim 1, wherein the second button body is configured to support ~~an~~ the object when the object is hanging on the second button body and~~while~~ at least partially positioned in the at least one gap.

11. (Previously Presented) The ladder of claim 1, wherein the second button body comprises a plate.

12. (Withdrawn) A button for a locking mechanism, the button comprising:

a button body including a first button body portion and a second button body portion;

a pivot pin coupled with the first button body portion and extending away from the button body; and

a biasing member operable to apply a biasing force to the button body, wherein the biasing force is configured to oppose a force applied to the button body opposite the pivot pin;

wherein the second button body portion includes a width portion and at least two side portions, the at least two side portions connecting the width portion to the first button body portion, wherein the second button body portion and the first button body portion define an opening.

13. (Withdrawn) The button of claim 12, wherein the second button body portion and the first button body portion are integrally formed as a single piece.

14. (Withdrawn) The button of claim 12, wherein the opening opens radially outward in a first direction.

15. (Withdrawn) The button of claim 14, wherein the opening opens radially outward in a second direction opposite the first direction.

16. (Withdrawn) The button of claim 12, wherein the at least two side portions are coupled to the first button body portion at opposite lateral ends of the width portion.

17. (Withdrawn) The button of claim 12, further comprising: a bracket coupled with the pivot pin; and

a pair of locking pins coupled with the bracket and oriented substantially parallel to the pivot pin.

18. (Withdrawn) The button of claim 12, wherein the second button body portion comprises a plate shape connected to an opposite side of the first button body portion relative to the pivot pin.

19. (Previously Presented) 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.

20. (Original) The ladder of claim 19, 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	B. Scott Maxfield		
Appln. No.:	18/490,715	Confirmation No.:	5970
Filing Date:	19 October 2023	Examiner:	Shiref M Mekhaeil
Title:	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	Group Art Unit:	3634

DECLARATION UNDER 37 C.F.R. §1.132

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

I, Brian B. Russell, declare that:

1. I have deep knowledge and experience in the ladder industry, including over 15 years of developing ladder and ladder accessories in the engineering department at Little Giant Ladder Systems, LLC. I am also a member of the American National Standards Institute (ANSI) A14 and the American Ladder Institute (ALI). I am currently the Director of Engineering and Innovations at Little Giant Ladder Systems, LLC. I have actively contributed to, and have been listed as an inventor on, more than 20 ladder and climbing equipment patents, with other patents pending.

2. I am familiar with the disclosure of the present application (U.S. Patent Application 18/490,715) and its relationship to other ladder products in the current marketplace and marketplaces of the past.

3. There was a long-felt, unmet need for hanging objects from articulating

ladders that was not met by the magnetic button of U.S. Patent Application Publication No. 2009/0229918 to Moss, as explained in detail in the Declaration Under 376 C.F.R. §1.132 by B. Scott Maxfield, which is being submitted herewith.

4. The Moss hinge button was an attempt and failure to serve that long-felt need, as also described in the accompanying Maxfield Declaration.

5. The Moss hinge button would not have been obvious to modify in view of the bracket of U.S. Patent No. 11,191,373 to Ng for the reasons described in the accompanying Maxfield Declaration. Furthermore, it would not have been obvious to modify a palm button that is hand-operated to include corners like those that would be introduced by the Ng bracket since the inclusion of pointed corners would hinder user comfort.

6. I have knowledge of the events in the following timeline, which is presented as evidence of copying (or near simultaneous invention) of our invention by a competitor (Gorilla Ladders):

a. March-May 26, 2022: The project started for hinge button assembly with storage features, initial prototyping set in motion;

b. May 26, 2022: Blueprints of the hinge button assembly of the present application were sent to ZCAL, a manufacturing partner of Little Giant Ladder Systems in China;

c. June 12, 2022: Similar blueprints were sent to PICA, another manufacturing partner of ours in China;

d. July 12, 2022: Tooling was started by ZCAL. By this time, we decided to not move forward with PICA on the hinge button assembly;

e. September 2022: First articles of the hinge button assembly were received for inspection by Little Giant Ladder Systems;

f. December 2022: Blueprints for the entire ladder were sent to ZCAL to start production;

g. April 17, 2023: Produced ladders with hinge button assembly were first shipped to our customer and retail sales partner;

h. May 2023: while visiting PICA, I saw the Gorilla Ladder hinge button assembly. It had plastic components including a button with a slender slot as shown, for example, in the Gorilla Ladder "18 ft Reach MPXA Aluminum Multi-Position Ladder with Tool Hangers."[1] For reasons further explained below, it was immediately apparent to me that the Gorilla "Tool Hanger" button had copied the feature from our invention as inspired by the blueprints sent to PICA in July 2022;

i. Fall 2023: the Gorilla Ladder with "Tool Hangers" appears in retail stores.

7. The Gorilla Ladder with "Tool Hangers" was not to my knowledge invented or known prior to Little Giant's blueprint disclosure to PICA in July 2022.

8. Gorilla Ladder works with PICA as a manufacturing partner, as evidenced by the presence of the "Tool Hanger" button I saw at the PICA facility in May 2023.

[1] *See* Gorilla Ladder website product page for MPXA 2.0 Aluminum Multi-Position Ladder with Integrated Tool Hangers (https://gorillamade.com/product/glmpxa-18-2/) and related Home Depot product website (https://www.homedepot.com/p/Gorilla-Ladders-18-ft-Reach-MPXA-Aluminum-Multi-Position-Ladder-with-Tool-Hangers-300-lbs-Load-Capacity-GLMPXA-18-2/325168129), accessed Nov. 2024.

9. Gorilla Ladder has a long history of copying innovations and infringing intellectual property of Little Giant Ladder Systems. This circumstantially indicates Gorilla Ladder's intent to copy the features of our claimed hinge button assemblies because they have done in multiple times in the past.

10. Based on my years of experience, engineering a hinge button assembly to have the features I saw in the Gorilla Ladder button would have taken several weeks of design time and weeks of beta testing, gathering feedback, and iterating a design. If Gorilla Ladder copied our features after gaining knowledge of them at PICA, it makes sense that their first sales would have come several months after our first sales (*i.e.*, in Fall 2023, after our first sales in Spring 2023).

11. The hinge button assemblies of the present application led to sales improvements and commercial success on the ladders on which they are offered. Ladders with the "Hinge Holster" feature included had a significant 19% improvement in sales volume to our retail customer on a year-over-year basis when comparing the year prior to first sales of the improved ladder (April 2022-March 2023) and the year after first sales of the improved ladder (April 2023-March 2024). Ladder models 16517-803 and 16522-803 were sold between April 2022-March 2023, and ladder models 16502T-803 and 16507T-803 (which each include "Hinge Holsters") were sold between April 2023-March 2024. The hinge button assemblies have been a commercial success in an important product segment for our company.

12. I further 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, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

Date: 12/2/2024

Brian B. Russell

4861-8996-4797\1

PGR2026-00044
TRICAM EX1002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	B. Scott Maxfield		
Appln. No.:	18/490,715	Confirmation No.:	5970
Filing Date:	19 October 2023	Examiner:	Shiref M Mekhaeil
Title:	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	Group Art Unit:	3634

DECLARATION UNDER 37 C.F.R. §1.132

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

I, N. Ryan Moss, declare that:

1. I reaffirm and reincorporate my previous declaration filed 25 July 2024 in the present application.

2. There has been a long-felt but unmet need for the invention claimed in the present application. As I explained in my previous declaration, the industry has long failed to meet the need of providing storage solutions for ladder users at the top ends or hinge areas of multi-position/articulating ladders.

3. I am one of the inventors named in the present application and in U.S. Patent Application Publication No. 2009/0229918 to Moss, which has now been cited in a rejection of the present application by the Examiner. As such, I have personal knowledge of the setting and circumstances of the inventions in each of these patent applications.

4. The magnetic hinge buttons described in the Moss reference did not

effectively address the long-felt need for storage options in articulating ladders. The magnetic buttons were implemented in ladders for many years, but users were not satisfied with and did not highly value the magnetic button features. Since the magnetic buttons were more costly to manufacture than buttons without magnetic features, we discontinued offering magnetic buttons on ladders in the mid 2010s. The need for effective ways to support tools at the top of an articulating ladder remained unmet, despite the existence of the magnetic buttons disclosed in the Moss reference and sold to customers.

5. I am not aware of any devices from competitors that included hinge button support features, including magnetic buttons, even after we were offering magnetic buttons for sale. The magnetic buttons disclosed in the Moss reference were publicly known for over 10 years before we developed the invention of the present application. During that time, no competitor devices were produced with magnetic buttons like the Moss reference, nor were brackets like the Ng reference added to buttons. The work and time required to design and implement the hinge button assemblies of the present application was considerable, but that time is only a fraction of a decade. The ladder industry is very competitive, and our competitors keep watch over our intellectual property, including patent filings. If it had been obvious to modify the magnetic button of the Moss reference in view of Ng, they likely would have seen the Moss reference. Yet, no competitor modified the buttons of Moss (or any hinge buttons for that matter) to include brackets such as those in Ng until we developed and implemented it in 2022. The long-felt need for effective support at the top end of an articulating ladder remained unsatisfied before the invention of the current application.

6. In my professional opinion, the absence of any solutions for hinge button tool hanging, followed by immediate copying of the idea by a Little Giant competitor upon apparently receiving access to our concept, as I explained in my previous declaration and as explained in connection with the Declaration of Brian B. Russell, filed herewith, shows without question that the inventions of our claims were not obvious at the time the application was filed.

7. I further 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, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

Date: 11-25-2024

N. Ryan Moss
CEO
Little Giant Ladder Systems, LLC

4874-5389-1837\1

REMARKS

This responds to the Office Action dated 5 September 2024. Claims 1-20 are currently pending (with claims 12-18 withdrawn). Claims 9 and 10 are currently amended. No new matter has been added. Applicant respectfully requests reconsideration of the application in view of the above amendments and the following remarks.

Claim Objections

Claims 9 and 10 stand objected to for informalities. Applicant has amended claims 9 and 10 and respectfully requests withdrawal of the objections.

Claim Rejections - 35 U.S.C. § 103

Claims 1-11 and 19-20 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent Application Publication No. 2009/0229918 to Moss in view of U.S. Patent No. 11,191,373 to Ng. Applicant respectfully traverses these rejections.

Claim 1 recites, *inter alia*, "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."

Claim 19 recites, *inter alia*, "a pair of retainers . . . ; 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."

The Moss and Ng references, either viewed alone or in any combination, do not teach or suggest the above-indicated limitations of claims 1 and 19 and would not render claims 1 and 19 obvious. Applicant respectfully traverses and rebuts the Examiner's rationales attempting to support the obviousness of applying the teachings of the Ng reference to modify the ladder of Moss. First, the ladders of claims 1 and 19 would not have been obvious because the Ng disclosure is not analogous art to the field of ladders, so it would not have been obvious to refer to Ng to modify a ladder, including the ladder of Moss. Second, objective indicia of non-obviousness, including a long-felt but unmet need for the ladders of claims 1 and 19, skepticism by others, unexpected results, commercial success of the invention, and copying by others, strongly support the allowability of claims 1 and 19.

Appendices I-IV include declarations from B. Scott Maxfield, Brian B. Russell, Paul B. Junius, and N. Ryan Moss, four persons having skill in the art and with personal knowledge of the setting and market in which the presently claimed ladders were designed, tested, manufactured, and implemented. As such, the evidence established in Appendices I-IV are incorporated by reference into the present remarks and will be referenced to overcome the Examiner's opinions presented in the Office Action.

1. Ng is non-analogous art to ladders, including the ladders of claims 1 and 19.

Claims 1 and 19 are non-obvious because the Ng reference is non-analogous art to ladders and therefore would not have been obvious to use to modify the Moss reference. "In order for a reference to be proper for use in an obviousness rejection under 35 U.S.C. 103 , the reference must be analogous art to the claimed invention." MPEP §2141.01(a) (citing *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004)). If a reference is not analogous art to the claimed invention, it may not be used in an obviousness rejection under 35 U.S.C. 103. *Id.* A reference is analogous art to the claimed invention if: (1) the reference is from the same field of endeavor as the claimed invention (even if it addresses a different problem); or (2) the reference is reasonably pertinent to the problem faced by the inventor (even if it is not in the same field of endeavor as the claimed invention). Note that "same field of endeavor" and "reasonably pertinent" are two separate tests for establishing analogous art; it is not necessary for a reference to fulfill both tests in order to qualify as analogous art. *Id.* The teachings of the Ng reference fail both tests for ladder hinge assemblies.

The bracket 10 of Ng is not from the same field of endeavor as the claimed invention. The mounting devices of Ng (*e.g.,* bracket 10) are intended to hang an article (*e.g.,* a picture frame or clock) on a wall or other vertical mounting surface. *See* Ng at Abstract. In particular, under "Field of the Disclosure," Ng clearly states that the disclosure therein "relates to mounting devices for wall-mounted articles." *Id.* at 1:15-18. Tools and other working implements contemplated with respect to the claimed invention are not "wall-mounted devices," and ladders are not used as mounting devices to hang other articles on a wall or other vertical mounting surface. Ng is not in the same field of endeavor as the claimed invention and is non-analogous.

The Ng reference is also not reasonably pertinent to the problem faced by the inventors of the present claims. Ng states that the "wall-mounted articles" contemplated therein are things such

as "frames, mirrors, art, bulletin boards, clocks" and the like. Ng. at col. 1, ll. 22-25. No person of ordinary skill in designing and developing ladders would ever turn to such a reference, because one does not hang art, mirrors or bulletin boards on the side of a ladder. As explained by B. Scott Maxfield, "A designer would not have turned to any picture frame brackets for inspiration in modifying a hinge button anyway. Picture frame brackets are placed on a *small* object (*e.g.,* a picture frame) to support it on a *larger* object (*e.g.,* a wall), but the Examiner would be obvious to use the Ng bracket to do the opposite – to place a bracket on a *large* object (*e.g.,* ladder) so that it can support a *smaller* object (*e.g.,* a tool). This would have been unconventional thinking prior to our invention of the hinge button assemblies of the present application." Appendix I at para. 7 (emphasis in original). Thus, persons having ordinary skill in the art at the time the invention was made would not have considered reversing the role of the Ng bracket 10 (to use it for hanging smaller objects from a larger object instead of vice versa) because it would have been unconventional and non-obvious to view a picture frame bracket that way.

The Ng reference is also not reasonably pertinent to problems faced by the inventor, and is therefore non-analogous art. As explained in the Maxfield Declaration, "picture frame brackets usually include notches and spikes (*e.g.,* to receive nails), and [designers] would not want to add parts to a hinge button that would apply uncomfortable pressure to the palm of your hand. It would not make sense to make a button more uncomfortable to press by adding a picture bracket such as bracket 10 of Ng to the palm pressing surface [of a ladder hinge push button]." *Id.* Moreover, Brian B. Russell supports this conclusion by explaining, "[I]t would not have been obvious to modify a palm button that is hand-operated to include corners like those that would be introduced by the Ng bracket since the inclusion of pointed corners would hinder user comfort." Appendix II at para. 5. Pointed corners and notches that would cause these user issues are found in the brackets

disclosed in the Ng reference. Thus, the fact that picture frame brackets are used for the purpose of hanging things in general is not enough to make it analogous art. *See, e.g., K-Tec, Inc. v. Vita-Mix Corp.*, 696 F.3d 1364, 1375 (Fed. Cir. 2012) (affirming judgment that prior art water pitchers having the same geometry as the claimed blending jar were non-analogous art despite being containers used to hold liquids). Persons having ordinary skill in the art would not have considered picture frame bracket designs found in Ng to be reasonably pertinent to designing the ladders of claims 1 and 19 because Ng's brackets would make the button more uncomfortable to use.

The Examiner has not cited any evidence that supports the idea that Ng can be considered analogous art. In contrast, Applicant has submitted compelling evidence to the contrary as cited above. Accordingly, evidence made of record in the Appendices establishes that the Ng reference is non-analogous art to ladders. As a result, the Ng reference is non-analogous art to the field of claims 1 and 19, and it would not have been obvious to reference the Ng disclosure to modify a ladder in the manner asserted by the Examiner. On this basis alone, the Examiner's obviousness rejection should be withdrawn.

2. Objective indicia establish the non-obviousness of claims 1 and 19.

In addition to Ng being non-analogous art, the following objective indicia of non-obviousness support the allowability of claims 1 and 19 over the Moss and Ng references.

Long-Felt But Unmet Need

Ladders having the features of claims 1 and 19 are non-obvious since they address a long felt but unmet need in the marketplace. MPEP §716.04(I) explains in detail the requirements for establishing a long-felt need that indicates non-obviousness: "First, the need must have been a

persistent one that was recognized by those of ordinary skill in the art. *In re Gershon,* 372 F.2d 535, 539 (C.C.P.A. 1967). . . . Second, the long-felt need must not have been satisfied by another before the invention by the inventor. *Newell Companies v. Kenney Mfg. Co.,* 864 F.2d 757, 768 (Fed. Cir. 1988). . . . Third, the invention must in fact satisfy the long-felt need. *In re Cavanagh,* 436 F.2d 491 (C.C.P.A. 1971)." The long-felt need leading to the ladders of claims 1 and 19 meets all of these requirements.

First, there was a persistent need for the ladders of the present application that was recognized by those of ordinary skill in the art. Applicant has established this persistent need using evidence from multiple sources of expert declarations: Declaration of B. Scott Maxfield (Appendix I at para. 3), Declaration of Brian B. Russell (Appendix II at para. 3), Declaration of N. Ryan Moss (filed 25 July 2024 at paras. 5-15), and Second Declaration of N. Ryan Moss (Appendix IV at paras. 2, 4, and 5). The need for hanging objects near the top end of an articulating ladder had existed from the time articulating ladders were first developed until the conception of the ladders of the present application.

Second, this long-felt need was not satisfied by another before the ladders of the present application. The Examiner asserts that the Moss reference "indeed discloses a tool hanging device, hence it is presented that: before the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to substitute one object hanging device . . . with another object hanging device . . . to provide for hanging articles." Office Action at p. 19. In doing so, the Examiner appears to assert that the Moss reference shows a lack of long-felt need for the present invention. However, the contrary is true—Moss proves that there was such a preexisting need, which Moss sought (unsuccessfully) to address. The existence of the Moss

reference does not rebut Applicant's assertion of the existence of a long-felt need because the Moss reference failed to meet the long-felt, unmet need for the ladders of the present application.

Specifically, the Moss reference disclosed a magnetic button that, despite being able to hold certain objects in place, did not in fact satisfy the need for tool hanging and was considered a failed attempt at doing so for multiple reasons. As presented herewith in evidence, the Moss magnetic hinge button "came with significant drawbacks that led our engineers away from pursuing hinge button hanging features for many years," such as how "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" and "its bill of materials was too expensive relative to the benefits it provided." Appendix I at para. 4. The failures of the magnetic button were even sufficient "to drive us away from further development of such technology." *Id.* Additional Declarations establish that the Moss hinge button "was an attempt and failure" to serve the long-felt need for hanging objects from articulating ladders and that "[l]adders incorporating the magnetic hinge button assemblies of the Moss reference affirmed that tool hanging functionality was not a readily solved problem for the industry." Appendix II at paras. 3-4; Appendix III at para. 2; *see also* Appendix IV at para. 4. The Moss button was even "discontinued after its initial design and sales." Appendix I at para. 4.

The mere existence of the Moss reference does not rebut the existence of the long-felt need for the ladders of the present application. To the contrary, the actual real-world facts surrounding the Moss reference prove the long-felt, unmet need remained after Moss, and Moss represents an unsuccessful attempt to serve that need. "The ladder industry is very competitive, and our competitors keep watch over our intellectual property, including patent filings. If it had been obvious to modify the magnetic button of the Moss reference in view of Ng, they likely would

have seen the Moss reference. Yet, no competitor modified the buttons of Moss (or any hinge buttons for that matter) to include brackets such as those in Ng until we developed and implemented it in 2022." Appendix IV at para. 5. Furthermore, "The magnetic buttons disclosed in the Moss reference were publicly known for over 10 years before [development of] the present application. During that time, no competitor devices were produced with magnetic buttons like the Moss reference, nor were brackets like the Ng reference added to buttons." *Id.* Therefore, the failures and inadequacies of the Moss device show that there was still a long-felt but unmet need for tool hanging solutions for articulating ladders as of the priority date of the present application.

Third, the ladders of claims 1 and 19 in fact satisfy the long-felt need. The hinge buttons of the present application solve all of the problems of the Moss device and serve the long-felt need for storage of objects at the tops of articulating ladders. Ladders of claims 1 and 19 have assemblies that can hold heavier objects than a magnetic button (*e.g.,* Moss) would reasonably be able to hold, do not attract unwanted objects (*e.g.,* due to not relying on magnetism), and are less expensive to produce (*e.g.,* due to lacking an expensive large magnet). Furthermore, the commercial success of ladders of claims 1 and 19 is evidence that they address this long-felt need, as indicated below.

Accordingly, ladders having the features of claims 1 and 19 are non-obvious at least because they address a long felt but unmet need in the marketplace at the time the invention was made.

Expert Skepticism

Ladders having the features of claims 1 and 19 were viewed with skepticism in the field of the invention. "Expressions of disbelief by experts constitute strong evidence of nonobviousness."

MPEP §716.05 (citing *Environmental Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 698 (Fed. Cir. 1983) (citing United States v. Adams, 383 U.S. 39, 52, 148 USPQ 479, 483-484 (1966))). "The skepticism of an expert, expressed before these inventors proved him wrong, is entitled to fair evidentiary weight." *In re Dow Chemical Co.*, 837 F.2d 469 (Fed. Cir. 1988).

Paul B. Junius is an expert in the field of ladders and ladder safety, and he has provided, by his Declaration filed 25 July 2024 and in a second declaration filed herewith as Appendix III, expert testimony in which he explains, "At the time the present application was filed, there was skepticism in the field by experts, including myself, that tool hanging functionality could be viably and safely incorporated into ladder hinge assemblies. Ladders incorporating the magnetic hinge button assemblies of the Moss reference affirmed that tool hanging functionality was not a readily solved problem for the industry. Accordingly, there was a disincentive in the field to modify hinge buttons to include tool hanging features, and a person having ordinary skill in the art would not have found it obvious to do so." Appendix III at para. 2.

Additionally, the Declaration of B. Scott Maxfield provides evidence of skepticism in the field that was *caused by* the introduction of the Moss devices. "Although [the Moss] design provided some assistance to a user . . . , it came with significant drawbacks that led our engineers away from pursuing hinge button hanging features for many years. 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. Beyond these issues its bill of materials was too expensive relative to the benefits it provided. . . . As a result the magnetic button product was discontinued after its initial design and sales. . . . [A]lthough there was an unmet need for hanging objects for articulating ladders, the magnetic button implementation had enough drawbacks to drive us away from further development of such technology." Appendix I

at para. 4. As a result of the drawbacks to the Moss device, "[T]here was no institutional will to further explore concepts of other ways for hanging objects from a button." *Id.* at para. 5.

Persons having ordinary skill in the art being "drive[n] away" from development of technology and recognizing a variety of drawbacks of the Moss reference shows that there was skepticism that it would have been obvious to produce a tool-holding hinge button for a ladder at the time the invention was made, even in view of the Moss reference. Accordingly, Applicant respectfully requests reconsideration of the rejection in view of the evidentiary weight provided by the expert opinions in the Declarations of Paul B. Junius and B. Scott Maxfield. Claims 1 and 19 are not obvious at least in part due to skepticism in the field of the invention at the time the invention was made.

Commercial Success

The ladders of claims 1 and 19 are non-obvious in view of their commercial success after introduction to the marketplace. As submitted in the Declaration of Brian B. Russell, ladders such as those of claims 1 and 19 had a "significant 19% improvement in sales volume to our retail customer on a year-over-year basis." Appendix II at para. 11.

The MPEP explains, "an applicant must show that the claimed features were responsible for the commercial success of an article if the evidence of nonobviousness is to be given any weight." §716.03(b) (citing *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996)). The evidence made of record shows that the features responsible for the improvement in sales volume can be attributed to the features of the present claims. The improvement in sales volume came after two ladder models (which were sold without "Hinge Holsters") were discontinued and two new ladder models (with "Hinge Holsters") were sold. Appendix II at para. 11. The sales data of the discontinued

models was for the period between April 2022 and March 2023, and the sales data for the new models, which was compared to indicate the improvement in sales volume, was for the period between April 2023 and March 2024. *Id.* Accordingly, the inclusion of the features of the present application can be reasonably attributed to the commercial success of the ladders using recent data. As such, evidence of commercial success shows the non-obviousness of claims 1 and 19.

Copying

The ladders of claims 1 and 19 are non-obvious in light of evidence of copying (and/or near simultaneous invention) by others in the field of the invention. "[A] form of secondary evidence which may be presented by applicants during prosecution of an application . . . is evidence that competitors in the marketplace are copying the invention instead of using the prior art." *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1325, 73 USPQ2d 1225, 1230 (Fed. Cir. 2004). "[C]opying 'requires evidence of efforts to replicate a specific product, which may be demonstrated through . . . ***access to the patented product combined with substantial similarity to the patented product***.'" MPEP §716.06 (citing *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010); emphasis added).

Applicant has presented evidence of copying of by others of the features of the present claims. As further explained in Applicant's remarks filed 25 July 2024 and in the Declaration of Brian B. Russell, filed herewith, competitor products have been identified that (1) show "evidence of efforts to replicate a specific product" due to the competitor's "access to the patented product" (*e.g.,* via Applicant's disclosure of the product to the manufacturer "PICA"), (2) have "substantial similarity to the patented product," as established by the buttons of the Gorilla Ladder having "Tool Hanger" slots, and (3) are "immediately apparent" as being copies of the ideas of the present

claims upon viewing by a person having at least ordinary skill in the art (since the slots have similar positioning and function to slots of the present application). Appendix II at para. 6(a)-(i).

Furthermore, evidence that shows access to a competitor's non-public information and use of that information to develop a product may be persuasive evidence of copying. *Liqwd, Inc. v. L'Oreal USA, Inc.*, 941 F.3d 1133, 1139 (Fed. Cir. 2019); *see also* MPEP §716.06. The Gorilla Ladder "Tool Hangers" were developed with apparent access to Applicant's non-public information, which included confidential blueprints of the features in claims 1 and 19 which were provided to PICA, a manufacturing partner of both Applicant and Gorilla Ladder. *See* Appendix II at para. 6(a)-(i). Additionally, the Gorilla Ladder "Tool Hangers" could not have reasonably been independently produced without access to Applicant's non-public information because the timing of the release of the Tool Hangers into the marketplace aligns with taking ideas from the blueprints provided by Applicant to PICA rather than independent conception. *Id.* at para. 10.

As set forth above, Applicant has present compelling objective evidence of a long-felt, un-met need, prior failure of others, industry skepticism, commercial success, and copying. Such compelling evidence can—and in this case is—"the most probative and cogent evidence in the record" and establishes that the "invention appearing to have been obvious in light of the prior art was not." *Apple Inc. v. Int'l Trade Comm'n*, 725 F.3d 1356, 1366 (Fed. Cir. 2013) (vacating ITC judgment of obviousness based on "compelling secondary considerations evidence"). Accordingly, the evidence of record shows that claims 1 and 19 were non-obvious in view of copying of features thereof by others in the marketplace.

For at least these reasons, the cited references do not teach or suggest every limitation of the rejected claims. Applicant therefore respectfully requests withdrawal of the Section 103 rejection of claims 1 and 19 and any claims dependent upon them.

Conclusion

For at least the foregoing reasons, Applicant believes that each of the presently pending claims in this application is in immediate condition for allowance. Accordingly, Applicant respectfully requests a favorable action on the merits. If the Examiner has any further comments or suggestions, Applicant invites the Examiner to contact the undersigned attorney to expedite the handling of this matter.

Applicant expressly disclaims all arguments, representations, and/or amendments presented or contained in any other patent or patent application, including any patents or patent applications claimed for priority purposes by the present application or any patents or patent applications that claim priority to this patent application. Moreover, all arguments, representations, and/or amendments presented or contained in the present patent application are only applicable to the present patent application and should not be considered when evaluating any other patent or patent application.

The Commissioner is hereby authorized to charge any additional fees which may be required for this application, or credit any overpayment, to Deposit Account No. 506181. If any extensions of time are needed for timely acceptance of these documents, such an extension is

hereby requested and payment of any such extension fees is authorized from Deposit Account No. 506181.

Respectfully submitted,

DORSEY & WHITNEY LLP
Customer No. 153211

Date: 18 December 2024

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LISTING OF APPENDICES

- Appendix I: Declaration under 37 C.F.R. §1.132 of B. Scott Maxfield
- Appendix II: Declaration under 37 C.F.R. §1.132 of Brian B. Russell
- Appendix III: Second Declaration under 37 C.F.R. §1.132 of Paul B. Junius
- Appendix IV: Second Declaration under 37 C.F.R. §1.132 of N. Ryan Moss

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 18/490,715	Filing Date 10/19/2023	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	12/18/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $480 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/DESHONNE T. MARTINO-RAY/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
18/490,715	10/19/2023	3634	1820	P298048US03 (506318-576)	20	3

CONFIRMATION NO. 5970

UPDATED FILING RECEIPT

153511
Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176

OC000000081621355

Date Mailed: 12/10/2024

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

B. Scott Maxfield, Mapleton, UT;
N. Ryan Moss, Mapleton, UT;

Applicant(s)

LITTLE GIANT LADDER SYSTEMS, LLC, Springville, UT;

Power of Attorney: The patent practitioners associated with Customer Number 153511

Domestic Priority data as claimed by applicant

This application is a CON of 18/324,971 05/27/2023
which claims benefit of 63/346,420 05/27/2022

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 10/31/2023

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/490,715**

Projected Publication Date: 02/08/2024

Non-Publication Request: No

Early Publication Request: No

Title

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Preliminary Class

182

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/490,715	10/19/2023	B. Scott Maxfield	P298048US03 (506318-576)

CONFIRMATION NO. 5970

153511
Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176

37 CFR 1.48 ACKNOWLEDGEMENT LETTER

OC000000081621356

Date Mailed: 12/10/2024

NOTICE OF ACCEPTANCE OF REQUEST UNDER 37 CFR 1.48(a)

This is in response to the applicant's request under 37 CFR 1.48(a) submitted on 12/05/2024.

The request under 37 CFR 1.48(a) to correct the inventorship, to correct or update the name of an inventor, or to correct the order of names of joint inventors is accepted.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/ambalinang/

United States Patent and Trademark Office

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Document Code:WFEE

User :Alma Balinang

Sale Accounting Date:12/06/2024

Sale Item Reference Number	Effective Date
18490715	12/05/2024

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I2024B6E16508200	1819	CORRECTION OF INVENTORSHIP ON MERITS	$640.00	Deposit Account

PTO/AIA/96 (08-12)
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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: LITTLE GIANT LADDER SYSTEMS, LLC

Application No./Patent No.: 18/490,715 Filed/Issue Date: 2023-10-19

Titled: MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

LITTLE GIANT LADDER SYSTEMS, LLC, a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 069318, Frame 0799, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

   1. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

   2. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PGR2026-00044
TRICAM EX1002

PTO/AIA/96 (08-12)
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STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Richard C. Galati/	2024-12-05
Signature	Date
Richard C. Galati	66,759
Printed or Typed Name	Title or Registration Number

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**12/05/2024 05:17:23 PM Z ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Molly Chappe
PATENT CENTER #	68249703	FILING DATE	10/19/2023
CUSTOMER #	153511	FIRST NAMED INVENTOR	B. Scott Maxfield
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Richard Galati

Documents

TOTAL DOCUMENTS: 3

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
20241205_RequestChangeInventor_P298048.US.03.pdf	3	Request under Rule 48 correcting inventorship	727 KB
20241205_Revised_ADS_P298048.US.03.pdf	9	Application Data Sheet	696 KB
Warning: This is not a USPTO supplied ADS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
20241205_StatementUnder37CFR3.73c_P298048.US.03.pdf	3	Assignee showing of ownership per 37 CFR 3.73	1057 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
20241205_RequestChangeInventor_P298048.US.03.pdf	28892FD0BC94B4A1D8B3848DE30BD0058A5770BEF296CE4654E4C3DFACE155A6C9A0DAA7F8C6F93949D547501EC0D6EB4D1C61B0BA8F1161173C303F59C0CE1B
20241205_Revised_ADS_P298048.US.03.pdf	8C77137DA49E5D4008F705223EC9335F4915526F8D37ED9055A8BE659A21C163B2211E81F2839C8B15D15DECA0E5B695A9FECDBD91E1900C392754ADAF1EB39B
20241205_StatementUnder37CFR3.73c_P298048.US.03.pdf	6F85E16EC0B2973CF9690011FCDC158B4518AB8FD9453B3DF4989ACE268840D935FB6FD6AE3FDA5E697B9B987D78CC60EBF50B33D4DB3406D2D69D7E42D4A971

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	18/490,715
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	B.	Scott	Maxfield	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Mapleton	State/Province	UT	Country of Residence	US

Mailing Address of Inventor:

Address 1	1262 North 1150 East		
Address 2			
City	Mapleton	State/Province	UT
Postal Code	84664	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	N.	Ryan	Moss	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Mapleton	State/Province	UT	Country of Residence	US

Mailing Address of Inventor:

Address 1	522 North 1400 East		
Address 2			
City	Mapleton	State/Province	UT
Postal Code	84664	Country	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	[redacted]	[redacted]	[redacted]	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	18/490,715
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

City	[redacted]	State/Province	[redacted]	Country of Residence	[redacted]

Mailing Address of Inventor:

Address 1	[redacted]		
Address 2			
City	[redacted]	State/Province	[redacted]
Postal Code	[redacted]	Country	[redacted]

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	153511		
Email Address	ip.docket.slc@dorsey.com	Add Email	Remove Email

Application Information:

Title of the Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT		
Attorney Docket Number	P298048US03 (506318-576)	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	16	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	18/490,715
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	(•) Customer Number	( ) US Patent Practitioner	( ) Limited Recognition (37 CFR 11.9)
Customer Number	153511		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	18324971	2023-05-27
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
18324971	Claims benefit of provisional	63346420	2022-05-27

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	18/490,715
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Remove Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	18/490,715
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	18/490,715
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

(•) Assignee	( ) Legal Representative under 35 U.S.C. 117	( ) Joint Inventor
( ) Person to whom the inventor is obligated to assign.	( ) Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. [X]

Organization Name	LITTLE GIANT LADDER SYSTEMS, LLC		
Mailing Address Information For Applicant:			
Address 1	1198 North Spring Creek Place		
Address 2			
City	Springville	**State/Province**	UT
Country	US	Postal Code	84663
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	18/490,715
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country[i]		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Richard C. Galati/			Date (YYYY-MM-DD)	2024-12-05 ~~2023-10-19~~
First Name	Richard C.	Last Name	Galati	Registration Number	66759

Additional Signature may be generated within this form by selecting the Add button. Add

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	18/490,715
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Doc Code: R48.REQ
Document Description: Request under Rule 48 correcting inventorship

PTO/AIA/48 (11-23)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

REQUEST FOR CORRECTION IN A PATENT APPLICATION RELATING TO INVENTORSHIP OR AN INVENTOR NAME, OR ORDER OF NAMES, OTHER THAN IN A REISSUE APPLICATION (37 CFR 1.48)

Application Number	18/490,715
Filing Date	2023-10-19
First Named Inventor	B. Scott MAXFIELD
Art Unit	TBA
Examiner Name	TBA
Practitioner Docket Number	P298048.US.03_506318-576

To: **Commissioner for Patents**
P.O. Box 1450
Alexandria, VA 22313-1450

Applicant hereby **requests that the inventorship be corrected or changed, or that the name of the inventor or a joint inventor, or the order of the names of joint inventors, be changed,** in the above-identified application. **Note:** 37 CFR 1.48 applies to any request to correct inventorship filed on or after September 16, 2012, regardless of the application filing date. **Do not submit this form after payment of the issue fee or if the application has been patented.** See 37 CFR 1.324 for correction of inventorship in a patent.

Please check the applicable box(es) below.

For a nonprovisional application:

☒ 1. This request is to correct or change the inventorship in a **nonprovisional** application (**under 37 CFR 1.48(a)**) and includes:

☒ An application data sheet (ADS) in accordance with 37 CFR 1.76(c) with the corrected or updated information shown with markings (*e.g.*, underlining for insertions, strikethrough for deletions). See the Manual of Patent Examining Procedure (MPEP) section 601.05(a) for information about filing an ADS in an application filed on/after September 16, 2012. For information about filing a Supplemental ADS in an application filed before September 16, 2012, see MPEP 601.05(b).

☒ The processing fee set forth in 37 CFR 1.17(i). $ 140

☐ An inventor is being added. An inventor's oath or declaration by any actual inventor who has not yet executed an oath or declaration is required (see 37 CFR 1.48(b)). See MPEP 602.01(a) for information about an inventor's oath or declaration for an application filed on/after September 16, 2012 (*e.g.*, form **PTO/AIA/01**). For information about an inventor's oath or declaration for an application filed before September 16, 2012 (*e.g.*, form **PTO/SB/01**), see MPEP 602.01(b).

☐ This request is being filed after the first Office action on the merits has been given or mailed (see 37 CFR 1.48(c) and 1.17(d)). Check one of the following:

☐ This request to correct or change the inventorship is due solely to the cancellation of claims in the application.

OR

☐ The fee set forth in 37 CFR 1.17(d) is due (in addition to the fee set forth in 37 CFR 1.17(i)). $ _____

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0031. Public burden for this form is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **If filing this completed form by mail, send to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/AIA/40 (11-23)
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U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

REQUEST FOR CORRECTION IN A PATENT APPLICATION RELATING TO INVENTORSHIP OR AN INVENTOR NAME, OR ORDER OF NAMES, OTHER THAN IN A REISSUE APPLICATION (37 CFR 1.48)

☐ 2. This request is to correct or update the name of the inventor or a joint inventor, or the order of names of joint inventors, in a **nonprovisional** application **(under 37 CFR 1.48(f))** and includes:

☐ An application data sheet in accordance with 37 CFR 1.76(c) identifying the complete inventive entity, including the corrected or updated name of the inventor, or the new order of names shown with markings (*e.g.*, underlining for insertions, strikethrough for deletions). See the MPEP 601.05(a) for information about filing an ADS in an application filed on/after September 16, 2012. For information about filing a Supplemental ADS in an application filed before September 16, 2012, see MPEP 601.05(b).

☐ The processing fee set forth in 37 CFR 1.17(i). $ _____

For a provisional application:

☐ This request is to change or correct the inventorship, or correct or update the name of the inventor or a joint inventor, in a **provisional** application **(under 37 CFR 1.48(d))** and includes:

☐ **Attached hereto** is a document that is signed by a party set forth in 37 CFR 1.33(b) and identifies each inventor by his or her legal name, in the preferred order. Note: the document may be an application data sheet in accordance with 37 CFR 1.76(c) that identifies the changes with markings (underlining for insertions, strikethrough for deletions).

☐ The processing fee set forth in 37 CFR 1.17(q). $ _____

Fee Payment Information:

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

■ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 506181.

☐ Payment made via USPTO patent electronic filing system.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ Applicant*

■ attorney or agent of record
Registration number 66,759

☐ attorney or agent acting under 37 CFR 1.34
Registration number _____

Signature /Richard C. Galati/

Typed or printed name Richard C. Galati

Date 2024-12-05

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. *Juristic entities must be represented by a patent practitioner (See 37 CFR 1.31, applicable to any paper filed on or after September 16, 2012 that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below**.

■ ** Total of 1 forms are submitted.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013). https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to:

1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;

2) a federal, state, local, or international agency, in response to its request;

3) a contractor of the USPTO having need for the information in order to perform a contract;

4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;

5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;

6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;

7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;

8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));

9) the Office of Personnel Management (OPM) for personnel research purposes; and

10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**12/05/2024 10:44:45 AM Z ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Molly Chappe
PATENT CENTER #	68237691	FILING DATE	10/19/2023
CUSTOMER #	153511	FIRST NAMED INVENTOR	B. Scott Maxfield
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Richard Galati

Documents

TOTAL DOCUMENTS: 3

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
20241205_RequestChangeInventorship_P298048.US.02.pdf	3	Request under Rule 48 correcting inventorship	727 KB
20241205_Revised_ADS_P298048.US.02.pdf	9	Application Data Sheet	555 KB
Warning: This is not a USPTO supplied ADS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
20241205_StatementUnder37CFR3.73c_P298048.US.02.pdf	3	Assignee showing of ownership per 37 CFR 3.73	1056 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
20241205_RequestChangeInventorship_P298048.US.02.pdf	C276CB7911A33948A7DFF6D9F810D911A5568BBC1AA8352F462DD79D6F87F1A7B4FCB88D09503EA0104E5EAFDB187B7F02BF41EFB661288FEBA38F484D12BEC2
20241205_Revised_ADS_P298048.US.02.pdf	F1988DD9E059F364C5575B34558FEA886231D92C1F3C73DFD98569EE4FEDB4B562270E7420A090066F808724C244116A5C459D54ECC8B1C05A718119EA1235D7
20241205_StatementUnder37CFR3.73c_P298048.US.02.pdf	BCB182882AA1240537A89EFF997CEE5237DF07871E0B35613E94D34445BDCEF6B05F6DC9352970A9F4FF8B5FD6B2389905701EB4FCB2F2406474CBAC3F688C31

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**12/05/2024 10:44:45 AM Z ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Molly Chappe
PATENT CENTER #	68237691	AUTHORIZED BY	Richard Galati
CUSTOMER #	153511	FILING DATE	10/19/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	B. Scott Maxfield

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 1083	**E2024B5A45406030**	**Molly Chappe**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1830	PROCESSING FEE, EXCEPT IN PROVISIONAL APPLICATIONS	140.00	1	140.00
			TOTAL AMOUNT:	**$140.00**

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage

submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PGR2026-00044
TRICAM EX1002

PTO/AIA/14 (01-22)
Approved for use through 05/31/2024. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US02 (506318-553)
	Application Number	18/324,971
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	B.	Scott	Maxfield	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	State/Province	Country of Residence
Mapleton	UT	US

Mailing Address of Inventor:

Address 1	1262 North 1150 East
Address 2	
City	Mapleton
State/Province	UT
Postal Code	84664
Country i	US

Inventor 2 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	N.	Ryan	Moss	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	State/Province	Country of Residence
Mapleton	UT	US

Mailing Address of Inventor:

Address 1	522 North 1400 East
Address 2	
City	Mapleton
State/Province	UT
Postal Code	84664
Country i	US

~~Inventor 3~~ — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Steven	S.	Miner	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

PGR2026-00044
TRICAM EX1002

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US02 (506318-553)
	Application Number	18/324,971
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

City	Springville	State/Province	UT	Country of Residence	US

Mailing Address of Inventor:

Address 1	1642 S. Main Street, Apt. 2		
Address 2			
City	Springville	State/Province	UT
Postal Code	84663	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	153511		
Email Address	ip.docket.slc@dorsey.com	Add Email	Remove Email

Application Information:

Title of the Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT		
Attorney Docket Number	P298048US02 (506318-553)	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	16	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US02 (506318-553)
	Application Number	18/324,971
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	153511		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Claims benefit of provisional	63346420	2022-05-27

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[j] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US02 (506318-553)
	Application Number	18/324,971
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US02 (506318-553)
	Application Number	18/324,971
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US02 (506318-553)
	Application Number	18/324,971
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	LITTLE GIANT LADDER SYSTEMS, LLC		
Mailing Address Information For Applicant:			
Address 1	1198 North Spring Creek Place		
Address 2			
City	Springville	**State/Province**	UT
Country	US	Postal Code	84663
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US02 (506318-553)
	Application Number	18/324,971
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	Given Name	Middle Name	Family Name	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		State/Province	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a juristic entity (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, all joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of all joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Richard C. Galati/			Date (YYYY-MM-DD)	2024-12-04 ~~2023-05-27~~
First Name	Richard C.	Last Name	Galati	Registration Number	66759

Additional Signature may be generated within this form by selecting the Add button. Add

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US02 (506318-553)
	Application Number	
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PGR2026-00044
TRICAM EX1002

PTO/AIA/96 (08-12)
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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: LITTLE GIANT LADDER SYSTEMS, LLC

Application No./Patent No.: 18/324,971 Filed/Issue Date: 2023-05-27

Titled: MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

LITTLE GIANT LADDER SYSTEMS, LLC, a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 069318, Frame 0799, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

   1. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

   2. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PGR2026-00044
TRICAM EX1002

PTO/AIA/96 (08-12)
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STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Richard C. Galati/	2024-12-04
Signature	Date
Richard C. Galati	66,759
Printed or Typed Name	Title or Registration Number

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Doc Code: R48.REQ
Document Description: Request under Rule 48 correcting inventorship

PTO/AIA/48 (11-23)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

REQUEST FOR CORRECTION IN A PATENT APPLICATION RELATING TO INVENTORSHIP OR AN INVENTOR NAME, OR ORDER OF NAMES, OTHER THAN IN A REISSUE APPLICATION (37 CFR 1.48)

Application Number	18/324,971
Filing Date	2023-05-27
First Named Inventor	B. Scott MAXFIELD
Art Unit	TBA
Examiner Name	TBA
Practitioner Docket Number	P298048.US.02_506318-553

To: **Commissioner for Patents**
P.O. Box 1450
Alexandria, VA 22313-1450

Applicant hereby **requests that the inventorship be corrected or changed, or that the name of the inventor or a joint inventor, or the order of the names of joint inventors, be changed,** in the above-identified application. **Note:** 37 CFR 1.48 applies to any request to correct inventorship filed on or after September 16, 2012, regardless of the application filing date. **Do not submit this form after payment of the issue fee or if the application has been patented.** See 37 CFR 1.324 for correction of inventorship in a patent.

Please check the applicable box(es) below.

For a nonprovisional application:

☒ 1. This request is to correct or change the inventorship in a **nonprovisional** application (**under 37 CFR 1.48(a)**) and includes:

☒ An application data sheet (ADS) in accordance with 37 CFR 1.76(c) with the corrected or updated information shown with markings (*e.g.*, underlining for insertions, strikethrough for deletions). See the Manual of Patent Examining Procedure (MPEP) section 601.05(a) for information about filing an ADS in an application filed on/after September 16, 2012. For information about filing a Supplemental ADS in an application filed before September 16, 2012, see MPEP 601.05(b).

☒ The processing fee set forth in 37 CFR 1.17(i). $ 140

☐ An inventor is being added. An inventor's oath or declaration by any actual inventor who has not yet executed an oath or declaration is required (see 37 CFR 1.48(b)). See MPEP 602.01(a) for information about an inventor's oath or declaration for an application filed on/after September 16, 2012 (*e.g.*, form **PTO/AIA/01**). For information about an inventor's oath or declaration for an application filed before September 16, 2012 (*e.g.*, form **PTO/SB/01**), see MPEP 602.01(b).

☐ This request is being filed after the first Office action on the merits has been given or mailed (see 37 CFR 1.48(c) and 1.17(d)). Check one of the following:

☐ This request to correct or change the inventorship is due solely to the cancellation of claims in the application.

OR

☐ The fee set forth in 37 CFR 1.17(d) is due (in addition to the fee set forth in 37 CFR 1.17(i)). $ _____

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0031. Public burden for this form is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **If filing this completed form by mail, send to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/AIA/40 (11-23)
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U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

REQUEST FOR CORRECTION IN A PATENT APPLICATION RELATING TO INVENTORSHIP OR AN INVENTOR NAME, OR ORDER OF NAMES, OTHER THAN IN A REISSUE APPLICATION (37 CFR 1.48)

☐ 2. This request is to correct or update the name of the inventor or a joint inventor, or the order of names of joint inventors, in a **nonprovisional** application **(under 37 CFR 1.48(f))** and includes:

☐ An application data sheet in accordance with 37 CFR 1.76(c) identifying the complete inventive entity, including the corrected or updated name of the inventor, or the new order of names shown with markings (*e.g.*, underlining for insertions, strikethrough for deletions). See the MPEP 601.05(a) for information about filing an ADS in an application filed on/after September 16, 2012. For information about filing a Supplemental ADS in an application filed before September 16, 2012, see MPEP 601.05(b).

☐ The processing fee set forth in 37 CFR 1.17(i). $ _____

For a provisional application:

☐ This request is to change or correct the inventorship, or correct or update the name of the inventor or a joint inventor, in a **provisional** application **(under 37 CFR 1.48(d))** and includes:

☐ **Attached hereto** is a document that is signed by a party set forth in 37 CFR 1.33(b) and identifies each inventor by his or her legal name, in the preferred order. Note: the document may be an application data sheet in accordance with 37 CFR 1.76(c) that identifies the changes with markings (underlining for insertions, strikethrough for deletions).

☐ The processing fee set forth in 37 CFR 1.17(q). $ _____

Fee Payment Information:

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

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I am the

☐ Applicant*

■ attorney or agent of record
Registration number 66,759

☐ attorney or agent acting under 37 CFR 1.34
Registration number _____

Signature /Richard C. Galati/

Typed or printed name Richard C. Galati

Date 2024-12-04

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. *Juristic entities must be represented by a patent practitioner (See 37 CFR 1.31, applicable to any paper filed on or after September 16, 2012 that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below**.

■ ** Total of 1 forms are submitted.

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6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;

7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;

8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));

9) the Office of Personnel Management (OPM) for personnel research purposes; and

10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

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Doc Code: ECOMM.AUTH/ECOMM.WTDW
Doc Description: Internet Communications Authorization/Internet Communications Authorization Withdrawal

PTO/SB/439 (11-15)

AUTHORIZATION FOR INTERNET COMMUNICATIONS IN A PATENT APPLICATION OR REQUEST TO WITHDRAW AUTHORIZATION FOR INTERNET COMMUNICATIONS		
	Application No.	18/490,715
	Filing Date	2023-10-19
	First Named Inventor	B. Scott Maxfield
	Art Unit	3634
	Examiner Name	SHIREF M MEKHAEIL
	Practitioner Docket No.	P298048.US.03_506318-576

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I. To authorize permission for Internet Communications.

☒ Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned and practitioners in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via video conferencing, instant messaging, or electronic mail. I understand that a copy of these communications will be made of record in the application file. (MPEP 502.03)

II. To withdraw authorization for Internet Communications.

☐ The authorization given on _____, to the USPTO to communicate with the undersigned and any practitioner in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via Internet communications such as video conferencing, instant messaging, or electronic mail is hereby withdrawn. I understand that the withdrawal is effective when approved rather than when received.

I am the

☐ applicant.

☒ attorney or agent of record. Registration number 66,759.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Richard C. Galati/	2024-11-04
Signature	Date
Richard C. Galati	(801) 933-4084
Typed or printed name	Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Juristic entities must be represented by a patent practitioner (see 37 CFR 1.31, which is applicable to any paper filed on or after September 16, 2012, that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below*.

☐ * Total of _____ forms are submitted.

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**11/04/2024 11:44:52 AM Z ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Molly Chappe
PATENT CENTER #	67826903	FILING DATE	10/19/2023
CUSTOMER #	153511	FIRST NAMED INVENTOR	B. Scott Maxfield
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Richard Galati

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
20241104_ICAF_P298048.US.03.pdf	2	Internet Communications Authorization	504 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
20241104_ICAF_P298048.US.03.pdf	068E2CEB7DFDEF67D668166CD92C446F4BE3062D535F2FE30EF4EA4898B58D0AA735A0C7FAE1396A61E15E47E21A73C885261FDCCAA8F6CBDF397634DCFCFA49

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/490,715	10/19/2023	B. Scott Maxfield	P298048US03 (506318-576)	5970

153511 7590 09/05/2024

Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176

EXAMINER	
MEKHAEIL, SHIREF M	

ART UNIT	PAPER NUMBER
3634	

NOTIFICATION DATE	DELIVERY MODE
09/05/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

davis.ashley@dorsey.com
ip.docket.slc@dorsey.com
mayo.samantha@dorsey.com

Office Action Summary	Application No. 18/490,715	Applicant(s) Maxfield et al.	
	Examiner SHIREF M MEKHAEIL	Art Unit 3634	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 07/25/2024.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) 12-18 is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-11 and 19-20 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/25/2024 has been entered. Claims 1, 10 and 9 have been amended. Claims 12-18 remain withdrawn; therefore, claims 1-11 and 19--20 remain pending in the application. Previous *35 USC § 112* rejections have been withdrawn in light of the applicant's amendments to the claims.

Claim Objections

Claims 9 and 10 are objected to because of the following informalities:

- Claim 9 recites "the second button body defines a surface facing axially inward toward the pair of hinges"; it appears that "a surface facing axially inward" is the same as "a first axially-facing surface" established in claim 1. Examiner recommends referring back to "*the* first axially-facing surface".

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TRICAM EX1002

- Claim 10 recites "an object hanging on the second button body"; it appears to be the same as "an object hanging from the second button body" established in claim 1. Examiner recommends referring back to "*the* object hanging from the second button body".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis (i.e., changing from AIA to pre-AIA) for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11 are rejected under 35 U.S.C. 103 as being unpatentable over Moss, US (2009/0229918) in view of Ng, US (11191373).

In regards to claim 1 Moss discloses:

A ladder (ladder; fig. 21 upper portion of ladder shown onto which hinge assembly 220 is affixed; unnumbered)**, comprising:**

a first assembly (right hand side assembly; figs. 20, 21; see annotated drawings; similar to what is shown in fig.1 with a different top cap and hinge assembly pointed to just for reference)**, including:**

a first pair of rails (rails between which right hand side rungs extends; see annotated drawings and similar to what is shown in fig.1 with a different top and hinge assembly pointed to just for reference) **spaced apart from each other;**

a first set of rungs (see annotated drawings; similar to what is shown in fig.1 with a different top cap and hinge assembly pointed to just for reference) **coupled to and extending between the first pair of rails;**

a first pair of hinge portions (right hand side hinge portions pointed to in annotated drawings of fig.20) **coupled to the first pair of rails** (fig. 21)**;**

a second assembly (left hand side assembly; figs. 20, 21; see annotated drawings; similar to what is shown in fig.1 with a different top and hinge assembly pointed to just for reference)**, including:**

a second pair of rails spaced apart from each other (rails between which left hand side rungs extends; see annotated drawings and similar to what is shown in fig.1 with a different top cap and hinge assembly pointed to just for reference)**;**

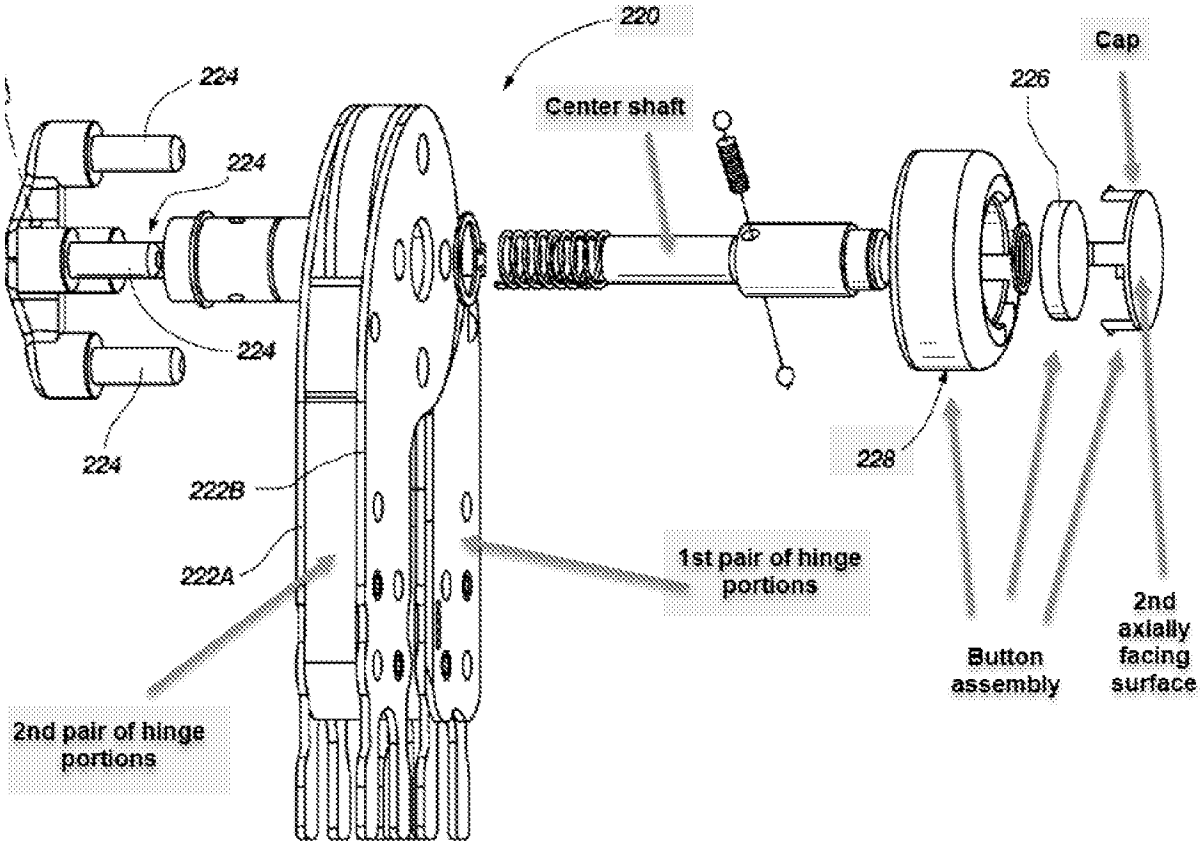
a second pair of hinge portions (left hand side hinge portions pointed to in annotated drawings of fig.20) **coupled to the second pair of rails** (fig. 21)**;**

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 (220;

fig. 20) **rotatable about a pivot axis** (axis passing through major longitudinal length of center shaft; see annotated drawings below)**; and**

a pair of hinge button assemblies (hinge button assembly shown in fig. 20 referring to one side of the ladder with the second of the pair on the other side between opposing pair of rails)**, wherein each hinge button assembly of the pair of hinge button assemblies includes:**

a first button body (228, and unnumbered cap shown in annotated drawings) **coupled with a hinge of the pair of hinges** (as shown in fig. 20)**.**



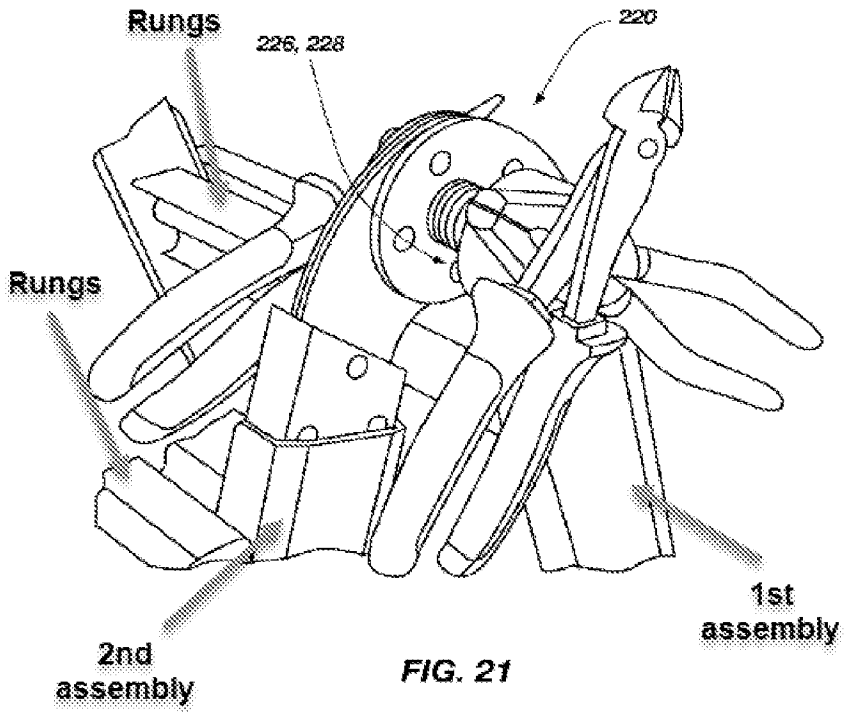
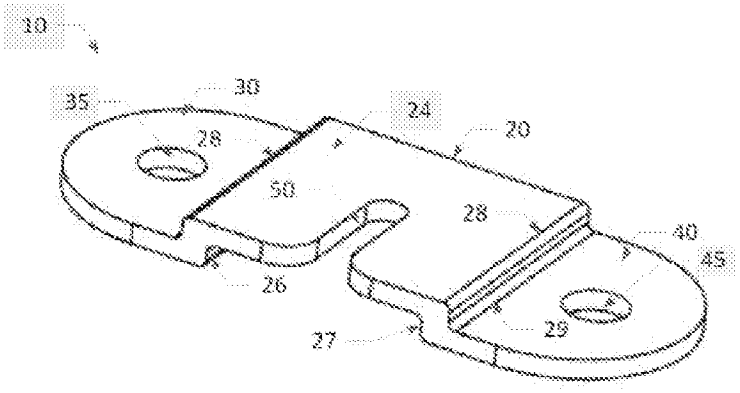


FIG. 21

In regards to claim 1 Moss does not disclose a second button body.

Ng teaches **a second button body** (10; fig. 1).



Therefore, before the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to substitute one object hanging device i.e., magnet 226 of moss shown in fig. 20 and utilized to hang objects as shown in fig. 21, with another object hanging device i.e., 10 as taught

by Ng; fig. 1; by attaching it via apertures 35 and 45 of bracket 10 as intended and described in Ng reference, to the cap of the button assembly of Moss; for the predictable result with reasonable expectation of success and following the teaching of Ng i.e., to provide for hanging articles, where one of ordinary skill in the art would recognize that depending on the objects needed when a worker is at the top of the ladder, some object may not be metallic and hence the magnet of Moss would not serve the intended purpose, where the object hanging device of Ng would serve for hanging smaller non-metallic object. One 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, phone clip, a clip attached to a tool, ID card etc. as non-limiting examples. The teaching of the bracket (second button body) of Ng onto the first button body of Moss consequently teaches: **the second button body** (10; Ng) **fixed to and movable with the first button body** (228, and unnumbered cap shown in annotated drawings; by screws through apertures 35, 45 of 10; Ng) **in response to movement of the first button body relative to the hinge, the second button body having a first axially-facing surface** (lower surface 25 of bracket 10; Ng; fig. 3) **being partially spaced axially outward from a second axially-facing surface** (outer right hand side facing surface of cap of the button assembly of moss; see annotated drawings above) **of the first button body by at least one gap** (gap resulting from the raised center portion 20 of bracket 10; Ng; gap created between surface 25 of Ng and second axially facing surface of first button body) **configured to receive an object hanging from the second**

button body (such as a clip, a zip tie, ID card, phone clip, etc. as non-limiting examples)**, wherein the first axially-facing surface and the second axially-facing surface face each other** (subsequently as a result of attaching bracket 10 of Ng onto cap of Moss; 25 of Ng facing outer surface of cap).

In regards to claim 2; Note: that Moss reference describes its hinge assembly 220 as being "*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*" as stated in paragraph [0063]. Note also that the hinge assembly of Moss, the details of which are shown in fig. 20 reflects the same structure as Boothe to support the limitations of claim 2. Hence, Moss via Boothe (incorporated) discloses:

the pair of hinge button assemblies (shown in figs. 1-5; Boothe) is movable between a first axial position along the pivot axis (along the central axis through the shaft member 80; first position when spring 82 is compressed; as shown in fig. 4B; Boothe) and a second axial position along the pivot axis (when spring 82 is not compressed and button 88 is retracted as shown in fig. 4A; Boothe); the first assembly is rotatable relative to the second assembly while the pair of hinge button assemblies is in the first axial position (as pins 70/72 are retracted; fig. 4B; Boothe); 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 (as pins 70/72 are inserted into openings 24/25 or 26/27 as shown in fig. 2; Boothe); each hinge button assembly further comprises a pivot pin (80) coupled to the first button body (88), a bracket (74) coupled to the pivot pin (as

shown in fig. 3; Boothe), and at least one locking pin (70/72) coupled to the bracket; the first pair of hinge portions includes a first opening (24/25 and 26/27 through which 70/72 passes in 12; fig. 1; Boothe) and the second pair of hinge portions includes a second opening (24/25 and 26/27 through which 70/72 passes in 14; fig. 1; Boothe); 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 (as shown in fig. 4A; Boothe); 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 (as shown in fig. 4B; Boothe).

In regards to claim 3 Moss as modified by Ng teaches the second button body comprises a substantially flat outward-facing surface (upper surface 24; Ng) parallel to the first button body (once taught onto outer surface of cap of Moss as shown in annotated drawings above).

In regards to claim 4 Moss as modified by Ng do not teaches the second button body is integrally formed with the first button body. However, it would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to have the second button body integrally formed with the first button body, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. Howard v. Detroit Stove Works, 150 U.S. 164 (1893). One of ordinary skill in the art before the effective filing date of the claimed invention would have found that having the second button body integrally formed with the

first button body would have yielded the predictable result of a more study structure less prone to breaking, cracking with repetitive use over time in a work environment.

In regards to claim 5 Moss as modified by Ng teaches the at least one gap forms a slot elongated along a direction perpendicular to the pivot axis (when bracket 10 of Ng is taught onto the outer surface of cap of moss; gap formed as a result of central raised section 20 of bracket 10 is elongated along a direction perpendicular to the pivot axis).

In regards to claim 6 Moss as modified by Ng teaches the at least one gap includes two open ends (either two ends at 26 and 27 or top and bottom ends of notched opening 50; Ng).

In regards to claim 7 Moss as modified by Ng teaches the at least one gap at least opens upward (when 10; Ng is mounted onto cap of Moss) while the pair of hinges (220) is positioned over the first pair of rails and the second pair of rails (as shown in fig. 21; Moss).

In regards to claim 8 Moss as modified by Ng teaches the second button body is directly coupled to the first button body at opposite ends of the second button body (subsequently since apertures 35, 45; Ng being on opposite ends of 10).

In regards to claim 9 Moss as modified by Ng teaches the second button body defines a surface facing (lower surface 25 of bracket 10; Ng; fig. 3) axially inward toward the pair of hinges and substantially parallel to the first button body

(as a result of attaching bracket 10 of Ng onto cap of Moss; 25 of Ng facing outer surface of cap).

In regards to claim 10 Moss as modified by Ng teaches the second button body is configured to support an object hanging on the second button body while at least partially positioned in the at least one gap (such as a clip, a zip tie, ID card, phone clip, etc. as non-limiting examples).

In regards to claim 11 Ng teaches the second button body comprises a plate (as shown in fig. 1).

Claims 19-20 are rejected under 35 U.S.C. 103 as being unpatentable over Moss, US (2009/0229918) in view of Ng, US (11191373).

In regards to claim 1 Moss discloses:

A ladder (ladder; fig. 21 upper portion of ladder shown onto which hinge assembly 220 is affixed; unnumbered)**, comprising: a first assembly** (right hand side assembly; figs. 20, 21; see annotated drawings; similar to what is shown in fig.1 with a different top cap and hinge assembly pointed to just for reference)**, including:**

a first pair of rails spaced apart from each other (rails between which right hand side rungs extends; see annotated drawings and similar to what is shown in fig.1 with a different top cap and hinge assembly pointed to just for reference)**;**

a first set of rungs coupled to and extending between the first pair of rails (see annotated drawings; similar to what is shown in fig.1 with a different top and hinge assembly pointed to just for reference)**;**

a first pair of hinge portions (right hand side hinge portions pointed to in annotated drawings of fig.20) **coupled to the first pair of rails (fig. 21) and defining a**

first opening (24/25 and 26/27 through which 70/72 passes in 12; fig. 1; Boothe; incorporated in its entirety in Moss reference as stated in paragraph [0063]; Moss)**;**

a second assembly (left hand side assembly; figs. 20, 21; see annotated drawings; similar to what is shown in fig.1 with a different top and hinge assembly pointed to just for reference)**, including:**

a second pair of rails spaced apart from each other (rails between which left hand side rungs extends; see annotated drawings and similar to what is shown in fig.1 with a different top cap and hinge assembly pointed to just for reference)**;**

a second pair of hinge portions (left hand side hinge portions pointed to in annotated drawings of fig.20) **coupled to the second pair of rails** (fig. 21) **and defining a second opening** (24/25 and 26/27 through which 70/72 passes in 14; fig. 1; Boothe; incorporated in its entirety in Moss reference as stated in paragraph [0063]; Moss)**;**

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 (axis passing through major longitudinal length of center shaft; see annotated drawings below)**; and**

a pair of retainers (pair of assemblies 228, 224 on each side of the ladder between each pair of rails)**, each retainer of the pair of retainers being movable between a respective first axial position** (as pins 70/72 are retracted; fig. 4B; Boothe) **along the pivot axis** (central axis passing through 80) **and a respective second axial position along the pivot axis** (as pins 70/72 are inserted into openings 24/25 or 26/27 as shown in fig. 2; Boothe)**;**

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wherein each retainer of the pair of retainers includes:

a body (cap; Moss) **having a body surface** (surface cap of button 228; Moss) **facing axially outward from the pair of hinges, the body surface having an entirely flat portion** (flat surface of cap shown in annotated drawings of fig. 20; Moss)**;**

a pivot pin (see annotated drawings; Moss) **coupled to the body on a side of the body opposite the plate structure** (opposite cap of button assembly 228; Moss)**;**

a bracket (see annotated drawings; Moss; equivalent to 74; Boothe) **coupled to the pivot pin** (fig. 20; Moss)**; and**

at least one locking pin (224; Moss equivalent to 70/72; Boothe) **coupled to the bracket** (fig. 20; Moss)**;**

wherein the first assembly is rotatable relative to the second assembly while the pair of retainers is in the first axial positions (along the central axis through the shaft member 80; first position when spring 82 is compressed; as shown in fig. 4B; Boothe) **and the at least one locking pin is removed from the first opening and from the second opening** (as shown in fig. 4B; Boothe)**; 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 (when spring 82 is not compressed and button 88 is retracted as shown in fig. 4A; Boothe) **and the at least one locking pin is**

positioned in the first opening and in the second opening (as shown in fig. 4A; Boothe)**.**

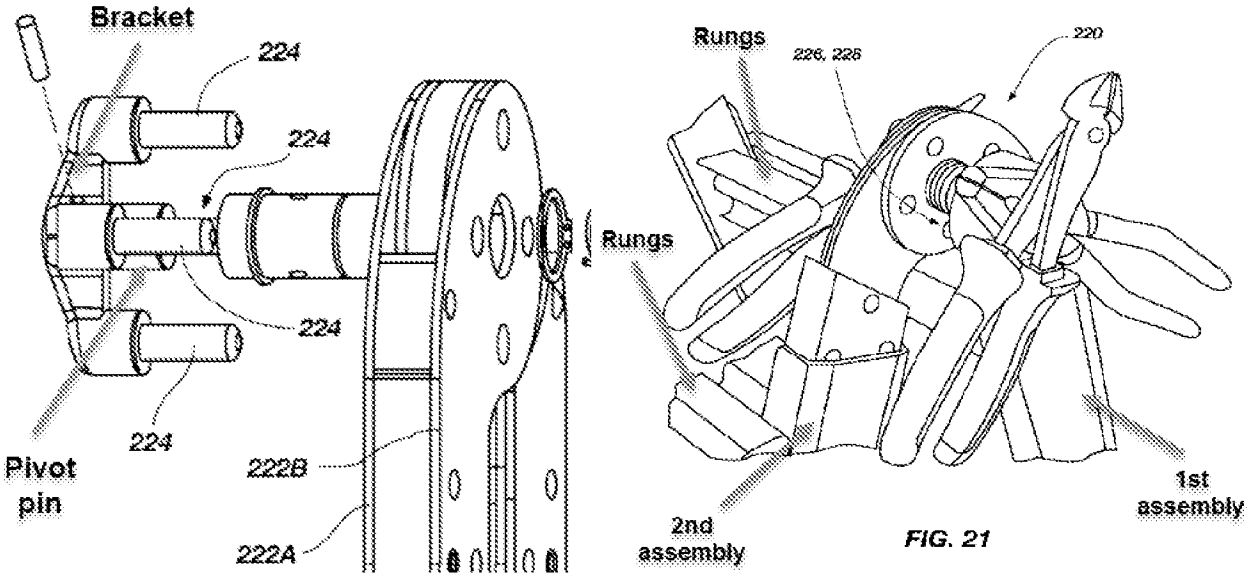
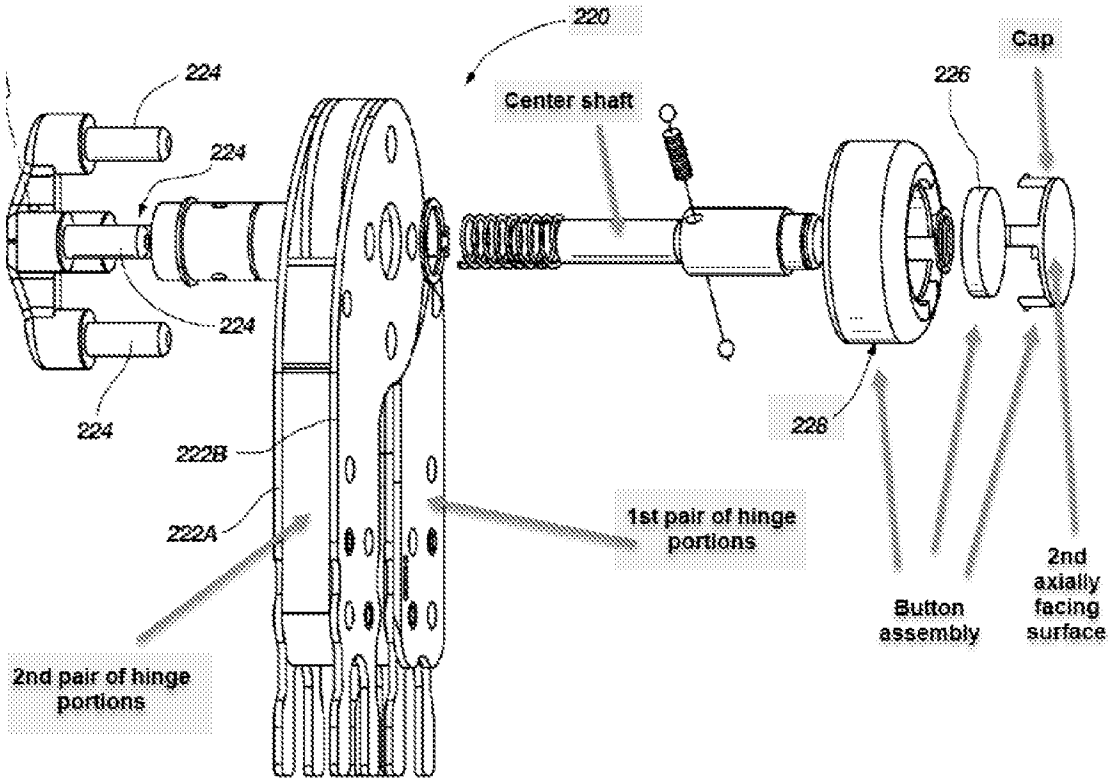
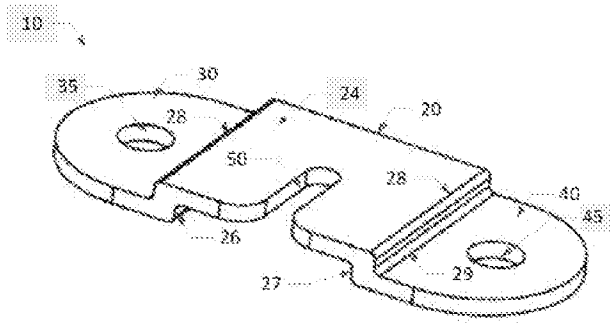


FIG. 21



In regards to claim 19 Moss does not disclose a plate structure spaced axially outward from the body surface by at least one elongated gap.

Ng teaches **a plate structure (10; fig. 1)**.



Therefore, before the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to substitute one object hanging device i.e., magnet 226 of moss shown in fig. 20 and utilized to hang objects as shown in fig. 21, with another object hanging device i.e., 10 as taught by Ng; fig. 1; by attaching it via apertures 35 and 45 of bracket 10 as intended and described in Ng reference, to the cap of the button assembly of Moss; for the predictable result with reasonable expectation of success and following the teaching of Ng i.e., to provide for hanging articles, where one of ordinary skill in the art would recognize that depending on the objects needed when a worker is at the top of the ladder, some object may not be metallic and hence the magnet of Moss would not serve the intended purpose, where the object hanging device of Ng would serve for hanging smaller non-metallic object. One 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, phone clip, a clip attached to a tool, ID card etc. as non-limiting examples. The teaching of the bracket (second button body) of Ng onto the first button body of Moss consequently teaches: **the plate structure formed on at least two ends**

of the plate structure on opposite sides of the entirely flat portion of the body surface (by attaching bracket 10 Ng via apertures 35 and 45 of the two ends of bracket 10 of Ng to the cap of the button assembly of Moss**), wherein the plate structure is spaced axially outward from the body surface by at least one elongated gap** (gap resulting from the raised center portion 20 of bracket 10; Ng; gap created between surface 25 of Ng and second axially facing surface of first button body)**, wherein the at least one elongated gap is parallel to the entirely flat portion of the body surface** (as a result of attaching bracket 10 of Ng onto cap of Moss; 25 of Ng facing outer surface of cap) **and configured to receive and support a tool hanging from the plate structure** (such as a clip, a zip tie, ID card, phone clip, etc. as non-limiting examples)**.**

Moss as modified by Ng do not teaches the plate structure integrally formed with the body. However, it would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to have the second button body integrally formed with the first button body, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. Howard v. Detroit Stove Works, 150 U.S. 164 (1893). One of ordinary skill in the art before the effective filing date of the claimed invention would have found that having the second button body integrally formed with the first button body would have yielded the predictable result of a more study structure less prone to breaking, cracking with repetitive use over time in a work environment.

In regards to claim 20 Moss 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 (when 12 rotates to be substantially coplanar and aligned with 14 and a pair of apertures 24/25, 26/27 in 12 are aligned with apertures in 14).

Response to Arguments

Applicant's arguments against reference Lee, US (2003/0037412) have been considered but are moot because the new ground of rejection does not rely on any reference applied in the prior rejection of record for any teaching or matter specifically challenged in the argument. Applicant's arguments against the previously presented Official Notice are also moot, since the current office action does not rely on any Official Notices.

The current rejection utilizes newly submitted reference Moss, US (2009/0229918) in view of previously used teaching reference Ng, US (11191373). Applicant arguments against the combination or art stating: "*Applicant respectfully traverses and rebuts the Examiner's rationales attempting to support the obviousness of applying the teachings of the Ng reference to modify the Lee ladder to attach tools to the push part 508 of Lee. Applicant respectfully submits that the combination of Lee and Ng is improper because the Office Action relies on information gleaned solely from Applicant's specification. MPEP §2142 states that "impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art" (emphasis added). "'Any judgement on obviousness is in a sense necessarily a reconstruction based on hindsight reasoning, but so long as it takes into account only knowledge which was within the level of*

ordinary skill in the art at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper"' (MPEP § 2145(X)(A), quoting In re McLaughlin, 443 F.2d 1392, 1395 (CCPA 1971), (emphasis added) … The Federal Circuit has explained, "Objective indicia "'may often be the most probative and cogent evidence" of nonobviousness.' Objective indicia are essential safeguards that protect against hindsight bias. The objective indicia analysis is, therefore, a fundamental part of the overall § 103 obviousness inquiry." Liqwd, Inc. v. L'Oreal USA, Inc., 941 F.3d 1133 (Fed Cir. 2019) (citations omitted). As a result, the Office must consider all such evidence of objective indicia and determine the weight to give it "enroute to a determination of obviousness." Id. (quoting Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 1538 (Fed. Cir. 1983)); see also MPEP §2141(II)."; examiner presents that as mentioned above, applicant's arguments as it pertains to the teaching of Ng onto base reference Lee are moot, since reference Lee is no longer utilized in the current invention.

Applicant further supports his arguments by referencing the declarations under 37 C.F.R. §1.132 from three experts in the field of ladders and related equipment, namely, David Smith, N. Ryan Moss, and Paul B. Junius. In view of said declarations, applicant presents that "*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."; examiner presents that said decelerations has erred in stating 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*"; since as clearly presented reference Moss indeed discloses a tool hanging device, hence it is presented that: before the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to substitute one object hanging device i.e., magnet 226 of moss shown in fig. 20 and utilized to hang objects as shown in fig. 21, with another object hanging device i.e., 10 as taught by Ng; fig. 1; by attaching it via apertures 35 and 45 of bracket 10 as intended and described in Ng reference, to the cap of the button assembly of Moss; for the predictable result with reasonable expectation of success and following the teaching of Ng i.e., to provide for hanging articles, where one of ordinary skill in the art would recognize that depending on the objects needed when a worker is at the top of the ladder, some object may not be metallic and hence the magnet of Moss would not serve the intended purpose, where the object hanging device of Ng would serve for hanging smaller non-metallic object.

Moreover, examiner has fulfilled the requirements for Substitution of One Known Element for Another: Namely, (a) examiner highlighted the device which differed from the claimed device i.e., the magnet versus the plate hanger. (b) examine presented via

reference (Ng) the component and its function, and that the function was known in the art. (c) examiner articulated why one of ordinary skill in the art could have substituted one known element for another, and the results of the substitution would have been predictable.

Furthermore, in regards to declaration stating the "*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*"; examiner presents that: (a) The failure to solve a long-felt need may be due to factors such as lack of interest or lack of appreciation of an invention's potential or marketability rather than want of technical know-how. Scully Signal Co. v. Electronics Corp. of America, 570 F.2d 355, 196 USPQ 657 (1st. Cir. 1977). MPEP 716.04 III, and (b) The existence of a prior art reference showing a solution to the problem is evidence that there is no long-felt need. The mere passage of time is insufficient to demonstrate nonobviousness. MPEP 716.04 & MPEP 2144.05(III)(B). In conclusion, it is presented that as detailed above the newly submitted references reads on the claim language as recited.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please refer to PTO-892 form for list of cited references.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHIREF M MEKHAEIL whose telephone number is (571)270-5334. The examiner can normally be reached 10-7 Mon-Fri.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an

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interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Cahn can be reached on 571-270-5616. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S.M.M/
Examiner, Art Unit 3634

/GREGORY J STRIMBU/
Primary Examiner, Art Unit 3634

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Notice of References Cited	Application/Control No. 18/490,715	Applicant(s)/Patent Under Reexamination Maxfield et al.	
	Examiner SHIREF M MEKHAEIL	Art Unit 3634	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-20090229918-A1	2009-09-17	Moss; N. Ryan	E06C1/30	182/180.1
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/490,715	Maxfield et al.
	Examiner	Art Unit
	SHIREF M MEKHAEIL	3634

CPC - Searched*		
Symbol	Date	Examiner
E06C 1/ 32, 38, 383 ; 7/ 082, 14, 50 ; 9/ 085	12/02/2023	SM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor name search	12/02/2023	SM
Assignee name search	12/02/2023	SM
Forward and backward citation search of relevant art	12/02/2023	SM
More like this search	12/02/2023	SM
Consulted CAT tool and global dossier	12/02/2023	SM
Class/subclass and text search	12/02/2023	SM
Updated	03/19/2024	SM
Updated	08/23/2024	SM

/S.M.M/ Examiner, Art Unit 3634	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/490,715	Maxfield et al.
	Examiner	Art Unit
	SHIREF M MEKHAEIL	3634

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/S.M.M/ Examiner, Art Unit 3634	

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	25	((("LITTLE") near3 ("GIANT") near3 ("LADDER") near3 ("SYSTEMS") near3 ("LLC"))).AS,AANM.	(USPAT)	OR	ON	ON	2023/11/30 06:24 PM
L2	458	((("MAXFIELD") near3 ("B")) OR (("MOSS") near3 ("N")) OR (("MINER") near3 ("Steven"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2023/11/30 06:25 PM
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L7	1032	E06C1/383.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:56 PM
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L19	69	("4403373" | "4407045" | "4566150" | "4697305" | "4773503" | "4890950" | "5353892" | "5620272" | "5954157" | "5992566").pn. OR ("6343406").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:02 PM

L20	67	("4290168" | "4407045" | "4602889" | "4614452" | "5219240" | "5265969" | "5353892").pn. OR ("5620272").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:02 PM
L21	71	("0470516" | "0501406" | "0697294" | "0745320" | "0796157" | "1461952" | "1633902" | "1936508" | "2210803" | "2647676" | "2880920" | "3692143" | "3811151" | "4182431" | "4210224" | "4216844" | "4371055" | "4376470" | "4403373" | "4407045" | "4566150").pn. OR ("4697305").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:04 PM
L22	58	("4152810" | "4216844" | "4377020" | "4407045" | "4543007" | "4566150").pn. OR ("4666328").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:05 PM
L23	66	("3731342" | "3924775" | "4202015" | "4666328" | "4718127" | "4718672" | "4832299" | "5428350" | "5687939" | "5713633" | "5805415" | "5813914" | "6019332" | "6068101" | "6112370" | "6128184" | "6135884" | "6164645" | "6254481" | "6266236" | "6357712" | "6475087" | "6512670" | "6532627" | "6590547" | "6623006" | "6644611" | "6665175" | "6682161" | "6711780" | "6758454" | "6997810" | "7059693" | "7147191" | "7267613" | "7283355" | "20020139822" | "20030027627" | "20040018870" | "20050056750" | "20050059496" | "20050121578" | "20060175499").pn. OR ("7540806").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:22 PM

L24	59	("0181305" | "1936508" | "3430972" | "3692143" | "3912043" | "4182431" | "4371055" | "4376470" | "4483415" | "4520896" | "4666328" | "4697305" | "4770559" | "4890950" | "4951780" | "4989692" | "5142739" | "5620272" | "5873433" | "5954157" | "5971102" | "6000497" | "6343406" | "6443261" | "6536557" | "6711780" | "6857503" | "7007344" | "7032711" | "7047597" | "7140072" | "7264082" | "7306075" | "7364017" | "7370726" | "7424933" | "8262124" | "8651259" | "10138680" | "10233692" | "10648234" | "10718160" | "20030012595" | "20030217888" | "20040129497" | "20090078503" | "20140251729" | "20150068842" | "20160153231" | "20170145745" | "20170356244" | "20190136625" | "20190145170" | "20190234144" | "20190368271" | "20190376343").pn. OR ("11505994").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:24 PM
L25	45	("1887878" | "1894489" | "2456054" | "2476427" | "2517125" | "2923565" | "3018122" | "3504569" | "3693469" | "3693770" | "3943794" | "4222473" | "4249799" | "4269422" | "4604910" | "4666328" | "4679756" | "4824278" | "5235867" | "5279387" | "5302039" | "5337869" | "5482144" | "5689999" | "5961220" | "6065897" | "6086284" | "6092778").pn. OR ("6244779").urpn. AND (PGPB | USPT |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:26 PM

		USOC).dbnm.					
L26	76	("0437936" | "3420333" | "3692143" | "3729063" | "3811151" | "3849834" | "D248777" | "4152810" | "4155422" | "4182431" | "4202428" | "4210224" | "4256200" | "4284171" | "4376470" | "4469193" | "4493392" | "4502566" | "4519478" | "4540306" | "4566150" | "4577986" | "4666328" | "4697305" | "4770559" | "4773503" | "4796727" | "4924970" | "4926964" | "4934485" | "D309502" | "4974701" | "5000289" | "5062179" | "5074377" | "5123768" | "5163532" | "5228535" | "5279387" | "5350038" | "5358352" | "5520474" | "5620272" | "5743355" | "5775460" | "5992566" | "6086284" | "6115886" | "6220389" | "6237718" | "6330733" | "6343406").pn. OR ("7424933").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:27 PM
L27	34	(Artificial Intelligence) More like doc: US-7424933-B2 Text: (US-20040129497-A1 OR US-20090200113-A1 OR US-7364017-B2 OR US-8376087-B2 OR JP-2006505726-A OR US-20120160609-A1 OR AU-2003290755-A1 OR WO-2004044365-A2 OR EP-1573166-A2 OR CA-2508885-C OR US-20040140156-A1 OR AU-2003290755-B2 OR US-8069948-B2 OR EP-1573166-B1 OR CA-2508885-A1 OR US-20080257645-A1 OR EP-1473432-A1 OR NZ-540647-A OR CA-3172553-A1 OR CA-2465252-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/01 03:27 PM
L28	20	("4645371" | "4770559" | "4805737" | "4890950"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:34 PM

		| "4925329" | "4928792" | "5022118" | "5026198" | "5058239" | "5353892").pn. OR ("6330733").urpn. AND (PGPB | USPT | USOC).dbnm.					
L29	40	(Artificial Intelligence) More like doc: US-6330733-B1 Text: (EP-1020653-B1 OR EP-1020653-A1 OR DE-19901125-C1 OR DE-3937535-C1 OR US-20040108764-A1 OR DE-1938696-A1 OR DE-19633761-A1 OR DE-19633761-C2 OR US-3955240-A OR US-4543006-A OR US-3643292-A OR KR-890003205-Y1 OR NL-2013148-A OR CN-216767249-U OR CZ-327496-A3 OR US-5197817-A OR PT-1020653-E OR US-6045189-A OR US-4612706-A OR US-20060005397-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/01 03:34 PM
L30	48	("4339844" | "4403373" | "4540306" | "4666327").pn. OR ("4890950").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:00 PM
L31	37	("2502641" | "3955240" | "4474264" | "4540306" | "4543006" | "4611945" | "4645371" | "4770559").pn. OR ("4824278").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:04 PM
L32	50	("3517965" | "4087885" | "4447033" | "4474264" | "4697305").pn. OR ("5954157").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:08 PM
L33	16248	E06C$/$.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:10 PM
L34	32	33 AND bracket WITH hold$4 WITH (clip (measuring ADJ tape)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:11 PM

		(screw ADJ drive))					
L35	5	("3029054").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:12 PM
L36	40	("0956835" | "1551243" | "2226228" | "2645443" | "2674427" | "2675982" | "2703215" | "2837306" | "2855170" | "3029054" | "3154282" | "3278148" | "3420486" | "4560127" | "4979710" | "4991808" | "5079795" | "5099952" | "5342008" | "6009976" | "6105911" | "8602365" | "8925683" | "9249003" | "10119332" | "20090147527" | "20140319297").pn. OR ("11661794").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L37	68	33 AND bracket WITH hold$4 WITH (tool)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L38	55	33 AND bracket WITH hold$4 WITH (object)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L39	9	33 AND bracket WITH hold$4 near2 (object)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L40	22	33 AND (bracket plate) WITH (protrud$4 gap) WITH hold$4	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:18 PM
L41	67	(U$2bracket (U ADJ shape$1 ADJ bracket)) WITH hold$4 WITH (clip (measuring ADJ tape) (screw ADJ drive))	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:23 PM
L42	25995	clip ADJ holder WITH (measuring ADJ tape) (screw ADJ drive)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:29 PM
L43	3	clip ADJ holder WITH (measuring ADJ tape)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:29 PM
L44	121	clip ADJ holder WITH (tool)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:29 PM
L45	5	("2003/0159304").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:30 PM
L46	7	("5388741" | "6269993" | "7117566" | "7216788" | "9173475" | "20080283563" | "20200253364").pn. OR ("11559131").urpn. AND (PGPB | USPT |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:30 PM

		USOC).dbnm.					
L47	14	("1519380" | "1980678" | "2995792" | "4757927" | "5026016" | "5054170" | "5201858" | "5622296" | "6233788").pn. OR ("7117566").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:31 PM
L48	6	("2008/0283563").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:32 PM
L49	17	("D196542" | "D221123" | "4598027" | "4821933" | "5213240" | "5388741" | "9173475" | "9248565" | "10182641" | "20030074803" | "20050284909" | "20080283563" | "20120260513" | "20180184791").pn. OR ("10470556").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:33 PM
L50	3	("2018/0184791").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:34 PM
L51	138	("1519380" | "3743147" | "3797717" | "3878589" | "4419794" | "4587818" | "4605335" | "4619020" | "4676420" | "4718586" | "4754528" | "4757927" | "4821934").pn. OR ("5054170").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:36 PM
L52	102	("0D29072" | "0D31665" | "0795553" | "0895846" | "1338154" | "D139216" | "2443149" | "2639109" | "D197188" | "3300173" | "3529799" | "3878589" | "D235308" | "3912216" | "D239593" | "D243190" | "D244508" | "D246346" | "4132335" | "D252851" | "4171117" | "D262688" | "4419794" | "D272044" | "D272211" | "4458872" | "D295369" | "D298604" | "D303716" | "D310479" | "D313740" | "5014892" | "5054170"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:38 PM

		| "D324991" | "D329192" | "5398906" | "5484126" | "5549234" | "5605313" | "5687942" | "D5850954" | "D408267" | "D409079" | "D409663" | "D410032" | "D414207" | "D428058" | "6142892" | "D438536" | "D452081" | "D454591" | "D464993" | "D465147" | "D468357" | "D492187" | "6866940" | "D507959" | "D511088" | "D531223" | "D547637" | "D560221" | "D567740" | "D572117" | "D572122" | "7594632" | "D607711" | "D623046" | "D623507" | "D629293" | "8303226" | "D685991" | "8544805" | "D704035" | "D715859" | "D732929" | "9138082" | "D753982" | "9683696" | "D817152" | "D818801" | "D819428" | "D829079" | "20060186304" | "20070039907" | "20070186384" | "20080209698" | "20080237282" | "20080272257" | "20130168429" | "20130232840" | "20150204366").pn. OR ("11191373").urpn. AND (PGPB | USPT | USOC).dbnm.					
L53	55	("D236855" | "D270120" | "D280466" | "4948022" | "5014892" | "D318949" | "5054170" | "5071049" | "D398835" | "5850954" | "D404038" | "D426701" | "D438536" | "6491194").pn. OR ("D507959").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:41 PM
L54	29	("D139216" | "D244508" | "D246346" | "4132335" | "D272211" | "D295369" | "D298604"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:47 PM

		| "D310479" | "D329192" | "5549234" | "5850954" | "D409079" | "D452081" | "D454591" | "D465147" | "D492187" | "D623507" | "8544805" | "D704035" | "D753982" | "9683696").pn. OR ("D818801").urpn. AND (PGPB | USPT | USOC).dbnm.					
L55	43	("20120267197"|"6883645"|"8387753"|"2127035"|"2827216"|"20030012595"|"20030062219"|"20030127288"|"20030217888"|"20040129497"|"20060155230"|"20070067957"|"20070201943"|"20080000723"|"20080073150"|"20080109994"|"20090050407"|"20110056764"|"20120267197"|"20150315844"|"4152810"|"4376470"|"4549632"|"4566150"|"4770559"|"5058239"|"5074377"|"5142739"|"5620272"|"5738186"|"5954157"|"5992566"|"6343406"|"6993808"|"7007344"|"7047597"|"7140072"|"7306075"|"7364017"|"8348015"|"8591444"|"9126622").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:27 PM
L56	56	("20040020718"|"20100258379"|"3643292"|"7424933"|"8104580"|"8381873"|"8387753"|"20070267252"|"4989692"|"20060283664"|"20090078503"|"20150204138"|"20030012595"|"20030062219"|"20030127288"|"20030188923"|"20030217888"|"20040129497"|"20050274571"|"20060155230"|"20070067957"|"20070201943"|"20080000723"|"20080073150"|"20080109994"|"20090050407"|"20110056764"|"20120267197"|"20150315844"|"2127035"|"2827216"|"4152810"|"4182431"|"4376470"|"4	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:27 PM

		549632"|"4566150"|"4770559"|"5058239"|"5074377"|"5142739"|"5620272"|"5738186"|"5954157"|"5992566"|"6343406"|"6993808"|"7007344"|"7047597"|"7140072"|"7306075"|"7364017"|"8348015"|"8591444"|"9126622").PN.					
L57	58	("0181305"|"10138680"|"10233692"|"10648234"|"10718160"|"1936508"|"20030012595"|"20030217888"|"20040129497"|"20090078503"|"20140251729"|"20150068842"|"20160153231"|"20170145745"|"20170356244"|"20190136625"|"20190145170"|"20190234144"|"20190368271"|"20190376343"|"3430972"|"3692143"|"3912043"|"4182431"|"4371055"|"4376470"|"4483415"|"4520896"|"4666328"|"4697305"|"4770559"|"4890950"|"4951780"|"4989692"|"5142739"|"5620272"|"5873433"|"5954157"|"5971102"|"6000497"|"6343406"|"6443261"|"6536557"|"6711780"|"6857503"|"7007344"|"7032711"|"7047597"|"7140072"|"7306075"|"7364017"|"7370726"|"7424933"|"8262124"|"8651259").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:27 PM
L58	97	55 56 57	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:27 PM
L59	18	("2005/0274571").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:29 PM
L60	59	("1942210"|"0140156"|"3476211"|"3811151"|"3869901"|"4027741"|"4031981"|"4182431"|"4210224"|"4371055"|"4376470"|"4407045"|"4469193"|"4470045"|"4483415"|"4577986"|"4666328"|"3481026"|"4060150"|"4216844"|"4502566"|"4566150"|"3692143"|"40	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:29 PM

		61203"|"0317024"|"4298093"|"4666327"|"4602889"|"4697305"|"4770559"|"4773503"|"4824278"|"4890950"|"4951780"|"4974701"|"0445453"|"5026198"|"5058239"|"5074377"|"5228535"|"5353892"|"5487207"|"5620272"|"5775460"|"5930872"|"5954157"|"5992566"|"6857503"|"D309502"|"RE30020"|"20030146046"|"5163532"|"20020166727").PN.					
L61	1	("11191373").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:35 PM
L62	2	("1505994").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:39 PM
L63	1	("11505994").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:39 PM
L64	53	("1696357" | "3811151" | "4085899" | "4210224" | "4216844" | "4403373" | "4407045" | "4566150" | "4577986" | "4666327" | "4666328" | "4697305" | "4770559" | "4890950" | "D309502" | "6343406").pn. OR ("6711780").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:25 PM
L65	1	("4216844").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:27 PM
L66	1	("6343406").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:29 PM
L67	48	("4339844" | "4403373" | "4540306" | "4666327").pn. OR ("4890950").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:31 PM
L68	52	((US-20050252721-A1 OR US-20030012595-A1 OR US-20190234144-A1 OR US-20050268434-A1 OR US-20080283563-A1 OR US-20180184791-A1 OR US-20050284909-A1).did. AND PGPB.dbnm.) OR ((US-11441356-B2 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK,	OR	ON	ON	2023/12/01 07:33 PM

		10718160-B2 OR US-10487580-B2 OR US-7140072-B2 OR US-7093321-B2 OR US-6711780-B2 OR US-6343406-B1 OR US-5620272-A OR US-4697305-A OR US-4666327-A OR US-4566150-A OR US-4216844-A OR US-7047597-B2 OR US-7540806-B2 OR US-6115886-A OR US-4824278-A OR US-4085899-A OR US-4666328-A OR US-7424933-B2 OR US-5954157-A OR US-4407045-A OR US-11505994-B2 OR US-6244779-B1 OR US-6330733-B1 OR US-4890950-A OR US-11661794-B2 OR US-4560127-A OR US-11559131-B1 OR US-9173475-B2 OR US-7117566-B1 OR US-5388741-A OR US-10470556-B1 OR US-5054170-A OR US-11191373-B2 OR US-8011071-B2 OR US-7077372-B2 OR US-D507959-S OR US-D492187-S OR US-5026016-A OR US-6866940-B1 OR US-D818801-S OR US-D560221-S).did. AND USPT.dbnm.) OR ((US-3029054-A OR US-2645443-A OR US-1980854-A).did. AND USOC.dbnm.)	TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L69	1954	E06C7/50.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/12/01 07:37 PM
L70	325	E06C7/50.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:37 PM
L71	0	("2019/0383099").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:39 PM
L72	12	("20030037412"|"20040	(US-PGPUB; USPAT;	OR	ON	ON	2023/12/01

		216277"|"20150315844"|"20180274296"|"2735772"|"3315298"|"4890950"|"6343406"|"6711780"|"4566150"|"6343406"|"6711780").PN.	USOCR)				07:39 PM
L73	9	("2003/0037412").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 07:41 PM
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L75	1	("11191373").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/02 03:11 PM
L76	1	("20030037412").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/02 05:44 PM
L77	102	("0D29072" | "0D31665" | "0795553" | "0895846" | "1338154" | "D139216" | "2443149" | "2639109" | "D197188" | "3300173" | "3529799" | "3878589" | "D235308" | "3912216" | "D239593" | "D243190" | "D244508" | "D246346" | "4132335" | "D252851" | "4171117" | "D262688" | "4419794" | "D272044" | "D272211" | "4458872" | "D295369" | "D298604" | "D303716" | "D310479" | "D313740" | "5014892" | "5054170" | "D324991" | "D329192" | "5398906" | "5484126" | "5549234" | "5605313" | "5687942" | "D5850954" | "D408267" | "D409079" | "D409663" | "D410032" | "D414207" | "D428058" | "6142892" | "D438536" | "D452081" | "D454591" | "D464993" | "D465147" | "D468357" | "D492187" | "6866940" | "D507959" | "D511088" | "D531223" | "D547637" | "D560221" | "D567740" | "D572117" | "D572122" | "7594632" | "D607711" | "D623046" | "D623507" | "D629293" | "8303226" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 08:05 PM

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L79	41	("3529799").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 08:26 PM
L80	7766	wall WITH (mount$3 hold$3) WITH nail	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 08:27 PM
L81	1660	wall NEAR (mount$3 hold$3) WITH nail	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 08:28 PM
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L84	13	("4068817" | "5524853" | "D440026" | "6640395" | "D484668").pn. OR ("6866940").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 09:13 PM
L85	101	("0910712" | "2144350" | "2144553" | "2344102" | "2409209" | "2421278" | "2469311" | "2477429" | "2875805" | "2991816" | "3020946" | "3217772" | "3219086" | "3259165" | "3356404" | "3478801" | "3700020" | "4094352" | "4193435" | "4219064" | "4695212" | "4730967" | "4755090" | "4768907" | "4863327" | "4895484" | "4929116" | "4973208" | "5022804" | "5067863" | "5154385" | "5190423" | "5193868" | "5245743" | "5324146" | "5378099" | "5489173" | "5507610" | "5630686" | "5632582" | "5716178" | "5820322" | "5928711" | "5947518" | "6142892" | "6146071" | "6474917" | "6594870" | "6715185" | "6726117" | "6854941" | "6918725" | "7044701" | "7128511" | "7165371" | "7178855" | "7192231" | "7309200" | "20040013492" | "20040165965" | "20040202523" | "20080310931" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/15 09:15 PM

		"20090103997" | "20090129885").pn. OR ("8353649").urpn. AND (PGPB | USPT | USOC).dbnm.					
L86	65	((US-20050252721-A1 OR US-20030012595-A1 OR US-20190234144-A1 OR US-20050268434-A1 OR US-20230228148-A1 OR US-20190383099-A1 OR US-20180274296-A1 OR US-20030037412-A1 OR US-20230008962-A1 OR US-20080283563-A1 OR US-20180184791-A1 OR US-20050284909-A1 OR US-20060186304-A1).did. AND PGPB.dbnm.) OR ((US-11441356-B2 OR US-10718160-B2 OR US-10487580-B2 OR US-7140072-B2 OR US-7093321-B2 OR US-6711780-B2 OR US-6343406-B1 OR US-5620272-A OR US-4697305-A OR US-4666327-A OR US-4566150-A OR US-4216844-A OR US-7047597-B2 OR US-7540806-B2 OR US-6115886-A OR US-4824278-A OR US-4085899-A OR US-4666328-A OR US-7424933-B2 OR US-5954157-A OR US-4407045-A OR US-11505994-B2 OR US-6244779-B1 OR US-6330733-B1 OR US-4890950-A OR US-11661794-B2 OR US-4560127-A OR US-11559131-B1 OR US-9173475-B2 OR US-7117566-B1 OR US-5388741-A OR US-10470556-B1 OR US-5054170-A OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/08/21 12:44 PM

		11191373-B2 OR US-8011071-B2 OR US-7077372-B2 OR US-D507959-S OR US-D492187-S OR US-5026016-A OR US-6866940-B1 OR US-D818801-S OR US-D560221-S OR US-4171117-A OR US-D272211-S OR US-6142892-A OR US-8353649-B2 OR US-9850936-B2 OR US-6769660-B2 OR US-D454481-S).did. AND USPT.dbnm.) OR ((US-3029054-A OR US-2645443-A OR US-1980854-A).did. AND USOC.dbnm.)					
L87	1	("20240151108").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/21 02:34 PM
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L92	1	("20090229918").pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/23 03:45 PM
L93	100	((("Wing") near3 ("Enterprises") near3 ("Incorporated"))).AS,AANM.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/23 03:50 PM
L94	56	((("LITTLE") near3 ("GIANT") near3 ("LADDER") near3 ("SYSTEMS") near3 ("LLC"))).AS,AANM.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/23 04:00 PM
L95	1	("20230008962").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/23 04:07 PM
L96	1	("20190383099").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/23 04:08 PM
L97	1	("4407045").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/23 04:26 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	18/490,715	Filing Date	2023-10-19	Docket Number (if applicable)	P298048.US.03_506318-576	Art Unit	3634
First Named Inventor	B. Scott Maxfield			Examiner Name	Mekhaeil, Shiref M.		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☒ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☒ Affidavit(s)/ Declaration(s)

☒ Other
1-Month EOT Fee

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 506181

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Richard C. Galati/	Date (YYYY-MM-DD)	2024-07-25
Name	Richard C. Galati	Registration Number	66759

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/22 (12-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional): P298048.US.03_506318-576

Application Number: 18/490,715

Filed: 19 October 2023

For: MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Art Unit: 3634

Examiner: SHIREF M MEKHAEIL

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	Micro Entity Fee	
☑	One month (37 CFR 1.17(a)(1))	$220	$88	$44	$ 220
☐	Two months (37 CFR 1.17(a)(2))	$640	$256	$128	$
☐	Three months (37 CFR 1.17(a)(3))	$1,480	$592	$296	$
☐	Four months (37 CFR 1.17(a)(4))	$2,320	$928	$464	$
☐	Five months (37 CFR 1.17(a)(5))	$3,160	$1,264	$632	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 506181.

☑ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71. 37 CFR 3.73(b) statement is enclosed (Form PTO/SB/96).

☑ attorney or agent of record. Registration number 66,759.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Richard C. Galati/ — Signature

25 July 2024 — Date

Richard C. Galati — Typed or printed name

801-933-4084 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☐ * Total of _____ forms are submitted.

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0031. Public burden for this form is estimated to average 6 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **If filing this completed form by mail, send to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing this form, call 1-800-PTO-9199 and select option 2.

PGR2026-00044
TRICAM EX1002

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**07/25/2024 07:40:57 PM Z ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Caitlin Newland
PATENT CENTER #	66526004	FILING DATE	10/19/2023
CUSTOMER #	153511	FIRST NAMED INVENTOR	B. Scott Maxfield
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Richard Galati

Documents

TOTAL DOCUMENTS: 9

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
P298048.US.03_506318-576 Appendix III - Declaration - Paul Junius - Executed.pdf	3	Affidavit-traversing rejections or objections rule 132	95 KB
P298048.US.03_506318-576 Appendix I - Declaration - David Smith - Executed.pdf	96	Affidavit-traversing rejections or objections rule 132	2717 KB
P298048.US.03_506318-576 Appendix II - Declaration - N. Ryan Moss - Executed .pdf	16	Affidavit-traversing rejections or objections rule 132	7316 KB
P298048.US.03_506318-576 Request for Continued Examination.pdf	3	Request for Continued Examination (RCE)	75 KB

Warning: This is not a USPTO supplied RCE fillable form. Data in the form cannot be automatically loaded to other USPTO systems.

P298048.US.03_506318-576 Petition for EOT.pdf		2	Extension of Time	228 KB
P298048US03_506318-576 Response to OA.pdf		19	-	182 KB
P298048US03_506318-576 Response to OA-AMSB.pdf	(1-1)	1	Amendment Submitted/Entered with Filing of Continued Prosecution Application (CPA)/Request for Continued Examination(RCE)	104 KB
P298048US03_506318-576 Response to OA-SPEC.pdf	(2-2)	1	Specification	79 KB
P298048US03_506318-576 Response to OA-CLM.pdf	(3-7)	5	Claims	108 KB
P298048US03_506318-576 Response to OA-REM.pdf	(8-19)	12	Applicant Arguments/Remarks Made in an Amendment	145 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
P298048.US.03_506318-576 Appendix III - Declaration - Paul Junius - Executed.pdf	BFB4C19044207ED2C403DB8AD27D87246CC4BF7DD5A6C564337E22063FEF4C0B4088F3089C77C333D885304DCDEC16BF583A987D72938575E657631BED7B5729
P298048.US.03_506318-576 Appendix I - Declaration - David Smith - Executed.pdf	3B2E99D1C3DA3579AE7EC02120C66296A04327E41538835BD2B97F6A5A167B95A2AEB38C9EF2E3C660A89E781D497A74A0BE52D7690E5BBED0C2338984E1F613
P298048.US.03_506318-576 Appendix II - Declaration - N.	461A3D6DD2D44909D3F5155448019EC6ADCF3A0546D407E3D9F838E433C2247670D81E9B6FDC065671A239616A827D9BAEF

PGR2026-00044
TRICAM EX1002

Ryan Moss - Executed .pdf	69D7CC35814E47F094B3661D5C969
P298048.US.03_506318-576 Request for Continued Examination.pdf	D763BFF1D1BF68DB735411919A9217C4F5F72F754683455273 0C193294B359955338C7263C318FFA283619C748DF16FD37EE 4238373AD4D6CABB3899CEB2870D
P298048.US.03_506318-576 Petition for EOT.pdf	EF657C777F7ADA9837838DF77090C1B8915607B8494EB8CCA D98CE9FBD25BFFB55A78501BE653388F914A6F17D35046DC2 D0E1B08932520F40DC52368350644B
P298048US03_506318-576 Response to OA.pdf	E7349E239235186B3E992823AE3B5F48D04C92FBBBA67C1277 8EF0EFD98BAADFDAD9AEA4D8E437FC240A7B05324F44E7BC CACEB11707622E6B00D41D3C3669D2
P298048US03_506318-576 Response to OA-AMSB.pdf	51DA25CA5D6D6E80D51C241E2C1A7C3F142D932126B8059C9 18FAC302DD0D6034B8846A85A77F96F144D462372AB9796B66 0FD3997B0DBB2C1DC749C7762060E
P298048US03_506318-576 Response to OA-SPEC.pdf	FD214D4CE9FDADA90F0E9C90016BAD8348B5B0509A2E75FB 9BE9C08EBBAC410791FE3DB2CBD838FD08632D91828F77F28 7AB641C2AC222012CCE6BBC4B83AA06
P298048US03_506318-576 Response to OA-CLM.pdf	C5B7EB231F934BB3948DCE44B5FA34393EEC037F8A901EAD EEA2FDEEAF8A40104B94E81C33925B2976E54342A64D5F5FD E5371559ACEBA2F8E418A4C289FD803
P298048US03_506318-576 Response to OA-REM.pdf	D435246EB326C3A50D37D7BC8484DBD46070D6A7E45A781D2 6EE8C90A14D5326CB205E6851D806F7E0A66500BAC71302645 310B779BBC99977FB9FB11030B176

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PGR2026-00044
TRICAM EX1002

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PGR2026-00044
TRICAM EX1002

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	07/25/2024 07:40:57 PM Z ET	P298048US03 (506318-576)

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Caitlin Newland
PATENT CENTER #	66526004	AUTHORIZED BY	Richard Galati
CUSTOMER #	153511	FILING DATE	10/19/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	B. Scott Maxfield

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 1083	E20247OJ41556909	Caitlin Newland

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1251	EXTENSION FOR RESPONSE WITHIN FIRST MONTH	220.00	1	220.00
1801	REQUEST FOR CONTINUED EXAMINATION (RCE) - 1ST REQUEST (SEE 37 CFR 1.114)	1360.00	1	1360.00
			TOTAL AMOUNT:	$1,580.00

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If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	B. Scott Maxfield		
Appln. No.:	18/490,715	Confirmation No.:	5970
Filing Date:	October 19, 2023	Examiner:	Mekhaeil, Shiref M.
Title:	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	Group Art Unit:	3634

RESPONSE AFTER FINAL OFFICE ACTION

VIA *e*FILE RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

This responds to the Office Action dated 25 March 2024. Please enter the following amendments and remarks:

Amendments to the Specification begin on page 2 of this document.

Amendments to the Claims are shown in the Listing of Claims beginning on page 3 of this document.

Remarks begin on page 8 of this document.

AMENDMENTS TO THE SPECIFICATION

Please amend paragraph 0059 of the specification as set forth below in marked-up form:

[0059] The articulating ladder 100 also includes a second rail assembly 114 that includes an inner assembly slidably coupled with an outer assembly. The inner assembly includes a pair of rails 111 coupled with a plurality of rungs and is configured similar to the inner assembly of the first rail assembly described above. Likewise, the outer assembly includes a pair of rails 113 coupled with a plurality of rungs and is configured similar to the outer assembly of the first rail assembly described hereinabove. Locking mechanisms 124 may be associated with inner and outer assemblies and to enable selective positioning of the inner assembly relative to the outer assembly as described above with respect to the first rail assembly 102. In some embodiments, the locking mechanisms 124 (or 112) may be adjustment mechanisms used to adjustably retain components to the ladder 100, such as accessories, tools, and other apparatuses. ~~Locking mechanisms 124 (or 112) can therefore be referred to as "retainers" herein.~~ Thus, the locking mechanisms may be used for purposes other than locking rails or hinges and may be used to adjust the positioning of components on the ladder.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) 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.

2. (Original) 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;

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

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;

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;

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

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.

3. (Previously Presented) The ladder of claim 1, wherein

the second button body comprises a substantially flat outward-facing surface parallel to the first button body.

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

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

6. (Original) The ladder of claim 1, wherein the at least one gap includes two open ends.

7. (Original) 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.

8. (Original) 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.

9. (Original) The ladder of claim 1, wherein the second button body defines a surface facing axially inward toward the pair of hinges and substantially parallel to the first button body.

10. (Currently Amended) The ladder of claim 1, wherein ~~the object is supportable by~~ the second button body is configured to support an object ~~by~~ hanging on the second button body while at least partially positioned in the at least one gap.

11. (Previously Presented) The ladder of claim 1, wherein the second button body comprises a plate.

12. (Withdrawn) A button for a locking mechanism, the button comprising:

a button body including a first button body portion and a second button body portion;

a pivot pin coupled with the first button body portion and extending away from the button body; and

a biasing member operable to apply a biasing force to the button body, wherein the biasing force is configured to oppose a force applied to the button body opposite the pivot pin;

wherein the second button body portion includes a width portion and at least two side portions, the at least two side portions connecting the width portion to the first button body portion, wherein the second button body portion and the first button body portion define an opening.

13. (Withdrawn) The button of claim 12, wherein the second button body portion and the first button body portion are integrally formed as a single piece.

14. (Withdrawn) The button of claim 12, wherein the opening opens radially outward in a first direction.

15. (Withdrawn) The button of claim 14, wherein the opening opens radially outward in a second direction opposite the first direction.

16. (Withdrawn) The button of claim 12, wherein the at least two side portions are coupled to the first button body portion at opposite lateral ends of the width portion.

17. (Withdrawn) The button of claim 12, further comprising: a bracket coupled with the pivot pin; and

a pair of locking pins coupled with the bracket and oriented substantially parallel to the pivot pin.

18. (Withdrawn) The button of claim 12, wherein the second button body portion comprises a plate shape connected to an opposite side of the first button body portion relative to the pivot pin.

19. (Currently Amended) 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 ~~set of~~ respective first axial position[[s]] along the pivot axis and a ~~set of~~ respective second axial position[[s]] 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 ~~set of~~ 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 ~~set of~~ second axial positions and the at least one locking pin is positioned in the first opening and in the second opening.

20. (Original) The ladder of claim 19, 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.

REMARKS

This responds to the Office Action dated 25 March 2024. Claims 1, 10, and 19 are currently amended. Paragraph 0059 of the specification is currently amended. The amendments are supported throughout the specification, drawings and original claims of the application, such as, for example, original paragraphs [0059] and [0079]-[0080] of the specification and figures 3A-3B, 14-15, and 22 and their related descriptions in the specification. No new matter has been added. Thus, claims 1-20 are currently pending (with claims 12-18 withdrawn). Applicant respectfully requests reconsideration of the application in view of the above amendments and the following remarks.

Drawing, Specification, and Claim Objections

Drawings

In the Office Action, the drawings stand objected to under 37 C.F.R. §1.83(a) as allegedly not showing the "object" of claim 10 and "a set of first axial positions" and "a set of second axial positions" of claim 19. The Examiner comments that the drawings and specification do not illustrate or explain "more than one first and one second axial position." Office Action at p. 3. The Examiner argues the "object" "would need to be illustrated since it is a component that is positively recited (in claim 10); *e.g.*, to show the manner of which it is hanging and to illustrate[] its partial positioning in the at least one gap." *Id.* at 20.

Applicant respectfully traverses this objection to the drawings. Claim 10 has been amended to provide additional clarity to the application. The second button body is now recited as being "configured to support an object hanging on the second button body while

at least partially positioned in the at least one gap." Accordingly, the object is not a component positively recited in claim 10, and the drawing objection should be moot. Applicant therefore respectfully requests withdrawal of the objection to the drawings.

Specification

The specification stands objected to under 37 C.F.R. §1.75(d)(1) as allegedly lacking antecedent basis for "a first set of axial positions" and "a second set of axial positions" recited in claim 19. In the Examiner's view, claim 19 requires "more than one first and more than one second positions i.e., at least four positions." Office Action at p. 21.

Applicant respectfully traverses this objection. Claim 19 has been amended to provide additional clarity to the application regarding the axial positions limitations by indicating that "each retainer" of the pair of retainers is movable between a respective first axial position along the pivot axis and a respective second axial position along the pivot axis. The specification supports this limitation at least in view of the Abstract, the original claims, and the descriptions of FIGS. 3A-3B, wherein a retainer (*e.g.*, a retainer including a button body 138) is shown and described as being movable between a first axial position (*e.g.*, in FIG. 3B) and a second axial position (*e.g.*, in FIG. 3A) along a pivot axis (*e.g.*, axis of rotation 135) of a ladder (*e.g.*, 100). Accordingly, the objection to the specification should be withdrawn.

Previous Amendment

Applicant's previous amendment to the specification stands objected to under 35 U.S.C. §132(a) as allegedly introducing new matter into the disclosure due to identifying that the locking mechanisms 124/112 can be referred to as "retainers." The Examiner contends that there is not support in the original disclosure for locking elements 124 being retainers.

Applicant respectfully traverses this rejection. Without acquiescing to the propriety of the objection, and solely to accelerate advancement of the application to allowance, Applicant has amended paragraph [0059] of the specification to remove reference to the locking mechanisms 124/112 as being referred to as retainers. No new matter has been added. Applicant reserves the right to present amendments and claims referring to locking mechanisms 124/112 as retainers at a future time or in a future related application. The objection to the previous amendment is therefore moot, and Applicant respectfully requests withdrawal of the objection under Section 132(a).

Claim Rejections - 35 U.S.C. § 112

Claims 19-20 stand rejected under 35 U.S.C. §112(b) as allegedly being indefinite in view of the previous amendment to paragraph [0059] of the specification. Applicant respectfully traverses this rejection.

Without acquiescing to the propriety of the rejection, and solely to accelerate advancement of the application to allowance, Applicant has amended paragraph [0059] of the specification to remove reference to the locking mechanisms 124/112 as being referred to as retainers. No new matter has been added. Applicant reserves the right to

present amendments and claims referring to locking mechanisms 124/112 as retainers at a future time or in a future related application. The rejection of claims 19-20 is therefore moot, and Applicant respectfully requests withdrawal of the Section 112(b) rejection of claims 19-20.

Claim Rejections - 35 U.S.C. §§ 102-103

Claims 1-2 stand rejected under 35 U.S.C. §102(a)(1) as allegedly being anticipated by U.S. Patent Application Publication No. 2003/0037412 to Lee or, in the alternative, as being obvious over Lee under 35 U.S.C. §103. Claims 1 and 3-11 stand rejected under 35 U.S.C. §103 as allegedly being unpatentable over Lee (using a different interpretation thereof as compared to the Section 102 rejection) in view of U.S. Patent No. 11,191,373 to Ng. Claims 19-20 stand rejected as allegedly being unpatentable over Lee in view of Ng. Applicant respectfully traverses these rejections.

Section 102 Rejection

Claim 1 as amended recites, *inter alia*, "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."

The Lee reference does not teach or suggest the above-indicated limitations of claim 1. The alleged second button body of Lee (press part 508) does not have a first axially-facing surface being partially spaced axially outward from a second axially-facing surface of the alleged first button body (locking pin 504) by at least one gap with the axially-facing surfaces facing each other. The press part 508 and locking pin 504 are both on the same press axle 500 and do not have any axially-facing surfaces directed toward each other. The locking pin 504, for example, only has a cylindrical outer surface that does not face axially, *i.e.,* along the axis of the hinge of Lee. Thus, Lee does not teach or suggest the surfaces of claim 1.

Additionally, there is no "gap" between elements 508 and 504 in Lee; they are two ends of the same continuous part 500. An object could not be positioned in the alleged gap of Lee because the Lee pin itself (*e.g.,* spring bearing end 506) is already positioned

in the "gap" alleged by the Examiner. *See* Office Action at p. 7. Thus, Lee does not teach or suggest the "gap" of claim 1.

Lee therefore does not teach or suggest each and every limitation of claim 1. Applicant respectfully requests withdrawal of the Section 102 rejection of claim 1 and any claims dependent upon it.

Section 103 Rejection

Regarding the Section 103 rejection of claims 1 and 19, the Examiner alleges that the first button body of the claims is press part 508 of Lee and that it would have been obvious and predictable to combine the press part 508 with an alleged second button body of Ng (bracket 10) "for hanging article[s]." Office Action at pp. 12 and 18. The Examiner also takes apparent official notice of the obviousness of the claims by arguing, "One 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" without documentary support from Lee or Ng. *See id.* at pp. 12, 18-19, and 22-23.

"Official notice unsupported by documentary evidence may be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art, are capable of instant and unquestionable demonstration as being well-known." MPEP §2144.03(A). Official notice "should be rarely used when an application is under final rejection." *Id.*

"To adequately traverse a finding based on official notice, an applicant must specifically point out the supposed errors in the examiner's action, which would include stating why the noticed fact is not considered to be common knowledge or well-known

in the art. . . . If applicant adequately traverses the examiner's assertion of official notice, the examiner must provide documentary evidence in the next Office action if the rejection is to be maintained." *Id.* at §2144.03(C).

Applicant respectfully traverses and rebuts the Examiner's rationales attempting to support the obviousness of applying the teachings of the Ng reference to modify the Lee ladder to attach tools to the push part 508 of Lee. Applicant respectfully submits that the combination of Lee and Ng is improper because the Office Action relies on information gleaned solely from Applicant's specification. MPEP §2142 states that "impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art" (emphasis added). "'Any judgement on obviousness is in a sense necessarily a reconstruction based on hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made and *does not include knowledge gleaned only from applicant's disclosure*, such a reconstruction is proper'" (MPEP § 2145(X)(A), quoting In re McLaughlin, 443 F.2d 1392, 1395 (CCPA 1971), (emphasis added).

The Federal Circuit has explained, "Objective indicia '"may often be the most probative and cogent evidence" of nonobviousness.' Objective indicia are essential safeguards that protect against hindsight bias. The objective indicia analysis is, therefore, a fundamental part of the overall § 103 obviousness inquiry." *Liqwd, Inc. v. L'Oreal USA, Inc.*, 941 F.3d 1133 (Fed Cir. 2019) (citations omitted). As a result, the Office must consider all such evidence of objective indicia and determine the weight to give it "en

route to a determination of obviousness." *Id.* (quoting *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983)); *see also* MPEP §2141(II).

The Examiner's position is founded on impermissible hindsight reasoning at least in view of the state of the art at the time the present application was filed and in view of objective indicia of non-obviousness of the embodiments of the present claims. Attached herewith are declarations under 37 C.F.R. §1.132 from three experts in the field of ladders and related equipment, namely, David Smith, N. Ryan Moss, and Paul B. Junius. These declarations set forth objective indicia for the record rebutting the Examiner's rationales and establishing the non-obviousness of the claims of the present application. *See* Appendices I-III.

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.

In view of the above, Applicant respectfully requests entry of these declarations in the record and reconsideration and withdrawal of the rejections under Section 103 of claims 1 and 19 and any claims dependent on them.

If the rejection is maintained in a future Office Action, Applicant hereby requests the Examiner to provide the required documentary evidence in the next Office Action that proves that it would have been obvious and predictable *at the time the invention was made* and *without the benefit of impermissible hindsight in view of Applicant's disclosure* to combine the teachings of the bracket 10 of Ng with the press part 508 of Lee for hanging articles. Applicant also respectfully requests documentary evidence showing that a person having ordinary skill in the art would have been motivated to include a hanging bracket of a picture frame (*e.g.,* the bracket 10 from Ng) on a ladder hinge (*e.g.,* the hinge of Lee) to attach small tools.

Conclusion

For at least the foregoing reasons, Applicant believes that each of the presently pending claims in this application is in immediate condition for allowance. Accordingly, Applicant respectfully requests a favorable action on the merits. If the Examiner has any further comments or suggestions, Applicant invites the Examiner to contact the undersigned attorney to expedite the handling of this matter.

Applicant expressly disclaims all arguments, representations, and/or amendments presented or contained in any other patent or patent application, including any patents or patent applications claimed for priority purposes by the present application or any patents or patent applications that claim priority to this patent application. Moreover, all arguments, representations, and/or amendments presented or contained in the present patent application are only applicable to the present patent application and should not be considered when evaluating any other patent or patent application.

The Commissioner is hereby authorized to charge any additional fees which may be required for this application, or credit any overpayment, to Deposit Account No. 506181. If any extensions of time are needed for timely acceptance of these documents, such an extension is hereby requested and payment of any such extension fees is authorized from Deposit Account No. 506181.

Respectfully submitted,

DORSEY & WHITNEY LLP
Customer No. 145730

Date: 25 July 2024

/Richard C. Galati/

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LISTING OF APPENDICES

- Appendix I: Declaration under 37 C.F.R. §1.132 of David Smith, including Appendices A-C referenced within Appendix I. (96 Pages)
- Appendix II: Declaration under 37 C.F.R. §1.132 of N. Ryan Moss. (16 Pages)
- Appendix III: Declaration under 37 C.F.R. §1.132 of Paul B. Junius. (3 Pages)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	B. Scott Maxfield		
Appln. No.:	18/490,715	Confirmation No.:	5970
Filing Date:	19 October 2023	Examiner:	Shiref M Mekhaeil
Title:	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	Group Art Unit:	3634

DECLARATION UNDER 37 C.F.R. §1.132

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

I, N. Ryan Moss, declare that:

1. I have been employed by Little Giant Ladder Systems LLC ("Little Giant") in a variety of positions, beginning in manufacturing in 1984 and continuing to advance in roles of increasing responsibility until I became CEO in 2008, a role I still hold today. I am well-versed in the history of the company and in the state of the ladder industry in general.

2. I am the current President of the American Ladder Institute (ALI). I also regularly attend industry conferences including those held by the American Ladder Institute (ALI), attend focus groups and customer meetings, including annual line reviews, and play a role both at Little Giant and ALI in promoting safety during Ladder Safety Month every March. All of these things keep me abreast of developments in the

needs of our customers, partners, and competitors. It has therefore been an extensive part of my life's work to see and respond to needs in the ladder marketplace.

3. I have actively contributed to, and have been listed as an inventor on, more than 40 ladder and climbing equipment patents, with other patents pending.

4. I have spent my entire professional career in the ladder industry and have 40 years of experience with ladders and climbing equipment.

5. LONG-FELT BUT UNMET NEED

6. There has been a long-felt but unmet need for the invention claimed in the present application (U.S. Patent Application 18/490,715).

7. Little Giant, formerly known as a DBA of Wing Enterprises, Inc., has been a pioneer, innovator, and market leader in ladder technologies since the 1970s. From the introduction of the original articulating ladder, coined the "Little Giant" ladder by Harold R. "Hal" Wing, to today, Little Giant has been at the forefront of ladder development and deployment around the world. While working with Little Giant and while under my leadership, I have overseen the development and launch of a variety of innovative ladder products such as the Sumostance, Hyperlite, SelectStep, and King Kombo products.

8. Throughout my many years of experience in this industry, I have monitored and responded to how customers have sought out ways to store, hold, hang, and otherwise support tools and other equipment while they use ladders from elevated positions.

9. Over this time, we at Little Giant have produced offerings to serve this need, including by providing ladders compatible with or including tool-supporting top

caps (*e.g.*, for the A-Force[1], King Kombo 2.0[2], Paint Pro[3], or Xtra-Lite Plus[4] ladders), cargo bags (*e.g.*, the Cargo Hold[5] tool holder accessory), table/tray attachments (*e.g.*, the AirDeck Workstation[6],), bucket accessories (*e.g.*, the Fuel Tank[7], or Loot Box[8]), tool tray accessories (*e.g.*, the Articulating Ladder Tool Tray[9], Quad Pod[10], or Tool Tray XL[11]),

[1] Website for "A-Force Ladder," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/a-force-a-frame-ladder

[2] Website for "King Kombo 2.0," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/king-kombo-2-0

[3] Website for "Paint Pro," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/paint-pro-painters-ladder

[4] Website for "Xtra-Lite Plus," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/xtra-lite-plus

[5] Website for "Cargo Hold," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/cargo-hold-ladder-tool-holder

[6] Website for "AirDeck Workstation," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/airdeck-workstation

[7] Website for "Fuel Tank," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/fuel-tank-ladder-paint-tray

[8] Website for "Loot Box," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/loot-box

[9] Website for "Articulating Ladder Tool Tray," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/articulating-ladder-tool-tray

[10] Website for "Quad Pod," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/quad-pod

[11] Website for "Tool Tray XL," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/tool-tray-xl

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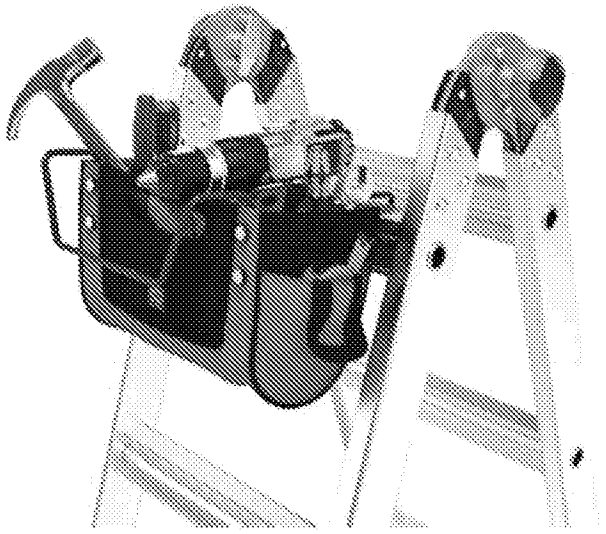
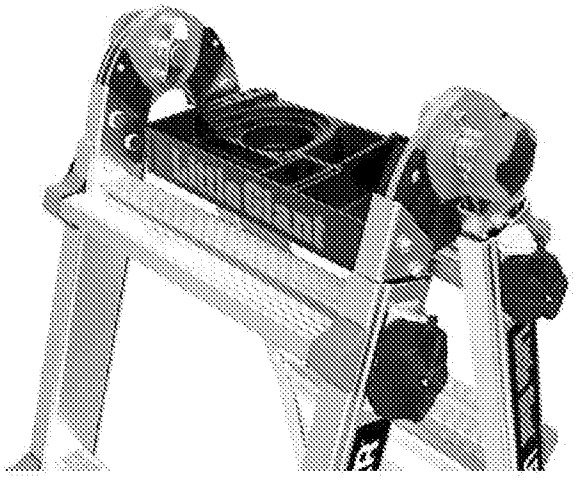
organizers (*e.g.*, the Vertical Organizer[12]), bags (*e.g.*, the Saddle Bag[13]).

10. Example images of some of these products are shown below.



Little Giant Cargo Hold



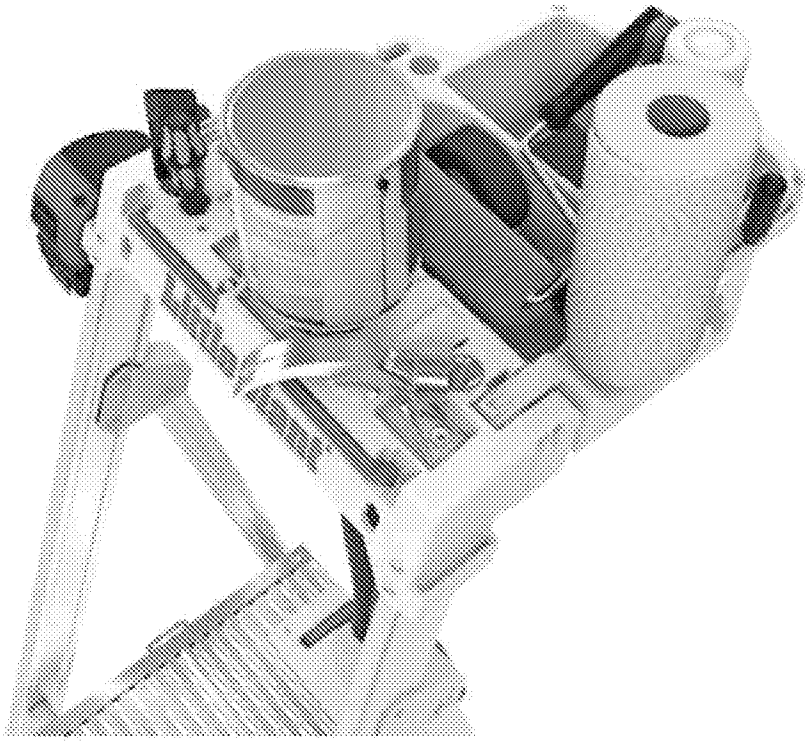
Little Giant Articulating Ladder Tool Tray

[12] Website for "Vertical Organizer," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/vertical-organizer

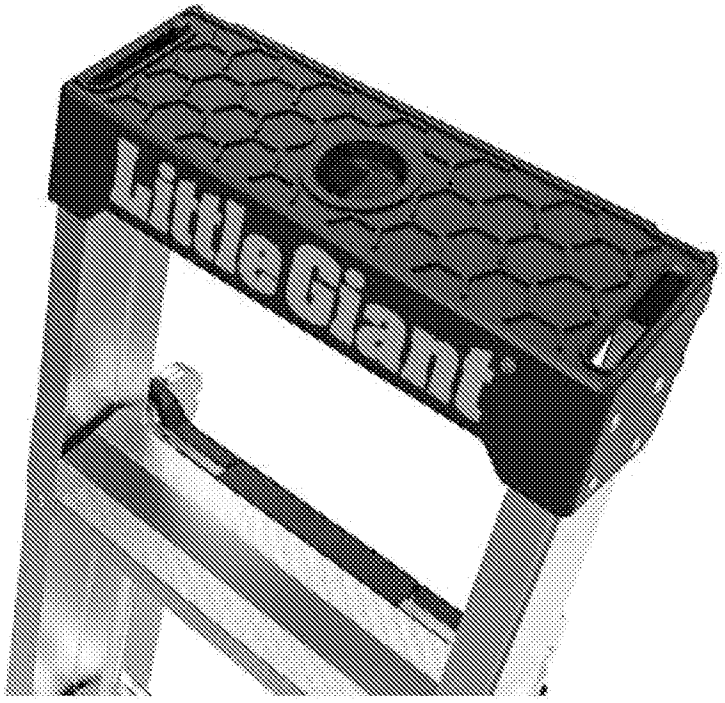
[13] Website for "Saddle Bag, Tool Bag Accessory for CAGE," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/saddle-bag-tool-bag-accessory-for-cage-elevated-enclosed-platforms

Little Giant AirDeck Workstation

Little Giant Vertical Organizer



Little Giant Paint Pro



Little Giant King Kombo 2.0

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11. I have observed over the years how Little Giant's competitors have likewise recognized and attempted to fill the need to hang or support tools at the tops of ladders. In some non-limiting examples, Werner Co. ("Werner") has developed and offers for sale ladders with tool-supporting top caps (*e.g.*, the LOCKTOP or HolsterTop ladders[14]), ladder-attachable tool bags (*e.g.*, the Lock-In Tool Bag[15]), ladder-attachable tool supports (*e.g.*, the Lock-In ToolLasso[16] and Utility Hook[17] or Paint Can Hook[18]), cups (*e.g.*, the Lock-In Paint Cup[19] or Lock-In Job Caddy[20]), and tool support shelves/trays (*e.g.*, the Molded Plastic Pail Shelf[21]).

12. Likewise, Louisville Ladder ("Louisville"), another long-standing

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[14] Website for "6FT TYPE IAA FIBERGLASS STEP LADDER 7306," WernerCo., accessed 17 June 2024, available at https://www.wernerco.com/us/products/ladders/step-ladders/7300Series/7306; website for "6FT TYPE IA FIBERGLASS STEP LADDER 6206," WernerCo., accessed 17 June 2024, available at https://www.wernerco.com/us/products/ladders/step-ladders/6200Series/6206.

[15] Website for "LOCK-IN TOOL BAG ACBAG15," WernerCo., accessed 17 June 2024, available at https://www.wernerco.com/us/products/ladders/ladder-accessories/Lock-InSeries/ACBAG15

[16] Website for "LOCK-IN TOOLLASSO AC58-TL," WernerCo., accessed 17 June 2024, available at https://www.wernerco.com/us/products/ladders/ladder-accessories/Lock-InSeries/AC58-TL

[17] Website for "LOCK-IN UTILITY HOOK AC56-UH," WernerCo., accessed 17 June 2024, available at https://www.wernerco.com/us/products/ladders/ladder-accessories/Lock-InSeries/AC56-UH

[18] Website for "AC20 PAINT CAN HOOK," WernerCo., accessed 17 June 2024, available at https://www.wernerco.com/us/products/ladders/ladder-accessories/AC20Series/AC20

[19] Website for "LOCK-IN PAINT CUP AC27-P," WernerCo., accessed 17 June 2024, available at https://www.wernerco.com/us/products/ladders/ladder-accessories/Lock-InSeries/AC27-P

[20] Website for "LOCK-IN JOB CADDY AC54-JC," WernerCo., accessed 17 June 2024, available at https://www.wernerco.com/us/products/ladders/ladder-accessories/Lock-InSeries/AC54-JC

[21] Website for "76-2 MOLDED PLASTIC PAIL SHELF," WernerCo., accessed 17 June 2024, available at https://www.wernerco.com/us/products/ladders/ladder-accessories/76-2Series/76-2

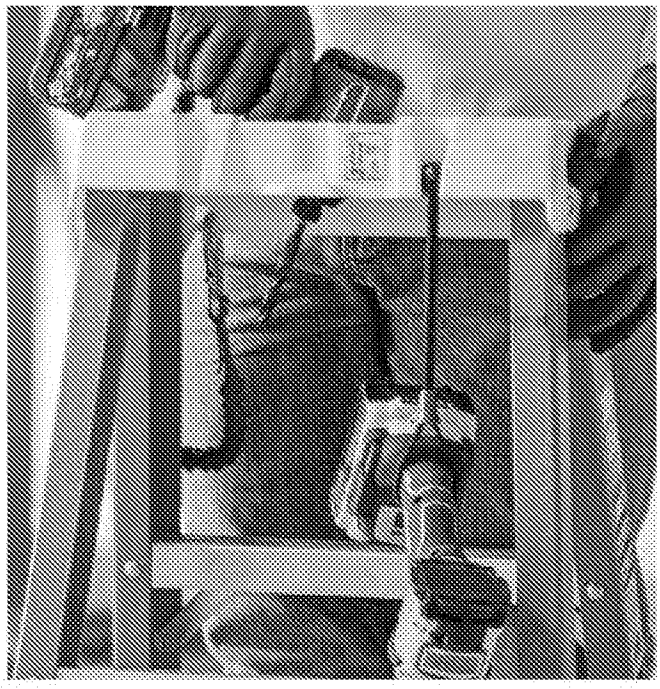
participant in the ladder market, offers modularly replaceable tool-supporting top caps (*e.g.*, Top Kit PF1500[22]), ladders with tool-supporting top caps (*e.g.*, AS2104[23]), and similar devices.

13. Example images from Werner and Louisville products listed above are shown below.

Werner Lock-In Tool Bag

[22] Website for "TOP KIT FS1500," Louisville Ladder, Inc., accessed 17 June 2024, available at https://louisvilleladder.com/parts-accessories/top-kit-fs1500-pk1042a

[23] Website for "LOUISVILLE LADDER 4-FOOT ALUMINUM STEP LADDER, TYPE I, 250-POUND LOAD CAPACITY, AS2104," Louisville Ladder, Inc., accessed 17 June 2024, available at https://louisvilleladder.com/ladders/step-ladders/louisville-ladder-4-foot-aluminum-step-ladder-type-i-250-pound-load-capacity-as2104&id=AS2104



Werner Lock-In ToolLasso

Werner Molded Plastic Pail Shelf

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Werner LOCKTOP Ladder Top Cap

Louisville Ladder 4-Foot Aluminum Step Ladder, Type I (AS2104)

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14. The above-listed Little Giant devices and competitor devices represent recent iterations of a broader array of similar tool support options that have been offered to customers for decades to address the customer's need to organize and support tools at the top end of a ladder. There has been, and continues to be, a long-felt need in the marketplace for such tool support options.

15. Although many of these tool support solutions are offered for various purposes, most apply to step ladders with top caps and remarkably few solutions have been devised to support tools from the top of a multi-position/articulating ladder (*e.g.*, the Little Giant 1A 22 or other multi-position ladders[24]). Storage and support of tools at the top ends of those types of ladders has been a more difficult need to meet, where ladder designers typically leave only rungs and hinge components. Ladder makers have tended to eschew modification of parts such as rungs and hinge components due to safety and reliability concerns. Little Giant has developed solutions such as the Cargo Hold[25] tool holder accessory or trays/platforms that extend between the rails and rungs of a multi-position/articulating ladder. However, there has remained a need for tool hanging options at the top of multi-position articulating ladders that would not take up the space between the rails along the rungs as do solutions such as cargo trays and tool bags. Until the developments disclosed in the present application, this need remained unfulfilled. Despite my years of experience, I have no knowledge, beyond information already provided to

[24] Website for "Multi-Position Ladders," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/collections/multi-position-ladder

[25] Website for "Cargo Hold," Little Giant Ladder Systems LLC, accessed 17 June 2024, available at https://www.littlegiantladders.com/products/cargo-hold-ladder-tool-holder

the United States Patent and Trademark Office, of any other ladder manufacturer attempting to adapt and use the hinge assembly and/or hinge buttons on multi-position articulating ladders for the purpose of hanging or storage of tools prior to the development of our invention. To my knowledge, at the time of the filing of the present application, only other types of storage solutions have been attempted by Little Giant and other ladder makers.

16. NON-OBVIOUS INVENTION

17. Adding tool-hanging capabilities to hinge buttons was not a simple or obvious exercise, even for those of us skilled in the art of the mechanics of ladders. For example, the inventions claimed in the present application required substantial development resources. We 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. In all, the project required over a year's worth of product development which included design, prototyping, and testing from inception to confidentially sending out engineering drawings to begin manufacturing. I affirm that the development of the inventions of the claims of the present application would not have been an obvious, simple, or routine exercise to a person having ordinary skill in the art.

18. COPYING AND/OR NEAR SIMULTANEOUS INVENTION

19. Finally, I attest to the non-obviousness of the invention of the present application in view of copying and/or contemporaneous invention by at least one of Little Giant's competitors.

20. Little Giant confidentially sent engineering drawings to, and had confidential manufacturing discussions with, at least two manufacturing vendors in China

in May of 2022. Little Giant selected one of the vendors as our manufacturing partner, and they started tooling the design in July 2022.

21. The concept was then confidentially pitched to a major retail partner of ours in the summer/early fall of 2022, and a confidential sample was provided to them in or about February 2023.

22. On 19 May 2023, Brian Russell, a Little Giant engineer, visited the manufacturing vendor in China to which we had previously shown our invention and that we had not selected as our partner for this project. Mr. Russell reported to me that he observed a competing button for a tool hanging product that was being produced by that manufacturing partner for a competitor of ours, Tricam Industries ("Tricam"). The product being produced included a slot on a hinge button/handle for hanging tools. I thus became aware of a competitor copying features of our design, apparently because they received access to the confidential disclosure we provided to our non-selected manufacturing partner.

23. Shortly thereafter, I observed the competing hinge button product being sold in Home Depot Stores and marketed by Tricam as the Gorilla Ladders "GMPXA-14 14 FT. REACH MPXA ALUMINUM MULTI-POSITION LADDER WITH INTEGRATED TOOL HANGERS[26]." I also accessed a promotional image of the product on the Tricam website prior to the filing 19 October 2023 filing date of the present application, which appeared as shown below.

[26] Website for "14 FT. REACH MPXA ALUMINUM MULTI-POSITION LADDER WITH INTEGRATED TOOL HANGERS, 300 LBS. LOAD CAPACITY," Gorilla, accessed 17 June 2024, available at https://gorillamade.com/product/gmpxa-14/

Image of the GMPXA-14 ladder marketing materials promoting "Tool Hangers" on hinge buttons

24. Multi-position/articulating ladders have been on the market for decades, and tool hanging solutions for ladders have been on the market for decades, yet substantially immediately after our disclosure to a manufacturing partner, one of our main competitors started producing a product located on a ladder hinge button and serving the purpose of hanging tools. Thus, based on my knowledge of the facts, timing, and

circumstances surrounding Little Giant's development and disclosure of features of our invention, the Tricam "integrated tool hangers" are evidence of copying of our concept by a competitor, or are at least evidence of near-simultaneous invention, both of which establish the non-obviousness of the claims of the present application.

25. In my professional opinion, the absence of any solutions for hinge button tool hanging, followed by immediate copying of the idea by a Little Giant competitor upon apparently receiving access to our concept, shows without question that the inventions of our claims were not obvious at the time the application was filed.

26. I further 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, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

Date: 24/06/2024

N. Ryan Moss
CEO
Little Giant Ladder Systems, LLC

4858-3314-5290\1

P298048.US.03_506318-576 Declaration - N. Ryan Moss

Final Audit Report 2024-06-24

Created:	2024-06-24
By:	Kathy Patton (kathy@ladders.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAACG2_XYNVVgu228RmiM_7oRykTDJiWUQZ

"P298048.US.03_506318-576 Declaration - N. Ryan Moss" History

Document created by Kathy Patton (kathy@ladders.com)
2024-06-24 - 3:26:35 PM GMT

Document emailed to Ryan Moss (ryan@ladders.com) for signature
2024-06-24 - 3:26:41 PM GMT

Email viewed by Ryan Moss (ryan@ladders.com)
2024-06-24 - 3:40:53 PM GMT

Document e-signed by Ryan Moss (ryan@ladders.com)
Signature Date: 2024-06-24 - 3:43:47 PM GMT - Time Source: server

Agreement completed.
2024-06-24 - 3:43:47 PM GMT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	B. Scott Maxfield		
Appln. No.:	18/490,715	Confirmation No.:	5970
Filing Date:	19 October 2023	Examiner:	Shiref M Mekhaeil
Title:	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	Group Art Unit:	3634

DECLARATION UNDER 37 C.F.R. §1.132

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

I, Paul B. Junius, declare that:

1. I have extensive experience in the ladder industry, including work in risk management for ladders from 1991 until today. Since 1991, I have worked for Ladder Management Services, Inc. (a now defunct entity) and Risk Retention Services, Inc., companies specializing in delivering excellence in litigation and claim management for high-risk exposures, including commercial clients in the ladder industry. I am currently the President of Risk Retention Services, Inc.

2. I am an attorney in good standing licensed to practice in the State of Wisconsin.

3. I have also been a member of the American National Standards Institute (ANSI) committee for over 15 years. This committee is involved with the development and updating of safety standards that involve various types of ladders and accessories. In

this capacity, I have constantly been exposed to developments in the ladder industry, how they affect the safety of users, and how they affect the companies that implement them.

4. I am familiar with the disclosure of the present application (U.S. Patent Application 18/490,715) and its relationship to other ladder products in the current marketplace and marketplaces of the past.

5. Based on my over 33 years of experience in this field, I respectfully submit 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. It would not have been obvious to modify ladder hinge buttons to include tool hanging functionality in the manner recited by the present claims at least because doing so would potentially increase a ladder manufacturer's exposure to product liability lawsuits. I attest that the ladder industry abstained from making accessories or usable top caps of any kind for standard stepladders for many years notwithstanding that today it is common to find functional top caps which was only obvious after someone developed the first one. At the time the present application was filed, there was skepticism in the field by experts, including myself, that tool hanging functionality could be viably and safely incorporated into ladder hinge assemblies. Accordingly, there was actually a disincentive in the field to modify hinge buttons to include tool hanging features, and a person having ordinary skill in the art would not have found it obvious to do so.

6. Additionally, I submit that I am not aware of any prior art ladder designs or products that added tool hanging functionality to ladder hinge assemblies in the manner described in the present application at or before the time the invention was made.

7. I further 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, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

Date: 6/25/2024

Paul B. Junius

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	B. Scott Maxfield		
Appln. No.:	18/490,715	Confirmation No.:	5970
Filing Date:	19 October 2023	Examiner:	Shiref M Mekhaeil
Title:	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	Group Art Unit:	3634

DECLARATION UNDER 37 C.F.R. §1.132

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

I, David Smith, declare that:

1. I hold a Master's of Science in Mechanical Engineering from Brigham Young University, Provo, Utah an MBA with an emphasis in product development from the Marriott School of Management at BYU, Provo, and a Bachelor of Science Degree in Mechanical Engineering from Brigham Young University Idaho, Rexburg, Idaho.

2. I am a licensed professional engineer (P.E.) in the states of Utah and Idaho. I am a Certified Safety Professional (CSP) in comprehensive practice. I am listed as an inventor on seven US Patents, with other patents pending. I started working at Alpine Engineering & Design, Inc., a mechanical engineering consulting firm, as an intern in 2006 and have worked my way through positions of increasing responsibility to my current position of President.

3. Over the past 18 years as an engineer, I have consulted on the design of hundreds of products and equipment ranging from coffee makes and blenders to exercise equipment to garbage trucks. Many of the products I have consulted on incorporate hinges. In my work I have also been directly responsible for engineering decisions relating to work-at-height equipment including fixed ladders, portable ladders, mobile stair cases, scaffolding, fall protection equipment and man lifts.

4. I am familiar with the disclosure, subject matter, and currently pending claims of U.S. Patent Application 18/490,715 ("the '715 Application").

5. I have reviewed the examiner's rejection based on U.S. Patent Application Publication No. 2003/0037412 to Lee ("the Lee reference") and U.S. Patent No. 11,191,373 to Ng ("the Ng reference"), and disagree that the disclosures of these two references render the invention obvious for a number of reasons.

6. First, it is my opinion that the Ng reference is non-analogous art to the field of the claims of the '715 Application. The Ng reference relates to brackets for hanging pictures, while the present invention relates to ladders. It is my understanding that a reference can be shown to be analogous art based on two separate tests. The first test is whether the reference is from the same field of endeavor. Here, the primary focus is on what the references disclose. It is my opinion that the Lee reference is from the same field of endeavor as the claims, as it discloses a hinge for collapsible ladders. However, the Ng reference relates to a mounting device for hanging articles on a wall. The disclosure of Ng is not related to ladders and is in fact a completely separate field of endeavor. As an expert in the field, I would not consider picture hanging devices as being in the same field of endeavor as ladders because ladders are not conventionally used as

picture hanging devices, and picture hanging devices are not conventionally part of ladders.

7. The second test for non-analogous art is whether the reference is reasonably pertinent to the problem being solved. A mechanical engineer facing the problem of storing and supporting tools while on a ladder would have many known ways of hanging tools that would be pertinent to address the problem, such as ladder top caps, trays, tool belts, and similar devices common to ladders and tool users. However, the task of hanging pictures and any problems associated with hanging pictures are far removed from the problem of storing and supporting tools. Pictures are typically hung indoors in a controlled environment. Ladders are commonly used and stored outdoors and need to be designed with materials and components that are non-corrosive and capable of withstanding the elements. Further, pictures are hung against a wall. When a picture is hung from its top back side, a torque or moment is generated due to the force of gravity acting on the center of gravity of the picture. The picture therefore contacts the wall at the bottom to counteract the torque allowing the picture to hang flat against the wall. By comparison, ladders typically have an empty space under the hinge when set up and cannot support the bottom of whatever is being hung. Thus, to a skilled mechanical engineer, an object hanging from the ladder hinge will not hang appropriately if it hangs at all. Accordingly, a picture hanging bracket of Ng would not be pertinent to the problem of supporting objects while on a ladder or at a ladder hinge because there would be no lateral (*e.g.*, wall) support for a picture below the hinge. The expected result of adding an Ng bracket to the hinge would be an article that slips and rotates off of the bracket due to lacking lateral support below the bracket.

8. Further, the Ng disclosure, and the bracket in particular, are not pertinent to the problem that would be faced by a mechanical engineer tasked to support tools at the top of a ladder. Tools are repeatedly hung and removed from top caps, trays, and tool belts. Picture frames and articles that would be supported by the Ng bracket are hung and left in the hanging position rather than being hung and rehung multiple times a day. Because of this, ANSI-ASC A14.2, which is a safety standard for ladders that would be followed by a skilled mechanical engineer, requires testing a minimum of 6,000 cycles for components of a ladder. *See* Appendix A at §7.4.2. For all of these reasons, a person having ordinary skill in the art ("POSITA") would not turn to Ng (or any other picture hanger designs) to try and solve the problem of how to safely and securely hang tools on a ladder while the ladder is in use. For these reasons, based on my professional experience, the only way one would consider the teachings of the Ng reference as being obvious to use to obtain the pending claims would be by using hindsight rooted in already knowing the purpose and features of the claimed invention.

9. Additionally, even if the Ng reference was analogous art to the Lee reference, it is my opinion that it would not have been obvious to combine the Lee and Ng references to arrive at the invention claimed in the '715 application. In the Office Action, the Examiner contends that it would be obvious for a person having ordinary skill in the art to have a hanging bracket such as the one taught by Ng because it "would be useful to a worker on a ladder." Final Office Action dated 25 March 2024 at p. 12. Respectfully, the Examiner's opinion is not supported by the cited references and would not be obvious to a person having ordinary skill in the art lacking the Examiner's hindsight bias.

10. First, ladder hinges, including the hinges of Lee, are not intended to be weight bearing members, unlike other parts such as rails or rungs. Modifying a handle or button for a hinge requires a clear motivation to do so because it affects both the safety and functionality of the hinge and ladder overall. Persons 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. Tools have various weights and sizes, so they would induce surplus or irregular loads to the hinge components and would need to be specifically designed around and tested for. Additionally, because hinge components such as the Lee handles are positioned far offset from the center of mass of the ladder, the weight of hanging tools would risk tilting or tipping the ladder. Thus, it would not be obvious to design hinge components to support potentially heavy hanging objects such as tools. For these reasons, in my opinion, there is no motivation or suggestion in Lee (or in the art in general at the time the '715 application was submitted) for the Lee handles to become weight bearing (*e.g.*, tool bearing) members. Without a reason to make them weight-bearing, there would be no reason to refer to the Ng bracket at all.

11. Even 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. Design for safety is critical in the design and development of ladders. Ladders are consistently on OSHA's Top 10 Most Frequently Cited Standards, as shown, for example, in the appended top 10 lists for the periods of October 2021 to September 2022 and October 2022 to September 2023, which reflect the circumstances surrounding the filing of the current application. *See* Appendices B and C. Even the Lee disclosure is directed to improving the safety of the

ladder: "As described above, the hinge for the collapsible ladders having a safety structure according to the present invention... keep an operator safe during use of the ladder." Lee at para. [0024]. Thus, to add a bracket for hanging tools to the hinge would require significant structural design considerations and would need to be evaluated and tested. The standard in ANSI-ASC A14.2 covers articulating ladders and is particularly directed to "provide reasonable safety for life limb and property." Appendix A at §1.2. The standard further specifies that "design verification tests shall be conducted during the initial evaluation of a specific product design and thereafter whenever there is a change in the design, method of manufacture, or material." *Id.* at §7.1.5. It would be critical to provide a load rating for the new bracket. An overloaded bracket could fail, allowing tools to fall and impacting and injuring those below the ladder. An engineer having ordinary skill in the art would understand the importance of verification tests for design changes or modifications, and ensuring weight bearing members, particularly elevated weight bearing members are designed to hold a specified amount of weight. In contrast, a picture hanging bracket such as one from Ng would be under no such stringent requirements. A POSITA therefore would not have any motivation to turn to Ng to find load bearing brackets of the kind that could properly be used on an articulating ladder.

12. Further, an engineer would know that the added bracket would need to be sufficiently large to hold tools. 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 conductive to adding a bracket of sufficient size for holding tools. The hinge of Lee appears to be sized for a normal ladder, even if the patent drawings are not necessarily to scale. An engineer would not have found it obvious to add an Ng-style bracket to the outer surface

of the press part 508 as the outer surface is too small (probably about 1.5-2.0 inches across). A bracket attached to such a small surface would not be obvious to use for holding a variety of tools, particularly since Ng shows that about half of the width Ng bracket is taken up by the portions (30, 40) through which the fasteners attach the bracket to a picture frame, thereby making any hanging opening (beneath center portion 20) very small and not obviously suited for supporting normal tools. An engineer would first have to decide to change the Lee reference before deciding that the bracket of Ng could be added to it, and I do not see any reason an engineer would have done so.

13. Modifying the press part 508 of the hinge of Lee to be larger (*e.g.*, to accommodate a larger Ng bracket and therefore to support larger tools) would also not have been obvious. Doing so would introduce additional forces/moments on the press part 508 and the hinge itself, which would result in increased stress on the shaft of the handle (*i.e.*, a longer moment arm between the edge of the press part and the shaft) and would require significant effort to redesign and re-verify compliance with the ladder-related safety and manufacturing standards. As an example, ANSI-ASC A14.2 states "a spreader or locking device *of sufficient size and strength* to securely hold the front and back sections in the open position shall be a component part of each stepladder." Appendix A at §6.1.9 (emphasis added). Modifying the press part 508 by making it larger (*e.g.*, to accommodate a useful Ng bracket 50) would decrease the strength of the locking device (press axle 500 and locking device 580 to which it is attached) and would require significant analysis and testing for verification of compliance with the ANSI-ASC A14.2 standard.

14. For at least the above reasons, an engineer or ladder designer would not

have been motivated to combine the Lee reference with the Ng reference.

15. Additionally, articulating ladders and picture frames with mounting brackets have both existed for many decades before the '715 application was filed. If the combination were indeed obvious, and there were teachings, suggestions, or motivations to combine the teachings of Lee and Ng, it stands to reason that the combination would have been made ages ago. As an expert in the field, I do not see anything in the cited references or in the knowledge of a POSITA at the relevant time that would have provided a design-based or market-based reason for a POSITA to modify Lee based on the teachings of Ng to obtain the ladder of the claims of the '715 application. Instead, I can only see the combination of these parts as a reconstruction of applied invention motivated by hindsight.

16. I further 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, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

Date: 6/17/2024

David Smith

4872-5806-2024\1

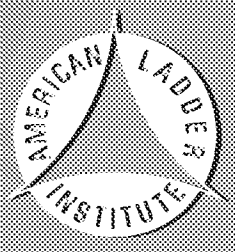
Listing of Appendices

- Appendix A: Copy of "American National Standard for Ladders – Portable Metal – Safety Requirements"/ANSI-ASC A14.2-2007, American Ladder Institute, American National Standards Institute, Inc., approved August 20, 2007. (78 Pages)
- Appendix B: Copy of website entitled "Commonly Used Statistics," U.S. Department of Labor, Occupational Safety and Health Administration, accessed 17 June 2024, available at https://www.osha.gov/data/commonstats. (3 Pages)
- Appendix C: Copy of website entitled "OSHA's Top 10 Most Frequently Cited Standards," U.S. Department of Labor, Occupational Safety and Health Administration, accessed 17 June 2024, available at https://www.osha.gov/top10citedstandards. (3 Pages)

APPENDIX A

Copy of "American National Standard for Ladders – Portable Metal – Safety Requirements" - ANSI-ASC A14.2-2007, American Ladder Institute, American National Standards Institute, Inc., approved August 20, 2007. (78 Pages)

American National Standard for Ladders — Portable Metal — Safety Requirements



American National Standards

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American National Standard for Ladders — Portable Metal — Safety Requirements

Secretariat
American Ladder Institute

Approved August 20, 2007
American National Standards Institute, Inc.

For information on possible errata sheets and other ANSI-ASC A14 Standards please refer to the ALI website located at:
www.americanladderinstitute.org

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American National Standard

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Foreword

(This Foreword is not a part of American National Standard A14.2-2007.)

This standard on portable ladders is one of many American National Standards prepared under the supervision of the ANSI Accredited Standards Committee on Safety in the Construction, Care, and Use of Ladders, A14. Subcommittees that report to the American National Standards Committee A14 have developed all of the standards. The subcommittees are A14.1, Portable Wood Ladders; A14.2, Portable Metal Ladders; A14.3, Fixed Ladders, A14.4, Job-Made Ladders; and A14.5, Portable Reinforced Plastic Ladders, and 14.9, Ceiling Mounted Disappearing Climbing Systems.

All standards, except A14.7 Mobile Ladders Stands and Mobile Ladder Stand Platforms, derive from the original American National Standards Safety Code for Construction, Care, and Use of Ladders, which was first approved on July 25, 1923. Revisions were approved on April 11, 1935; April 2, 1948; and November 10, 1952.

The earlier editions contained some treatment of metal and fixed ladders. Requirements for these types were removed from the 1948 revision because rapid development in the metal ladder field warranted special consideration and treatment of metal ladders, and fixed ladders (usually metal) in separate standards.

The Metal Ladder Manufacturers Association is responsible for initiating the standard on portable metal ladders. This group prepared the original draft and submitted it to Standards Committee A14 for consideration in May 1951. Subcommittee A14.2 was then created to review the document and make any changes necessary to conform to the requirements of all the interested groups. After consideration and some revision by the subcommittee, nearly 200 copies of the draft were sent to various organizations and individuals for review and comment. The suggestions received were considered in the preparation of the final draft, which was submitted to the Standards Committee for letter ballot in December 1955, and approved in 1956. Subcommittee A14.2 also developed the 1972 edition.

Responding to a Consumer Product Safety Commission challenge in August 1975, the A14 Committee mounted a three-prong attack to upgrade the portable ladder standards within the consensus framework of developing standards. Three Task Forces — Anthropometric, Testing, and Labeling — were established in October 1975.

Without question the Testing Task Force carried out the most massive technically difficult task, which included a significant amount of human-factors work. Over 100 known ladder experts were solicited to join this task force and provide their technical expertise. The work involved 50 meetings, over 400 test documents and the use of numerous test ladders over a period of nearly two years. The cost of the project has been conservatively estimated at over $300,000.

At the August 11, 1977, joint meeting of the Testing Task Force and the A14 Advisory Committee, 23 procedures were presented. These procedures, with an accompanying rationale based upon statistical and human factors data, were distributed to the three portable-ladder subcommittees for review and incorporation into the standards. Recommendations for nomenclature, and for care and use of ladders had been previously balloted. In addition, the Ladder Use Survey Form and Bi-Level Fall Victim Report Form (that have been included in the Appendixes), had also been balloted so the more technical material from the Testing Task Force could receive full attention of the three subcommittees.

Test procedures were developed for three different applications, namely, design verification, quality control, and in-service testing. Design verification tests would generally be conducted on a one-time basis during the original design development of the product and would usually be destructive tests. The manufacturer on an on-going basis would conduct quality control tests; some of the tests would be destructive and some would be nondestructive. In-service tests would be conducted by the user on a periodic basis and would be nondestructive in nature.

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ANSI A14.2-1981 was approved March 4, 1980 with an effective date of March 4, 1982. This 2 year period was to allow the manufacturers the necessary lead time to evaluate their products for conformance to the 1981 edition of the three portable ladder standards, to redesign and test their products where applicable, to design and build the required manufacturing tooling and machinery, and to convert their manufacturing operations to produce the revised products.

During development of product for compliance with the 1981 revision, experience by some of the manufacturers indicated that the inclined load test was not practical when applied to all available length ladders. Also, recommendations were received for clarifications in test procedure descriptions. In the course of resolving these questions, evidence was produced to warrant modifications in the label test requirements and further investigations brought about changes in the label test specifications.

To allow time for investigating these issues, the effective date of the 1981 revision was postponed to June 4, 1982 and then to October 4, 1982. Once the issues were resolved, ANSI A14.2-1982 was approved with the needed changes incorporated and an effective date of October 4, 1982.

In the 1990 revision, several issues, which had arisen since the 1982 revision, were addressed. Most significantly, requirements were developed to cover the multipurpose articulated ladder. In addition the label/marking section improved the graphics as well as presented new labels.

Considerable effort went into preparing the 2000 revision to assure consistency between the A14.2 standard for portable metal ladders and the new revisions of A14.1 (portable wood ladders) and A14.5 (portable reinforced plastic ladders) standards.

In this current revision, several issues, which have arisen since the last revision, are addressed. As a result of efforts by an Articulated Ladder Task Force, additional dynamic testing has been added to the testing requirements for articulated ladders. Additionally, requirements for ladders with a 375 pound duty rating, designated as "Special Duty Type IAA" are now being incorporated within the ANSI A14.2 and A14.5 standards. Requirements for Special Duty Type IAA ladders were previously developed and issued in the ANSI A14.10-2000 standard. The A14.10 subcommittee was originally formed in order to *quickly* respond to a petition to ANSI by cable TV and electric companies for a higher duty rating ladder. After incorporation of the Special Duty Type IAA requirements into the A14.2 and A14.5 standards, the A14.10 standard will be withdrawn.

Each revision of the standard was processed and approved for submittal to ANSI by American National Standards Committee on Safety in the Construction, Care, and Use of Ladders, A14. Committee approval of the standard does not necessarily imply that all the committee members voted for its approval.

Suggestions for improvement of this standard are welcome. They should be sent to the American Ladder Institute, 401 N. Michigan Ave., Chicago, IL 60611.

At the time it approved this standard, the A14 Committee had the following members:

Erick Knox, Chairman
Don Gibson, Vice Chair
Ron Pietrzak, Administrative Secretariat

Organization Represented	**Name of Representative**
American Insurance Association	George Earhart
	Thomas Murray (Alt)
American Ladder Institute	Marc McConnell
American Society of Safety Engineers	Earnest Harper
	Michael Lorenzo (Alt)
Associated General Contractors of America	Charles Bird
	John O'Donovan (Alt)
Canadian Standards Association	Walter Dick
Cosco Home and Office Products	Eric Kruse
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International Brotherhood of Painters and Allied Trades . . . . . Dan Penski
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Dale King (Alt)
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National Frame Builders Association . . . . . Stan Virkler
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Subcommittee A14-2 on portable ladders, which revised this standard, consists of the following members:

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I. Ojalvo
D. Plotner
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M. VanBree
K. Vidal
E. Wolff-Klammer

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American National Standard for Ladders — Portable Metal — Safety Requirements

1. Scope and Purpose

1.1 Scope

This standard prescribes rules governing the safe construction, design, testing, care and use of portable metal ladders of various types and styles. Ladder Types included are:

Duty Rating	Ladder Type	Working Load (pounds)
Special Duty	IAA	375
Extra Heavy-Duty	IA	300
Heavy-Duty	I	250
Medium-Duty	II	225
Light-Duty	III	200

Ladder styles include ladder type step stools, portable extension, step, trestle, sectional, combination, single, platform, and articulating ladders, but excluding ladders in and on mines, the fire services, mobile equipment, hoisting equipment, work platforms, antenna communications towers, transmission towers, utility poles, and chimneys. It does not cover special-purpose ladders that do not meet the general requirements of this standard, nor does it cover ladder accessories, including, but not limited to, ladder levelers, ladder stabilizers or stand-off devices, ladder jacks, or ladder straps or hooks, that may be installed on or used in conjunction with ladders.

Note: Ladder type step stools are covered by A14.2. It is recognized that a step stool standard is under development. When the step stool standard is approved, A14.2 will no longer cover ladder type step stools.

These requirements are also intended to prescribe rules and criteria for labeling/marking of the kinds of portable ladders cited in this standard, but exclusive of furniture type step stools and special purpose ladders. These labeling/marking requirements do not apply to those situations where training, supervision, or documented safety procedures would be in conflict, or serve in lieu of, these labeling/marking requirements.

1.2 Purpose

The purpose of this standard is to provide reasonable safety for life, limb, and property. In order to develop an effective safety program, the standard may serve also as a basis for purchase requirements and for instructions in personnel training, and in the preparation of motivational/instructional material such as safety practices, manuals, posters, and the like.

This standard is also intended to provide the manufacturer, purchaser, and user of metal ladders with a set of performance and dimensional requirements against which this product may be compared. It is not the purpose of this standard to specify all the details of construction of portable metal ladders. The limitations imposed are for the purpose of providing adequate general requirements and testing methods needed for consistency.

2. General

2.1 Rationale

A rationale has been developed covering the specifications and performance requirements of this standard.[1]

2.2 Application

This standard is intended for voluntary use by establishments that use, manufacture or evaluate ladders. It is also designed to serve as a guide to federal and state authorities or other regulatory bodies in the formulation of laws or regulations.

The methods employed to ensure compliance with this standard shall be determined by the proper regulatory or administrative authority.

[1]The rationale is on file with the Secretariat. American Ladder Institute, 401 N. Michigan Avenue, Chicago, IL. 60611.

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2.3 Interpretation

To secure uniform application of this standard, it is recommended that suggestions involving changes in the requirements or disputes over its interpretation shall be referred to the following organization:

A14 Administrative Secretariat
American Ladder Institute
401 N. Michigan Ave.
Chicago, IL 60611
FAX: 312-673-6929
www.americanladderinstitute.org

If it is determined that your inquiry requires an interpretation of the standard, the inquiry must be submitted in writing and the Secretariat will forward the inquiry to the appropriate Subcommittee Chairman for committee response.

In view of the many different kinds of ladders and the many different conditions under which they are used, this standard should be liberally construed considering the rationale (see 2.1). In cases of practical difficulty or under special-service conditions, it is expected that the administrative authority will grant exceptions to the literal requirements of this standard or will permit the use of alternate designs or features, but only if equivalent safety is thereby secured.

2.4 Mandatory and Advisory Provisions

The word "shall" is to be understood as denoting a mandatory requirement. The word "should" is to be understood as denoting a recommendation.

2.5 Equivalent

The word "equivalent" in this standard means a construction, connection, or material providing equal performance.

2.6 Effective Date

The requirements of this standard shall become effective one year after the date the revised A14.2 standard is approved by ANSI.

3. Related Standards

This standard is intended for use in conjunction with the following American National Standards (see Section 10):

American National Standard Safety Requirements for Scaffolding, ANSI A10.8-2001

American National Standard for Ladders — Portable Wood — Safety Requirements, ANSI A14.1-2007

American National Standard for Ladders — Portable Reinforced Plastic — Safety Requirements, ANSI A14.5-2007

4. Definitions and Nomenclature

Angle of inclination. The preferred pitch for portable non-self-supporting ladders.

Articulated joint. A hinge which can be locked in one or more positions.

Articulated ladder. A portable ladder with one or more pairs of locking articulated joints which allow the ladder to be set up in several modes such as a straight or extension ladder, with or without a stand-off, as a regular or double front stepladder, scaffold or work table.

Back leg (rear rail). The support members of a self-supporting portable ladder back section. The back legs are joined by rungs, bars, rear braces or other bracing to form the back section.

Combination ladder. A portable ladder capable of being used either as a stepladder or as a single or extension ladder. It may also be capable of being used as a trestle ladder or a stairwell ladder. Its components may be used as single ladders.

Duty rating. The combination of factors, including, but not limited to, ladder types and design features, which imply service capability.

Extension ladder. A non-self-supporting portable ladder adjustable in length. It consists of two or more sections traveling in guides or brackets or the equivalent and so arranged as to permit length adjustment.

Extension trestle ladder. A self-supporting portable ladder, adjustable in length, consisting of a trestle ladder base and a vertically adjustable extension section, with a suitable means for locking the ladders together.

Highest Standing Level. The vertical distance, expressed in feet and inches, from the uppermost rung or step the climber is advised to use to the horizontal plane of the ladder base support, with the ladder in the preferred climbing position.

Inside clear width. The distance between the inside flanges of the side rails of a ladder.

Ladder. A device incorporating or employing steps, rungs, or cleats on which a person may step to ascend or descend.

Ladder foot, shoe, or slip-resistant bearing surface. That component of ladder support that is in contact with the lower supporting surface.

Ladder Type. The designation that identifies the working load.

Marking. Any sign, label, stencil, or plate of a primary hazard or informational character, or both, affixed, painted, burned, stamped or embossed on a ladder surface. (See Appendixes A and B.)

Maximum extended length or maximum working length. The total length of the extension ladder when the middle or intermediate and top or fly sections are fully extended (maintaining the required overlap).

Permanent deformation (set). That deformation remaining in any part of a ladder after all external loads have been removed.

Pitch. The included (acute) angle between the horizontal and the ladder, which is measured on the side of the ladder opposite the climbing side. It is usually expressed as the ratio H/L, which is the horizontal distance H from the base of the ladder to the supporting surface divided by the working length L of the ladder.

Plastic top cap. Molded thermoset or thermoplastic uppermost horizontal member of a portable stepladder.

Platform. A landing surface that is used as a working or standing location.

Platform ladder. A self-supporting portable ladder of fixed size with a platform provided at the intended highest standing level.

Portable ladder. A ladder that can readily be moved or carried, usually consisting of side rails joined at intervals by steps, rungs, cleats, or rear braces.

Rail. The side members joined at intervals by rungs, steps, cleats, or rear braces.

Rear braces. Crosspieces or diagonals (in the back section of a self-supporting ladder) not intended for climbing, which may be spaced at any interval.

Rungs, steps, or cleats. Ladder crosspieces that are intended for use by a person in ascending or descending.

Scaffold. A temporary elevated platform and its supporting structure used for supporting worker(s) or materials or both.

Section

(1) Bottom or base section. The lowest section of a non-self-supporting portable ladder.

(2) Top or fly section. The uppermost section of a non-self-supporting portable ladder.

(3) Middle or intermediate section. The section between the top (fly) and bottom (base) sections of a non-self-supporting portable ladder.

Sectional ladder. A non-self-supporting portable ladder, nonadjustable in length, consisting of two or more sections, and so constructed that the sections may be combined to function as a single ladder.

Single ladder. A non-self-supporting portable ladder, nonadjustable in length, consisting of one section.

Size. The quantitative description of the length of the ladder. Methods of defining size are presented in the individual standards.

Special-purpose ladder. A portable ladder that is either an experimentally designed ladder or a modification or assemblage of A14 approved requirements for design, testing or construction features of one of the general-purpose ladders defined elsewhere in this section, in order to adapt the ladder for special or specific climbing uses.

Stand-off. A means by which a ladder may be erected at some horizontal distance away from its upper support point.

Stepladder. A self-supporting portable ladder, nonadjustable in length, with flat steps and hinged base.

Step stool (ladder type). A self-supporting, foldable, portable ladder, nonadjustable in length, 32 inches or less in size, with flat steps and without a pail shelf, designed so that the ladder top cap as well as all steps can be climbed on. The side rails may continue above the top cap.

Step surfaces. The clear portion of steps, rungs, or cleats on which a person may step while ascending or descending ladder.

Straight ladder. An articulated ladder where all of the sections are in-line.

Test failure. Damage or visible weakening of the ladder structure or a component, except where otherwise defined by the test protocol.

Test load. The applied load used to demonstrate compliance with performance test requirements.

Top cap. The uppermost horizontal member of a portable stepladder or step stool.

Top step. The first step below the top cap of a portable stepladder or step stool. Where a ladder is constructed without a top cap, the top step is the first step below the top of the rails.

Trestle (double front) ladder. A self-supporting portable ladder, non-adjustable in length, consisting of two sections, designed to be able to be climbed on by two (2) individuals simultaneously, one (1) per side and hinged at the top to form angles with the base.

Ultimate failure. The collapse of the ladder structure or, where applicable, a component thereof.

Uncoated vinyl flooring. In this standard, it shall be the Classic Corlon vinyl flooring from Armstrong.

Visual damage. Damage evident by visual inspection.

Visual inspection. Inspection by the eye without recourse to any optical device except prescription eyeglasses.

Working length. The length of a non-self-supporting portable ladder measured along the rails from the base support point of the ladder to the point of bearing at the top.

Working load. The maximum applied load, including the weight of the user, materials, and tools which the ladder is to support for the intended use.

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5. General Requirements

Specific design and construction requirements are minimized in this standard because of the wide variety of metals and design possibilities. However, the design shall have such characteristics as to produce a ladder of sufficient strength and stiffness to meet the performance requirements of this standard and shall produce a ladder without structural defects or accident hazards such as sharp edges, burrs, and the like.

While this standard addresses known performances issues, it is based on current designs and materials of construction. Alternative designs and materials may bring new issues that are not presently addressed. Therefore, in addition to the requirements of this standard, each design/material configuration must be carefully evaluated according to sound engineering practice to assure a ladder that meets its intended use.

5.1 Flare

Because of the varied conditions and the wide variety of ladder uses, ladders may be designed with parallel side rails, with side rails varying uniformly in separation along the length (tapered), or with side rails flaring at the base.

5.2 Side Rails

The design of the side rails shall be such as to ensure a product that will conform to the requirements of this standard.

5.3 Rung and Step Spacing

The spacing between ladder rungs or steps shall be on 12-inch centers ±1/8 inch, except for step stools where the spacing shall be uniform but not less than 8 inches ±1/8 inch nor more than 12 inches ±1/8 inch measured along the side rail. On articulated and combination ladders, the 12-inch spacing shall be maintained across hinged sections.

Note: Stepladders with the top step 18 inches below the top cap and the bottom step 6 inches above the base support are permitted as an alternate means of construction. In this case the top step may be used for stepping purposes. When the top step is 18 inches below the top cap, provision should be made to restrict inadvertent stepping into the opening.

5.4 Rung Connections

Rung-to-side-rail or step-to-side-rail connections shall be so constructed as to ensure sufficient rigidity and strength to conform to the requirements of this standard. All connections shall be riveted, welded, swaged, fastened with a locking type bolt or other permanent means.

5.5 Rungs, Steps, and Platform

Those surfaces of rungs, steps, and platforms designed for use in ascending, descending, working, or standing, shall be corrugated, serrated, knurled, dimpled, or coated with a slip-resistant material, across their entire width. Provided the overall slip-resistant characteristics are not compromised, interruption in the slip-resistant surfaces is permissible if necessitated by operational and/or structural requirements or other considerations that could affect safety or function.

5.6 Hardware

Hardware shall meet the requirements for the ladder's component parts and shall be of a material that is protected against corrosion unless it is inherently corrosion-resistant. Metals shall be so selected as to avoid excessive galvanic action.

5.7 Burrs, Bolts, Rivets, and Welds

All workmanship shall be free from burrs in excess of 1/64 inch.

5.8 Angle of Inclination

The angle of inclination for single and extension ladders, and articulated ladders, and combination ladders when used as a single ladder, shall be 75-1/2°. The angle of inclination for articulated ladders using rungs, when used as a single or extension ladder shall be 75-1/2°, but the tread portion is not required to be horizontal. For articulated or combination ladders using steps, this angle may range from 70° to 75-1/2°, to the extent necessary to permit the tread portion of the steps to be horizontal (level).

5.9 Plastic Top Caps

Top cap shall be manufactured in a controlled process yielding good commercial workmanship of the part. Finished component shall meet specified dimensions, possess a minimum of shorts or voids, be reasonably free from distortion or warping, discoloration and excessive sink marks or parting line flash.

6. Specifications

6.1 Stepladders

6.1.1 Stepladder Size. The size shall be measured along the front edge of the front side rail, including top cap and foot, with a tolerance of ±1/2 inch, and shall be within the limits as follows:

Duty Rating	Ladder Type	Size (feet)
Special Duty	IAA	3-12
Extra Heavy-Duty	IA	3-20
Heavy-Duty	I	3-20
Medium-Duty	II	3-12
Light-Duty	III	3-6

6.1.2 Slope. Slope is the angle of the side rails or back legs with respect to the vertical and is expressed as the horizontal deviation from the vertical per unit length of the member. Stepladders shall be constructed so that when they are in the open position, the slope of the front section is not less than 3-1/2 inches, and the slope of the back section is not less than 2 inches, for each 12-inch length of side rail.

6.1.3 Width and Spread. The minimum inside clear width at the top step shall be 12 inches. From top to bottom the spread between the side rails shall increase a minimum of 1-1/4 inches per foot of side rail length.

6.1.4 Steps. Steps shall be parallel and level within 1/8 inch (see 5.3).

6.1.5 Step Width. The minimum width of the step or tread shall be 3 inches.

6.1.6. Bucket (Pail) Shelves. Where bucket shelves are an integral part of the stepladder, they shall be so fastened that they can be folded up within the ladder when the ladder is closed. On ladders eight feet or less in length, the shelf shall be designed so that it must be folded before the ladder can be closed, or during the closing of the ladder the shelf shall fold and the bucket shelf arms shall not project beyond the front rail frame surfaces facing the user.

6.1.7 Back Section. The back section may be designed with any type of rear braces as long as it meets the general and testing requirements (see Section 7).

6.1.8 Feet. The bottoms of the four rails shall be made of or covered with slip-resistant material. The dimensions of the slip-resistant surface shall not be less than the dimensions of the projected area outlined by the cross section of the end of the rail.

6.1.9 Spreaders. A spreader or locking device of sufficient size and strength to securely hold the front and back sections in the open position shall be a component part of each stepladder. The spreader shall not be more than 6-1/2 feet above the lower support surface and shall have all sharp points or edges covered or removed to protect the user. For ladders using double sets of spreaders, the foregoing height limitation applies only to the lower set.

6.1.10 Plastic Top Caps. Specification of the particular resin, filler and additives are the responsibility of the manufacturer, who shall give consideration that certain requirements are achieved. All filled thermoplastics shall have the appropriate coupling agent and adequate ultraviolet inhibitors should be incorporated.[1]

The assembled part shall be designed to exhibit satisfactory corrosion resistance, outdoor weathering, thermal stability, and structural integrity under the stipulated thermal conditions outlined in the standard.

6.2 Single and Extension Ladders

6.2.1 Single Ladder Width. The minimum inside clear width shall be not be less than 12 inches for ladders 10 feet and under and shall increase 1/8 inch for each additional foot of length.

6.2.2 Extension Ladder Width. The minimum inside clear width between side rails of the fly or intermediate section shall not be less than 12 inches. The minimum inside clear width between side rails at the bottom of the base section shall not be less than the following dimensions:

Ladder Size (feet)	Minimum Inside Clear Width (inches)
Up to and including 28	14
Over 28, up to and including 40	15
Over 40, up to and including 72	18

6.2.3 Single Ladder Size. The size of a single ladder is designated by the overall length at the side rail, excluding any foot or end cap, with a tolerance of ±1/2 inch. Single ladders shall not exceed the sizes specified in Table 1.

6.2.4 Extension Ladder Size. The size of an extension ladder is designated by the sum of the lengths of one side rail of each section measured along the side rails, excluding any foot or end cap. A tolerance of ±3 inches per section shall be allowed. Extension ladders shall not exceed the sizes specified in Table 1.

Extension ladders shall be marked to indicate both the total length of sections and the maximum extended length or maximum working length.

6.2.5 Overlap and Bearing Length. Each section of a multi-section ladder, when fully extended in the locked in-use position shall overlap the adjacent section as indicated in Table 2. Bearing length is determined by performance tests.

6.2.6 Overlap Control. Extension ladders shall be equipped in such a manner that the ladder cannot be used with an overlap less than the minimum specified in Table 2. Designs employing ladder lock location, mechanical stops, or the equivalent are acceptable, but not those depending upon pulley location.

6.2.7 Extension Locking Device. The extension locking device shall be designed to withstand all performance tests. Locks may be any design, such as gravity, spring-action, rope-operated, or stationary types.

A section incorporating locks that result in the elimination of a rung in the section or one not intended

[1]One preferred system is a minimum of 0.25% by weight of HALS (Hindered Amino Light Stabilizer) and 0.12% antioxidant.

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Table 1
Single and Extension-Ladder Size

Duty Rating and Type	Single Ladder	Two-Section (feet)	Three-Section (feet)
Special duty - Type IAA	Up to and including 16	Up to and including 32	Up to and including 36
Extra heavy-duty - Type IA	Up to and including 30	Up to and including 60	Up to and including 72
Heavy-duty - Type I	Up to and including 30	Up to and including 60	Up to and including 72
Medium-duty - Type II	Up to and including 24	Up to and including 48	Up to and including 60
Light-duty - Type III	Up to and including 16	Up to and including 32	–

for separate use because of non-compliance with single ladder requirements shall include a permanent marking*, in letters not less than 1/8 inch high, such as:

Caution — This Ladder Section Is Not Designed for Separate Use

*labels qualify as permanent markings provided they comply with Section 7.6.

In lieu of the above marking, permanently attached stops shall be provided to prevent removal of the section. Permanently attached stops are considered to be those that would require cutting or drilling, or similar forcible means, for removal.

6.2.8 Rope and Pulley.

6.2.8.1 Extension ladders 20 feet and longer shall be equipped with a rope and pulley. The pulley shall be attached to the ladder in such a manner as not to weaken either the rungs or the side rails. Fastening means to secure the pulley shall not be construed as weakening the rungs, provided the rungs meet the applicable rung bending strength test. The pulley shall be not less than one inch in diameter, measured at the base of the sheive.

6.2.8.2 The rope used with the pulley shall be not less than a nominal 5/16 inch in diameter, shall have a minimum breaking strength of 560 pounds, and shall be of sufficient length for the purpose intended. On three-section ladders, on the fly section only, wire cable may be used in the rope and pulley hook-up. The cable shall be not less than 1/8 inch in diameter.

Table 2
Minimum Required Overlap for Extension Ladders (inches)

Ladder Size (feet)	Two Section	Three Section
Up to and including 32	34	33
Over 32, up to and including 36	46	45
Over 36, up to and including 48	58	57
Over 48, up to and including 72	70	69

6.2.9. Shoes, Spurs, and Other Slip-Resistant Devices. Each rail of a single ladder and each rail of an extension ladder base section shall be provided with a means of slip resistance secured to the lower end of the ladder rail and designed to function at the specified angle of inclination. Such devices include, but are not limited to, safety shoes, spurs, spikes, conformable shoes, and flat or radiused tread feet.

6.2.10 End Caps and End Closures. End caps shall be provided on the upper end of each side rail of the fly or intermediate section of an extension ladder and on a single ladder. End closures or equivalent protection against sharp edges and snagging shall be provided on the bottom of each side rail of the fly or intermediate section when it operates on the front of the base section, or on the top of the base section when the fly or intermediate section operates in the rear of the base section. End closures on the bottom of the fly or intermediate sections, when suitably designed in accordance with 6.2.9, may serve as ladder shoes where the unit permits the sections to be taken apart.

6.3 Trestle (Double Front) and Extension Trestle Ladders

6.3.1 Size. Trestle ladders, or extension sections, or base sections of extension trestle ladders, shall be sized as follows:

Duty Rating and Type	Trestle	Extension Trestle
Special Duty - Type IAA	3-12	–
Extra Heavy-Duty - Type IA	3-20	6-20
Heavy-Duty - Type I	3-20	6-20
Medium-Duty - Type II	3-12	6-12
Light-Duty - Type III	3-6	–

A tolerance of +2 inches, -1/2 inch, shall apply to all sections. In no case shall the extension section size exceed the base-section size.

6.3.1.1 Trestle (Double Front) Ladder. The length of the side rails measured along the front edge, including the foot or shoe designates the size of a trestle ladder.

6.3.1.2 Extension Trestle Ladder. The size of an extension trestle ladder is designated by the length of the trestle ladder base along the front edge of the side rail, including the shoe.

6.3.2 Width. The minimum inside clear width of the trestle or extension section at any point shall not be less than 12-1/2 inches. The width spread shall not be less than 1-1/4 inches per foot of side rail length.

6.3.3 Base Spread. The spread when the base section is open shall not be less than 5-1/2 inches per foot of base section side rail.

6.3.4 Extension Trestle Overlap. The extension section of the extension trestle ladder, when fully extended, shall overlap the base section as indicated in Table 3.

Table 3
Minimum Required Extension Trestle Ladder Overlap

Base Section Size (feet)	Overlap (inches)
6 up to and including 8	34
Over 8, up to and including 12	46
Over 12, up to and including 16	58
Over 16, up to and including 20	70

6.3.5 Overlap Control. Extension trestle ladders shall be equipped in such a manner that the ladder cannot be used with an overlap less than the minimum specified in Table 3. Designs employing ladder lock locations, mechanical stops, or the equivalent are acceptable.

6.3.6 Extension Locking Device. The extension locking device shall be designed to withstand all load tests.

6.3.7 Spreaders. A spreader or locking device of sufficient size and strength to securely hold the front and back sections in the open position shall be a component of each trestle ladder. The spreader shall have all sharp points or edges covered or removed to protect the user. When double sets of spreaders are used, the lower set shall not be more than 6-1/2 feet above the lower support surface. On extension trestles where the extension guidance system serves as the spreaders, its location may be more than 6-1/2 feet above the base.

6.3.8 Feet. The bottoms of the four rails of the trestle ladder and the base section of an extension trestle ladder shall be made of or covered with slip-resistant material. The dimensions of the slip-resistant surface shall not be less than the dimensions of the projected area outlined by the cross section of the end of the rail.

6.3.9 End Caps and End Closures. End caps shall be provided on the upper end of each side rail of the extension section of an extension trestle ladder. End closures or equivalent protection against sharp edges and snagging shall be provided on the bottom of each side rail of the extension section. End closures on the bottom of the extension section, when suitably designed, may serve as ladder shoes where the unit permits the sections to be taken apart.

6.4 Platform Ladders

6.4.1 Size. The size of a platform ladder is designated by the overall length as determined by the length of the front edge of the front side rail from the top of the platform to the base of the ladder, including any foot or shoe, with a tolerance of ±1/2 inch and shall be within the limits as follows:

Duty Rating	Ladder Type	Size (feet)
Special Duty	IAA	2-8
Extra Heavy-Duty	IA	2-18
Heavy-Duty	I	2-18
Medium-Duty	II	2-10
Light-Duty	III	2-4

6.4.2 Slope. Slope is the angle of the side rails or back legs with respect to the vertical and is expressed as the horizontal deviation from the vertical per unit length of the member. Platform ladders shall be so constructed that when in the open position, the slope of the front section is not less than 3-1/2 inches, and the slope of the back section is not less than one inch, for each 12-inch length of side rail.

6.4.3 Width and Spread. The minimum inside clear width at the platform shall be 14 inches for Type IAA, Type IA, Type I and Type II ladders and 13 inches for Type III ladders. The width spread shall not be less than 1-1/4 inch per foot of side rail length.

6.4.4 Platform. The platform area shall be at least 20 inches below the top of the ladder. The platform area shall not be less than 200 square inches for Type IAA, Type IA, Type I and Type II ladders, and not less than 130 square inches for Type III ladders. The platform shall not extend more than 1-1/2 inches beyond the back rail.

6.4.5 Top Rail. The back legs and side rails of a platform-type ladder shall extend at least 20 inches of vertical height above the top of the platform and shall be connected with a top member to form a three-sided rail. Equivalent construction may be provided.

6.4.6 Spreaders. Extra spreaders shall be provided on all ladders greater than six feet in size. Only ladders six feet or under may use the platform hinging device as the spreader if the device locks the ladder open. The spreaders shall have all sharp points or edges covered or removed to protect the user. The spreader shall not be more than 6-1/2 feet above the lower support surface. For ladders where double sets of spreaders are used, the foregoing height limitation applies only to the lower set.

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6.4.7 Feet. The bottoms of the four rails shall be made of or covered with slip-resistant material. The dimensions of the slip-resistant surface shall not be less than the dimensions of the projected area outlined by the cross section of the end of the rail.

6.4.8 Other Requirements. The requirements of 6.1.1 through 6.1.9 that are not in conflict with 6.4.1 through 6.4.7 shall also apply to platform ladders.

6.5 Combination Ladder

6.5.1 Size. When the combination ladder is used as a self-supporting ladder, the size is designated by the length of the ladder, measured along the front edge of the front side rail from the bottom of the foot to the top of the top cap, or to the top step when no top cap is used, with a tolerance of ±1/2 inch, and shall be within the limits shown in Table 4.

When the combination ladder is used as an extension ladder, the maximum extended length shall be at least twice the stepladder length less 3 feet. The stepladder length and the maximum extension ladder length shall be within ±1/2 inch of the size indicated on the label.

Table 4
Combination Ladder Size

	Length in Feet	
Duty Rating and Type	Minimum	Maximum
Special duty - Type IAA	4	10
Extra heavy duty - Type IA	4	10
Heavy duty - Type I	4	10
Medium duty - Type II	4	10
Light duty - Type III	4	6

6.5.2 Slope. Slope is the angle of the front side rails (stepladder section) or the rear side rails (single or extension-ladder section) with respect to the vertical and is expressed as the horizontal deviation from the vertical per unit length of the member. Combination ladders shall be so constructed that when in the open position for use as a stepladder, the slope of the front section is not less than 3-1/2 inches, and the slope of the back section is not less than 2 inches for each 12-inch length of side rail.

6.5.3 Width and Spread. The minimum inside clear width between front side rails at the top step shall be 12 inches. From top to bottom the spread shall increase a minimum of 1-1/2 inches per foot of side rail length. The inside clear width of the rear section (extension or single ladder section) shall be 12 inches.

6.5.4 Steps and Rungs. Either steps or rungs may be used on the front and rear sections. Step surfaces shall be parallel and level within ±1/8 inch. When steps are used in the rear section, the step surfaces shall be parallel within ±1/8 inch with the step surfaces in the front section when the ladder is used as a single or extension ladder.

6.5.5 Step Width. Where used, the minimum width of the step in the front section only (stepladder section) shall be 3 inches.

6.5.6 Bucket (Pail) Shelves. Where bucket shelves are provided they shall be in compliance with Section 6.1.6 and 7.5.5 test requirements.

6.5.7 Feet. The bottoms of the four rails shall be made of or covered with slip-resistant material. The dimensions of the slip-resistant surface shall not be less than the dimensions of the projected area outlined by the cross section of the end of the rail.

6.5.8 Spreaders. A spreader or locking device of sufficient size and strength to securely hold the front and rear sections in the open position shall be a component part of each combination ladder. The spreader shall have all sharp points or edges covered or removed to protect the user. The spreaders shall not be more than 6-1/2 feet above the base supporting surface.

6.5.9 Extension locking device. The extension locking device shall be designed to withstand all load tests without test failure (see also Section 7.3.4.5).

6.5.10 Stops. Combination ladders shall be equipped in such a manner that the ladders, when used as extension ladders, shall not exceed the maximum working lengths specified by the manufacturer. Designs employing ladder lock location, mechanical stops, or the equivalent are acceptable.

6.5.11 End Caps. End caps shall be provided on the upper ends of each side rail of a combination section when the rail is not otherwise capped.

6.6 Step Stools (Ladder Type)

6.6.1 Size. Step stool size shall be 32 inches or less measured along the front edge of the front side rail, including the top cap and feet, with a tolerance of ±1/2 inch. The front side rails may continue around and over the top cap, but such side rail extension is not considered part of the ladder size. This standard does not cover Type IAA ladder type step stools (see 8.2.1.1).

6.6.2 Slope. Slope is the angle of the side rails or back legs with respect to the vertical and is expressed as the horizontal deviation from the vertical per unit length of the member. Step stools shall be constructed so that when in the open position, the slope of the front section is not less than four inches, and the slope of the back section is not less than 2-1/2 inches, for each 12-inch length of side rail.

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6.6.3 Width and Spread. The minimum inside clear width at the top step shall be 10-1/2 inches. The minimum outside width at the top cap shall be 12 inches. From top to bottom the spread between the side rails shall increase a minimum of 1-1/4 inches per foot of side rail length.

6.6.4 Steps. Steps shall be parallel and level within the tolerance specified (see 5.3). Excluding the interval between the bottom step and the support surface, the steps and top cap shall be uniformly spaced at intervals of 8 to 12 inches.

6.6.5 Step Width. The minimum width of the step or tread shall be 3 inches.

6.6.6 Back Section. The back section may be designed with any type of rear braces as long as it meets the General and Test requirements (See Section 7).

6.6.7 Feet. The bottoms of the 4 rails shall be made of or covered with slip-resistant material. The dimensions of the slip-resistant surface shall not be less than the dimensions of the projected area outlined by the cross section of the end of the rail.

6.6.8 Spreaders. A spreader or locking device of sufficient size and strength to securely lock the front and back sections in the open position shall be a component part of each step stool. All sharp points or edges shall be covered or removed to protect the user.

6.6.9 Top Cap. The top cap shall be of sufficient strength and slip resistance to permit its use as a climbing surface. Its size shall be not less than 12 inches wide and 4-3/4 inches deep. The top cap shall not overhang the ladder in any direction in excess of the dimensions of the attaching hardware or the equivalent. The top cap shall not be split for folding the ladder.

6.7 Articulated Ladders

6.7.1 Articulated Ladder Size. When the articulated ladder is used in a stepladder mode, the size is designated by the length of the ladder measured along the front edge of the front side rail from the bottom of the foot to the center of the pivot pin of the hinge, with a tolerance of ±1/2 inch, and shall be within the limits as follows:

Duty Rating	Ladder Type	Size (feet)
Special Duty	IAA	Not Provided
Extra Heavy-Duty	IA	3-15
Heavy-Duty	I	3-15
Medium-Duty	II	3-12
Light-Duty	III	3-6

This standard does not cover Type IAA articulated ladders (See 8.2.1.1).

When the articulated ladder is used in a straight or extension ladder mode, the size is designated by the overall length at the side rail, including any feet and hinges, with a tolerance of ±1/2 inch, and shall be within the limits as follows:

Duty Rating	Ladder Type	Size (feet)
Special Duty	IAA	Not Provided
Extra Heavy-Duty	IA	Not to Exceed 30
Heavy-Duty	I	Not to Exceed 30
Medium-Duty	II	Not to Exceed 24
Light-Duty	III	Not to Exceed 12

6.7.2 Slope. Slope is the angle of the front side rails or the rear side rails with respect to the vertical and is expressed as the horizontal deviation from the vertical per unit length of the member. Articulated ladders shall be constructed so that when the ladder is in the open position for use in the stepladder mode, the slope of the front section is not less than 3-1/2 inches, and the slope of the back section is not less than 2 inches, for each 12-inch length of side rail.

If the ladder permits use in the double front stepladder mode, the spread when the ladder is open shall not be less than 5-1/2 inches for each 12-inch length of side rail.

6.7.3 Width and Spread. The minimum inside clear width at the top step when set up in a stepladder mode shall be 12 inches. If the ladder is provided with a straight back section, then the front section's minimum outside width at the bottom support shall exceed the width at the top of the rails by 1-1/2 inches per foot of ladder length when measured to the outside of the top side rails. If the ladder is provided with both a front and back section which spread, then both sections' minimum outside width at the bottom support shall exceed the width at the top of the rails by 1-1/4 inches per foot of ladder length when measured to the outside of the top side rails. The minimum inside clear width at the base when set up in a single or extension ladder mode shall be 12 inches for ladders 10 feet and under and the minimum inside width shall increase 1/8 inch for each additional foot of length.

6.7.4 Steps and Rungs. Either steps or rungs may be used on the front and rear sections. Step surfaces shall be parallel and level within ±1/8 inch. When steps are used in the rear section, the step surfaces shall be parallel within ±1/8 inch with the step surfaces in the front section when the ladder is used in a single or extension ladder mode.

6.7.5 Step Width and Rung Diameter. If steps are used, the minimum width of a step shall be three inches. If rungs are used, they may be round, D-shaped or equivalent, trapezoidal, square, or rectangular.

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Round rungs shall have a minimum diameter of 1-1/8 inches. Trapezoidal, D-shaped or equivalent, square or rectangular rungs shall have a step surface of not less than 1 inch, either flat or along a segment of arc of 3 inches or greater radius. Right-angle or near-right angle corners shall have their edges rounded to a radius of not less than 1/16 of an inch.

6.7.6 Bucket (Pail) Shelves. Where bucket shelves are provided they shall be in compliance with Section 6.1.6 and 7.5.5 test requirements.

6.7.7 Feet. The bottoms of the four rails shall be made of, or covered with, slip-resistant material. The dimensions of the slip-resistant surface shall not be less than the dimensions of the projected area outlined by the cross section of the end of the rail. The tread surface may be a radius.

6.7.8 Articulated Joints. The joints, and the joint to side rail connections, shall be so constructed as to ensure sufficient strength and rigidity to conform to the requirements of this standard. The joints shall have set locking positions to allow set up at the proper angles designated by the manufacturer. All sharp points or edges or pinch points shall be covered or removed to protect the user. Each lock shall visibly indicate whether it is locked or unlocked.

6.7.9 Worktable Position. Use as a worktable shall be limited to working heights of 5 feet or less. The manufacturer shall supply suggestions for an appropriate decking for safe usage.

6.7.10 Telescoping Sections. The locks for any telescoping sections shall visibly indicate as to whether they are locked or unlocked.

6.7.11 Scaffold Position. Use as a scaffold shall be based on a one person usage (working load not to exceed duty rating of ladder including weight of user and all clothing, tools, and materials). The manufacturer shall supply or suggest an appropriate decking for safe usage. Working heights shall be limited to 6 feet or less. The height shall not exceed three times the minimum outside width of the bottom support in the scaffold position. Hand rails and toeboards are not required.

7. Test Requirements

7.1 General

7.1.1 The test methods depicted in this section represent the preferred methods to be followed in determining whether a ladder conforms to the requirements of this standard. Variations from the specific methods depicted in the various diagrams shall be acceptable provided such alternate means provide equivalent results and comply with the intent of the applicable preferred test method. However, where the supposed equivalent test methods yield different results, the preferred test methods shall determine whether or not the ladder is in conformance with the standard.

7.1.2 The test requirements were developed using statistical tolerances. Hence, where a single test result indicates noncompliance, the test may be repeated utilizing a statistically justifiable number of test samples to ultimately determine compliance or noncompliance with the standard.

7.1.3 Many of the tests required by the standard are inherently dangerous. The American National Standards Institute, the A14 Committee, the A14 Subcommittees, and the A14 Task Forces neither assume nor accept any responsibility for any injury or damage that may occur during or as the result of tests, wherever performed, whether performed in whole or in part by the manufacturer, an outside laboratory or consultant, the user or owner of the product, or any other individual or organization, and whether or not any equipment, facility, or personnel for or in connection with the test is furnished by the manufacturer or by any other such individual, consultant, laboratory, or organization. Extreme care shall be exercised to avoid personal injury when setting up and conducting the tests and when disassembling the test gear at the conclusion of the tests.

7.1.4 Diligent effort and close attention to all details shall be exercised in setting up and conducting the tests. Subtle variations in test techniques may introduce significant testing errors that bias the testing program. Personnel inexperienced in ladder testing, even though otherwise professionally qualified, should be especially careful to follow the preferred test methods.

7.1.5 Design verification tests shall be conducted during the initial evaluation of a specific product design and thereafter whenever there is a change in the design, method of manufacture, or material. It is not intended that design verification tests shall be conducted on ladders that have been in use or subjected to prior damage, misuse, or abuse. Ladders subjected to design verification tests are not intended for subsequent use.

7.1.6 Quality control tests should be conducted during the manufacturing process employed to produce the ladder. Such tests normally shall not be conducted on every ladder manufactured or on ladders that have been in use or subjected to prior damage, misuse, or abuse. Certain quality control tests, such as dimensional verifications, hardness, chemistry, spectroscopic, and mechanical properties tests may be conducted on ladders subsequent to their use when done with

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extreme care by properly qualified professionals following applicable ASTM standards for such tests, where proper recognition is given to the influence on the test results of the prior use and the test method itself. Except where the quality control tests are destructive in nature, ladders subjected to quality control tests may be subsequently placed into field service.

7.1.7 The manufacturer, the actual owner, the user, or their agents, to evaluate the condition of the product following actual field service may conduct in-service tests in the field. Ladders that conform to the in-service use tests may continue to be employed.

Note: The tests with the full text in italics are advisory, not mandatory, when conducted for in-service testing purposes.

7.1.8 The development and ongoing implementation of overall quality control shall be the responsibility of each individual manufacturer.

7.1.9 Conformance to the design verification test requirements shall be determined 5 minutes after load removal, where applicable.

7.1.10 The test load shall be applied slowly, using care to minimize dynamic loading and eliminate impact loading during the test.

7.2 Combination Ladder Tests

Combination ladders shall comply with the test requirements for stepladders when in the stepladder position, and for extension ladders when in the extension ladder position. The 75-1/2° angle of inclination for extension ladders shall be modified when applied to combination ladders in their extension-ladder orientation to the extent necessary to permit the tread portion of the steps to be horizontal (level).

7.3 Single, Extension, Combination, and Articulated Ladder Tests

7.3.1 Horizontal Bending Test.
Note: This is a design verification test.

7.3.1.1 The ladder shall be placed in a flat horizontal position, as shown in Fig. 1a. When articulated, extension, and combination ladders are tested, the unit shall be opened to its maximum working length. The unit shall be loaded with the preload shown in Table 5. It shall be applied to the center of the rung nearest to the center of the test span over a 3-1/2 inch length of the rung, ensuring that the load is applied equally to both side rails, as shown in Fig. 1b. The preload shall be held for a minimum period of one minute and then unloaded.

After preloading, a deflection test load in accordance with Table 5 shall be applied in the same manner as the preload. Vertical measurements shall be taken of both rails before and during loading, and after the load is removed. The maximum average deflection of both side rails shall not exceed the value given in Table 6.

7.3.1.2 The ladder shall then be subjected for at least one minute to an increased load, equal to the ultimate test load in accordance with Table 5. The ladder shall sustain the ultimate test load without ultimate failure. The test load shall be sequentially applied at the three different rung locations: first to the center of the highest base rung below the overlap; second to the center of the fly rung in the center of the overlap or, if necessary, 6 inches higher than the center of the ladder span; and third to the center of the lowest fly rung above the overlap. When testing an articulated ladder, the test load shall be applied to the center of the rung immediately above the center of the test span. When the articulated ladder is intended to be climbed from either side, the horizontal bending test shall be conducted front and back. The end support bars shall be designed to permit longitudinal translation of either one or both supports during loading as the test unit deflects, yet still maintain the 6-inch overhang at each end.

7.3.2 Deflection Test.
Note: *This is both a design verification test and an in-service use test.*

The ladder shall be supported and the load shall be applied to the rung closest to the midpoint of the span, over a 3-1/2 inch bearing on the rung, as shown in Fig. 2a and b. All supporting and loading apparatus shall conform to that shown in Fig. 2a and 2b. The test results shall be recorded on a data sheet

Table 5
Horizontal Bending Test Loads (pounds)

Duty Rating and Type	Working Load	Preload	Deflection Test Load	Ultimate Test Load
Special duty - Type IAA	375	280	375	470
Extra heavy-duty - Type IA	300	225	300	375
Heavy-duty - Type I	250	188	250	310
Medium-duty - Type II	225	169	225	280
Light-duty - Type III	200	150	200	250

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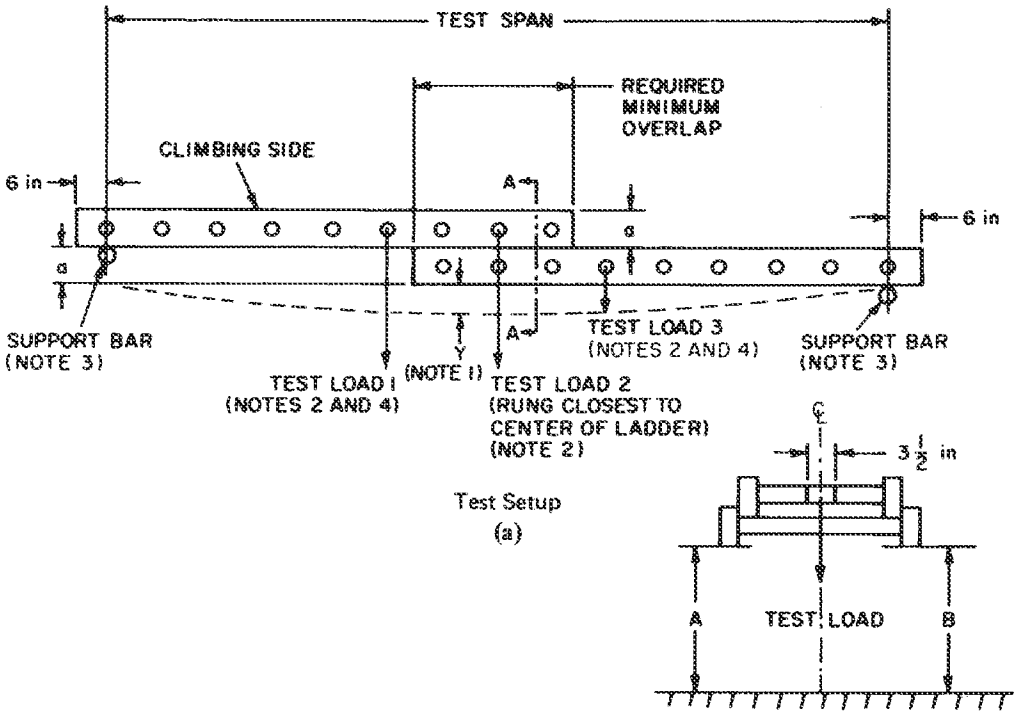
Figure 1
Horizontal Bending Test



NOTES:

(1) y = deflection of the ladder under load.

(2) The ultimate test load shall be applied at three different locations: (a) to the center of the highest base rung below the overlap (test load 1); (b) to the center of the fly rung in the center of the overlap or, if necessary, 6 inches higher than the center of the ladder span (test load 2); and (c) to the center of the lowest fly rung above the overlap (test load 3). The deflection test load, which is applied before the ultimate test load, shall be applied only to the center of the rung nearest the center of the test span (test load 2).

(3) The support bars shall have a nominal radius of 1 inch.

(4) This test is illustrated for a ladder design in which the fly section is behind the base section, shown here with the base section on the left. For the alternative design in which the base section is behind the fly section, the base should be on the right, and test load positions 1 and 3 would be reversed.

(5) Auxiliary means that do not increase the strength of the ladder may be used to ensure that the ladder locks remain engaged during the test to prevent translation of the fly section relative to the base section during the test.

that contains at least the minimum data shown in Fig. 3, or the equivalent.

The ladder shall be preloaded with a 30 lb. load for one minute before applying the test load. The test load shall be applied for a period of one minute, in accordance with Table 7.

Deflections shall be determined by measuring, at the midpoint between the supports, the vertical distance from the extreme outside edges of the widest section of both rails to the floor or other reference surface both before loading and while the full test load is applied. These measurements shall be entered on the data sheet (see Fig. 3). The test shall be repeated with the load applied to the other rail of the ladder. The twist angle between a line joining the loaded and unloaded rails and the horizontal shall be calculated from the trigonometric equation:

$$\alpha = arc\ sine\left(\frac{difference\ in\ deflection\ of\ rails}{outside\ width\ of\ widest\ section}\right)$$

$$= arc\ sine\left(\frac{B-A}{W}\right)$$

The ladder shall pass this test without exceeding the values of deflection and angle of twist shown in Table 8.

7.3.3 Simulated In-Use Inclined Load Test.
Note: This is a design verification test.

Table 6
Maximum Allowable Average Deflections for Horizontal Bending Test

Ladder Size (feet)	Maximum Working Length (Size less Minimum Overlap)* Two-Section (feet)	Three-Section (feet)	Maximum Average Deflection (inches)
12	9	—	3.6
14	11	—	5.2
16	13	—	6.8
20	17	—	10.0
24	21	—	13.2
28	25	—	16.4
32	—	26	17.4
32	29	—	19.6
36	—	28	20.6
36	32	—	22.8
40	—	30	22.6
40	35	—	26.0
44	—	34	26.0
44	39	—	29.2
48	—	38	29.2
48	43	—	32.4
52	—	40	31.2
52	46	—	35.6
56	—	44	34.4
56	50	—	38.8
60	—	48	38.6
60	54	—	42.0
64	—	52	41.2
68	—	56	44.5
72	—	60	47.9

*For single ladders use column for maximum working length for two-section extension ladder.

The ladder shall be extended to the maximum working length and supported as shown in Fig. 4. The load shall be applied equally to both side rails on the lowest fly rung above the overlap on extension ladders and at the first rung at midspan or above on all other ladders. The load shall be applied using two 3-1/2 inch straps, each located next to a rail and centrally loaded through an equalizer bar on the climbing side of the ladder. All supporting and loading apparatus shall conform to that shown in Fig. 4 or shall be such as to produce equivalent results.

The ladder shall be loaded in accordance with Table 9. The full load shall be applied for a period of one minute before release. The ladder shall sustain this load without ultimate failure. Permanent deformation (set) shall be allowed.

This test shall be used only for design verification. It shall not be employed for quality control or field inspection purposes.

7.3.4 Hardware Test Requirements.

7.3.4.1 Column and Hardware Load Test
Note: This is a design verification test.

7.3.4.1.1 Single and Extension Ladders. The test unit shall either be the shortest full-size ladder manufactured or a unit merely of sufficient length for test purposes. If a full-size ladder is used, the fly section shall be extended a minimum of one rung beyond the minimum working length of the ladder. Short test units shall consist of portions of the base and fly sections of the extension ladder with all the hardware or fittings attached.

The unit shall be placed at a 75-1/2° working angle, as shown in Fig. 5, with both locks engaged. A downward distributed load, in accordance with Table 10, shall be applied for a period of one minute, to the lowest fly rung above the overlap on extension ladders and to

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Table 7
Deflection Test Loads

Duty Rating and Type	Deflection Test Load (pounds)
Special duty - Type IAA	85
Extra heavy-duty - Type IA	70
Heavy-duty - Type I	60
Medium-duty - Type II	55
Light-duty - Type III	50

Table 9
Simulated In-Use Inclined Load Test

Duty Rating and Type	Working Load (pounds)	Test Load (pounds)
Special duty - Type IAA	375	1200
Extra heavy-duty - Type IA	300	1000
Heavy-duty - Type I	250	1000
Medium-duty - Type II	225	900
Light-duty - Type III	200	800

Table 8
Deflections and Angles of Twist

Single* and Extension Ladders			Combination Ladders						
Maximum Working Length (Size less Minimum Overlap) (feet)			Maximum Deflection Y of Loaded Rail† (inches)		Twist Angle α ‡ (degrees)		Sine α	
Size of Ladder (feet)	Two-Section*	Three-Section	Maximum Working Length (feet)	Single Extension Articulated Ladders	Combination Ladder	Single Extension Articulated Ladders	Combination Ladder	Single Extension Articulated Ladders	Combination Ladder
—	—	—	7	—	1.00	—	2.1	—	0.03664
—	—	—	8	—	1.20	—	2.3	—	0.04013
—	—	—	9	—	1.40	—	2.5	—	0.04362
—	—	—	10	—	1.60	—	2.6	—	0.04536
14	11	—	11	1.00	1.80	2.90	2.8	0.05059	0.04885
15	12	—	12	1.25	2.15	3.00	3.1	0.05234	0.05408
16	13	—	13	1.50	2.35	3.10	3.3	0.05408	0.05756
17	14	—	14	1.75	2.50	3.20	3.4	0.05582	0.05931
18	15	—	15	2.00	2.80	3.30	3.5	0.05756	0.06105
20	17	—	17	2.50	3.10	3.50	3.6	0.06105	0.06279
22	19	—	19	3.00	3.40	3.70	4.0	0.06453	0.06976
24	21	—	—	3.50	—	3.90	—	0.06802	—
28	25	—	—	4.50	—	4.30	—	0.07498	—
32	29	26	—	5.50	—	4.70	—	0.08194	—
36	32	28	—	6.50	—	5.10	—	0.08889	—
40	35	30	—	7.50	—	5.50	—	0.09585	—
44	39	34	—	8.50	—	5.90	—	0.10279	—
48	43	38	—	9.50	—	6.30	—	0.10973	—
52	46	40	—	10.50	—	6.70	—	0.11667	—
56	50	44	—	11.50	—	7.10	—	0.12360	—
60	54	48	—	12.50	—	7.50	—	0.13053	—
64	—	52	—	13.50	—	7.90	—	0.13744	—
68	—	56	—	14.50	—	8.30	—	0.14436	—
72	—	60	—	15.50	—	8.70	—	0.15126	—

* For single ladder use column for maximum working length for two-section extension ladder.
† $Y = 0.25X - 2.5$, where Y = maximum deflection of loaded rail (inches) and X = maximum working length or size of ladder (feet).
‡ $\alpha = 0.10X + 1.50$, where α = twist angle (degrees) and X = maximum working length or size of ladder (feet).

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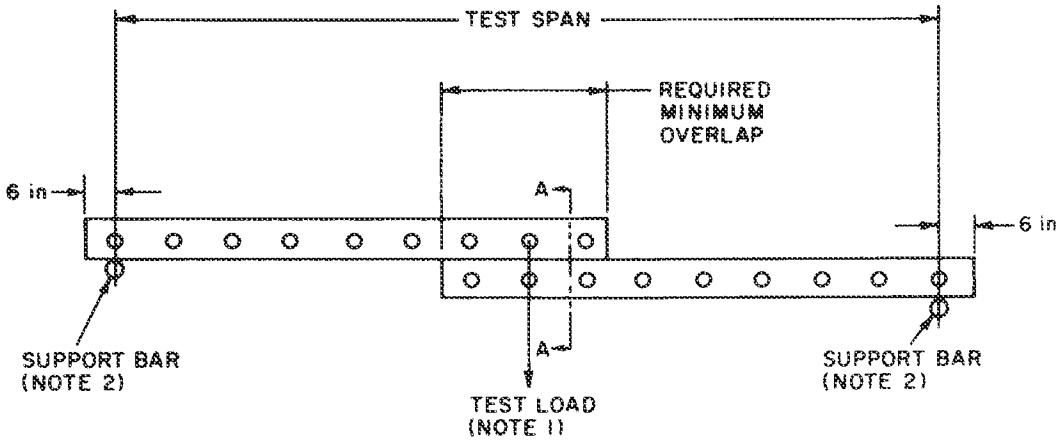
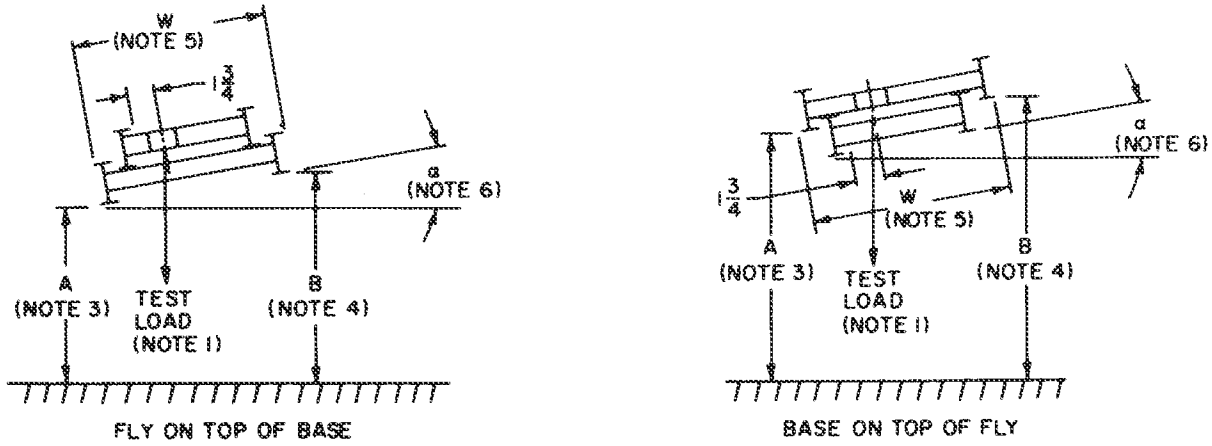
Figure 2
Deflection Test



Test Setup
(a)



Section A-A
(b)

NOTES:
(1) The test load shall be applied to the rung closest to the midpoint of the test span over a 3-1/2-inch bearing on the rung.
(2) The support bars shall have a nominal radius of 1 inch.
(3) A = vertical height of loaded rail.
(4) B = vertical height of unloaded rail.
(5) W = width of widest ladder section.
(6) α = angle of twist.
(7) Auxiliary means that do not increase the strength of the ladder may be used to ensure that the ladder locks remain engaged during the test to prevent translation of the fly section relative to the base section during the test.

Figure 3
Deflection Test Data Sheet

DATA SHEET

Company: _____
Date of test: _____
Recorded by: _____
Type of ladder: Single _____ Extension _____ Combination _____
Code name: _____
Ladder size: _____
Length of test span: _____
Width of widest section, *W*: _____
Rated load of ladder: 200 lbs _____ 225 lbs _____ 250 lbs _____ 300 lbs _____ 375 lbs _____

Vertical Readings	Deflection at No Load (inches)	Deflection at _____ lb Load (inches)	Actual Deflection due to Load (Column 2 – Column 1) (inches)	Difference in Actual Deflection, *B* – *A* (inches)
Right-hand loaded				
A				
B				
Left-hand loaded				
A				
B				

		Right rail loaded	Left rail loaded
Angle of twist $\alpha = \text{arc sine } \frac{B - A}{W}$	=	_____	_____
Allowable angle of twist (Table 8)	=	_____	_____
Deflection of loaded side rail	=	_____	_____
Allowable deflection (Table 8)	=	_____	_____

Remarks:

NOTE: This is a suggested format for a data sheet used to record test results from the deflection test.

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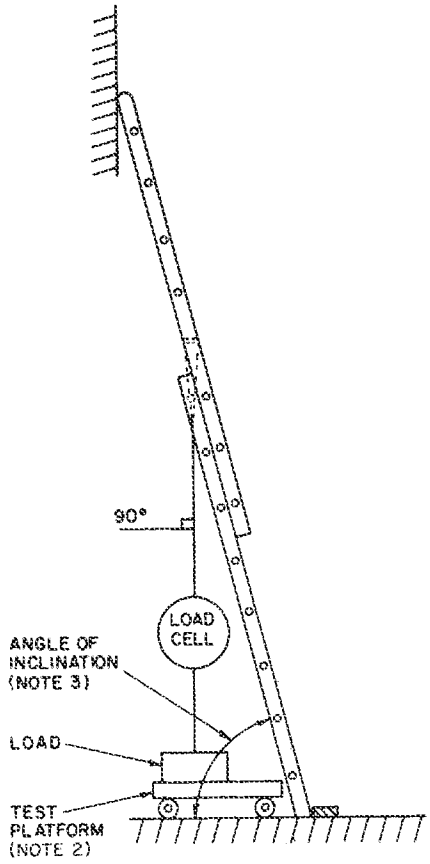
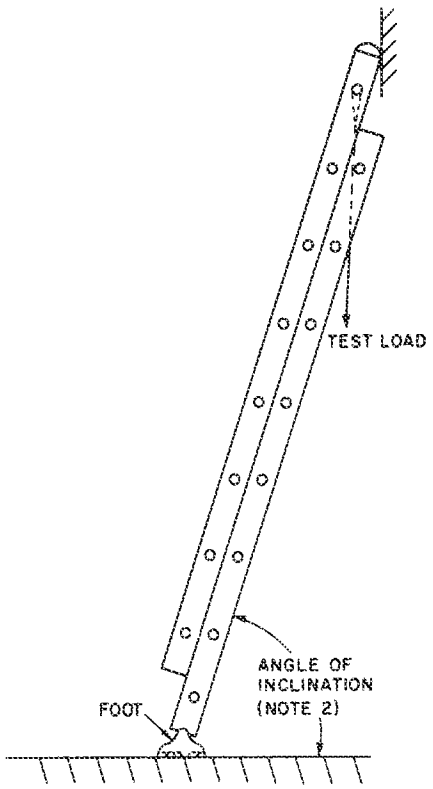
Figure 4
Inclined Load Test



NOTES:
(1) This illustration shows the test setup before the load is applied.
(2) The test platform follows the test load as the ladder deflects into the wall.
(3) The angle of inclination shall be 75-1/2°, except that for combination ladders in the extension-ladder orientation a slightly modified angle shall be used so that the tread portions of the steps are horizontal (level).

Figure 5
Column and Hardware Load Test and Single Lock Load Test



NOTES:
(1) The fly section may be located either to the front or to the rear of the base section.
(2) The angle of inclination shall be 75-1/2°, except that for combination ladders in the extension-ladder orientation a slightly modified angle shall be used so that the tread portions of the steps are horizontal (level).
(3) Both locks shall be engaged for the column and hardware load test (7.3.4.1); for the single lock load test (7.3.4.2), one lock shall be engaged and the other lock removed.

the top rung of single ladders. The load shall be applied equally to both side rails using two 3-1/2 inch straps, each located next to a rail and centrally loaded through an equalizer bar over the climbing side of the ladder. Permanent deformation in other parts of the ladder structure due to the test is not a test failure. However, the ladder shall still support the test load after the application of the load, even if the rung assumed permanent deformation (set).

7.3.4.1.2 Combination Ladders. The test unit shall be a full-size ladder. The extension section shall be extended a minimum of one rung or step beyond the minimum working length of the ladder. The unit, set up as an extension ladder as shown in Fig. 5, shall be placed against a vertical support, with both locks engaged at an angle of 75-1/2°.

A downward distributed load, in accordance with Table 10, shall be applied for a minimum period of 1 minute on a standard loading block (see Fig. 6) resting on the center of the highest fly rung or step, or by means of a 3-1/2-inch strap over the rung on the climbing side of the ladder. During the test, the tread portion of the steps on the front rail section shall be parallel

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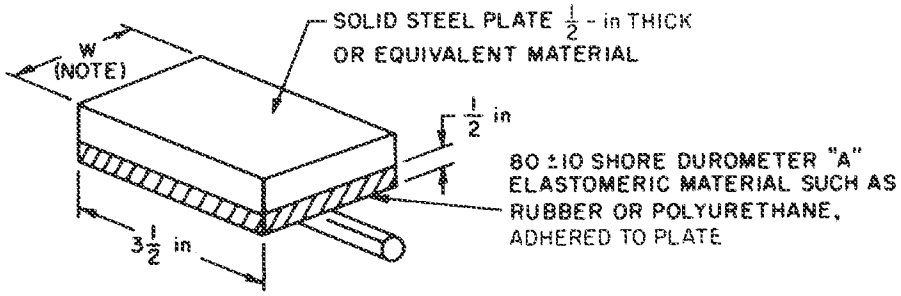
Table 10
Hardware Tests

Duty Rating and Type	Lock Tip Column and Hardware Test Load (pounds)	Single Lock Test Load (pounds)
Special duty - Type IAA	1500	1200
Extra heavy-duty - Type IA	1200	1000
Heavy-duty - Type I	1000	1000
Medium-duty - Type II	900	900
Light-duty - Type III	800	800

Figure 6
Standard Loading Block



NOTE: W = width of step or rung plus 1 inch.

to the ground. If the treads are used on the single or extension ladder section, these treads shall also be parallel to the ground. The unit shall withstand this test with no permanent deformation (set) or other visible weakening of the structure.

7.3.4.1.3 Articulated Ladders. The test unit shall be a full size ladder. If equipped with an extension section, it shall be extended a minimum of one rung or step beyond the minimum working length of the ladder. The unit shall be set up as an extension or single ladder and placed against a vertical support, with all locks engaged.

The ladder shall be placed at a 75-1/2° working angle. A downward distributed load, in accordance with Table 10, shall be applied for a period of one minute, equally to both side rails on the highest rung, using two 3-1/2-inch straps, each located next to a rail and centrally loaded through an equalizer bar over the climbing side of the ladder. Permanent deformation in other parts of the ladder structure due to the test is not a test failure. However, the ladder shall still support the test load after the application of the load, even if the rung assumes permanent deformation.

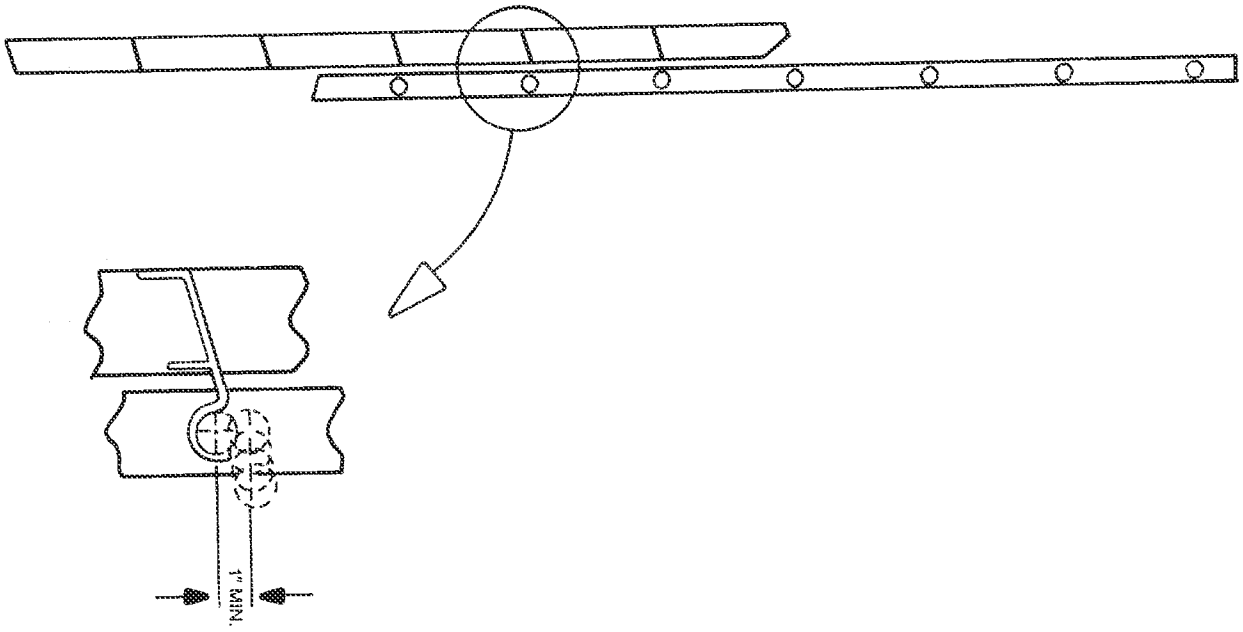
7.3.4.2 Single Lock Load Test
Note: This is a design verification test. Not applied to articulated ladders.

The test unit shall either be the shortest full-size ladder manufactured or a unit only of sufficient length for test purposes. If a full-size ladder is used, the fly section shall be extended one rung beyond the minimum working length of the ladder. Short test units shall consist of portions of the base and fly sections of the extension ladder with all the hardware or fittings attached.

The test unit shall be set, as shown in Fig. 5, at a 75-1/2° working angle, with one lock removed. For combination ladders in the extension ladder orientation a slightly modified angle shall be used so that the tread portions of the steps are horizontal (level).

A downward distributed load, in accordance with Table 10, shall be applied for a minimum period of one minute, equally to both side rails on the lowest fly rung above the overlap using two 3-1/2 inch straps, each located next to a rail and centrally

Figure 7
Lock Test



loaded through an equalizer bar over the climbing side of the ladder.

The locks shall withstand this test with no permanent deformation (set) or other visible weakening of the locks. Permanent deformation in other parts of the ladder structure including racking of the ladder structure due to the test is not a test failure. However, the ladder shall still support the test load after the application of the load, even if the rung assumes permanent deformation (set).

7.3.4.3 Lock Tip Load Test
Note: This is a design verification test. Not applied to articulated ladders.

The test unit shall be either the shortest full-size ladder manufactured or a unit only of sufficient length for test purposes. If a full-size ladder is used, the fly section shall be extended a minimum of one rung beyond the minimum working length of the ladder. Short test units shall consist of portions of the base and fly sections of the extension ladder, with the locks attached.

The test unit shall be set at a 75-1/2° working angle, as shown in Fig. 8a and b, with both locks partially engaged. For combination ladders in the extension-ladder orientation a slightly modified angle shall be used so that the tread portions of the steps are horizontal (level). The bottom end of the ladder shall be prevented from slipping by a block or equivalent means. The tip of each lock shall bear on the center of a steel test fixture placed over the top of a rung, as shown in Fig. 8a and b. During the test, each lock shall be prevented from pivoting by a means located adjacent to its pivot point, but which shall not in any way affect that portion of the lock under test.

A downward distributed load, in accordance with Table 10, shall be applied for a period of one minute, equally to both side rails on the lowest fly rung above the overlap, using two 3-1/2 inch straps, each located next to a rail and centrally loaded through an equalizer bar over the climbing side of the ladder. Permanent deformation in other parts of the ladder structure due to the test is not a test failure. However, the ladder shall still support the test load after the application of the load, even if the rung assumes permanent deformation (set).

7.3.4.4 Cyclic Rung-Lock Design Verification Test
Note: This is a design verification test. Not to be applied to articulated ladders, or ladders with fixed lock designs.

A machine equivalent to that pictured in Fig. 9 shall be used to operate the rung lock through the following cycle, as shown in Fig. 10:

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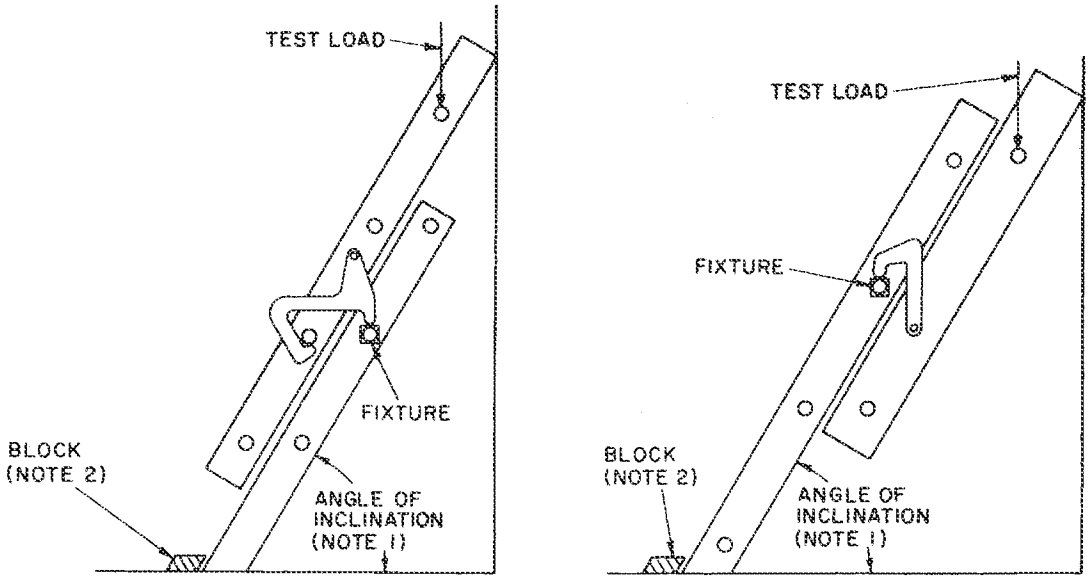
Figure 8
Lock Tip Load Test



NOTES:
(1) The angle of inclination shall be 75-1/2°, except that for combination ladder in the extension-ladder orientation a slightly modified angle shall be used so that the tread portions of the steps are horizontal (level).
(2) A block or equivalent means shall be used to prevent the bottom of the ladder from slipping.

(1) One 6-inch upstroke to allow rung lock to engage rung

(2) Full 6-inch downstroke to lock rung lock on rung

(3) Full 12-inch upstroke to disengage rung lock

(4) Full 12-inch downstroke to return rung lock to starting position

Locks shall be tested with the ladder at a 75-1/2° angle. For combination ladders in the extension-ladder orientation, a slightly modified angle shall be used so that the tread portions of the steps are horizontal (level). Spring-loaded locks shall be tested with the ladder in the vertical position.

The rung lock may be manually lubricated prior to or during the test. The stroke speed shall be 6 to 12 inches per second. A minimum of 6000 cycles shall be imposed. Any malfunction of the rung lock or fracture of its components, including springs, shall be considered as a failure to meet this requirement. The presence of wear that does not affect the proper functioning of the lock shall not constitute failure.

This test is not intended to apply to fixed-type locks used on extension or combination ladders.

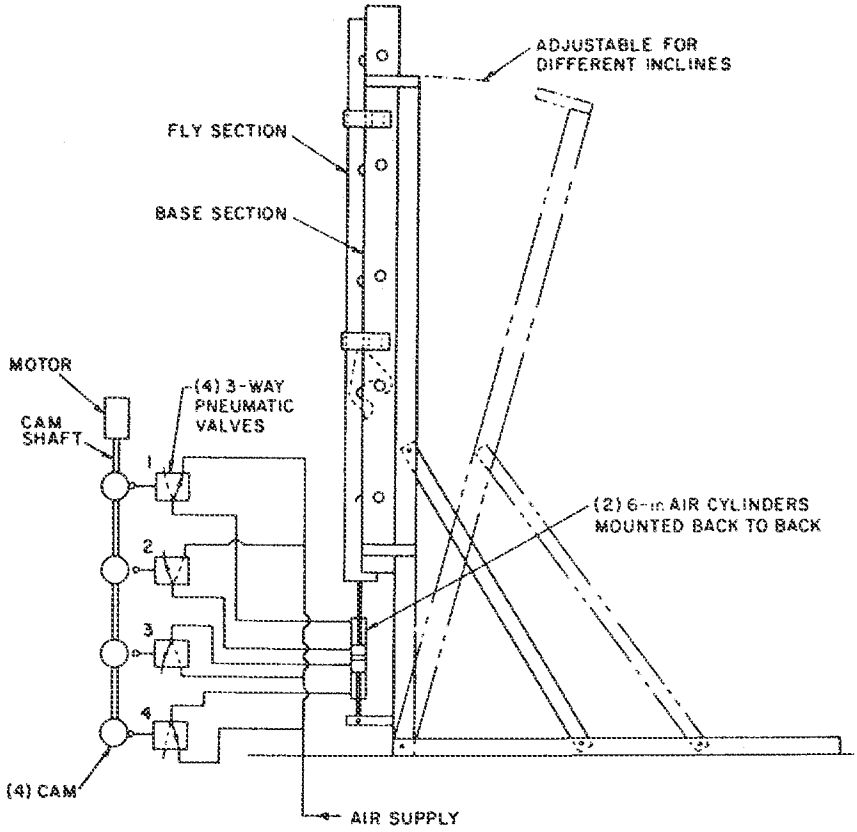
7.3.4.5 Combination Ladder Lock Test. The ladder shall be placed in the horizontal bending test position (See Fig. 1) and the extension section moved forward until it disengages from the lock (See Fig. 7). The distance for such disengagement shall not be less than one inch.

7.3.5 Extension-Ladder Rung Bending Strength Test. **Note**: This is a design verification test.

The test shall be conducted on either a single section of the ladder or on a three-rung test sample taken from the maximum width portion of a like ladder section with a like rung. The test unit shall be supported and the load shall be applied as shown in Fig. 11a, using a standard loading block. The rung tested shall be unbraced.

A downward distributed load, in accordance with Table 11, shall be applied on the standard loading block for a period of 1 minute. Upon removal of the test load, the permanent deformation (set) shall be measured with a straight edge and a rule as shown in Fig. 11b. The allowable permanent deformation (set)

Figure 9
Cyclic Rung Lock Test Arrangement



	Air-Valve Position*			
Operating Cycle	No. 1	No. 2	No. 3	No. 4
Full upstroke	O	C	C	O
Full downstroke	C	O	O	C
One-half downstroke to latch	O	C	O	C
Downstroke to lock	C	O	O	C

*O means open to atmosphere; C means closed to pressure.

shall not exceed L/K for rung length (L) measured between the inside webs of the attached side rails, in accordance with Table 11 (K is a factor that varies with duty rating and Type). Other than buckling related to the allowable permanent deformation (set), there shall be no test failure.

7.3.6 Rung-to-Side-Rail Shear Strength Test.
Note: This is a design verification test.

The test unit shall consist either of a single section of the ladder or a three-rung section taken from a like ladder having the same rung cross-section and rung joint. The test unit shall be set at a working angle of 75-1/2° to horizontal. For combination ladders in the extension-ladder orientation, a slightly modified angle shall be used so that the tread portions of the steps are horizontal (level).

A downward distributed load, in accordance with Table 11, shall be applied for a minimum period of 1 minute, as shown in Fig. 11a, but resting on the widest like cross section braced and unbraced test rungs as near the side rail as possible. On removing the load, the unit shall show no indication of test failure either in the fastening means attaching the rung or in the side rail.

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Figure 10
Rung Lock Testing Cycle

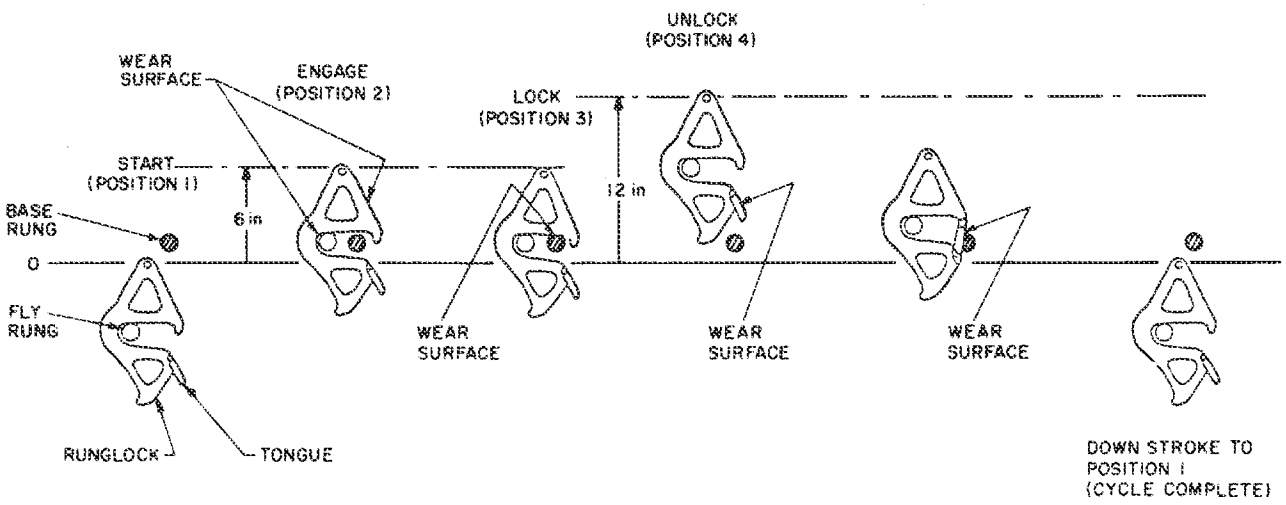
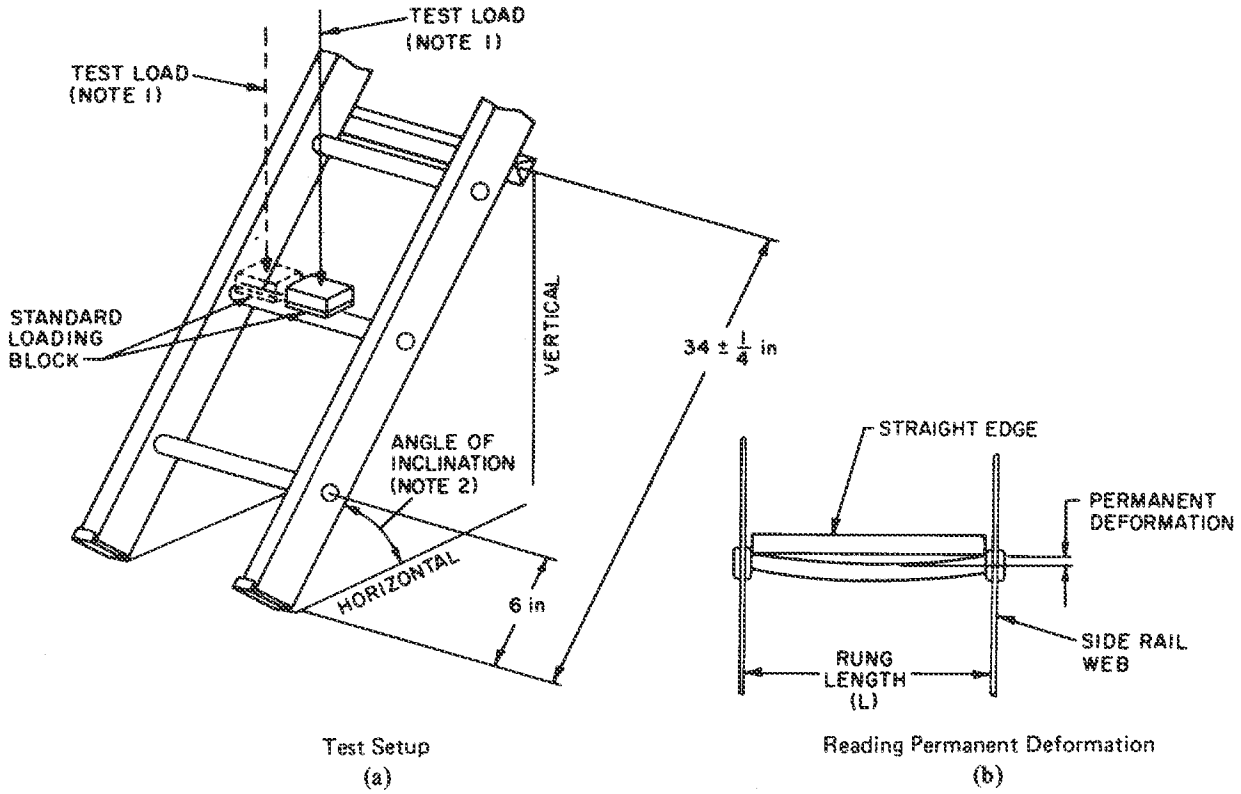


Figure 11
Rung Bending Test and Rung-to-Side-Rail Shear Strength Test



Test Setup
(a)

Reading Permanent Deformation
(b)

NOTES:

(1) The test load for the rung bending test (7.3.5) is indicated by a solid arrow; the test load for the rung-to-side-rail shear strength test (7.3.6) is indicated by the dashed arrow.

(2) The angle of inclination shall be 75-1/2°, except that for combination ladders in the extension-ladder orientation a slightly modified angle shall be used so that the tread portions of the steps are horizontal (level).

Table 11
Step Bending, Rung Bending, Side-Rail Bending, Compression, and Shear Strength Tests

	Test Load* (pounds)		Maximum Allowable Permanent Deformation (Set)
Duty Rating and Type	Compression, Side-Rail Bending, and Shear Strength Tests	Rung and Step Bending Tests	*L / K*†
Special duty - Type IAA	1200	1000	*L / 25*
Extra heavy duty - Type IA	1200	1000	*L / 25*
Heavy duty - Type I	1000	900	*L / 50*
Medium duty - Type II	900	850	*L / 75*
Light duty - Type III	800	800	*L / 100*

* This test load is for use in the step bending, rung bending, compression, side rail bending, and shear strength tests.

† Values listed are for rung bending test only. L is the rung length in inches. The factor K varies with duty rating and type; K = 25 for Special duty and extra-heavy-duty ladders, 50 for heavy-duty ladders, 75 for medium-duty ladders, and 100 for light-duty ladders.

When a 3-foot test sample is used, the test shall be applied to the center rung. When single sections of a ladder are tested, the test load shall be applied to the third or fourth rung from the bottom.

7.3.7 Rung Torque Tests. The test unit shall consist of either an extension ladder with rungs or a short test sample comprising of at least one rung and two side rails in the case of the in-service test (7.3.7.2) or one rung and one side rail when employing the design verification test (7.3.7.1) (see Fig. 12a and b). The torque load, in accordance with Table 12, shall be applied in a clockwise and then counterclockwise direction, alternately, for 10 cycles at each torque test load increment. The rung joint shall be so secured to the side rails that this alternating torque load shall cause no relative motion between the rung and the side rails in excess of 9° (based on 1/16 inch maximum movement for a 1-1/4 inch diameter round rung), for both the design verification test (7.3.7.1) and the in-service test (7.3.7.2).

Torque test loads shall start at 300 inch-pounds and shall increase in 300 inch-pound increments until the maximum load application required to meet the requirements of Table 12 is reached.

7.3.7.1 Rung Torque Design Verification Test
Note: This is a design verification test.

The test unit shall consist of one rung and one side rail and shall be trimmed so that the rung extends 5 to 6 inches from the rung joint (see Fig. 12a). The rail itself shall extend 2 to 2-3/4 inches from each side of the joint. The surface that is visible in the area around the rung joint, consisting of the adjacent area of the rail, the rung joint itself, and the adjacent area of the rung, shall be coated with die bluing or similar material and allowed to dry. A reference line shall be scribed, running along the rung, across the rung joint, and onto the side rail. In the case of tubular rungs, a clamp shall be placed over the rung, and the torque shaft shall be slid through the pillow block into the cut end of the rung until it is within 5/8 inch of the rung joint. The rail shall be clamped in place with the hold-down plate. The rung clamps shall be located 3 inches from the rung joint and shall be tightened in place. All bolts shall be checked for tightness.

When solid rungs are tested, the test rung shall be inserted into a chuck, collet, or rung clamp, after which the rail shall be clamped in place with the hold-down plate and the rung chuck, collet, or rung torque tube clamp shall be tightened.

The load shall be applied with a torque wrench. The load at which the first movement is noted should be recorded, as well as the type of break (R-J for rung-to-joint movement; J-R for joint-to-rail movement; or R-J-R for rung-to-joint-to-rail movement).

7.3.7.2 Rung Torque In-Service Test
***Note**: This is an in-service use test.*

The test unit shall consist of either a single section of the ladder or a short section comprising of at least one rung and two side rails (see Fig. 12b). The torque load shall be applied to a 3-1/2 inch wide block in the center of the rung, made of such material that the block will not deform the rung locally. The torque shall be applied, as described

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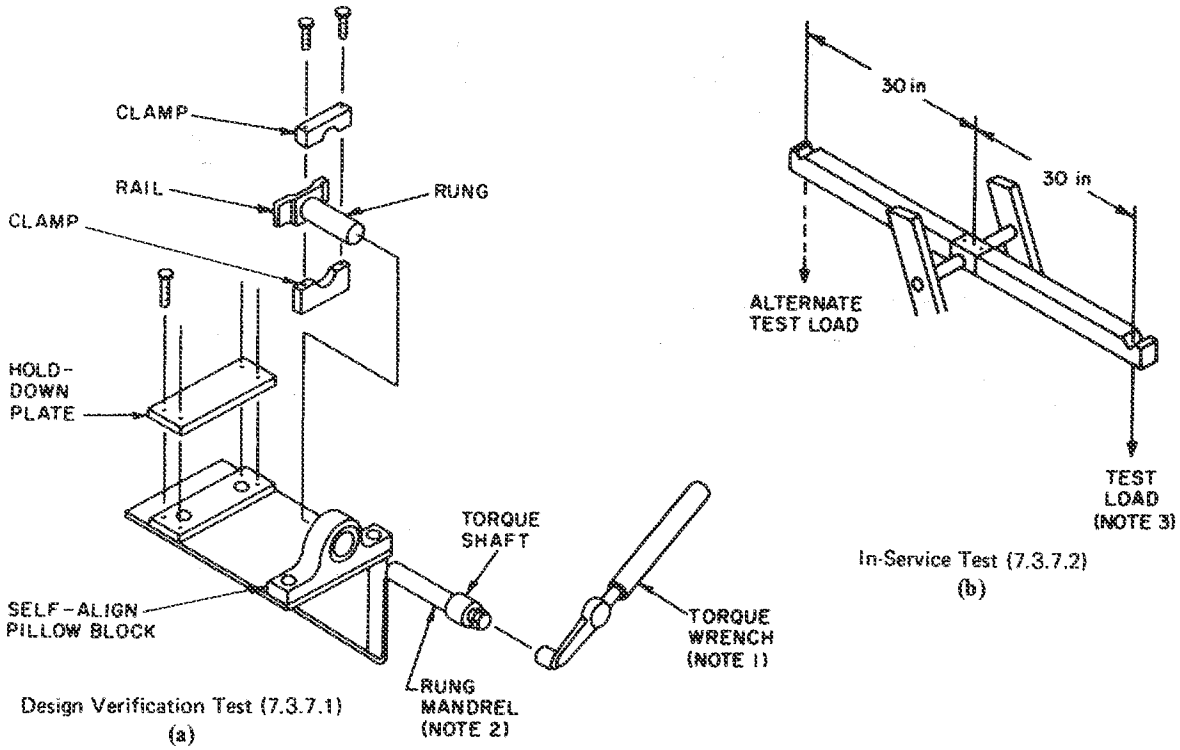
Table 12
Rung Torque Tests

Duty Rating and Type	Maximum Test Load	
	Design verification Torque Test* (inch-pounds)	In-Service Torque Test* (inch-pounds)
Special duty - Type IAA	600	900
Extra heavy duty - Type IA	600	900
Heavy duty - Type I	600	900
Medium duty - Type II	600	900
Light duty - Type III	600	900

* The test load (pounds) at a 30 inch moment arm is 20 pounds for the design verification torque test and 30 pounds for the in-service torque test. These values will vary with the moment arm selected.

Figure 12
Rung Torgue Test



NOTES:

(1) An equivalent method may be used to apply torque.

(2) The testing of a hollow rung is illustrated. The rung mandrel is put inside the hollow rung being tested to keep it from collapsing.

(3) The load may be applied by means of a dead weight or a force gage. The moment arm shown may be replaced by a pipe wrench or the equivalent.

(4) Shim the test unit as required, so that the run neutral axis is approximately coincident with the pillow block centerline.

above, using a test bar whose moment arm may vary as long as the required torque test load in inch-pounds is obtained. In no case, however, shall the moment arm be less than 18 inches.

Both sets of rung joints and the immediately adjacent areas of the rung and side rail shall be coated with a die marking material, and a line shall be scribed along the rung, across the rung joint, and onto the side rail at both rung joint locations.

The rung shall be so secured to the side rails that the alternating torque load shall cause no relative motion between the rung and the side rails. Both rung joints in the assembly shall meet this requirement. Fig. 12b illustrates typical methods that are acceptable alternates for performing this test.

7.3.8 Side Sway Test.

Note: *This is both a design verification and an in-service use test.*

The test unit shall consist of a single ladder, a section from an extension ladder, a section of an articulated ladder, including a mid-span joint, or both the stepladder portion and the single or extension ladder portion of a combination ladder. This test shall be conducted for all sections of an extension ladder. The sections from a combination ladder shall be individually tested.

The test section shall be placed on edge, resting on level supports located 6 inches from each end of the ladder, as shown in Fig. 13. The side rail shall be in an approximately horizontal plane, and the rungs shall be in the vertical plane and perpendicular to the ground.

A preload of 30 pounds shall be applied at the center of the span, held for a period of one minute, and unloaded. This establishes the zero-reference for deflection measurements. A test load, in accordance with Table 7, shall then be applied for a minimum period of one minute to the center of the span over a 3-1/2 inch length of the bottom side rail.

The load shall be applied by hanging weights from the bottom of the lower rail. Care shall be taken to ensure that the load is centered with respect to the width of the rail.

The maximum deflection of the midpoint of the lower side rail, measured to a reference surface, shall not exceed the deflection listed in Table 13.

Each section shall withstand this test without any permanent deformation (set) in excess of 1/1000 of the effective span of the side rails.

Table 13
Maximum Allowable Deflection for Side Sway Test — Midspan Deflection of Lower Side Rail

Test Section Length X* (feet)	Maximum Deflection Y* (inches)	
	Straight and Extension	Combination Ladders
4	0.84	0.84
5	0.88	0.88
6	0.92	0.92
7	0.96	0.96
8	1.00	1.00
9	1.04	1.04
10	1.08	1.08
12	1.16	—
14	1.24	—
16	1.32	—
18	1.40	—
20	1.48	—
22	1.56	—
24	1.64	—
26	1.72	—
28	1.80	—
30	1.88	—

*$Y = 0.04X + 0.68$, where Y = maximum allowable midspan deflection in the side sway test (inches) and X = ladder test section length (feet).

7.3.9 Side-Rail Cantilever Bending Tests.

7.3.9.1 Static Side-Rail Cantilever Bending Test

Note: This is a design verification test.

The test unit shall consist of a single ladder section or the base section of an extension ladder, articulated or combination ladder; any safety shoes or spikes affixed to the section shall be removed before the test is conducted. The test unit shall be placed on edge with the rungs in a vertical plane, as shown in Fig. 14a and b. For articulated ladders built with a stabilizer bar across the bottom of the front rail, the test unit shall be placed on edge with the rungs in a vertical plane as shown in Fig. 14c. The lower side rail shall be clamped to a support and shall be unsupported from the bottom end to the midpoint of the lowest rung. If the rung has a flat surface, that surface shall be parallel to the edge of the support.

The test load shall be applied by means of a weight, in accordance with Table 14, for a minimum period of one minute, to the extreme bottom end of the upper side rail, as shown in Fig. 14a. The load shall be centrally applied to a 2-inch long block resting on the full width of the side rail and held in place by a clamp. The load attachment point on the clamp shall not be more than 2 inches

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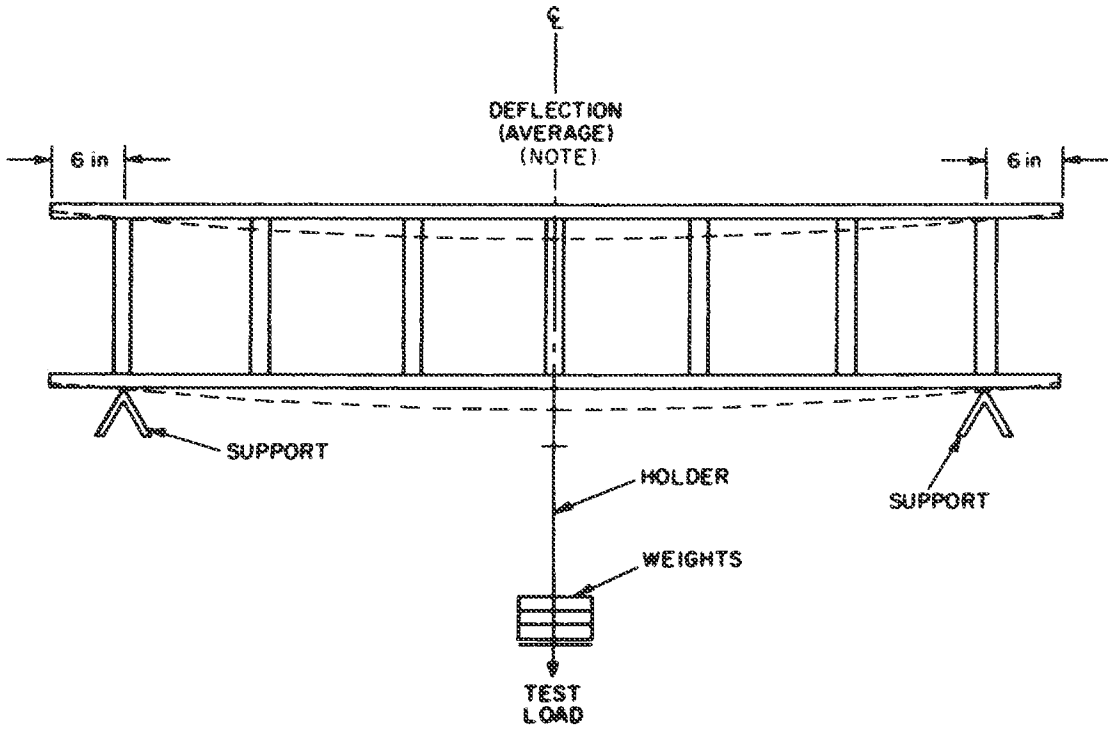
Figure 13
Side Sway Test



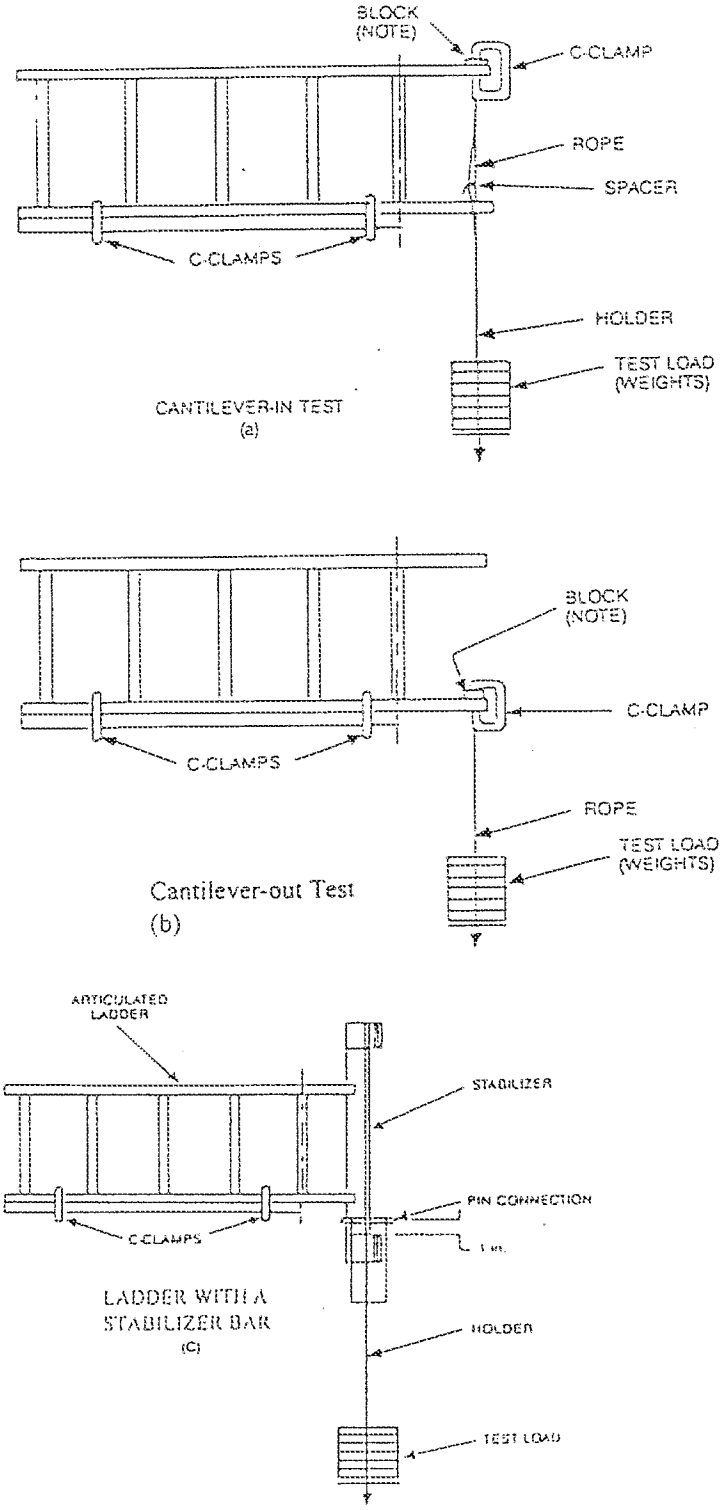
NOTE: The deflection is the difference between the height of the lower edge of the ladder side when unloaded (solid line) and when loaded (dotted line).

Table 14
Static Side-Rail Cantilever Bending Test Load

	Section or Base Section of Articulated or Combination Ladder		Articulated Ladder with Stabilizer Bar*
Duty Rating and Type	Working Load (pounds)	Test Loads (pounds)	Test Loads (pounds)
Special duty - Type IAA	375	600	–
Extra heavy duty - Type IA	300	500	1000
Heavy duty - Type I	250	400	800
Medium duty - Type II	225	300	600
Light duty - Type III	200	200	400

* Stabilizer bar which joins both rails.

Figure 14
Static Side-Rail Cantilever Bending Test



Note: The block shall be a minimum of 1/4" and a maximum of 1-inch thick, and shall be 2-inches long measured along the side rail, and a minimum width equal to the full width of the side rail including side rail flanges.

below the underside of the web of the rail being tested. The weight shall be suspended so that it is acting through the vertical neutral axis of the side rail. The allowable permanent deformation (set) of the upper side rail shall not exceed 1/4 inch.

The test load shall then be applied to the extreme bottom end of the lower side rail in a like manner, as shown in Fig. 14b. Ladders with a stabilizer bar shall have their test load applied to the extreme bottom end of the lower stabilizer bar as shown in Fig. 14c. The allowable permanent deformation (set) of the lower side rail shall not exceed 1/4 inch.

Provided the ladder continues to support the test load, permanent deformation (set) or ultimate failure of any ladder components as a result of the tests, except for the limitation on the maximum allowable permanent deformation (set) of the upper and lower side rails, shall not constitute test failure.

7.3.9.2 Side-Rail Cantilever Dynamic Drop Test
Note: This is a design verification test.

The test unit shall be the longest extension ladder for each base section rail size and the longest single ladder for each rail size. An extension ladder shall be opened one foot for the drop test. Ladder feet shall remain on the section, but each foot shall be taped so the bottom surface makes an angle of 90° with the rail length.

The test ladder shall be placed in a horizontal position with the rungs vertical. The fly section shall be supported 6 inches from the very top of the fly section (including caps), so that the lower rail of the base section is 36 inches from a concrete floor. (See Fig. 15a). When testing a ladder with a stabilizer bar, see Fig. 15b for setup.

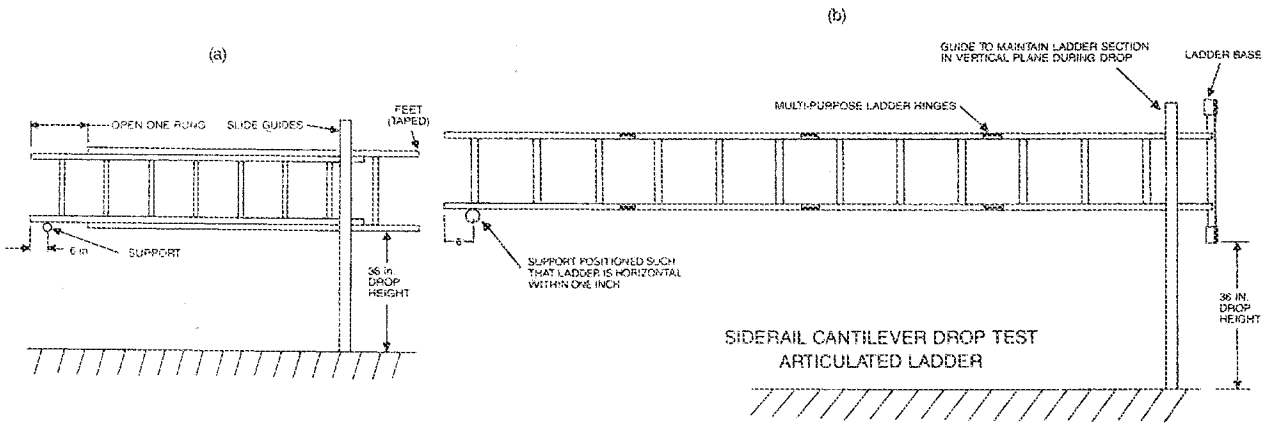
To perform the drop test, both rails of the base section shall be guided in a vertical plane during a free-fall drop. The allowable permanent deformation (set) of the lower side rail shall not exceed 1/4 inch.

7.3.10 Ladder Section Twist Test.
Note: This is a design verification test.

The test unit shall consist of a ladder base section of any length, supported over a 7-foot test span. The ladder shall be placed in a flat horizontal position and supported at each end, as shown in Fig. 16. The horizontal support for the ladder on one end shall be fixed. An initial preload of 600 inch-pounds, applied in a clockwise direction, shall be used to establish a reference for angular deflection. The ladder shall be unloaded after the application of 600 inch-pounds and the angular deflection set to 0 degrees to establish a datum. A torque of 1200 inch-pounds shall then be applied, using one of the two methods described in Fig. 16 (note 2). The torque shall be applied first in a clockwise direction, and the angle of twist shall be recorded with respect to the 0 degree datum. Then apply a 1200 inch-pound torque in the counterclockwise direction and record the angle of twist using the same 0 degree datum. Neither measurement shall be greater than the values in Table 15. Attention shall be given to ensure that the ladder is tightly clamped onto the test fixtures during this test.

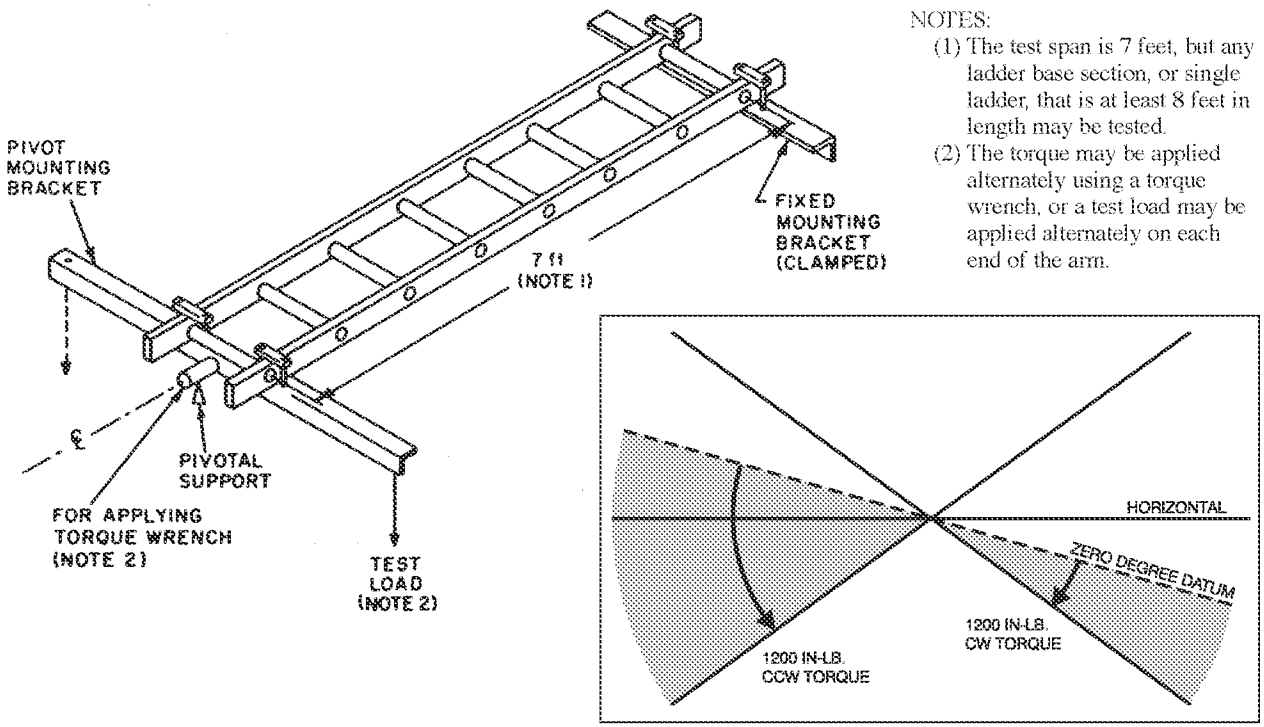
When testing an articulated ladder, this test shall be repeated with a joint at mid-span. If more than one joint design is used, each shall be tested. No permanent deformation to any component, which would interfere

Figure 15
Side-Rail Cantilever Dynamic Drop Test



NOTES: This test evaluates the result of inward-cantilever dynamic loading of the ladder.

Figure 16
Ladder Twist Test (Single, Extension, or Articulated Ladders)



NOTES:
(1) The test span is 7 feet, but any ladder base section, or single ladder, that is at least 8 feet in length may be tested.
(2) The torque may be applied alternately using a torque wrench, or a test load may be applied alternately on each end of the arm.

Table 15
Ladder Section Twist Test

Duty Rating and Type	Working Load (pounds)	Maximum Allowable Angle of Twist θ (degrees)
Special duty - Type IAA	375	14
Extra heavy duty - Type IA	300	14
Heavy duty - Type I	250	18
Medium duty - Type II	225	20
Light duty - Type III	200	22

with the smooth operation of the joint, is permissible.

7.3.11 Foot Slip Test.
Note: This is a design verification test.

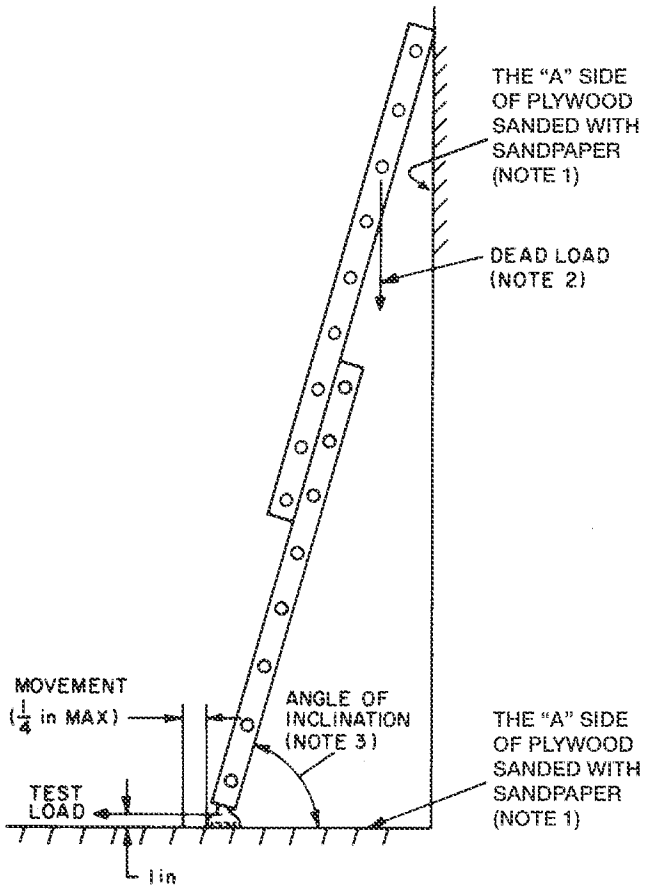
Single, extension, combination and articulated ladders shall be tested for slip resistance as shown in Fig. 17. The test unit shall be a 16-foot model (or longest available if only shorter versions are manufactured). The test surface shall be A-C plywood, which shall be pre-sanded using 320 fine wet/dry sandpaper. The "A" side of the plywood shall be placed in contact with the bottom of the ladder. The surface that the top of the ladder rests against shall also be A-C plywood, similarly treated.

A dead load, in accordance with Table 16, shall be centrally applied to the third highest rung. A horizontal test load force, in accordance with Table 16, statically applied centrally to the bottom of the ladder at 1 inch above the test surface, shall not cause movement in excess of 1/4 inch across the test surface.

7.3.12 Multisection Extending Force Test.
Note: This is a design verification test.

The test unit shall be a complete extension ladder or an articulated ladder with an extendible section where no hinge is employed. The unit shall be set in a vertical position, at the minimum working length of the ladder. The base section may be braced or otherwise held to maintain vertical alignment.

Figure 17
Foot Slip Test



NOTES:

(1) The grain of the plywood shall be parallel to the direction of loading; the grain on the vertical sheet under the upper end of the fly section shall run in a vertical direction, and the grain on the horizontal sheet under the base section shall be parallel to the direction of the test load.

(2) The dead load shall be applied on the third highest rung.

(3) The angle of inclination shall be 75-1/2°, except that for combination ladders in the extension-ladder orientation a slightly modified angle shall be used so that the tread portions of the steps are horizontal (level).

A measured downward force shall be applied to the rope if the ladder has a rope and pulley system installed. The force shall be smoothly applied to cause vertical extension of the extending section(s) of two feet or more, at a rate of 1/2 to 1 foot per second. For those ladders not equipped with a rope and pulley, the measured force shall be applied vertically to the bottom rung of the fly section.

The maximum measured force that occurs during each pull shall be recorded. Three test pulls shall be done for each ladder, and the maximum forces shall be averaged for the three pulls. This average maximum shall not exceed two times the weight of the extending section(s).

Table 16
Foot Slip Test

Duty Rating and Type	Dead Load (pounds)	Horizontal Test Load (pounds)
Special duty - Type IAA	200	50
Extra heavy duty - Type IA	200	50
Heavy duty - Type I	200	50
Medium duty - Type II	200	50
Light duty - Type III	200	50

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Table 17
Articulated Ladder Tests

Duty Rating and Type	Working Load (pounds)	Scaffold Bending Strength Test Load (pounds)	Dynamic Joint Lock Tests Cyclic Horizontal Test Load (pounds)	
			Scaffold Position *	Straight & Stepladder Position
Extra Heavy Duty - Type IA	300	1200	50	75
Heavy Duty - Type I	250	1000	42	63
Medium Duty - Type II	225	1000	38	57
Light Duty - Type III	200	1000	34	50

* The scaffold position cyclic load is applied in both the push and pull direction.

7.4 Articulated Ladder Tests

Note: These are design verification tests.

This standard does not cover Type IAA articulated ladders. Articulated ladders shall comply with the test requirements for stepladders when in the stepladder mode, for trestle ladders when in the trestle ladder mode, for straight ladders when in the straight ladder mode, and with the test requirements 7.4.1 when in the scaffold or worktable position. In addition, it shall comply with the additional joint tests 7.4.2 through 7.4.5. If the ladder design includes extendable sections all tests shall be conducted with those sections, fully extended. The tests shall be conducted with the ladder on a test surface of A-C plywood, which shall be pre-sanded using 320 fine wet/dry sandpaper. The "A" side of the plywood shall be placed in contact with the feet of the ladder.

7.4.1 Scaffold Bending Strength Test. When set up in all scaffold positions recommended by the manufacturer, the ladder shall be capable of withstanding, without test failure, a test load as indicated in Table 17. The load is to be applied for 1 minute to the center of the standing area of the scaffold on the manufacturer's recommended decking material, or a steel plate 6" wide and 3/8" thick, extending the length of the scaffold top, as shown in Fig. 18. The feet of the ladder shall rest on the "A" side of AC plywood, which shall be pre-sanded with 320 fine wet/dry sandpaper.

7.4.2 Cyclic Joint Test. A pair of joints shall be cycled from the closed position to fully open and back to the closed position for 6,000 cycles. The test sample shall be a pair of hinges and the ladder sections directly above and below the hinges. The hinges are to be locked and unlocked in each of its locking positions during every cycle. The use of additional lubricant on the joints or hinges during the test, and the use of machine to cycle the hinges is not permissible. Clamp either the top or lower ladder section to a fixed member, such as a table, and cycle the opposite ladder section through each hinge position. Following this test, the ladder shall meet the requirements of the 7.3.1 Horizontal Bending Test, 7.3.3 Inclined Load Test, 7.4.3 Unlocked Joint Test, and 7.4.5 Dynamic Joint Lock Tests.

7.4.3 Unlocked Joint Test. A test of the internal joint friction shall be conducted with the test ladder in the straight ladder mode. With all joints locked and dry (no lubricant other than that used during manufacture), and telescoping sections fully retracted (if provided), the ladder shall be set at an angle of 75-1/2° with the top leaning against a vertical wall. The ladder shall be oriented such that the mid-span joints, when unlocked, allow the ladder to fold toward the wall. The mid-span joints shall then be unlocked, and a 5 pound vertical load applied over a 3-1/2 inch wide area at the center of the lowest rung. The ladder shall fold toward the wall and no longer remain straight. Folding of the ladder at less than 5 pounds is also acceptable.

7.4.4 Single Joint Lock Test. The test unit shall be a full-length ladder set in the single or extension ladder mode, at a 75-1/2° working angle, with one hinge at midspan unlocked.

A downward distributed load, in accordance with Table 10, shall be applied for a period of one minute equally to both side rails on the lowest rung above the unlocked hinge. The load shall be applied using two 3-1/2 inch straps, each located next to a rail and centrally loaded through an equalizer bar over the climbing side of the ladder.

The ladder shall withstand this test without ultimate failure. Permanent deformation shall be allowed.

7.4.5 Dynamic Joint Lock Tests. Each test in this section (7.4.5) shall be conducted on a new and unused ladder, as well as a ladder subjected to the cyclic joint test (7.4.2). The use of additional lubricant during the test is not permissible.

7.4.5.1 Dynamic Joint Lock Test for the Scaffold Position This test is for articulated ladders that have approved uses (by the manufacturer) in a scaffold position as shown in Figure 18b. The ladder shall be set up

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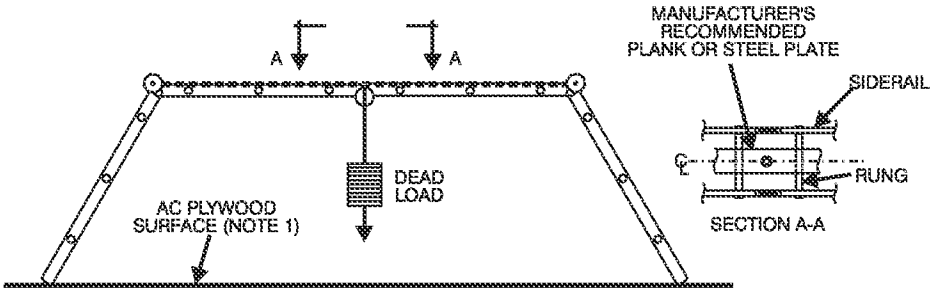
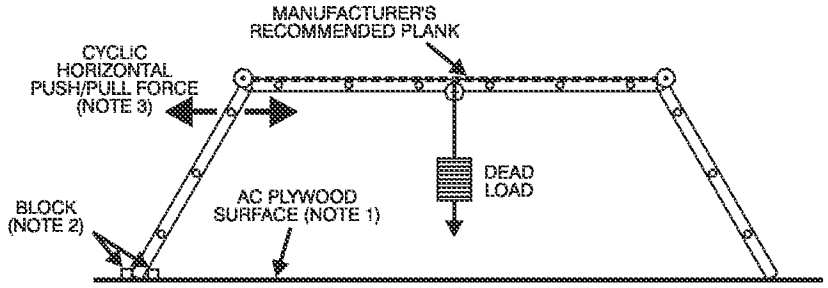
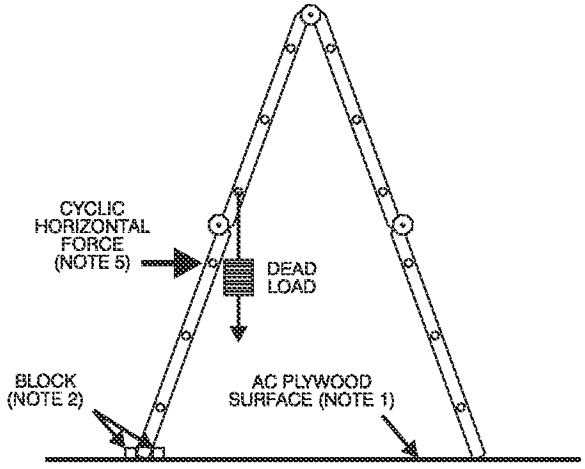
Figure 18
Scaffold Bending Strength and Dynamic Joint Lock Tests



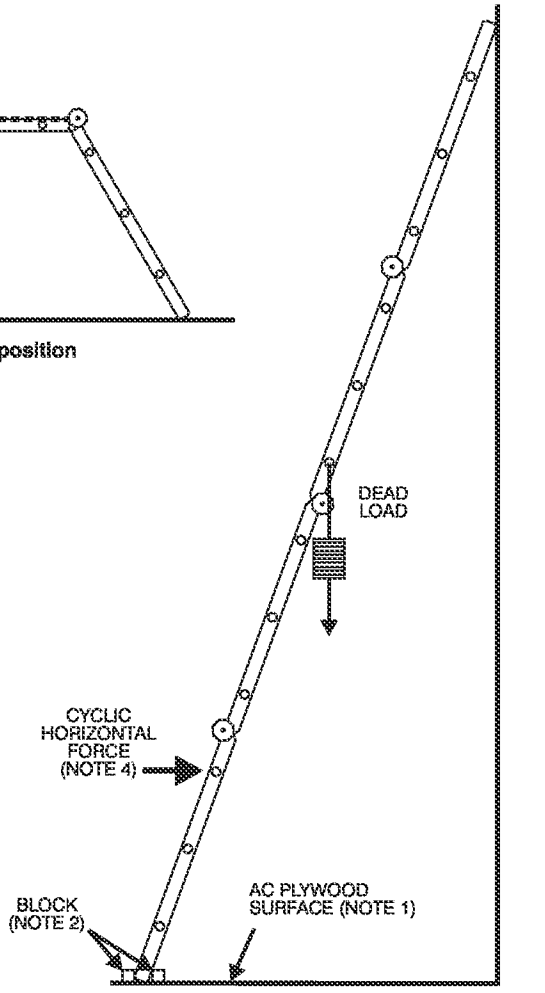
a)Scaffold bending strength test



b) Dynamic joint lock test- scaffold position



c) Dynamic joint lock test- stepladder position



d) Dynamic joint lock test- straight ladder position

NOTES:

(1) The ladder shall be placed on the A side of A/C plywood, sanded with 320 fine wet/dry sandpaper.
(2) A block or equivalent means shall be used to prevent the bottom of the feet from sliding, but the feet shall not be clamped or otherwise restrained.
(3) The horizontal force is applied in both the push and pull directions during cycling.
(4) The horizontal force is applied toward the support wall and then removed during cycling.
(5) The horizontal force is applied toward the center of the ladder and then removed during cycling.

in the scaffold position with the telescoping sections extended to maximum length (if applicable) and the manufacturer's recommended scaffold plank in place. A dead load equal to the duty rating of the ladder, comprised of lead weights or the equivalent to maximize the density of the loading medium, shall be suspended at the center of the plank, as shown in Figure 18, in a manner that equalizes the load to both side rails. A horizontal force, in accordance with Table 17, shall be applied in both the push and pull direction to the middle of the first rung below the hinge joint. The feet of the ladder closest to the application of the horizontal force shall be blocked from sliding, but not otherwise restrained. The feet furthest from the application of the horizontal force shall not be blocked or restrained (see Figure 18b). The horizontal push/pull force shall be cycled for 6,000 cycles at a rate of 50-70 cycles per minute. The cycling shall consist of applying the specified horizontal force first in the push direction, then in the pull direction, and then repeating. The ladder shall not collapse, and all of the locks shall be in their locked position at the completion of the test.

7.4.5.2 Dynamic Joint Lock Test for the Straight Ladder Position. This test is for articulated ladders that have approved use (by the manufacturer) in the straight ladder position. The ladder shall be opened to a straight position, with the telescoping sections extended to maximum length (if applicable). The ladder shall be set at an angle of 75-1/2°. A dead load equal to the duty rating of the ladder comprised of lead weights or the equivalent, to maximize the density of the loading medium, shall be suspended to the rung closest to midspan, or the first rung above midspan if the two closest rungs are equidistant, as shown in Figure 18d. The load shall be applied in a manner that equalizes the load to both side rails. A horizontal force, in accordance with Table 17, shall be applied toward the upper support wall to the middle of the third rung above the floor. The feet of the ladder shall be blocked from sliding, but not otherwise restrained. The top of the ladder shall not be blocked or restrained (see Fig. 18d). The horizontal force shall be cycled for 6,000 cycles at a rate of 50-70 cycles per minute. Cycling shall consist of applying the specified horizontal force toward the upper support wall, then removing the force, and then repeating. The ladder shall not collapse, and all of the locks shall be in their locked position at the completion of the test.

7.4.5.3 Dynamic Joint Lock Test for the Stepladder Position. This test is for articulated ladders that have approved use (by the manufacturer) in the stepladder position. The ladder shall be set in the stepladder position, with the telescoping sections extended to maximum length (if applicable). A dead load equal to the duty rating of the ladder comprised of lead weights or the equivalent to maximize the density of the loading medium, shall be suspended to the highest standing level, as shown in Figure 18c, in a manner that equalizes the load to both side rails. To the same side of the ladder, a horizontal force, in accordance with Table 17, shall be applied toward the center of the ladder to the middle of the third rung above the floor. The feet of the ladder closest to the application of the horizontal force shall be blocked from sliding, but not otherwise restrained. The feet furthest from the application of the horizontal force shall not be blocked or restrained (see Fig. 18c). The horizontal force shall be cycled for 6,000 cycles at a rate of 50-70 cycles per minute. Cycling shall consist of applying the specified horizontal force toward the center of the ladder, then removing the force, and then repeating. The ladder shall not collapse, and all of the locks shall be in their locked position at the completion of the test.

7.5 Step, Trestle (Double Front), Extension Trestle, Platform, Combination, Articulated Ladder and Step Stool Tests

7.5.1 Compression Test.
Note: This is a design verification test.

A load test of the entire ladder or step stool shall be made with the ladder or stool in an open position, as shown in Fig. 19 and 20. A uniformly distributed load, in accordance with Table 11, shall be applied for a minimum period of one minute to the ladder top cap or platform. A combination ladder shall be tested in its stepladder position, with the test load applied uniformly to the top cap, or to the top step when no top cap is used. Trestle ladders, articulated ladders which permit their use as a double front stepladder and the base section of extension trestle ladders shall be subjected to twice the test loads in Table 11, by applying the test load simultaneously to both sections of the ladder, at the top cap of each section, or to the top step when no top cap is used. The unit shall withstand the load without test failure.

7.5.2 Side-Rail Bending Test.
Note: This is a design verification test.

The resistance to side-rail bending shall be tested by placing a load, in accordance with Table 11, over a 3-1/2 inch width on the middle step adjacent to one side rail of the ladder for a minimum period of one minute, with the ladder in an open position, as shown in Fig. 19 and 20. The next higher step shall also be tested. A combination or articulated ladder shall be tested while erected in its stepladder position. The ladder shall withstand the load without test failure.

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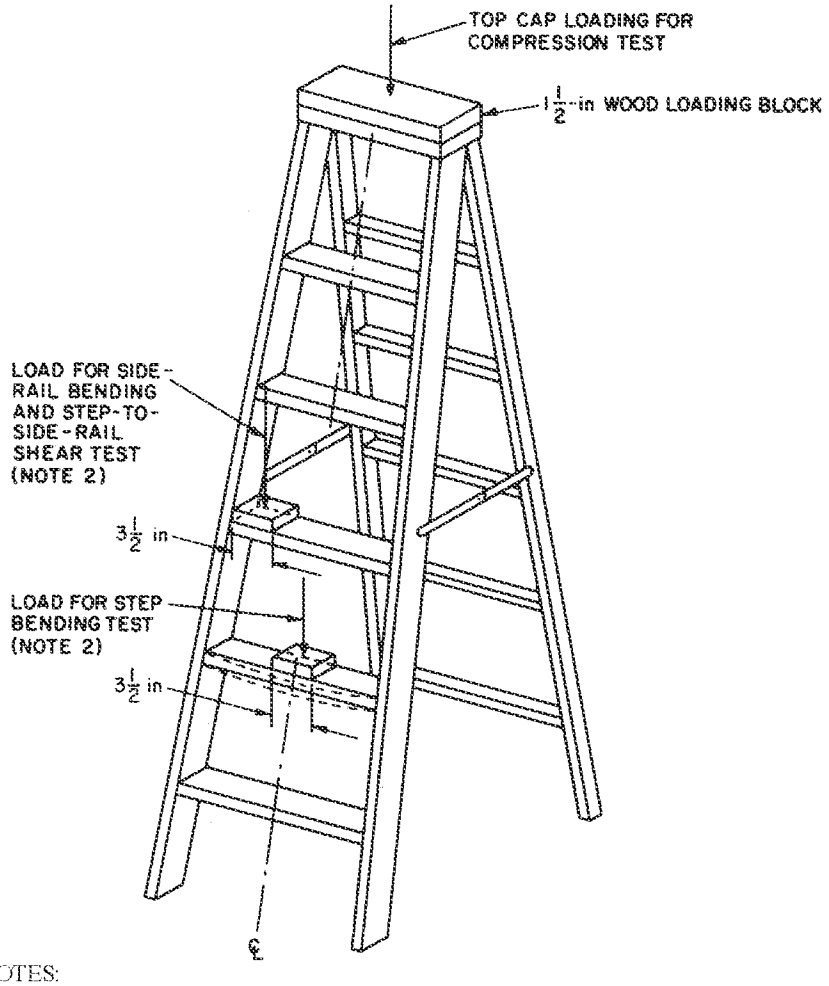
7.5.3 Step or Platform Bending Test.
Note: This is a design verification test.

The strength of the step, rung, or platform section shall be tested by applying a load, in accordance with Table 11, for a minimum period of 1 minute, over a 3-1/2 inch length across the full width of the step, rung, or platform and on the center of the longest or bottom step or rung with the ladder in the open position, as shown in Fig. 19 and 20. The test load shall also be applied to the longest like step or rung without braces, as well as to steps, rungs, or platforms of different designs or material specifications. The test load shall also be applied to the top cap of a step stool. The step, rung, platform or step stool top shall withstand the load without test failure or permanent deformation (set), in excess of 1/100 of the clear length of the step, rung, or platform between the side rails (between inside flanges) or of the overall length of the stool top cap.

7.5.4 Step-to-Side-Rail Shear Strength Test.
Note: This is a design verification test.

The shear strength of the step- or rung-to-side rail joint shall be measured by applying a test load, in accordance with Table 11, for a minimum period of one minute, over a 3-1/2 inch width of the step or rung. The test load shall be applied on the longest braced and unbraced steps with the least fastening. The same test load shall be applied to steps or rungs of different cross sectional design or materials. The

Figure 19
Compression, Step Bending, Side-Rail Bending, and Step-to-Side-Rail Shear Tests



NOTES:
(1) This test setup is illustrated for a stepladder.
(2) Typical locations for the test loads are shown; see 7.5.1, 7.5.2, 7.5.3, and 7.5.4 as to the placement of the loads.

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test load shall be applied as near the side rail as possible with the ladder in a fully opened position, with the spreaders or hinges locked, as shown in Fig. 19 and 20. The test load shall also be applied to the top cap of a step stool, over a 3-1/2 inch wide area across the front-to-back depth of the top cap adjacent to one side rail. When the load is removed, the unit shall show no indication of test failure in the fastening means attaching the step, rung, or top cap to the side rail or test failure of any other component.

7.5.5 Bucket (Pail) Shelf Test.
Note: This is a design verification test.

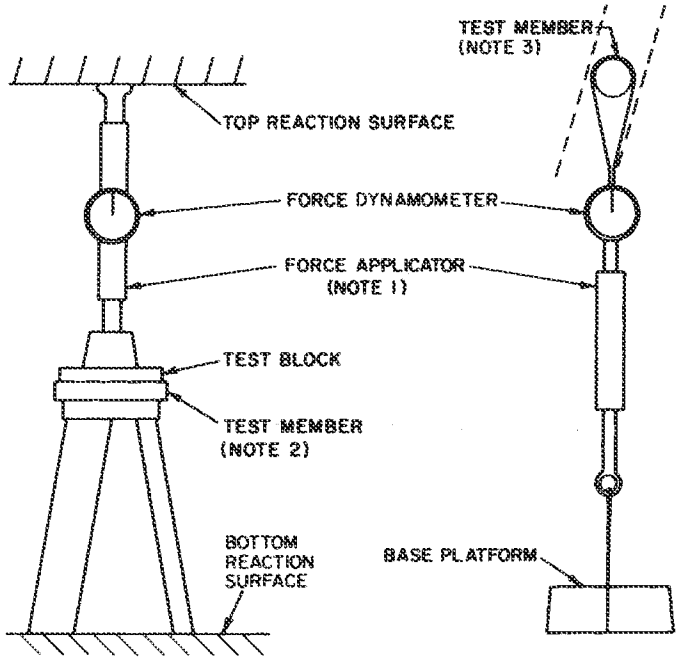
The bucket shelf shall be constructed so that it supports a distributed load of 100 pounds, applied to the shelf for a minimum period of one minute, with the ladder in an open position with the spreaders locked. The bucket shelf shall withstand the load without ultimate failure.

7.5.6 Front Stability Test.
Note: This is a design verification test.

The ladder shall be set in the open position on a level floor; a combination ladder shall be opened to its stepladder position. A uniformly distributed load, in accordance with Table 18, comprising lead weights or the equivalent to maximize the density of the loading medium, shall be applied to the second highest step, rung, or platform (the highest proper standing level), as shown in Fig. 21. (For an extension trestle ladder, the load shall be applied to the second highest extension-section rung.)

The ladder shall then be subjected to a horizontal pulling force, in accordance with Table 18, applied at the geometric center of the stepladder top cap, at a distance of not more than 1/2 inch above its top surface, towards the front of the ladder, as shown in

Figure 20
Methods (Other Than Dead Weight) for Applying Test Loads



Top-Loading Method
(a)

Bottom-Loading Method
(b)

NOTES:
(1) Hydraulic, pneumatic, or mechanical means may be used to apply the load.
(2) The top loading method is illustrated for the compression test, where it is applied to the top of the ladder, but it can also be used for the other tests.
(3) The bottom loading method is illustrated for the rung bending test, but it can also be used for the other tests.

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Fig. 21. The pulling force shall be applied to the top horizontal guardrail member of platform ladders, to the apex of the base section of trestle and extension trestle ladders, and to the top cap of combination ladders or to the top step when no top cap is used. Step stools shall be loaded with the distributed load on the top cap, and the pulling force shall be applied to the top cap also. The test surface shall be such as to ensure that the ladder does not slip or slide during the test.

During this test, the minimum load that causes the ladder to tip over shall not be less than the value shown in Table 18. Ladders equipped with a bucket shelf shall be tested with the bucket shelf in the in-use position.

7.5.7 Side Stability Test.
Note: This is a design verification test.

The side stability of a ladder shall be measured with the ladder set in an open position on a level floor. A uniformly distributed load, in accordance with Table 18, comprising lead weights or the equivalent to maximize the density of the loading medium, shall be applied to the second highest step, rung, or platform, as shown in Fig. 21. (For an extension trestle ladder, the load shall be applied to the second highest extension-section rung.)

The ladder shall then be subjected to a horizontal pulling force, in accordance with Table 18, applied to the side of the front rail, at the geometric center of the stepladder top cap, at a distance of not more than 1/2 inch above its top surface, as shown in Fig. 21. The pulling force shall be applied to the top horizontal guard rail member of platform ladders, to the apex of the base section of trestle and extension trestle ladders, and to the top cap of combination ladders or to the top step when no top cap is used. Step stools shall be loaded with the distributed load on the top cap, and the pulling force shall be applied to the top cap also. The test surface shall be such as to ensure that the ladder does not slip or slide during the test.

During this test, the minimum load that causes the ladder to tip over shall not be less than the value shown in Table 18. The test shall be run with the force applied to both sides, and the values shall be averaged to obtain the minimum load. Ladders equipped with a bucket shelf shall be tested with the bucket shelf in the in-use position.

7.5.8 Rear Stability Test.
Note: This is a design verification test.

The rear stability of a ladder shall be measured by placing the ladder in an open position on a level floor. A uniformly distributed load, in accordance with Table 18, comprising lead weights or the equivalent to maximize the density of the loading medium, shall be placed on the second highest step, rung, or the platform (the highest proper standing level), as shown in Fig. 21. (For an extension trestle ladder, the load shall be applied to the second highest extension-section rung.)

The ladder shall then be subjected to a horizontal pulling force, in accordance with Table 18, applied to the geometric center of the stepladder top cap, at a distance of not more than 1/2 inch above its top surface, in a rearward direction, as shown in Fig. 21. The pulling force shall be applied to the top horizontal guard rail member of platform ladders, to the apex of the base section of trestle and extension trestle ladders, and to the top cap of combination ladders or to the top step when no top cap is used. Step stools shall be loaded with the distributed load on the top cap, and the pulling force shall be applied to the top cap also. The test surface shall be such as to ensure that the ladder does not slip or slide during the test.

During the test, the minimum load to cause the ladder to tip over shall not be less than the value shown in Table 18. Ladders equipped with a bucket shelf shall be tested with the bucket shelf in the in-use position.

Table 18
Stability Test Loads (pounds)

Duty Rating and Type	Distributed Dead Load	Front Pulling Force	Side Pulling Force	Rear Pulling Force		Torsional Stability Pulling Force
				Platform Ladders	Other Ladders and Step Stools	
Special duty - Type IAA	200	25	20	35	45	35
Extra heavy duty - Type IA	200	25	20	35	45	30
Heavy duty - Type I	200	25	20	35	45	30
Medium duty - Type II	200	25	20	35	45	25
Light duty - Type III	200	25	20	35	45	20

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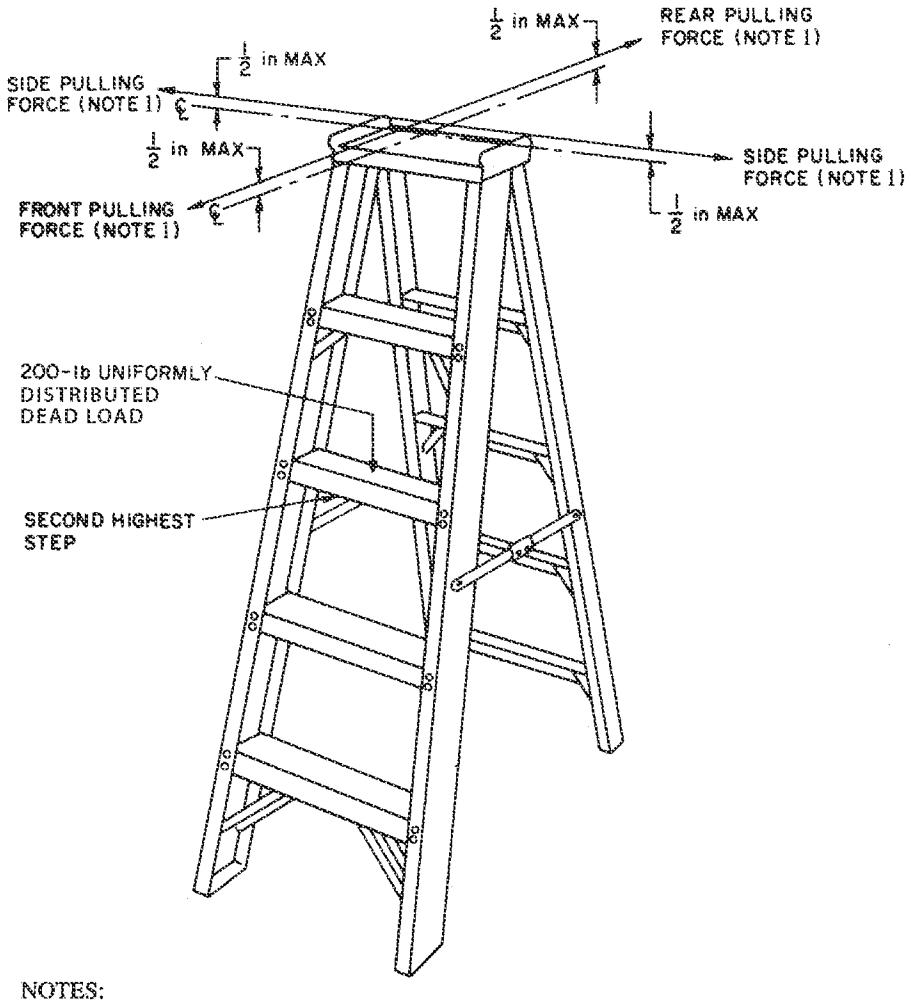
Figure 21
Front, Side, and Rear Stability Tests



NOTES:
(1) The pulling force shall be applied at a maximum distance of 1/2 inch above the top of the stepladder.
(2) This test is illustrated for a stepladder.

7.5.9 Torsional Stability Test.
Note: This is a design verification test.

The test unit shall be placed on a level floor, in the fully opened position, with the spreaders properly set. A 200-pound distributed dead load, comprising lead weights or the equivalent to maximize the density of the loading medium, shall be applied to the ladder top cap, platform, or top step when no top cap is used, as shown in Fig. 22.

A horizontal force, in accordance with Table 18, directed to the rear of the ladder, shall be applied to the ladder top cap at a distance of 18 inches from the vertical centerline of the ladder, as shown in Fig. 22. For articulated ladders, the horizontal force shall be applied as close as possible to the apex hinge. The force shall be maintained perpendicular to the moment arm, at the final load position, with a tolerance of ±10°, during the test. The test shall be conducted on dry, uncoated, vinyl flooring (see Section 4).

Relative movement in excess of one inch of the ladder with respect to the floor, any damage or visible weakening of the ladder structure or component, or any significant visible major damage from permanent deformation (set) of the test unit upon release of the test force shall constitute failure to meet this requirement. Minor permanent deformation (set) of individual ladder components, such as diagonal braces or rear horizontal braces, of less than 1/8 inch, shall not constitute test failure.

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Ladders equipped with a bucket shelf shall be tested with the bucket shelf in the in-use position. This test is not applicable to ladder-type step stools, platform ladders less than 3 feet in size, and other step-type ladders less than 5 feet in size.

7.5.10 Racking Test

Note: This is a design verification test.

7.5.10.1 The test unit shall be placed on a level floor, in the fully opened position, with the spreaders properly set. Both front feet shall be individually blocked to prevent movement relative to the floor, as shown in Fig. 23a. A 100-pound distributed dead load shall be applied to the bottom step or rung, no part of the load shall contact either of the two front rails during the test.

A vertical pulling force shall be applied to the rear of the ladder top cap, top guardrail or top step when no top cap is used, so as to lift both rear feet and provide a 3-inch clearance between the rear feet and the floor. A 4-pound pre-load shall then be applied at the bottom of one rear side rail; after which the ladder shall be unloaded to establish a no-load reference point. A 6-pound lateral pulling force shall be applied at the bottom of one rear rail, using a force gage or the equivalent, as shown in Fig. 23b, and the lateral displacement of the rear rail shall be measured relative to its no-load position. The maximum lateral displacement shall not exceed the value given in Table 19.

Ladders equipped with a bucket shelf shall be tested with the bucket shelf in the in-use position. This test is not applicable to ladder type step stools.

7.5.10.2 Ladders with Plastic Top Caps. A high temperature and a low temperature racking test shall be required for ladders with plastic top caps. The high temperature test shall be performed with the stepladder at 140°F±5°F with 50 percent greater rack allowable than in the room temperature test. The low temperature test shall be performed at a temperature of -20°F±5°F with no fracture permitted.

7.5.11 Rail Cantilever Bending Tests

7.5.11.1 Front Rail Static Cantilever Bending Test

Note: This is a design verification test.

The front rail cantilever bending strength of a ladder or step stool shall be measured by applying an edgewise load to the bottom end of a front side rail.

Use appropriate means to ensure that the test load is applied to the lower end of the side rail, such as removing, prior to testing, slip-on feet or feet extending below the end of the rail, or using special purpose test fixtures to load the side rail appropriately. The test unit shall be opened and placed on its side, with the steps perpendicular to the ground, as shown in Fig. 24. Combination ladders shall be opened to their stepladder position. The lower side rail shall be clamped to a support and shall be unsupported from the bottom end of the rail to the

Table 19
Maximum Allowable Racking Deflection (inches)

Ladder Size (feet)	Deflection†			
	Type-IAA (Y=1.35X)	Type-I and I-A (Y=1.35X + 3.9)	Type-II (Y=1.35X + 7.9)	Type-III (Y=1.35X + 7.9)
3	4.05	7.95	11.95	11.95
4	5.40	9.30	13.30	13.30
5	6.75	10.65	14.65	14.65
6	8.10	12.00	16.00	16.00
7	9.45	13.35	17.35	–
8	10.80	14.70	18.70	–
10	13.50	17.40	21.40	–
12	16.20	20.10	24.10	–
14	–	22.80	–	–
16	–	25.50	–	–
18	–	28.20	–	–
20	–	30.90	–	–

† Y = lateral racking deflection (inches) during a 6 pound pull; X = ladder size (feet).

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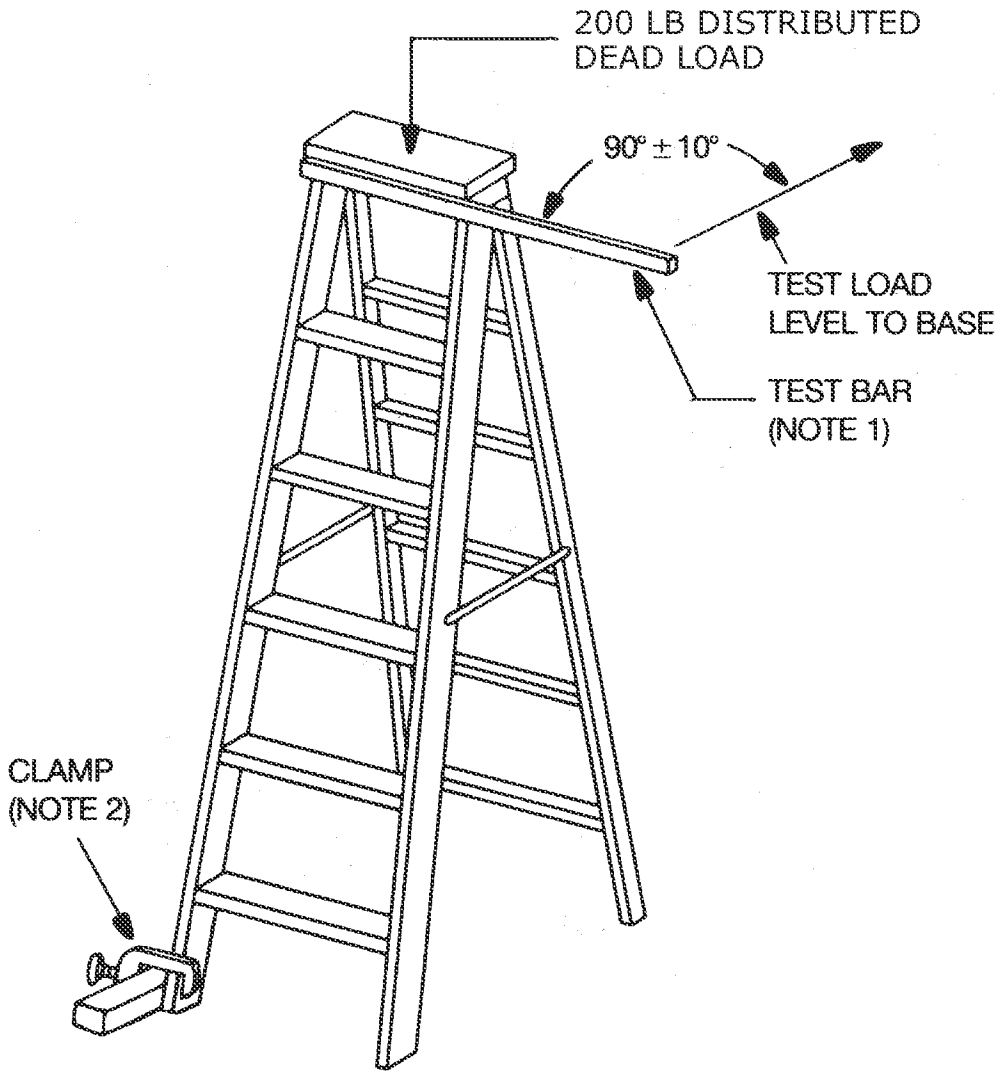
Figure 22
Torsional Stability and Rail Torsion and Spreader Tests



NOTES:
(1) The test bar is clamped to the top cap.
(2) The clamp is used only for the Rail Torsion and Spreader tests in 7.5.12.
(3) The test surface shall be dry, unwaxed vinyl flooring (see Section 4).
(4) This test is illustrated for a stepladder.

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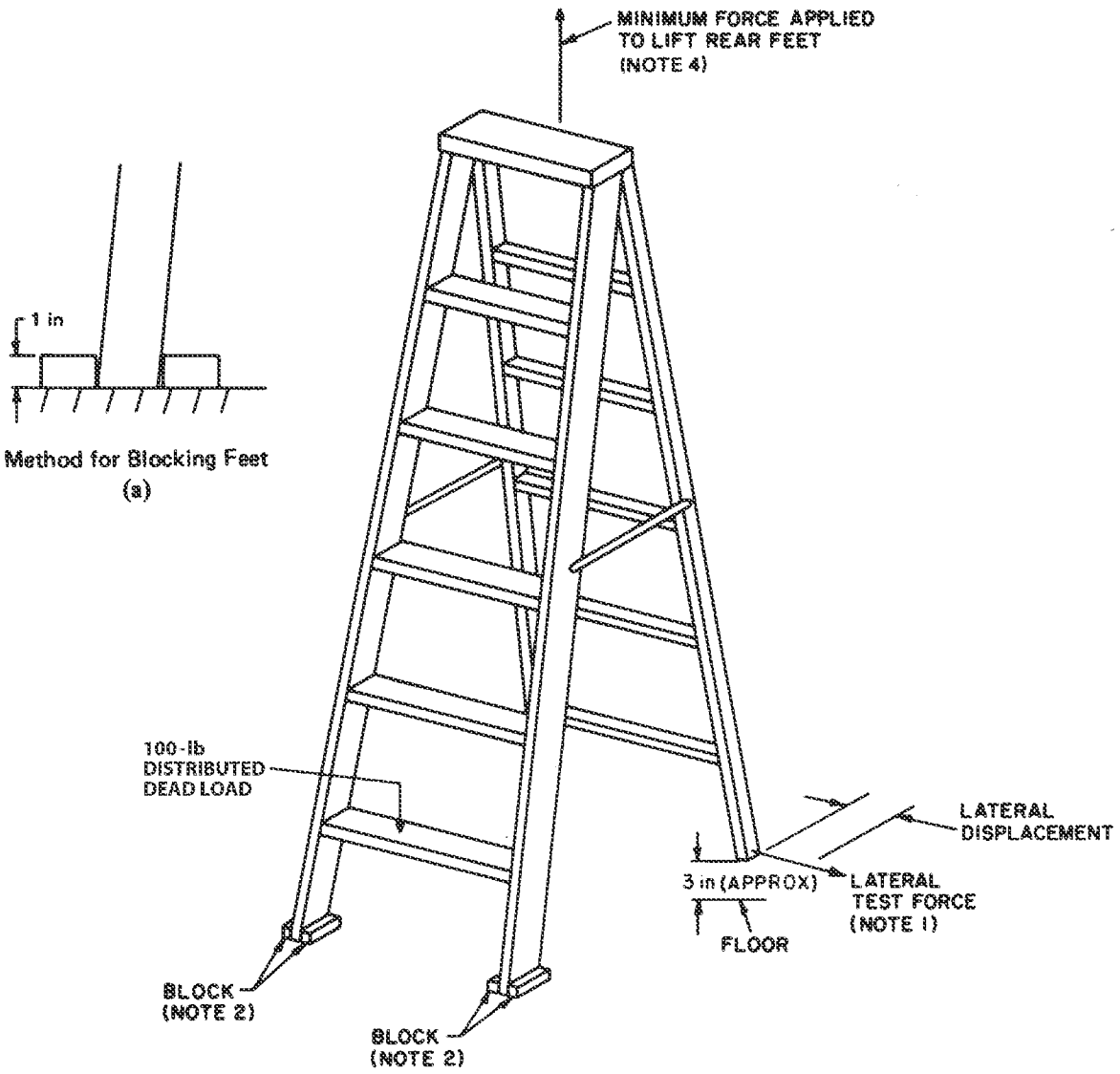
Figure 23
Racking Test



NOTES:

(1) The lateral force shall be applied using a force gage or the equivalent. The force shall be applied parallel to the bottom of the front section. The lateral displacement of the rear section shall be measured parallel to the direction the lateral force is applied.

(2) Blocks fixed to the test surface are used to resist rail rotation.

(3) This test is illustrated for a stepladder.

(4) The vertical lifting force shall be applied by a member bearing against the rear center of the ladder top cap, and shall be attached to a 5/16-inch minimum diameter rope at least 3 feet long with the rope secured against motion in any direction at least 3 feet above the ladder top.

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Table 20
Static Cantilever Bending Tests

Duty Rating and Type	Working Load (pounds)	Front Rail Cantilever Test Loads (pounds)	Rear Rail Cantilever Test Loads (pounds)
Special duty - Type IAA	375	375	250
Extra heavy duty - Type IA	300	300	200
Heavy duty - Type I	250	250	175
Medium duty - Type II	225	200	150
Light duty - Type III	200	150	125

top of the bottom step. The top surface of the step shall be parallel to the edge of the support.

The test load shall be applied by means of a weight, in accordance with Table 20, for a minimum period of 1 minute, to the extreme bottom end of the upper side rail (see Fig. 24a). The load shall be centrally applied to a 2-inch long block resting on the full width of the side rail and held in place by a C-clamp; the load attachment point on the C-clamp shall not be more than 2 inches below the underside of the web of the rail being tested. The weight shall be suspended so that it is acting through the vertical neutral axis of the side rail. The maximum allowable permanent deformation (set) of the upper side rail is 1/4 inch. The test load shall then be applied to the extreme bottom end of the lower side rail in a like manner (see Fig. 24b). The maximum allowable permanent deformation (set) of the lower side rail is 1/4 inch.

Provided the ladder continues to support the test load, permanent deformation (set) or ultimate failure of any ladder components as a result of the tests, except for the limitation of the maximum allowable permanent deformation (set) of the upper and lower side rails shall not constitute test failure.

7.5.11.2 Rear Rail Static Cantilever Bending Test
Note: This is a design verification test.

The rear rail cantilever bending strength shall be measured by applying an edgewise load to the bottom end of a rear side rail. Use appropriate means to ensure that the test load is applied to the lower end of the side rail, such as removing, prior to testing, slip-on feet or feet extending below the end of the rail, or using special purpose test fixtures to load the side rail appropriately. The test unit shall be opened and placed on its side, with the horizontal rear braces perpendicular to the ground, as shown in Fig. 24. The lower side rail shall be clamped to a support and shall be unsupported from the bottom end of the rail to the top of the bottom horizontal brace. Guides shall be used which have a nominal clearance between the rear section rails to prevent lateral movement of the section when the test load is applied. The test load shall be applied by means of a weight, in accordance with Table 20, for a minimum period of 1 minute, to the extreme bottom end of the upper side rail (see Fig. 24a). The load shall be centrally applied to a 2-inch long block resting on the full width of the rail and held in place by a C-clamp; the load attachment point on the C-clamp shall not be more than 2 inches below the underside of the web of the rail being tested. The weight shall be suspended so that it acts through the vertical neutral axis of the rear rail — lower horizontal brace assembly, so as to avoid introducing twisting into the rear rail. The maximum permanent deformation (set) of the upper side rail is 1/4 inch. The test load shall then be applied to the extreme bottom end of the lower side rail, in a like manner (see Fig. 24b). The allowable permanent deformation (set) of the lower side rail shall not exceed 1/4 inch.

Provided the ladder continues to support the test load, permanent deformation (set) or ultimate failure of any ladder components as a result of the tests, except for the limitation on the maximum allowable permanent deformation (set) of the upper and lower side rails, shall not constitute test failure.

7.5.11.3 Front and Rear Rail Dynamic Drop Test
Note: This is a design verification test.

The test unit shall be the tallest ladder for each rail size, with the same bottom bracing for each unit tested. The stepladder shall be tested in a closed position, with the ladder horizontal so that the steps are vertical. The top of the ladder shall be supported 6 inches from its top so that the bottom of the lower rail is 24 inches from a concrete floor, as shown in Fig. 25.

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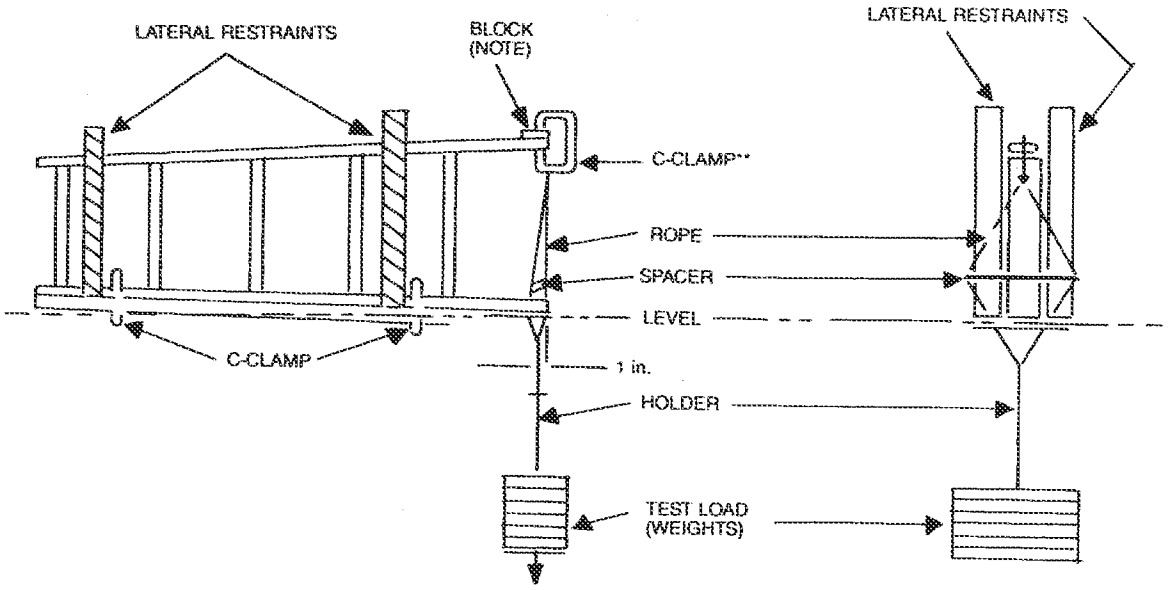
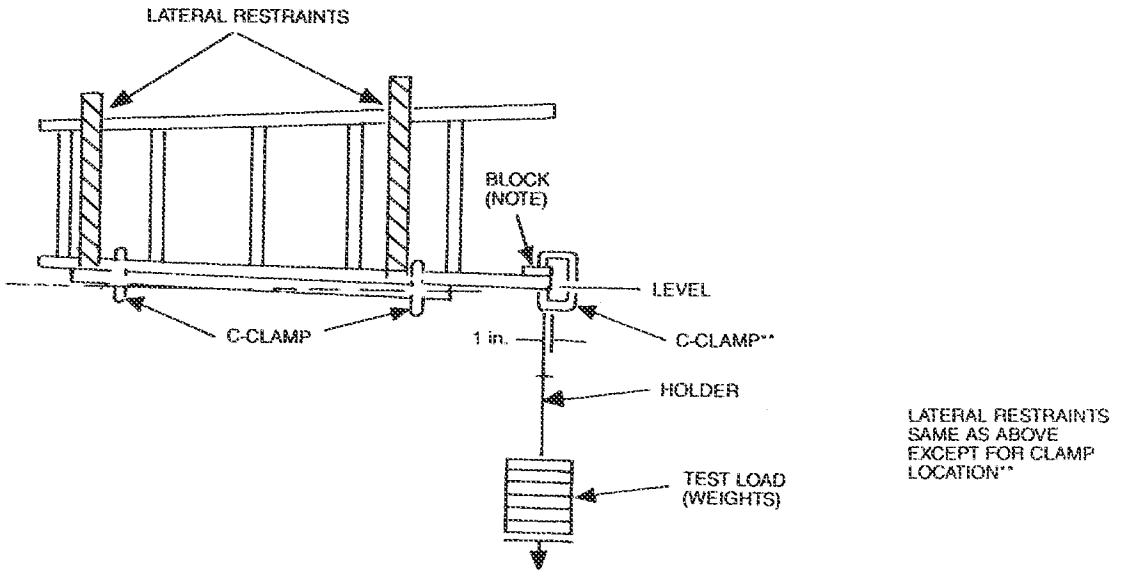
Figure 24
Rail Static Cantilever Test



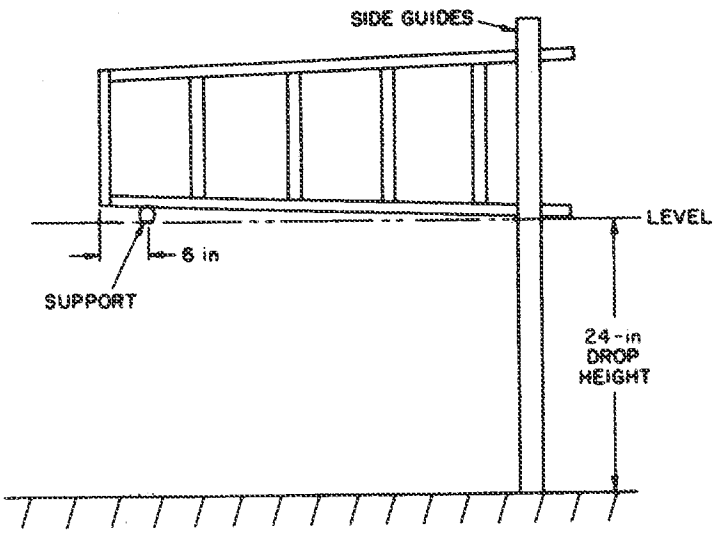
CANTILEVER-IN TEST
(a)



CANTILEVER-OUT TEST
(b)

Note: The block shall be a minimum of 1/4" and a maximum of 1-inch thick, and shall be 2-inches long measured along the side rail, and a minimum width equal to the full width of the side rail including side rail flanges.

Figure 25
Dynamic Drop Test



NOTE: This test is for cantilever in only. It is performed with the ladder closed.

To perform the drop test, the front and rear rails shall be guided in a vertical plane, during a free-fall drop. The maximum allowable permanent deformation (set) of the lower side rail is 1/4 inch.

7.5.12 Rail Torsion and Spreader Test.
Note: This is a design verification test.

The test unit shall be placed on a level floor, in the fully opened position, with the spreaders properly set. A 200-pound distributed dead load, comprising lead weights or the equivalent to maximize the density of the loading medium, shall be applied to the ladder top cap, platform, or top step when no top cap is used. A horizontal force, directed to the rear of the ladder, shall be applied to the ladder top cap at a distance specified in Table 21 from the vertical centerline of the ladder, as shown in Fig. 22. For articulated ladders, the horizontal force shall be applied as close as possible to the apex hinge. The force shall be perpendicular to the moment arm, with a tolerance of ±10°, when the test load is reached. The front side rail, opposite from the side where the horizontal force is applied, shall be blocked from movement. The test shall be conducted on dry, uncoated vinyl flooring (see Section 4).

The test unit shall withstand a horizontal force of not less than the value given in Table 21, without the spreaders unlocking, any damage or visible weakening of the ladder or components, or any significant visible major permanent deformation (set) of the test unit upon release of the test force. Minor permanent deformation (set) of individual ladder components, such as diagonal braces or rear horizontal braces, of less than 1/8 inch shall not constitute test failure.

Ladders equipped with a bucket shelf shall be tested with the bucket shelf in the in-use position. This test is not applicable to step stools.

Table 21
Rail Torsion and Spreader Test

Duty Rating and Type	Working Load (pounds)	Rail Torsion Test Force (pounds)	Distance from Vertical Centerline (inches)
Special duty - Type IAA	375	75	36
Extra heavy duty - Type IA	300	125	18
Heavy duty - Type I	250	100	18
Medium duty - Type II	225	75	18
Light duty - Type III	200	50	18

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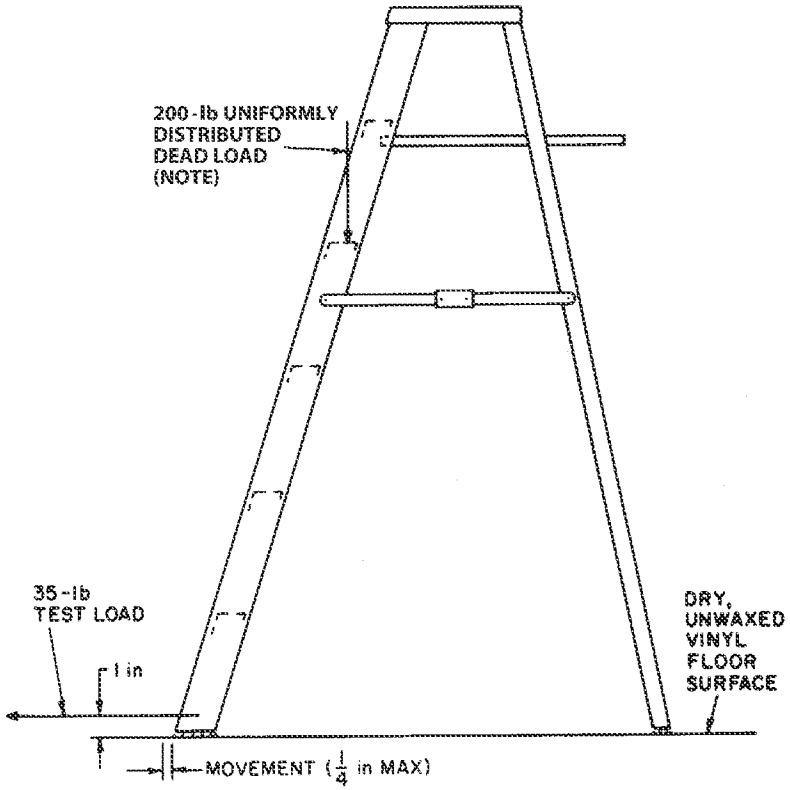
Figure 26
Stepladder Slip Test



NOTE: The 200-pound distributed dead load shall be placed on the second highest step.

7.5.13 Stepladder Slip Test.
Note: This is a design verification test.

Stepladders shall be tested for slip resistance as shown in Fig. 26. The test unit shall be a 6-foot stepladder, fully opened and spreaders locked. When testing an articulated ladder, the test unit shall be a 6-foot ladder or the shortest size greater than 6-foot, fully opened and all hinges locked. A uniformly distributed load of 200 pounds shall be placed on the second highest step. A horizontal pulling force of 35 pounds, statically applied centrally to the bottom of the ladder at a distance of 1 inch above the test surface, shall not cause any movement in excess of 1/4 inch across the test surface. The test surface shall be dry, uncoated, vinyl flooring (see Section 4).

7.5.14 Stepladder Plastic Top Cap Reference Material Tests.

7.5.14.1 Plastic tops from the initial lot of moldings, which were employed for performance tests, shall be employed to perform the following tests, and the results shall be recorded and retained for future reference.

7.5.14.2 Ten (10) top caps shall be weighed and both the mean and standard deviation determined.

7.5.14.3 The specific gravity or density of the minimum and maximum section thickness' of plastic top caps shall be determined. The sample size shall be ten (10) and the mean and standard deviation for each set of samples shall be computed.

7.5.14.4 A differential scanning calorimetric test shall be performed to catalog the material for future reference.

7.5.14.5 An infrared analysis of the material shall be performed and the results shall be retained.

7.5.14.6 The Heat Deflection Temperature (HDT) at 264 psi shall be at least 120°F in accordance with ASTM D648-82. (Re-approved 1988).

7.5.14.7 For the material tensile strength test, Type I tensile coupons of the material shall be prepared and shall comply with ASTM D638-91.

Half of the coupons shall be tested as received without any special conditioning, and the other half shall

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be tested after exposure to accelerated weathering as defined by Sec. 7.9.5.1 "Accelerated Weathering Test Procedure," of ANSI A14.5 for 1,000 hours. Failure occurs when elongation after 1,000 hours is 70% or less than the elongation of the "as received" material. Alternate criteria is when the area under the stress-strain curve "after weathering" is less than 70% of the "as received" curve area.

7.5.14.8 For the cold impact test, a full size sample of the top cap shall be subjected to a 5 ft.-lb. impact from a 1.18 lb., 2" diameter guided steel ball after being conditioned for 24 hours at -20°F. The top cap, where the design permits, shall be placed on a flat horizontal surface and impact applied to the geometric center of the top cap. Where top cap geometry precludes complete support on a flat horizontal surface the requirement shall be achieved by equivalent means of positioning. One such method is to position the top cap so that it is supported as close to its sides as possible resting on 1/4 inch thick steel plates supporting the underside of the top cap across the full width of the top (front to back) so that the top of the cap rests in a horizontal plane within ±2° in any direction. The top cap shall show no signs of cracking after impact.

7.6 Labeling Tests

7.6.1 General. The following procedures are designed to evaluate the suitability of primary hazard (danger and caution), safety use instruction (safety first), and product data information (notice) labels for application to ladders, and the performance of printed labels applied to surfaces representative of those employed in the intended application.

Unless otherwise specified, the labels are applied to the appropriate surfaces and conditioned for 24 hours at 73°F (±5°F) and 50% relative humidity (±5%). Satisfactory results are needed on 3 samples for each test to fulfill the requirements. It is not intended that the tests shall be conducted on a progressive basis to 1 set of test samples. After each environmental test, the samples should be conditioned at 73°F (±5°F) and 50% relative humidity (±5%) for 24 hours before subsequent tests are conducted.

7.6.2 Tests

Note: These tests are all design verification tests and should be performed on standard substrates rather than on actual ladders. These substrates shall be aluminum extrusions, 6061-T6 or the equivalent in mechanical properties, of 0.045 to 0.070 inch nominal thickness.

Labels shall be mounted using a 4-1/2 pound weighted roller and then cured for 24 hours before being subjected to test.

7.6.2.1 Adhesion Test. The test shall be conducted on a new label that has not been subjected to the other tests in 7.6.2, according to ASTM D903-49 (1978), Test for Peel or Stripping Strength of Adhesive Bonds.[1] A minimum force of 30 ounces shall be required to remove the label.

7.6.2.2 Scratch Resistance Test. The label shall resist defacement or removal when a flat metal blade 1/32 inch thick, held at a right angle to the test panel, is scraped across it. This test shall be run on labels before and immediately after the water immersion test.

7.6.2.3 Water Immersion Test. Applied labels shall be immersed in water, label side down, with the water level a minimum of 1/8 inch above the label, for 48 hours at 75°F. No significant change shall occur in the legibility of the labels or in their adhesion to the ladder surface (as evidenced by delaminating or curling) following the test.

7.6.2.4 Oven Aging Test. Applied labels shall be placed in an oven maintained at a temperature of 158°F (70° C) for 240 hours. No significant change shall occur in the legibility of the labels or in their adhesion to the ladder surface (as evidenced by delaminating or curling) following the test.

8. Selection, Care, and Use

8.1 General

8.1.1 For maximum serviceability and safety, and to eliminate unnecessary damage to equipment and goods, users shall employ safe practices in the use and care of ladder equipment. The guidelines discussed in this section constitute the most appropriate and proper procedures for the care and use of ladders.

8.1.2 A comparison of studies within A14 jurisdiction, by government bodies, by other researchers, and in the ILO[2] publications CIS-12, Ladders, indicates a close correlation between major accident causes and the failure to follow guidelines like those provided in this section.

8.1.3 The major causes of falls from self-supported portable ladders are lack of stability and sliding. The major causes of falls from non-self-supporting portable ladders are lateral sliding at the top support, outward sliding at the lower base support, and human

[1] Available from the American Society for Testing and Materials.

[2] Available from the International Occupational Safety and Health Information Centre, International Labour Office, CH 1211, Geneva 22, Switzerland.

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Table 22
Summary of Significant Accident Causes

Ladder Design	Cause of Accident	Possible Factors Involved in Accident: Base Support or surface	Top Support	Set-Up	User Location	Ladder Selection and Condition
Self-supporting (stepladder)	Stability	Soft Uneven Unstable surface Slipper surface Differences in firmness of surface Slope of surface	Not applicable	Unlocked spreaders One or more feet unsupported Used unstable or insuffficient supports Ladder not close enough to work location User's physical condition	Above "highest standing level" label Reaching out too far, particularly laterally Climbing onto ladder from above Handling heavy loads or unstable objects Applying side load	Too short (size) Incorrect ladder type (IA, I, II, or III) Incorrect style ladder (for example, platform or single versus stepladder) Use of improper equipment (for example, ladder versus scaffold)
	Sliding	Uneven surface Low friction Unstable surface Ice snow or wet surface Slippery surface	Not applicable	Used as a non-self-supporting ladder Ladder not close enough to work location Worn, missing or contaminated feet	Reaching out too far Stepping off ladder Applying side load	Use of improper equipment (for example, ladder versus scaffold) Removal or deterioration of slip-resistant ladder feet
Non-self-supporting (extension and single)	Human slip	Not applicable	Not applicable	Pitch (angle) too steep (especially with flat rungs) User's physical condition or shoes	Descending	Dirty, oily, or icy step surfaces Use of improper equipment (for example, ladder versus scaffold)
	Lateral sliding (left or right) at top support	Uneven surface Differences in firmness of surface Unstable surface	Uneven surface Slippery surface Unstable surface (pole, tree, corner of building, and the like) Ice, snow, or wet surface Insufficient top support	Not tied off Not held at base Inadequate or excessive extension above top support Ladder not close enough to work location Pitch (angle) too steep Feet unsupported or unstable Extension locks not engaged	Getting on or off ladder to roof Reaching out too far laterally Applying side load	Too short or too long (size) Not extended far enough (too steep) Use of improper equipment (for example, ladder versus scaffold)
	Outward sliding at lower base support	Unstable surface Low friction Loose surface Ice, snow, or wet surface Slippery surface	Overextension above top support	Used unstable or insufficient supports Pitch (angle) too flat Ladder not footed Ladder not tied off or blocked Worn, missing or slippery feet Improper selection of feet or slip-resistant bearing surfaces Extension locks not engaged	Above "highest standing level" label Sliding tendency increases above ladder working length midpoint Careless climbing onto or off of ladder (from or to roof, and the like) Applying side load	Wrong floor or slip-resistant bearing surface Too long (size) or extended too far Use of improper equipment (for example, ladder versus scaffold)

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slip. Table 22 provides a summary of significant accident causes.

8.1.4 Proper selection of a ladder is essential for ensuring safety and reducing the potential for accidents.

8.1.5 Proper use of a ladder will contribute significantly to safety. Factors contributing to falls include: haste, sudden movements, lack of attention during use, ladder condition (worn or damaged), user's age or physical condition, or both, and the footwear employed by the user.

The user's excessive weight or size does not increase the likelihood of falls. However, improper climbing posture creating user clumsiness on the ladder may cause falls.

8.1.6 The safe useful life of the ladder is dependent upon its proper in-service care. In-service use test methods (see Section 7, including the italicized advisory in-service use tests) are available for evaluating the ladder's condition. While ladders are designed for extended service, it is necessary to provide periodic in-service care and maintenance to ensure their continued safe use. Ladders are not designed or intended to possess an infinite safe useful life.

8.1.7 The information provided in the balance of this section principally addresses stepladders and extension ladders. The principles, however, are applicable to all self-supporting and non-self-supporting portable ladders.

8.2 Selection

8.2.1 Ladder Selection. Portable ladders are designed for one-man use to meet the requirements of the man, the task, and the environment. This section covers the factors involved in making the proper ladder selection. Product information data necessary for proper ladder selection is found on the ladder rail.

8.2.1.1 Duty Rating. Ladders have been designed in five duty classifications:

Duty Rating	Ladder Type	Working Load (pounds)
Special Duty	IAA	375
Extra Heavy-Duty	IA	300
Heavy-Duty	I	250
Medium-Duty	II	225
Light-Duty	III	200

8.2.1.2 Loading and Service. Users shall give consideration to the length required, the working load, the duty rating, and frequency of use to which the ladder will be subjected. Users shall not overload a ladder.

The following criteria shall be used when purchasing or using a ladder:

(1) Special Duty. For users requiring a 375-pound working load or duty rating, such as industry, utilities, contractors, and the like.

(2) Extra Heavy-Duty. For users requiring a 300-pound working load or duty rating, such as industry, utilities, contractors, and the like.

(3) Heavy-Duty. For users requiring a 250-pound working load or duty rating, such as industry, utilities, contractors, and the like.

(4) Medium-Duty. For users requiring a 225-pound working load or duty rating, such as painters, offices, light maintenance, and the like. Medium duty ladders shall not be used with ladder jacks or scaffold planks, or both, with the exception of articulated ladders used in a scaffold position as described in section 6.7.11.

(5) Light-Duty. For users requiring no more than a 200-pound working load or duty rating, such as general household use. Light duty ladders shall not be used with ladder jacks or scaffold planks, or both, with the exception of articulated ladders used in a scaffold position as described in section 6.7.11.

Table 23
Ladder Size, Working Length, and Height (feet)

Extension Ladder Size	Maximum Working Length	Height to Top Support on Wall	Height to Roof Eave with 1- to 3-Foot Extension *
16	13	To 12-1/2	9-1/2–11-1/2
20	17	12-1/2–16-1/2	13-1/2–15-1/2
24	21	16-1/2–20	17–19
28	25	20–24	21–23
32	29	24–28	25–27
36	32	28–31	28–30
40	35	32–34	31–33

* Extend ladder approximately three feet above roof for access.

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8.2.1.3 Proper Size

8.2.1.3.1 Extension Ladders. Selection of proper extension-ladder size requires knowledge of the vertical height or elevation to the top support point. Where the top support is a roof eave, additional working length is needed to permit the required 1- to 3-foot extension beyond this point. The highest standing level shall also be considered, although the actual dimension will change as the ladder is extended. The nominal relationships between size, working length, and height to the top support point are given in Table 23.

8.2.1.3.2 Stepladders. The highest standing level is constant for a specific stepladder. Typical relationships are as follows:

Stepladder Size (feet)	Recommended Highest Standing Level
4	1 foot, 11 inches
5	2 feet, 10 inches – 2 feet, 11 inches
6	3 feet, 10 inches
7	4 feet, 9 inches – 4 feet, 10 inches
8	5 feet, 9 inches – 5 feet, 10 inches
10	7 feet, 8 inches – 7 feet, 9 inches
12	9 feet, 7 inches – 9 feet, 8 inches

The maximum work height is then established by adding the user's height and safe reach to the highest standing level dimension.

8.2.1.3.3 User On-Ladder Location. There are situations in which the user of a particular size ladder creates a gap in the height that can be reached by the user. For example, extension ladders of 28-foot size and longer cannot be used to work on a wall below a certain height because the user would be too far out from the wall. Usually the lower portion of the wall can be reached from the ground, which means up to a height of about seven feet. When this 28-foot extension ladder is closed to 14 feet, then working on a wall below 10 feet becomes a problem.

These conditions create a gap between seven and 10 feet in height where another ladder selection is recommended. To work in this zone, a shorter non-self-supporting ladder or a self-supporting ladder such as a stepladder should be considered.

8.2.1.3.4 Work Site Restrictions on Working Length. In cases where the work site imposes a height restriction on the non-self-supporting ladder's working length, the user may find that longer ladders are not capable of erection at the proper angle of inclination of 75-1/2°. To safeguard against bottom sliding, select a shorter extension ladder or single ladder.

8.2.2 Self-supporting vs. Non-self-supporting ladders. In choosing between a self-supporting and a non-self-supporting ladder, an important factor to consider is the bottom and top support conditions. A stepladder requires level support for four rails. If such support is lacking or is not convenient, and if a top support is available, an extension ladder might be a better choice. In addition, the top support allows the opportunity to secure or tie off the top to increase stability.

8.2.3 Two Person Ladders. Manufacturers do design and offer certain ladders intended for use by more than one person. These products shall be so identified on their labels and markings.

8.2.4 Ladders Designed for Special Purposes. Certain ladders are designed, specified, and identified, as special purpose ladders (see Section 4).

8.3 Rules for Ladder Use

8.3.1 Intended Use. Ladder use shall be restricted to the purpose for which the ladder is designed.

8.3.1.1 Ladders shall not be climbed by more than one person at a time unless designed to support more than one person.

8.3.1.2 Self-supporting ladders shall not be used as single ladders or in the partially closed position.

8.3.1.3 Unless specifically designed for a cantilever operation, a non-self-supporting ladder shall not be used to climb above the top support point.

8.3.1.4 Combination ladders, when used as self-supporting stairway ladders, shall not be climbed on their back sections.

8.3.1.5 A ladder jack system shall not be used by more than two persons (see 8.3.19).

8.3.2 Climbing and Working Locations. The user shall climb or work with the body near the middle of the step or rung. The user shall not step or stand higher than the step or rung indicated on the label marking the highest standing level of a ladder. The user shall not step or stand on:

(1) A ladder top cap and the top step of a step or trestle ladder, or the bucket or pail shelf of a self-supporting ladder.

Note: This restriction is not applicable to top steps located 18 inches under the top cap.

(2) The rear braces of a self-supporting ladder unless they are designed and recommended for that purpose by the manufacturer.

(3) The top step of the extension section of an extension trestle ladder.

(4) The top cap or top step of a combination ladder when it is used as a self-supporting ladder.

8.3.3 Angle of Inclination. Portable non-self-supporting ladders should be erected at a pitch of 75-1/2° from the horizontal for optimum resistance to sliding, strength of the ladder, and balance of the climber. A simple rule for setting up a ladder at the proper angle is to place the base a distance from the wall or upper support equal to one-quarter the effective working length of the ladder (the "quarter length rule"). Effective working length is measured by the distance along the side rails from the bottom of the ladder to the upper support point. Combination ladders should be erected so that the step surfaces are in a horizontal plane.

8.3.4 Footing Support. The ladder base shall be placed with a secure footing on a firm, level support surface. Ladder levelers may be used to achieve equal rail support on uneven surfaces. Devices such as shoes, spurs, spikes, combinations thereof, or similar devices of substantial design should be installed where required for slip resistance and bearing area. Where ladders with no safety shoes, spurs, spikes, or similar devices are used, a foot ladder board or similar device may be employed. Ladders shall not be used on ice, snow, or slippery surfaces unless suitable means to prevent slipping are employed. Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height.

8.3.5 Top Support. The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment. Such an attachment should be substantial and large enough to support the ladder under load. It should be used when the ladder top support is a pole, light standard, building corner, or in tree-type operations (pruning, fruit picking, and the like). When it is necessary to support the top of a ladder at a window opening, a device should be attached across the back of the ladder, extending across the window, to provide firm support against the building walls or window frames.

8.3.6 Side Loading. Portable ladders are not designed for excessive side loading, and such abuse of the ladder shall be avoided. The ladder shall be kept close to the work. The user shall not overreach, but shall descend and relocate the ladder instead. When using a ladder, the user shall never push or pull unless the ladder is properly secured.

8.3.7 Climbing Ladders. When ascending or descending the ladder, the user shall face the ladder and maintain a firm hold on the ladder. The user shall not climb onto a ladder from the side, from one ladder to another, or from a swing-stage to a ladder, unless the ladder is secured against sideways motion or has been tied to the structure. The user shall not climb a broken or bent ladder or a ladder that does not comply with 8.4.1.

8.3.8 Electrical Hazards. Users are cautioned to take proper safety measures when ladders are used in areas containing electrical circuits. These precautions should prevent any contact or possible contact with an energized, uninsulated circuit or conductor in order to avoid electrical shock or short circuit. Metal ladders and wood ladders with side-rail metal reinforcement wires shall not be used where they would come in contact with exposed energized electric wires.

All ladders should be kept away from electric power lines unless they are specifically designed for that application. Ordinary precautions should be employed as would be taken when using any tool that may become a conductor of electricity. Users are cautioned to be particularly careful when manipulating any ladder around an overhead electrical power line.

8.3.9 Improper Use. A ladder shall not be used as a brace, skid, lever, guy or gin pole, gangway, platform, scaffold plank, material hoist, or for any other use for which it was not intended, unless the manufacturer specifically recommends such use. Ladders shall not be erected on scaffolds to gain additional height, unless specifically designed for the application.

8.3.10 Getting on or off ladder at upper levels. Ladder should extend approximately three feet above the upper access level. The ladder shall be tied to the upper access level before climbing onto or off the ladder at the upper level. The user shall take care when getting on or off the ladder at the upper level in order to avoid tipping the ladder over sideways or causing the ladder base to slide.

8.3.11 Fastening Together. Ladders and ladder sections, unless so designed, shall not be tied or fastened together to provide a longer length. Ladders and ladder sections shall not have their length increased by other means unless specifically designed for the means employed.

8.3.12 Doorways. Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.

8.3.13 Setup and Adjustment of Ladders.

8.3.13.1 Extension Ladders. Adjustment of extension ladders shall only be made by the user when standing at the base of the ladder so the user may observe when the locks are properly engaged. The user shall check that the rope is tracking correctly in the pulley. Adjustments of extension ladders from the top of the ladder (or any level over the locking device) is a dangerous practice and shall not be attempted. Adjustments shall not be made while anyone is standing on the ladder. The user shall ensure that both upper and lower ladder support points are contacting firm support surfaces.

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8.3.13.2 Stepladders. The user shall ensure that the stepladder is fully opened, with spreaders locked and all feet contacting a firm level support surface.

8.3.14 Erection of Extension Ladders. Extension ladders shall always be erected so that the top section (fly section) is above and resting on the bottom section (base section) with the rung locks engaged. The top section may be located in front of or behind the bottom section, depending upon the design. The ladder shall never be used in a reverse position where the top end of the fly section becomes the lower end of the ladder, and the lower end of the base section becomes the upper end of the ladder. Where extension ladders have been previously used as single ladders, care should be exercised to ensure that the sections are properly reassembled and that the interlocking guides or brackets are properly engaged between the sections before further use.

8.3.15 Relocating Ladders. A ladder shall not be relocated while anyone is on it.

8.3.16 Bracing of Stepladders. The bracing on the rear rails of stepladders is designed solely for increasing stability and not for climbing. This does not apply to the stepladders provided with steps for climbing on both front and rear sections.

8.3.17 Use of individual sections of sectional ladders and sections of extension trestle ladders. Middle and top sections of sectional ladders should not be used for bottom sections, unless so designed, and identified by the manufacturer. Extension sections of extension trestle ladders should not be used as single ladders, unless so designed, and identified, by the manufacturer.

8.3.18 Hooks. When service conditions warrant, hooks may be attached at, or near the top of, portable ladders to give added security. (Such hooks are used for upper support in cable strand or roofing applications.)

8.3.19 Ladder Jacks. Only special duty (Type IAA), extra-heavy duty (Type IA), and heavy-duty (Type I) ladders shall be used in conjunction with ladder jacks, stages, or planks. Medium duty (Type II) and light-duty (Type III) ladders shall never be used with ladder jacks. For additional information on ladder jack systems, see American National Safety Requirements for Scaffolding, ANSI A10.8-2001.

8.3.20 High Static Electrical Fields. Ladders specifically designed to permit grounding or dissipation of static electricity should be used around high static electrical fields to assist in preventing shocks to the user.

8.4 Care

8.4.1 Inspection. A thorough ladder inspection shall be made when the ladder is originally purchased, received, and put into service. The ladder shall be inspected periodically, preferably before each use. Working parts and rung/step-to-side rail connections shall be checked. Where structural damage or other hazardous defect is found, the ladder shall be taken out of service and either discarded or repaired by a competent mechanic.

8.4.1.1 Tipping Over, and Other Impact Damage. The ladder shall be inspected for side rail dents or bends, or excessively dented rungs. All rung/step-to-side rail connections shall be checked, as well as hardware connections, rivets (for shear), and all other components.

8.4.1.2 Exposure to Fire. If ladders are exposed to excessive heat, as in the case of fire, their strength may be reduced. After such exposure the ladder shall be inspected visually for damage and tested for deflection and strength characteristics. More information is provided in Section 7. In doubtful cases, refer to the manufacturer.

8.4.1.3 Corrosive Substances. If ladders are subjected to certain acids or alkali materials, they may experience chemical corrosion and a reduction in strength. Consult the manufacturer or a qualified person prior to use.

8.4.1.4 Oil and Grease. Ladders should be free of oil, grease, or slippery materials on climbing or gripping surfaces.

8.4.1.5 Ropes and Pulleys. Ropes, cables, and pulleys should be inspected frequently, checked to ensure that they operate properly, and replaced if they are worn or defective.

8.4.2 Damaged Ladders. Broken or bent ladders shall be marked and taken out of service until they are repaired by a competent mechanic or destroyed in such a manner as to render them useless. The user shall not attempt to repair a defective side rail.

8.4.3 Proper Handling. Ladders, like any tool, must be handled with care and not be subjected to dropping, jarring, or misuse. They are designed for the purpose intended. Therefore, any variation from this purpose constitutes a mishandling of the equipment.

8.4.4 Transporting. Ladders transported on road, street, and highway motor vehicles shall be properly supported. Overhang of the ladders beyond supporting points should be limited. Supporting points should be of a material such as wood or rubber-covered iron pipe, to minimize chafing and the effects of road shock. Securing the ladder to each support point will greatly reduce damage due to road shock.

8.4.4.1 Truck Racks. Ladders shall be secured to the truck rack in a manner that will avoid chafing from relative horizontal and vertical motion. The

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ladder feet, when present, should be secured from pivoting about the ladder while the vehicle is in motion. The ladder truck rack shall be designed to positively secure the ladder into a fixed position, and the rack should be designed to fit the particular ladder being fixed to the truck. If these requirements are not satisfied, excessive wear of the ladder will occur, which will cause premature deterioration of the ladder and reduce its service life. Improperly designed and used truck racks may damage side rails, steps or rungs, feet, and other ladder parts, owing to vehicle vibration and road shock.

8.4.5 Storage. Ladders should be stored in or on racks designed to protect the ladder when it is not in use. These racks should have sufficient supporting points to avoid sagging. Materials shall not be placed on the ladder while it is in storage.

8.4.6 Maintenance. Proper ladder maintenance ensures the safe condition of the ladder. Hardware, fittings, and accessories should be checked frequently and kept in proper working condition. All pivotable connections and the rung-lock cam surfaces should be lubricated frequently (See also 8.4.1.4). All bolts and rivets shall be in place and secure before using a ladder, and no ladder should be used if any bolts or rivets are missing or if the joints between the steps (or rungs) and the side rails are not tight. Ladders with safety shoes or padded feet which are excessively worn shall be taken out of service until repaired.

9. Labeling/Marking Requirements

9.1 General Requirements

9.1.1 Primary hazard "DANGER" and "CAUTION" markings shall conform to the general design principles (and where labels are used) to the design and color principles of these requirements as provided in Appendixes "A" and "B" for the kinds of ladders in this standard. Appendix B refers to "THE SAFETY INSTRUCTIONS AND PRODUCT DATA INFORMATION" labels/markings.

9.1.2 Marking shall be legible and readily visible.

9.1.3 The preferred location for markings, unless otherwise specified, is 4-1/2 to 6 feet from the bottom of the ladder on the outside of the rails.

9.1.4 Marking No. 00 shall be placed on all portable ladders.

9.1.5 Markings shall be positioned so that other parts of the ladder shall not damage the label/marking when the ladder is open, closed or extended.

9.1.6 Where compliance with 9.1.3 is not possible due to the size or design of the ladder, markings shall be in the most prominent locations available. When rail space is limited, such as on step stools or ladders constructed of tubular side rails, markings may be located under top caps or steps when accompanied by markings similar to Marking No. 00D or Marking No. 00E in prominent locations.

9.1.7 The labels/markings in the Appendicies shall be considered as illustrations only. For example, Marking No. 5 can have fly section either over or under base section. Also, illustrations in this standard may not be optimum size — see appendix for size notes.

9.1.8 Exception. Modification of these marking requirements within the design or color principles of Section 9.1, including equivalent wording and symbols to accommodate material, finish and construction features shall be permitted.

9.2 Product Data Information Markings

9.2.1 The product data information markings in 9.2.2 shall appear on the ladder.

9.2.2 The following information is required:

(1) Ladder size.
(2) Type and duty rating.
(3) Maximum working length (if extension ladder).
(4) Highest standing level.
(5) Total length of sections (if extension ladder).
(6) Model number or name.
(7) Manufacturer or distributor name (may be logo).
(8) Manufacturing plant if multi-plant organization (may be coded).
(9) Month and year of manufacture.
(10) ANSI standard compliance.

9.2.3 Typical Presentation. Product data information markings may be presented as provided by the labels/markings and instructions in Appendix B (See Marking No. 23).

9.3 Specific Labeling/Marking Requirements

9.3.1 Stepladder.

9.3.1.1 Marking No. 1 shall meet the general requirements of location and positioning to avoid damage to the label/marking.

9.3.1.2 Marking No. 2 or Marking No. 24 shall be located on the top cap of stepladders. An equivalent marking for plastic top caps is to mold into the top cap "DANGER: DO NOT STAND OR SIT" in bold or raised letters at least 1/4 inch high.

9.3.1.3 Marking No. 3 shall be located on the first step below the top cap when this step is 18 inches or less from the top and may be omitted when the

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first step is more than 18 inches from the top cap.

9.3.1.4 The placement of Markings No. 2 or No. 24, and No. 3 shall be such as to assure best viewing position and to accommodate design, construction features and materials and finishes.

9.3.1.5 Marking No. 4 shall met the general requirements in Section 9.1.

9.3.2 Extension and Single Ladders.

9.3.2.1 Marking No. 5 and No. 6 shall meet the general requirements for location.

9.3.2.2 Marking No. 6 shall be used on all extension ladders and single ladders constructed of metal.

9.3.2.3 Marking No. 7 shall be placed in lieu of Marking No. 8, on the inside of the right rail of single ladders and the right rail of the fly section of extension ladders, with the arrow pointing to the second or third rung, depending upon which rung is 22 inches or more from the top of the section.

9.3.2.4 Marking No. 8 shall be placed in lieu of Marking No. 7 on the second or third rung from the top of single ladders or fly section of extension ladder depending upon which rung is 22 inches or more from the top of the section.

9.3.2.5 In lieu of embossed letters, marking No. 9 shall be placed on extension ladder sections not designed for separate use if the ladder is not equipped with permanent means to preclude separation of ladder sections.

9.3.2.6 Marking No. 10 shall meet the general requirements in Section 9.1.

9.3.3 Step Stool.

9.3.3.1 Markings No. 11 and No. 12 shall conform to the general requirements in Section 9.1.

9.3.4 Trestle (Double Front) Ladder.

9.3.4.1 Marking No. 2 or marking No. 24 shall be located on the top cap. An equivalent marking for plastic top caps is to mold into the top cap "DANGER: DO NOT STAND OR SIT" in bold or raised letters at least 1/4 inch high.

9.3.4.2 Marking No. 3 shall be located on the first step below the top cap on each side when this step is 18 inches or less from the top and may be omitted when the first step is more than 18 inches from the top cap.

9.3.4.3 The placement of markings No. 2 or No. 24, and No. 3 shall be such as to assure best viewing position and to accommodate design, construction features, materials and finishes.

9.3.4.4 Marking No. 13 and No. 14 shall meet the general requirements in Section 9.1.

9.3.5 Extension Trestle Ladder.

9.3.5.1 Markings No. 6, No. 7 and No. 8 shall be used on the extension section as required for single section straight ladders.

9.3.5.2 Marking No. 13 and No. 15 shall meet the general requirements in Section 9.1.

9.3.5.3 Markings shall meet the requirements of Sections 9.3.4.1 through 9.3.4.3 for the trestle sections.

9.3.5.4 In lieu of embossed letters, marking No. 9 shall be placed on the extension section if not designed for separate use if the ladder is not equipped with permanent means to preclude separation of ladder sections.

9.3.6 Platform Ladder.

9.3.6.1 Marking No. 1 shall meet the general requirements of location and positioning to avoid damage to the label/marking.

9.3.6.2 Marking No. 2 or No. 24 shall be located on the top cap or highest cross member above the platform. An equivalent marking for plastic top caps is to mold into the top cap "DANGER: DO NOT STAND OR SIT" in bold or raised letters at least 1/4 inch high.

9.3.6.3 Marking No. 18 shall conform to the general requirements in Section 9.1

9.3.7 Combination Ladder.

9.3.7.1 In the stepladder mode, Markings No. 1 and No. 3 shall meet the requirements set forth for stepladders.

9.3.7.2 In the single or extension ladder mode, Marking No.5, No. 6, No. 7 and No. 8 shall meet the requirements set forth for single and extension ladders.

9.3.7.3 Marking No. 16 and No. 17 shall meet the general requirements in Section 9.1.

9.3.7.4 In lieu of embossed letters, marking No. 9 shall be placed on the extension section if not designed for separate use if the ladder is not equipped with permanent means to preclude separation of ladder sections.

9.3.8 Articulating Ladders.

9.3.8.1 Markings No. 5, No. 6 and No. 19 shall meet the general requirements in Section 9.1.

9.3.8.2 Marking No. 20 and No. 21 shall be in a

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predominate location as near to the center hinge as possible.

Exception: Since the definition of marking allows for stamping and embossing, a combination of stamping, embossing and color coding shall be permitted to meet the precautionary warning intent of this marking.

9.3.8.3 Marking No. 22 shall be located on the outside of one of the side rails when the ladder is in the folded (storage) position.

9.3.8.4 In lieu of embossed letters, marking No. 9 shall be placed on the ladder sections if not designed for separate use if the ladder is not equipped with permanent means to preclude separation of the ladder sections.

10. Revision of American National Standards Referred to in this Document

When the American National Standards referred to in this document are superseded by a revision approved by the American National Standards, Inc., the revision shall apply.

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Notes

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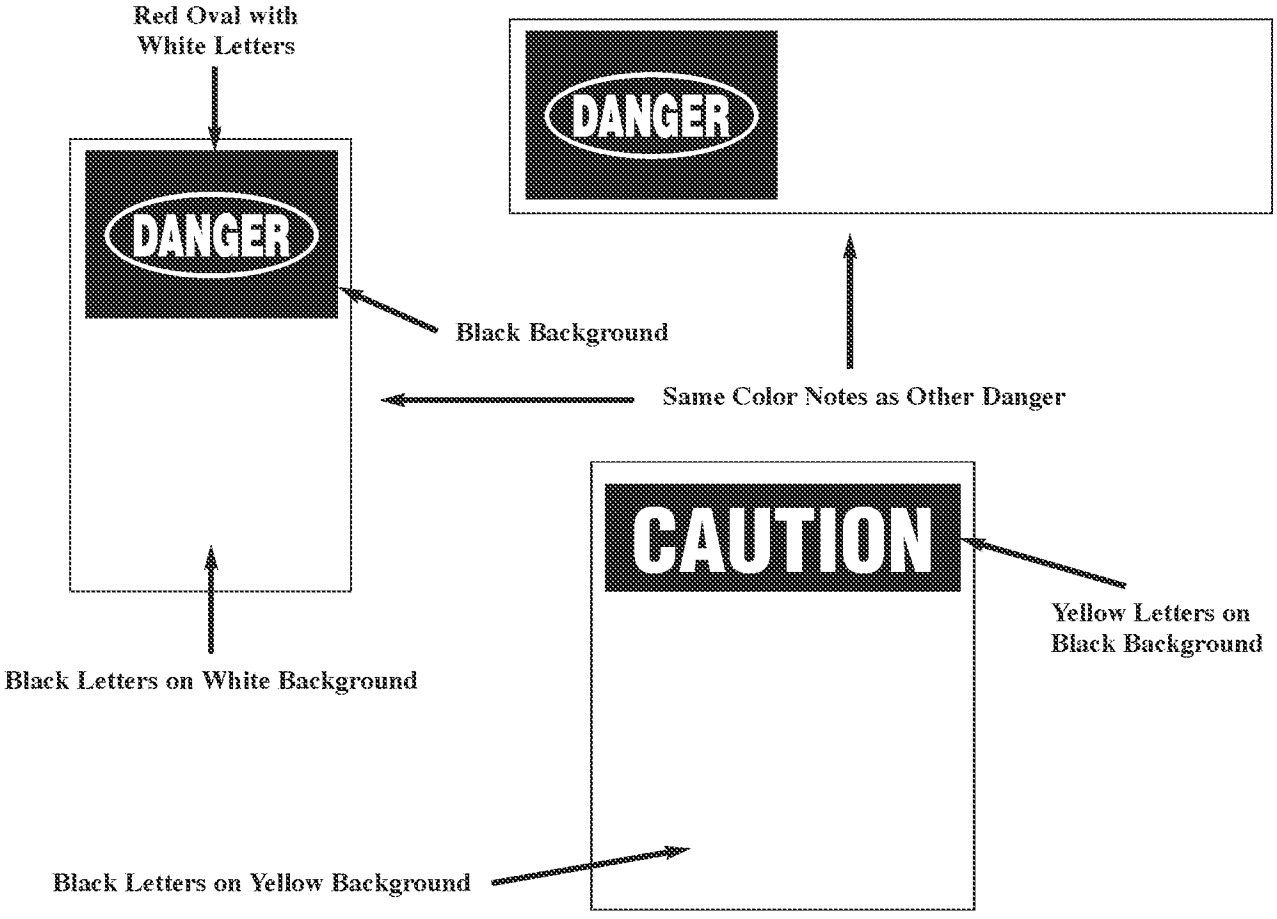
Appendicies

(These Appendicies are included for information purposes only.)

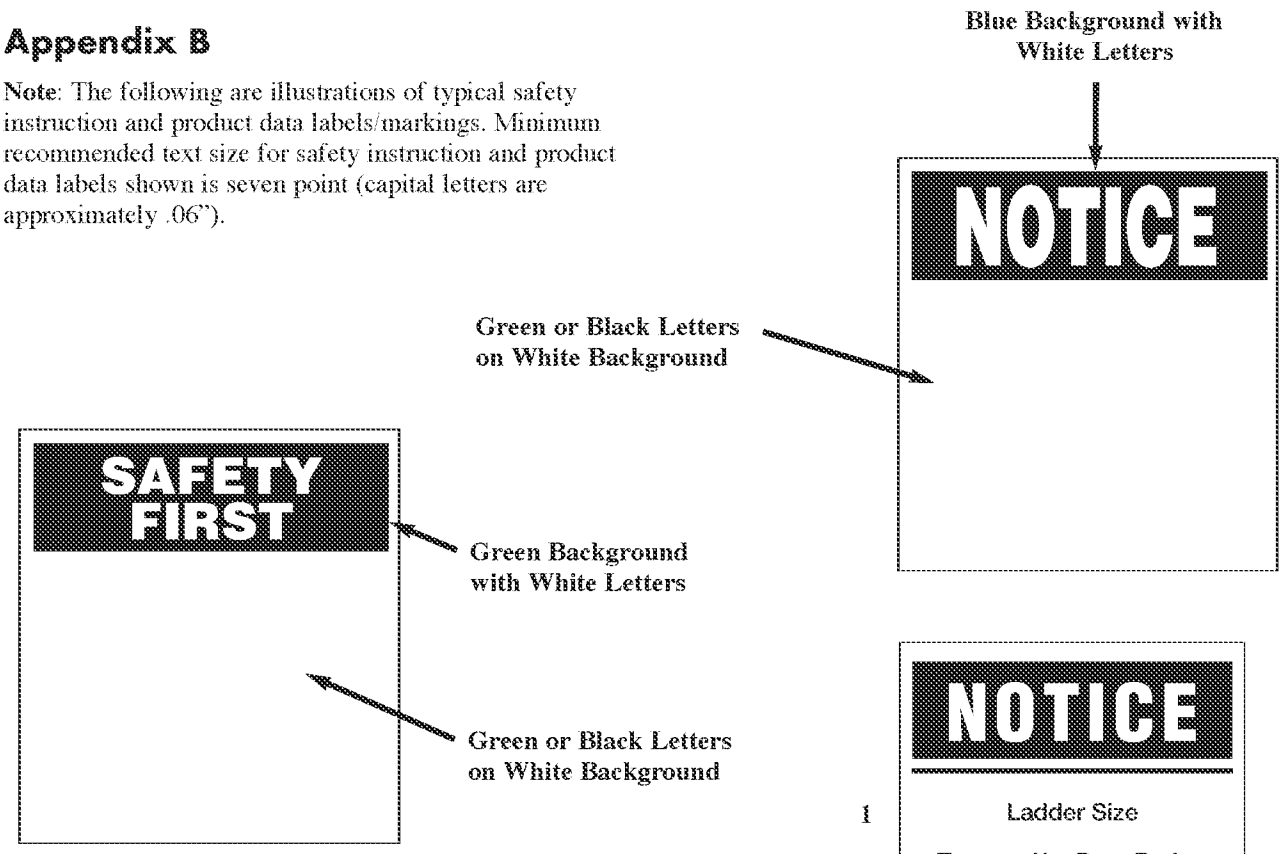
Appendix A

Note: The following are the preferred design and color principles for the primary hazard "DANGER" and "CAUTION" labels/markings for the kinds of portable metal ladders cited in this standard. These labels/markings are illustrations of typical labels/marking. Minimum recommended text size for the caution and warning labels shown is nine point (capital letters are approximately .08").



Appendix B

Note: The following are illustrations of typical safety instruction and product data labels/markings. Minimum recommended text size for safety instruction and product data labels shown is seven point (capital letters are approximately .06").



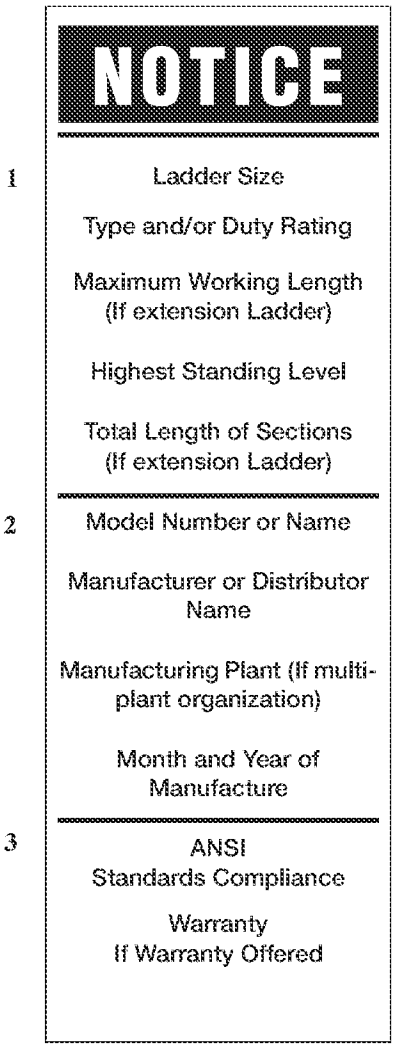
Typical Presentation of Product Data Information Markings

A typical method would be to present the notice and three panels as one label or marking. This method would mean the month and year data, for economic use of preprinted labels, would have to be entered by ink stamp for the 1-label approach. Permanent inks should be sought — and are available — for such applications. In fact, if this information is stamped, the rest of the marking can be a label or similarly stamped, as long as the 1-label effect is maintained.

The three panels are also designed to be divided between panels No. 1 and 2 and panels No. 2 and 3. Panel No. 1 should be presented as one unit either in a label or other marking, since this product information is most critical in selecting the right ladder. Such information provides the necessary elements of a sound purchase that allows the user to match his needs and requirements to the capabilities of the ladder.

Panel No. 2, if separated, may be stamped, embossed, or otherwise marked, including a label which provides for ink stamping of month and year data. An effort should be made to avoid the placement of other Markings between panels which are separated. In fact, the information in panel No. 2 may be placed elsewhere if it is first placed as required by 9.2. Additionally, the optional character of panel No. 3 may eliminate its use or incorporate its information in either panel No. 1 or 2.

Manufacturer's and distributor's name may be a logo. Manufacturing plant (if multi-plant organization) may be coded.



Marking No. 23
Preferred Notice Presentation

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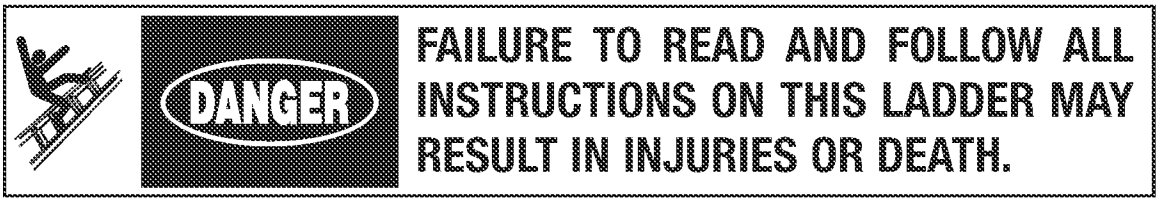
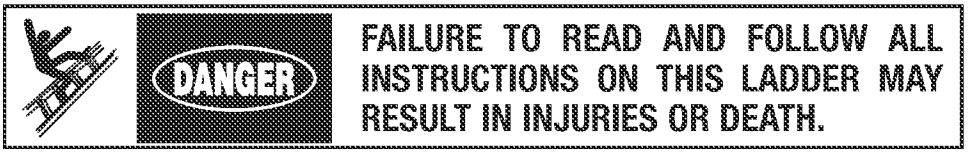
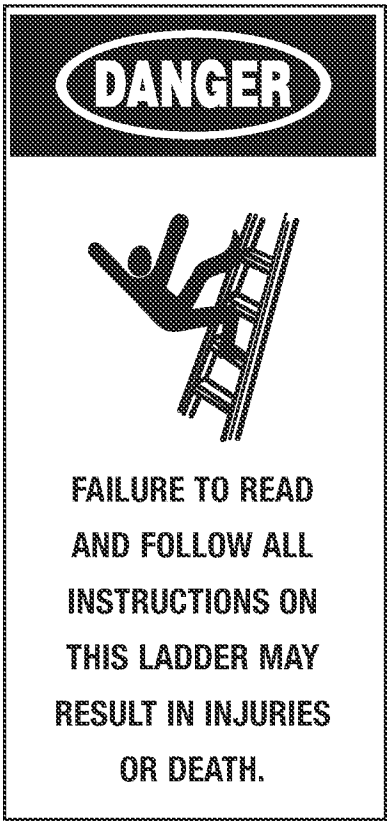


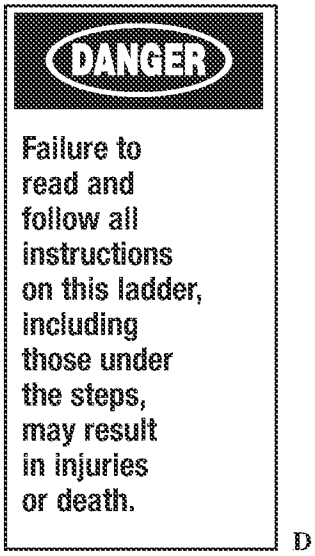
A



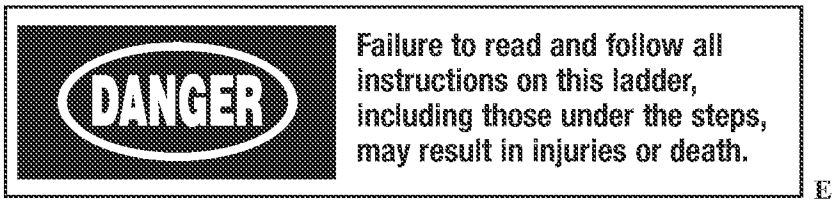
B



C



D



E

Marking No. 00 (A, B, C, D, E)

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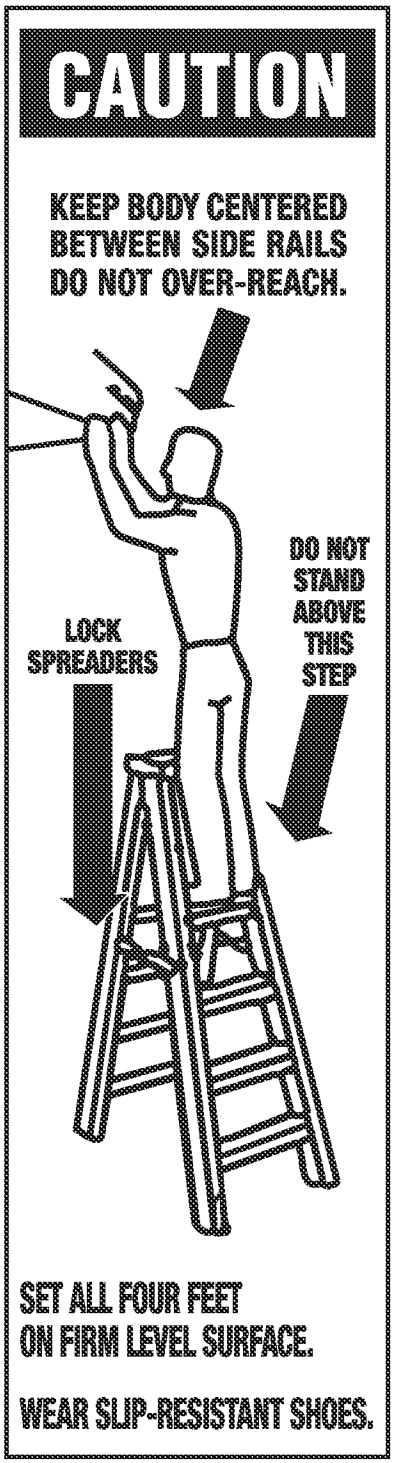


Marking No. 1

Marking No. 2

Marking No. 3

SAFETY FIRST

STEPLADDER — FOR YOUR SAFETY READ CAREFULLY

PROPER SELECTION

1. Select ladder of proper length to reach working height.
2. IMPORTANT: Ladders are designed to support one person plus materials and tools not more than the working load on the notice sign on this ladder.
3. Select ladders within the following:

TYPE	DUTY RATING	WORKING LOAD
IAA	SPECIAL DUTY	375 lbs.
IA	INDUSTRIAL-EXTRA HEAVY	300 lbs.
I	INDUSTRIAL-HEAVY	250 lbs.
II	COMMERCIAL-MEDIUM	225 lbs.
III	HOUSEHOLD-LIGHT	200 lbs.

INSPECTION

1. Inspect upon receipt and before each use; never climb a damaged, bent or broken ladder. All parts must be in good working order.
2. Make sure all rivets, joints, nuts, and bolts are tight; steps, spreaders, and braces secure; spreaders and pail shelf function properly.
3. Keep ladder clean, free from grease, oil, mud, snow, wet paint, and other slippery material. Keep your shoes clean, leather soles should not be used.
4. Never make temporary repairs of damaged or missing parts.
5. Destroy ladder if broken, worn or if exposed to fire or chemical corrosion.

PROPER SET-UP

1. DANGER! METAL CONDUCTS ELECTRICITY! Do not let ladders of any material come in contact with live electrical wires.
2. Make sure ladder is fully open, spreaders are secure, pail shelf in position.
3. Place on firm level surface with a secure footing. Do not use on slippery surfaces. Do not place on boxes, unstable bases or scaffolds to gain additional height. Do not place in front of door opening toward ladder.

PROPER CLIMBING AND USE

1. DO NOT USE LADDERS if you tire easily, or are subject to fainting spells, or are using medicine or alcohol, or are physically impaired.
2. To protect children, do not leave ladder set up and unattended.
3. Face ladder when climbing up or down, keep body centered between side rails.
4. Maintain a firm grip. Use both hands in climbing.
5. Never climb ladder from the side unless ladder is secured against side-wise motion.
6. Do not overreach; move ladder when needed.
7. Do not "walk" or "jog" ladder when standing on it.
8. Do not stand, climb or sit on braces, spreaders, pail shelf, back section, or above second step from top of ladder.
9. Do not overload. Ladders are meant for one person. Do not use as brace, platform or plank.
10. Keep ladder close to work, avoid pushing or pulling off to the side of ladders.

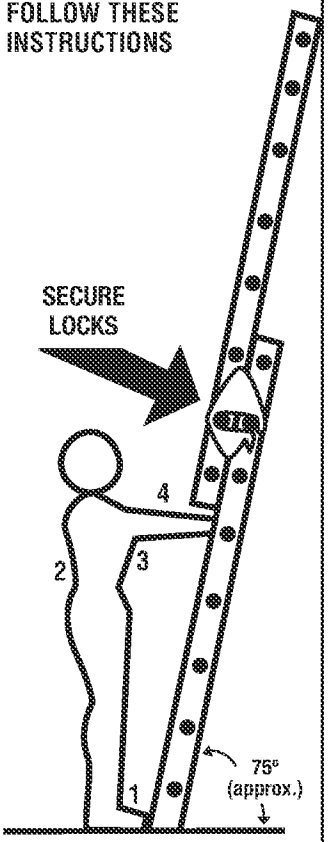
PROPER CARE AND STORAGE

1. Store ladder in safe and dry place.
2. Properly secure and support ladder while in transit.
3. Never store materials on ladder.
4. Keep ladder clean and free of all foreign materials.

Marking No. 4

CAUTION

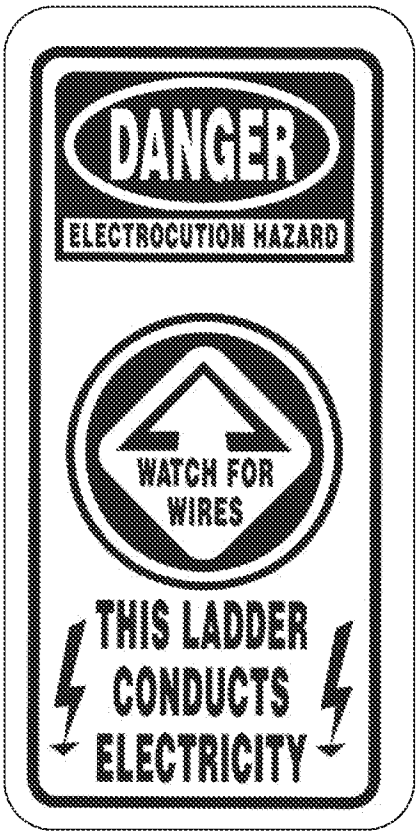
SET UP LADDER PROPERLY TO REDUCE SLIP AND OVERLOAD HAZARDS. FOLLOW THESE INSTRUCTIONS



① PLACE TOES AGAINST BOTTOM OF LADDER SIDE RAILS.
② STAND ERECT
③ EXTEND ARMS STRAIGHT OUT
④ PALMS OF HANDS SHOULD TOUCH TOP OF RUNG AT SHOULDER LEVEL

1. DO NOT OVER-REACH. KEEP BODY CENTERED BETWEEN SIDE RAILS
2. EXTEND LADDER APPROXIMATELY THREE FEET ABOVE ROOF FOR ACCESS

Marking No. 5



Marking No. 6

Marking No. 7

Marking No. 8

Marking No. 9

SAFETY FIRST

EXTENSION AND SINGLE LADDER — FOR YOUR SAFETY READ CAREFULLY

PROPER SELECTION

1. Select ladder of proper length to reach working height.
2. IMPORTANT: Ladders are designed to support one person plus materials and tools not more than the working load on the notice sign on this ladder.
3. Select ladders within the following:

TYPE	DUTY RATING	WORKING LOAD
IAA	SPECIAL DUTY	375 lbs.
IA	INDUSTRIAL-EXTRA HEAVY	300 lbs.
I	INDUSTRIAL-HEAVY	250 lbs.
II	COMMERCIAL-MEDIUM	225 lbs.
III	HOUSEHOLD-LIGHT	200 lbs.

INSPECTION

1. Inspect upon receipt and before each use; never climb a damaged, bent, or broken ladder. All parts must be in good working order.
2. Make sure all rivets, joints, nuts, and bolts are tight, rungs secure, ladder extension locks and feet functioning (if necessary, lubricate); rope properly attached and in good condition.
3. Keep ladder clean, free from grease, oil, mud, snow, wet paint and other slippery material. Keep your shoes clean; leather soles should not be used.
4. Never make temporary repairs of damaged or missing parts.
5. Destroy ladder if broken, worn or if exposed to fire or chemical corrosion.

PROPER SET-UP

1. DANGER! METAL CONDUCTS ELECTRICITY! Do not let ladders of any material come in contact with live electrical wires.
2. Secure base when raising extension and never set up ladder when it is extended.
3. Set single or extension ladder at proper 75-1/2 degree angle by bracing ladder base a distance equal to 1/4 total working length of ladder away from base of vertical support. If distance is less than 3 ft., place base of ladder a minimum of 3 ft. from vertical support.
4. Set ladder on firm ground. Do not lean sideways. Do not use on ice or snow or slippery surface without non-skid devices or securing feet.
5. Erect ladder so that approximately 3 ft. extends above roof line or working surface; tie top at support points.
6. Extend top section only from ground, never by "bouncing" or from the roof.
7. Do not over-extend. Maintain minimum overlap of 34" for ladders up to 32', 46" for ladder over 32' up to 36', 58" for ladders over 36' up to 48', and 70" for ladders over 48' up to 60'.
8. Place on firm level surface with a secure footing. Do not use on slippery surfaces. Do not place on boxes, unstable bases or on scaffolds or tie or fasten ladders together to gain additional height.
9. Do not place in front of door opening toward ladder.
10. Where possible use second person to hold ladder.

PROPER CLIMBING AND USE

1. DO NOT USE LADDERS if you tire easily, or are subject to fainting spells, or are using medicine or alcohol, or are physically impaired.
2. To protect children, do not leave ladder set-up and unattended.
3. Securely engage ladder locks before climbing. Check that top and bottom ends of ladder rails are firmly supported.
4. Face ladder when climbing up or down; keep body centered between side rails. Move ladder as needed.
5. Maintain a firm grip. Use both hands when climbing.
6. Do not climb onto a ladder from the side unless ladder is secured against side-wise motion, or climb from one ladder to another.
7. Do not stand closer than 3 ft. from the top. Never climb above the top support point.
8. Do not use ladder in high winds.
9. Never use ladder as a platform, plank or hoist. Never use ladder on a scaffold. Do not overload. Ladders are meant for one person.
10. Keep ladder close to work; avoid pushing or pulling off to side of ladder.
11. Never drop or apply an impact load to ladder.
12. Do not "walk" or "shift" ladder when standing on it.

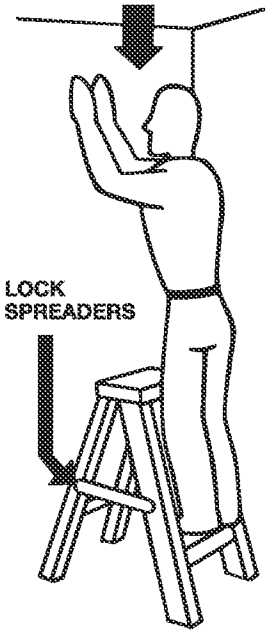
PROPER CARE AND STORAGE

1. Hang ladder on racks in dry place at intervals of 6 feet for support.
2. Properly secure and support ladder while in transit.
3. Never store materials on ladder.
4. Keep ladder clean and free of all foreign materials.

Marking No. 10

CAUTION

KEEP BODY CENTERED BETWEEN SIDE RAILS.
DO NOT OVER-REACH.



SET ALL FOUR FEET ON FIRM LEVEL SURFACE.

WEAR SLIP-RESISTANT SHOES.

Marking No. 11

SAFETY FIRST

STEP STOOL — FOR YOUR SAFETY READ CAREFULLY

INSPECTION

1. Inspect upon receipt and before each use; never climb a damaged, bent or broken step stool. All parts must be in good working order.
2. Make sure all rivets and joints, nuts and bolts are tight; steps, spreaders, and braces are secure; spreaders function properly.
3. Keep step stool clean, free from grease, oil, mud, snow, wet paint and other slippery material. Keep your shoes clean; leather soles should not be used.
4. Never make temporary repairs of damaged or missing parts.
5. Destroy step stool if broken, worn or if exposed to fire or chemical corrosion.

PROPER SET-UP

1. DANGER! METAL CONDUCTS ELECTRICITY! Do not let step stools of any material come in contact with live electrical wires.
2. Make sure step stool is fully open and spreaders secure.
3. Place on firm surface and a secure footing. Do not use on slippery surfaces. Do not place on boxes, unstable bases or scaffolds to gain additional height. Do not place in front of door opening toward step stool.

PROPER CLIMBING AND USE

1. DO NOT USE STEP STOOLS if you tire easily, are subject to fainting spells, are using medicine or alcohol or are physically impaired.
2. To protect children, do not leave step stool set up and unattended.
3. Face step stool when climbing up or down. Keep body centered between side rails.
4. Do not overreach, move step stool when needed.
5. Do not "walk" or "jog" step stool when standing on it.
6. Do not overload. Step stools are meant for one person. Do not use as brace, platform or plank.
7. Keep step stool close to work; avoid pushing or pulling off to the side of step stool.

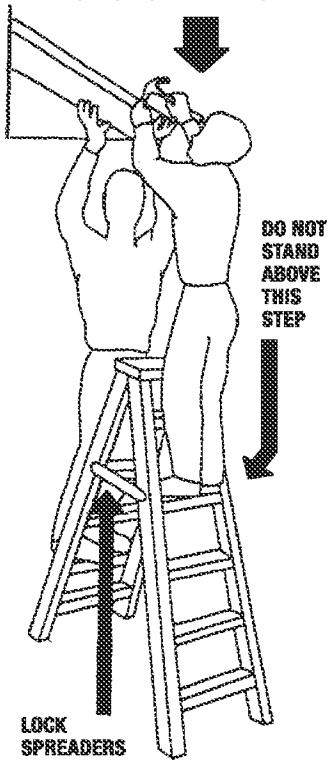
PROPER CARE AND STORAGE

1. Store step stool in safe and dry place.
2. Properly secure and support step stool while in transit.
3. Never store materials on step stool.
4. Keep step stool clean and free of all foreign materials.

Marking No. 12

CAUTION

KEEP BODY CENTERED BETWEEN SIDE RAILS.
DO NOT OVER-REACH.



SET ALL FOUR FEET ON FIRM LEVEL SURFACE.

DO NOT EXCEED WORKING LOAD PER SIDE.

WEAR SLIP-RESISTANT SHOES.

Marking No. 13

SAFETY FIRST

TRESTLE LADDER — FOR YOUR SAFETY READ CAREFULLY

PROPER SELECTION

1. Select ladder of proper length to reach working height.
2. IMPORTANT: This ladders is designed to support, simultaneously, one person on each side, whose weight including materials and tools is not more than the working load on the NOTICE sign on this ladder.
3. Select ladders within the following:

TYPE	DUTY RATING	WORKING LOAD
IAA	SPECIAL DUTY	375 lbs.
IA	INDUSTRIAL-EXTRA HEAVY	300 lbs.
I	INDUSTRIAL-HEAVY	250 lbs.

INSPECTION

1. Inspect upon receipt and before each use; never climb a damaged, bent or broken ladder. All parts must be in good working order.
2. Make sure all rivets, joints, nuts, and bolts are tight; rungs, spreaders, and braces are secure; spreaders function properly.
3. Keep ladder clean, free from grease, oil, mud, snow, wet paint and other slippery material. Keep your shoes clean; leather soles should not be used.
4. Never make temporary repairs of damaged or missing parts.
5. Destroy ladder if broken, worn or if exposed to fire or chemical corrosion.

PROPER SET-UP

1. DANGER! METAL CONDUCT ELECTRICITY! Do not let ladders of any material come in contact with live electrical wires.
2. Make sure ladder is fully open and spreaders secure.
3. Place on a firm surface and a secure footing. Do not use on slippery surfaces. Do not place on boxes, unstable bases or scaffolds to gain additional height. Do not place in front of door opening toward ladder.

PROPER CLIMBING AND USE

1. DO NOT USE LADDERS if you tire easily, or are subject to fainting spells, or are using medicine or alcohol or are physically impaired.
2. To protect children, do not leave ladder set up and unattended.
3. Face ladder when climbing up or down; keep body centered between side rails.
4. Maintain a firm grip. Use both hands in climbing.
5. Never climb ladder from the side unless ladder is secured against side-wise motion.
6. Do not overreach, move ladder when needed.
7. Do not "walk" or "jog" ladder when standing on it.
8. Do not stand, climb or sit on braces, spreaders, or above second rung from top of ladder.
9. Do not overload. Do not use as brace, platform or plank.
10. Keep ladder close to work; avoid pushing or pulling off to the side of ladders.

FOR SCAFFOLD USE

1. Follow instructions on scaffold plank.
2. Do not place plank above second rung from top.
3. Secure plank to ladder before each use.
4. Secure or guy ladder to prevent excessive movement.
5. Use properly secured third ladder to access plank.

PROPER CARE AND STORAGE

1. Store ladder in safe and dry place.
2. Properly secure and support ladder while in transit.
3. Never store materials on ladder.
4. Keep ladder clean and free of all foreign materials.

Marking No. 14

SAFETY FIRST

EXTENSION TRESTLE LADDER — FOR YOUR SAFETY READ CAREFULLY

PROPER SELECTION

1. Select ladder of proper length to reach working height.
2. IMPORTANT: This ladder is designed to support, simultaneously, one person on each side, whose weight including materials and tools is not more than the working load on the NOTICE sign on this ladder.
3. Select ladders within the following:

TYPE	DUTY RATING	WORKING LOAD
IA	INDUSTRIAL-EXTRA HEAVY	300 lbs.
I	INDUSTRIAL-HEAVY	250 lbs.

INSPECTION

1. Inspect upon receipt and before each use. Never climb a damaged, bent or broken ladder. All parts must be in good working order.
2. Make sure all rivets, joints, nuts and bolts are tight, rungs, spreaders, and braces are secure; spreaders, trestle hinge, extension ladder locking device function properly.
3. Keep ladder clean, free from grease, oil, mud, snow, wet paint and other slippery material. Keep your shoes clean; leather soles should not be used.
4. Never make temporary repairs of damaged or missing parts.
5. Destroy ladder if broken, worn or if exposed to fire or chemical corrosion.

PROPER SET-UP

1. DANGER! METAL CONDUCTS ELECTRICITY! Do not let ladders of any material come in contact with live electrical wires
2. Make sure ladder is fully open and spreaders secure.
3. Place on firm level surface and a secure footing. Do not use on slippery surfaces. Do not place on boxes, unstable bases or scaffolds to gain additional height. Do not place in front of door opening toward ladder.
4. Always attach guy lines to insure stability before climbing on extension section or positioning plank. See other labels for guy line instructions. IMPORTANT! STEEL CABLE CONDUCTS ELECTRICITY. DO NOT USE IF WORKING NEAR ELECTRICAL CURRENT. USE HEMP GUY LINES INSTEAD.

PROPER CLIMBING AND USE

1. DO NOT USE LADDERS if you tire easily, or are subject to fainting spells, or are using medicine or alcohol or are physically impaired.
2. To protect children, do not leave ladder set up and unattended
3. Face ladder when climbing up or down, keep body centered between side rails.
4. Maintain a firm grip. Use both hands in climbing.
5. Never climb ladder from the side unless ladder is secured against side-wise motion.
6. Do not over reach, move ladder when needed.
7. Do not "walk" or "jog" ladder when standing on it.
8. Do not stand, climb or sit on braces, spreaders, or above second rung from top of trestle section when used without extension portion.
9. Do not overload. Do not use as a brace, platform or plank.
10. Keep ladder close to work; avoid pushing or pulling off to side of ladder.
11. Do not use this ladder in high winds or storms.

FOR SCAFFOLD USE

1. Follow instructions on scaffold plank.
2. Do not place plank above second rung from top.
3. Secure plank to ladder before each use.
4. Secure or guy ladder to prevent excessive movement.
5. Use properly secured third ladder to access plank.

PROPER CARE AND STORAGE

1. Store ladder in safe and dry place.
2. Properly secure and support ladder while in transit.
3. Never store materials on ladder.
4. Keep ladder clean and free of all foreign materials.

Marking No. 15

SAFETY FIRST

COMBINATION LADDER — FOR YOUR SAFETY READ CAREFULLY

PROPER SELECTION

1. Select ladder of proper length to reach working height.
2. IMPORTANT: Ladders are designed to support one person plus materials and tools per side on 2-man stepladders or only one person, plus materials and tools on step or single ladders not more than the working load on the notice sign on this ladder.
3. Select ladders within the following:

TYPE	DUTY RATING	WORKING LOAD
IAA	SPECIAL DUTY	375 lbs.
IA	INDUSTRIAL-EXTRA HEAVY	300 lbs.
I	INDUSTRIAL-HEAVY	250 lbs.
II	COMMERCIAL-MEDIUM	225 lbs.
III	HOUSEHOLD-LIGHT	200 lbs.

INSPECTION

1. Inspect upon receipt and before each use; never climb a damaged, bent or broken ladder; all working parts must be in good working order.
2. Make sure all rivets and joints, nuts and bolts are tight; feet, steps and rungs secure; spreaders function properly.
3. Keep ladder clean, free from grease, oil, mud, snow, wet paint and other slippery material. Keep your shoes clean; leather soles should not be used.
4. Never make temporary repairs of damaged or missing parts.
5. Destroy ladder if broken, worn or if exposed to fire or chemical corrosion.

PROPER SET-UP

1. DANGER! METAL CONDUCTS ELECTRICITY! Do not let ladders of any material come in contact with live electrical wires.
2. Place on a firm, level surface with a secure footing. Do not use on slippery surfaces. Do not place on boxes, unstable bases or scaffolds to gain additional height. Do not place in front of door opening toward ladder.

PROPER CLIMBING AND USE

1. DO NOT USE LADDERS if you tire easily, are subject to fainting spells, are using medicine or alcohol or are physically impaired.
2. To protect children, do not leave ladder set-up and unattended.
3. Face ladder when climbing up or down; keep body centered between side rails.
4. Maintain a firm grip. Use both hands in climbing.
5. Do not overreach; move ladder when needed.
6. Do not "walk" or "jog" ladder when standing on it.
7. Do not overload. Do not use as brace, platform or plank.
8. Keep ladder close to work; avoid pushing or pulling off to the side of ladders.

AS A STEPLADDER

1. Make sure ladder is fully open and spreaders are secure.
2. Do not stand, climb or sit on pail shelf, braces or back section, or higher than 2nd step from ladder top.

AS A SINGLE OR EXTENSION LADDER

1. Set single or extension ladder at proper angle (75-1/2 degrees) by placing ladder base a distance equal to 1/4 total working length of ladder away from base of vertical support. If distance is less than 3 ft., place base of ladder a minimum of 3 ft. from vertical support.
2. Do not stand closer to the top than 3 ft. from the top. Never climb above support point.

AS AN EXTENSION LADDER

1. Extend top section only from ground, never by "bouncing" or from the roof.
2. Securely engage ladder locks before climbing. Check that top and bottom ends of ladder rails are firmly supported.

PROPER CARE AND STORAGE

1. Store ladder in safe and dry place.
2. Properly secure and support ladder while in transit.
3. Never store materials on ladder.
4. Keep ladder clean and free of all foreign materials.

Marking No. 16

CAUTION

MANUFACTURER'S INSTRUCTIONS AND/OR GRAPHICS DEPICTING LOCKING MECHANISMS

MANUFACTURER'S GRAPHICS SHOWING USES/POSITIONS

Marking No. 17

SAFETY FIRST

PLATFORM LADDER — FOR YOUR SAFETY READ CAREFULLY

PROPER SELECTION

1. Select ladder of proper length to reach working height.
2. IMPORTANT: Ladders are designed to support one person plus materials and tools not more than the working load on the notice sign on this ladder.
3. Select ladders within the following:

TYPE	DUTY RATING	WORKING LOAD
IAA	SPECIAL DUTY	375 lbs.
IA	INDUSTRIAL-EXTRA HEAVY	300 lbs.
I	INDUSTRIAL-HEAVY	250 lbs.
II	COMMERCIAL-MEDIUM	225 lbs.

INSPECTION

1. Inspect upon receipt and before each use; never climb a damaged, bent or broken ladder. All parts must be in good working order.
2. Make sure all rivets, joints, nuts and bolts are tight; steps, rungs, spreaders, braces, and platforms are secure; spreaders and platform hinge function properly.
3. Keep ladder clean, free from grease, oil, mud, snow, wet paint and other slippery material. Keep your shoes clean; leather soles should not be used.
4. Never make temporary repairs of damaged or missing parts.
5. Destroy ladder if broken, worn or if exposed to fire or chemical corrosion.

PROPER SET-UP

1. DANGER! METAL CONDUCTS ELECTRICITY! Do not let ladders of any material come in contact with live electrical wires.
2. Make sure ladder is fully open, spreaders and/or platform are secure.
3. Place on a firm level surface with a secure footing. Do not use on slippery surfaces. Do not place on boxes, unstable bases or scaffolds to gain additional height. Do not place in front of door opening toward ladder.
4. If equipped with casters, lock in proper position before climbing.
5. If equipped with outriggers, position per manufacturer's instructions before climbing.

PROPER CLIMBING AND USE

1. DO NOT USE LADDERS if you tire easily, or are subject to fainting spells, or are using medicine or alcohol, or are physically impaired.
2. To protect children, do not leave ladder set up and unattended.
3. Face ladder when climbing up or down; keep body centered between side rails.
4. Maintain a firm grip. Use both hands in climbing.
5. Never climb ladder from the side unless ladder is secured against side-wise motion.
6. Do not overreach; move ladder when needed.
7. Do not "walk" or "jog" ladder when standing on it.
8. Do not stand, climb or sit on braces, spreaders or any surface higher than the platform.
9. Do not overload. Ladders are meant for one person. Do not use as brace, platform, or plank.
10. Use extreme caution when pushing or pulling anything while on the ladder.

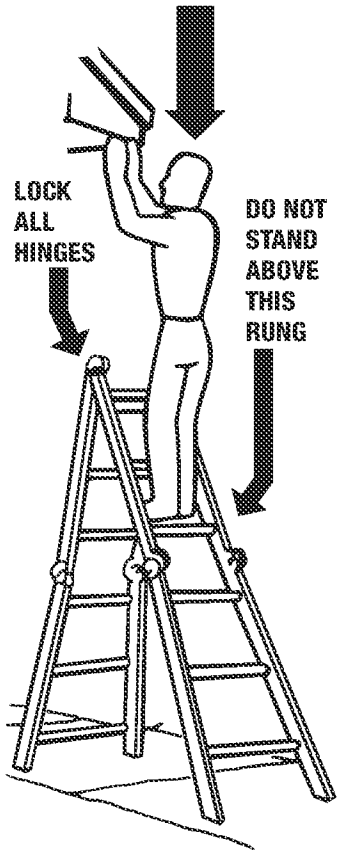
PROPER CARE AND STORAGE

1. Store ladder in safe and dry place.
2. Properly secure and support ladder while in transit.
3. Never store materials on ladder.
4. Keep ladder clean and free of all foreign materials.

Marking No. 18

CAUTION

KEEP BODY CENTERED BETWEEN SIDE RAILS. DO NOT OVER-REACH.



SET ALL FOUR FEET ON FIRM LEVEL SURFACE.

WEAR SLIP-RESISTANT SHOES.

Marking No. 19

DANGER

THE LOCKING MECHANISM MUST BE ENGAGED BEFORE USING LADDER.

MANUFACTURER'S INSTRUCTIONS FOR USE

HINGE OPERATION

MANUFACTURER'S GRAPHIC DRAWING

LOCKED

MANUFACTURER'S GRAPHIC DRAWING

UNLOCKED

ADDITIONAL INSTRUCTIONS FOR PROPER CARE AND USE OF THE LOCK/HINGE MECHANISM ACCORDING TO THE TYPE EACH MANUFACTURER EMPLOYS IN THE LADDER.

Marking No. 20

DANGER

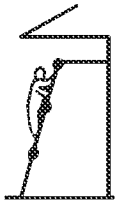
USE LADDERS ONLY IN POSITIONS SHOWN.

USE IN ANOTHER POSITION MAY RESULT IN DEATH OR SERIOUS INJURY.

STRAIGHT LADDER

STEP LADDER

DOUBLE LADDER



OVERHANG LADDER

SHORT STEP LADDER

ADDITIONAL POSITIONS MAY BE ADDED ACCORDING TO THE CAPABILITIES OF EACH PRODUCT THAT MEET APPLICABLE TEST PROTOCOLS AND SPECIFICATIONS OF THIS STANDARD.

Marking No. 21

SAFETY FIRST

ARTICULATED LADDER — FOR YOUR SAFETY READ CAREFULLY

PROPER SELECTION

1. Select ladder of proper length to reach working height.
2. IMPORTANT: Ladders are designed to support one person plus materials and tools per side on 2-man stepladder positions or only one person plus materials and tools on all other positions not more than the working load on the notice sign on this ladder.
3. Select ladders within the following:

TYPE	DUTY RATING	WORKING LOAD
IA	INDUSTRIAL-EXTRA HEAVY	300 lbs.
I	INDUSTRIAL-HEAVY	250 lbs.
II	COMMERCIAL-MEDIUM	225 lbs.
III	HOUSEHOLD-LIGHT	200 lbs.

INSPECTION

1. Inspect upon receipt and before each use. Never climb a damaged, bent or broken ladder. All parts must be in good working order.
2. Make sure all rivets, joints, nuts and bolts are tight; feet, steps and rungs are secure; all hinges function properly.
3. Keep ladder clean, free from grease, oil, mud, snow, wet paint, and other slippery material. Keep your shoes clean; leather soles should not be used.
4. Never make temporary repairs of damaged or missing parts.
5. Destroy ladder if broken, worn or if exposed to fire or chemical corrosion.

PROPER SET-UP

1. DANGER! METAL CONDUCT ELECTRICITY! Do not let ladders of any material come in contact with live electrical wires.
2. Upon receipt lubricate all hinges with light machine oil, TRI-FLOW® or similar substance and again at least once a year depending on use.
3. Securely engage ladder hinges before climbing. Proper operation of hinges is as follows:

A. To Lock
MANUFACTURER'S SPECIFIC INSTRUCTIONS HERE

B. To Unlock
MANUFACTURER'S SPECIFIC INSTRUCTIONS HERE.

4. NOTE: FOR LADDERS HAVING HINGES EQUIPPED WITH LOCKING DOGS: It may be difficult to unlock hinges if there is pressure on the locking dog. To relieve the pressure, simply jiggle one half of the ladder back and forth until locking dog can be moved without force.
5. Adjust all hinges before climbing or using ladder. Never release hinge locks or attempt to reposition hinges while working on the ladder.
6. Place on firm level surface with a secure footing. Do not use on slippery surfaces. Do not place on boxes, unstable bases or scaffolds to gain additional height. Do not place in front of door opening toward ladder.
7. Where possible, use second person to hold ladder.
8. Set single or extension ladder at proper (75-1/2) degree angle by placing ladder base a distance equal to 1/4 total working length of ladder away from base of vertical support.
9. Erect ladder so that approximately 3 ft. extends above roof line or working surface; tie top at support points.

PROPER CLIMBING AND USE

1. DO NOT USE LADDERS if you tire easily, or are subject to fainting spells, or are using medicine or alcohol or are physically impaired.
2. To protect children, do not leave ladder set up and unattended.
3. Make sure all hinges are securely locked before climbing. Check that top and bottom ends of ladder rails are firmly supported.
4. CAUTION: A 2" x 10" construction grade lumber plank or better must be used in all approved horizontal positions where indicated.
5. Face ladder when climbing up or down; keep body centered between side rails.
6. Maintain a firm grip. Use both hands in climbing.
7. Never climb ladder from the side unless ladder is secured against side-wise motion, or climb from one ladder to another.
8. Do not stand closer to the top than 3 ft. from the top. Never climb above the top support point.
9. Do not use ladder in high winds or storms.
10. Never pull the hinge release levers and operate hinges when standing on the ladder.
11. Cover up hinges during messy work. Obstacles in hinge will destroy its function.
12. Do not over reach, move ladder when needed.
13. Do not "walk" or "jog" ladder when standing on it.
14. Do not overload.
15. Keep ladder close to work; avoid pushing or pulling off to the side of ladders.

PROPER CARE AND STORAGE

1. Keep hinges free of foreign materials that could destroy its function.
2. Store ladder in safe and dry place.
3. Keep ladder clean and free of all foreign materials.
4. Lubricate mechanism of hinges regularly.

Marking No. 22

NOTICE

Ladder Size

Type and/or Duty Rating

Maximum Working Length (If extension Ladder)

Highest Standing Level

Total Length of Sections (If extension Ladder)

Model Number or Name

Manufacturer or Distributor Name

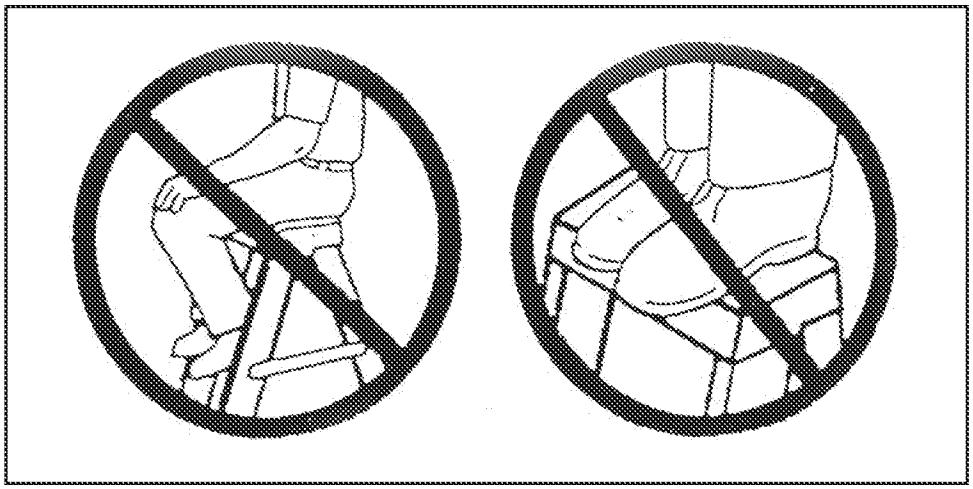
Manufacturing Plant (If multi-plant organization)

Month and Year of Manufacture

ANSI Standards Compliance

Warranty If Warranty Offered

Marking No. 23



Marking No. 24

Appendix C

The interpretation below represents the committee's view of understanding properly the use of labels/marking in the appendices of this standard.

Preface

Over the years, there have been a number of interpretations of various requirements within the A14 ladder standards. One which keeps reappearing and has required periodic revisiting is the labeling/marking requirements as these relate to the illustrations of more detailed and apparently specific labels/markings in the appendix following Appendix B. To clarify this issue as definitively as possible the following interpretation, reviewed and approved by the A14 standards committee, is provided:

Interpretation

While the requirements in the body of the portable ladder standards for labels/marking are keyed to specifically numbered markings, the referred to labels/markings are illustrations only and not intended to be exact renditions of the labels/markings placed on portable ladders. As illustrations, the labels/markings, except for technical information in the text, are not required to be exact duplications of those following Appendix B. The graphics of the labels/markings including figures of users, arrows pointing out locations or direction, formatting text with the use of numbers or alphabet or both, and style of expression need not be followed exactly but rather is left to the discretion of the developer of the label/marking or as ordered by a label/marking buyer. Such text or verbiage can be added or presented more cogently as long as the broad general intent of the label/marking is achieved without changing the basic technical information thus meeting the requirements of the standard for label/marking.

Underscoring the above position is the description of labels/markings as illustrations. Use of the word illustration has been specifically chosen, based upon its meaning, which is defined as an example and explanation. Coupled with this definition — and lending emphasis to it — is the placement of the label/marking illustrations in the appendix since appendices are not part of the standard but explanations and elaboration of the standard, and its applicable requirements. In the traditional structuring and development of standards the use of the appendix was also specifically chosen as a recognized means of stating through illustration and explanation how requirements of the standard can be implemented. The use of labels/markings appendix and the illustrations contained therein is construed in the broadest sense as offering designers or buyers general guidance, rather than dictating exact duplication, in creating signs or labels/markings for portable ladders.

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ANSI-ASC A14 Comment / Request for Interpretation Form

This form shall serve as the official form for comments/requests for interpretation on A14 Standards. It shall be the responsibility of those wishing to comment on a proposed standard to complete all sections of this form. The appropriate Sub-Committee will review all comments received. A notice of action taken will be forwarded to those issuing substantive comments/requests.

Please complete the information below

Date_____

Standard #_____ Title_____

Name_____

Organization/Company_____

Address_____

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Phone _____ Fax_____

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A request for comment/interpretation shall not be processed if it:

(a) Involves a determination of compliance to the applicable Standards in the areas of a design, installation, or product, or equivalency of protection.

(b) Involves a review of plans or specifications, or requires judgment or knowledge that can only be acquired as a result of on-site inspection.

(c) Involves tests that clearly and decisively provide the requested information.

(d) Involves subjects that were not previously considered by the Committee or that are not addressed in the Standard.

(e) Involves product evaluation judgments concerning safe work practices.

(f) Involves issues in litigation or in preparation for litigation.

I confirm that the comment/interpretation request is not for a lawsuit that is involved in litigation or is not for a matter that is being prepared for litigation.

Signed _____

Only one comment per form – please copy this form for additional comments/request for interpretation!

Comment: (Please be specific)_____

Rationale: (Each comment must include a rationale)_____

Please mail or fax to: ALI Headquarters, 401 N. Michigan, Chicago, Illinois, 60611 • Fax: 312.673.6929

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Notes

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A National Trade Association

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www.americanladderinstitute.org

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APPENDIX B

Copy of website entitled "Commonly Used Statistics," U.S. Department of Labor, Occupational Safety and Health Administration, accessed 17 June 2024, available at https://www.osha.gov/data/commonstats. (3 Pages)

U.S. DEPARTMENT OF LABOR

Occupational Safety and Health Administration

Commonly Used Statistics

Federal OSHA coverage

Federal OSHA is a small agency; with our state partners we have approximately 1,850 inspectors responsible for the health and safety of 130 million workers, employed at more than 8 million worksites around the nation — which translates to about one compliance officer for every 70,000 workers.

Federal OSHA has 10 regional offices and 85 local area offices.

OSHA budget

FY 2023 Appropriations: $632,000,000
FY 2022 Appropriations: $612,000,000
FY 2021 Appropriations: $591,233,000

OSHA inspections

FY 2023 total federal inspections: 34,267

Worker fatalities

There were 5,486 fatal work injuries in 2022 (3.7 fatalities per 100,000 full-time equivalent workers). Learn about key findings.

Most frequently violated standards

Preliminary Top 10 most frequently cited OSHA standards violated in FY 2022

The following are the preliminary top 10 most frequently cited standards by Federal OSHA in fiscal year 2022 (October 1, 2021, through September 30, 2022):

1. **Fall Protection, construction** (29 CFR 1926.501) [related safety resources]
2. **Hazard Communication, general industry** (29 CFR 1910.1200) [related safety resources]
3. **Ladders, construction** (29 CFR 1926.1053) [related safety resources]

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TRICAM EX1002

4. **Respiratory Protection, general industry** (29 CFR 1910.134) [related safety resources]
5. **Scaffolding, construction** (29 CFR 1926.451) [related safety resources]
6. **Control of Hazardous Energy (lockout/tagout), general industry** (29 CFR 1910.147) [related safety resources]
7. **Powered Industrial Trucks, general industry** (29 CFR 1910.178) [related safety resources]
8. **Fall Protection Training, construction** (29 CFR 1926.503) [related safety resources]
9. **Eye and Face Protection, construction** (29 CFR 1926.102) [related safety resources]
10. **Machinery and Machine Guarding, general industry** (29 CFR 1910.212) [related safety resources]

- The final top 10 most frequently cited OSHA standards violated in FY 2023 will be available in April 2024.
- To search the top violations of an industry with a specific NAICS code, see https://www.osha.gov/ords/imis/citedstandard.html
- To search and view the industry profile for violations of any specific OSHA standard, see https://www.osha.gov/ords/imis/industryprofile.html

OSHA is Making a Difference

- In roughly half a century, OSHA and our state partners, coupled with the efforts of employers, safety and health professionals, unions and advocates, have had a dramatic effect on workplace safety.
- Worker deaths in America are down—on average, from about 38 worker deaths a day in 1970 to 15 a day in 2022.
- Worker injuries and illnesses are down—from 10.9 incidents per 100 workers in 1972 to 2.7 per 100 in 2022.

Occupational Safety and Health Administration
200 Constitution Ave NW
Washington, DC 20210
1-800-321-OSHA
1-800-321-6742
www.osha.gov

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APPENDIX C

Copy of website entitled "OSHA's Top 10 Most Frequently Cited Standards," U.S. Department of Labor, Occupational Safety and Health Administration, accessed 17 June 2024, available at https://www.osha.gov/top10citedstandards. (3 Pages)

U.S. DEPARTMENT OF LABOR

Occupational Safety and Health Administration

NOTE: Generally, OSHA does not post the top ten violations until after the first week in April, so as to allow the prior fiscal year's inspection data to finalize past the close of the fiscal year (September 30th).

Top 10 Most Frequently Cited Standards

for Fiscal Year 2023 (Oct. 1, 2022, to Sept. 30, 2023)

The following is a list of the top 10 most frequently cited standards following inspections of worksites by federal OSHA for all industries. OSHA publishes the list to alert employers about these commonly cited standards so they can take steps to find and fix recognized hazards addressed in these and other standards before OSHA shows up. Workers suffer preventable injuries, illnesses, and deaths related to the hazards addressed in these standards.

1. **Fall Protection, construction** (29 CFR 1926.501) [related safety resources]
2. **Hazard Communication, general industry** (29 CFR 1910.1200) [related safety resources]
3. **Ladders, construction** (29 CFR 1926.1053) [related safety resources]
4. **Scaffolding, construction** (29 CFR 1926.451) [related safety resources]
5. **Powered Industrial Trucks, general industry** (29 CFR 1910.178) [related safety resources]
6. **Control of Hazardous Energy (lockout/tagout), general industry** (29 CFR 1910.147) [related safety resources]
7. **Respiratory Protection, general industry** (29 CFR 1910.134) [related safety resources]
8. **Fall Protection Training, construction** (29 CFR 1926.503) [related safety resources]
9. **Eye and Face Protection, construction** (29 CFR 1926.102) [related safety resources]
10. **Machinery and Machine Guarding, general industry** (29 CFR 1910.212) [related safety resources]

- To search an OSHA standard, see this webpage: OSHA Law and Regulations

- To search the top violations of an industry with a specific NAICS code, see this webpage: Frequently Cited OSHA Standards
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 18/490,715	Filing Date 10/19/2023	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	07/25/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $480 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/GAIL D WOOTEN/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/490,715	10/19/2023	B. Scott Maxfield	P298048US03 (506318-576)	5970

153511 7590 03/25/2024

Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176

EXAMINER	
MEKHAEIL, SHIREF M	

ART UNIT	PAPER NUMBER
3634	

NOTIFICATION DATE	DELIVERY MODE
03/25/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

davis.ashley@dorsey.com
ip.docket.slc@dorsey.com
mayo.samantha@dorsey.com

Office Action Summary	Application No. 18/490,715	Applicant(s) Maxfield et al.	
	Examiner SHIREF M MEKHAEIL	Art Unit 3634	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 03/12/2024.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) 12-18 is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-11 and 19-20 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☑ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 10/19/2023 is/are: a)☐ accepted or b)☑ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

The amendment filled 03/12/2024 has been entered. Claims 1, 3, 11 and 19 have been amended. Claims 1-20 remain pending in the application. Previous *35 USC § 112* rejections have been withdrawn in light of the applicant's amendments to the claims. However new *35 USC § 112 rejections* have been introduced also as a result of the amendment.

Election/Restriction

Applicant's election without traverse of group I in the reply filed on 03/12/2024 is acknowledged. Claims 12-18 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group II, there being no allowable generic or linking claim.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "**object**" as recited in claim 10, "**a set of first axial positions**" and "**a set of second axial positions**" as recited in claim 19 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

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Note that the drawings as well as the specification do not illustrate or explain more than one first and one second axial position.

Note that while applicant has identified "**a pair of retainers**" in the amended specification, there remains to be unclarity due to referring to two different elements as retainers. See new matter in specification objection below.

There is not reference numeral for a retainer to be found in the specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

The specification does not provide antecedent basis for: "a set of first axial positions" and "a set of second axial positions" as recited in claim 19. Implying more than one first and more than one second positions i.e., at least four positions.

The amendment filed 03/12/2024 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

- "*Locking mechanisms 124 (or 112) can therefore be referred to as "retainers"*". There is not support in the original disclosure of locking mechanism 124 being retainers. Currently the specification is referring to mechanism 124, as well as hinge mechanism 126 having a button body 138 and a button plate 140 as being the retainer.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 19-20 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

- Claim 19 recites "a pair of retainers movable between a set of first axial positions along the pivot axis and a set of second axial positions along the pivot axis"; indefiniteness arises in light of applicant's amendment to the specification where currently the specification is referring to mechanism 124, as well as hinge mechanism 126 having a button body 138 and a button plate 140 as being the retainer. Hence, it is not clear which of the mechanisms is being referred to in claim 19. Claim will be examined as best understood.
- Claim 20 is rejected at least for depending from rejected claim 19.

Claim Rejections - 35 USC § 102/103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

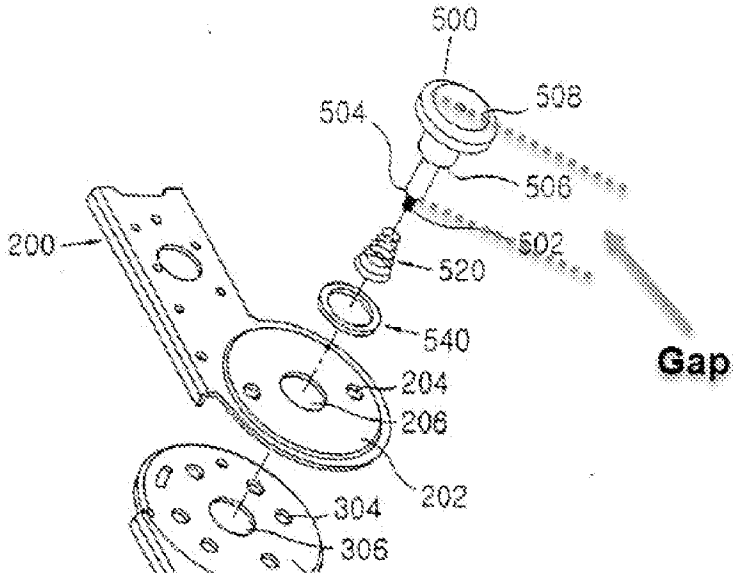
> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

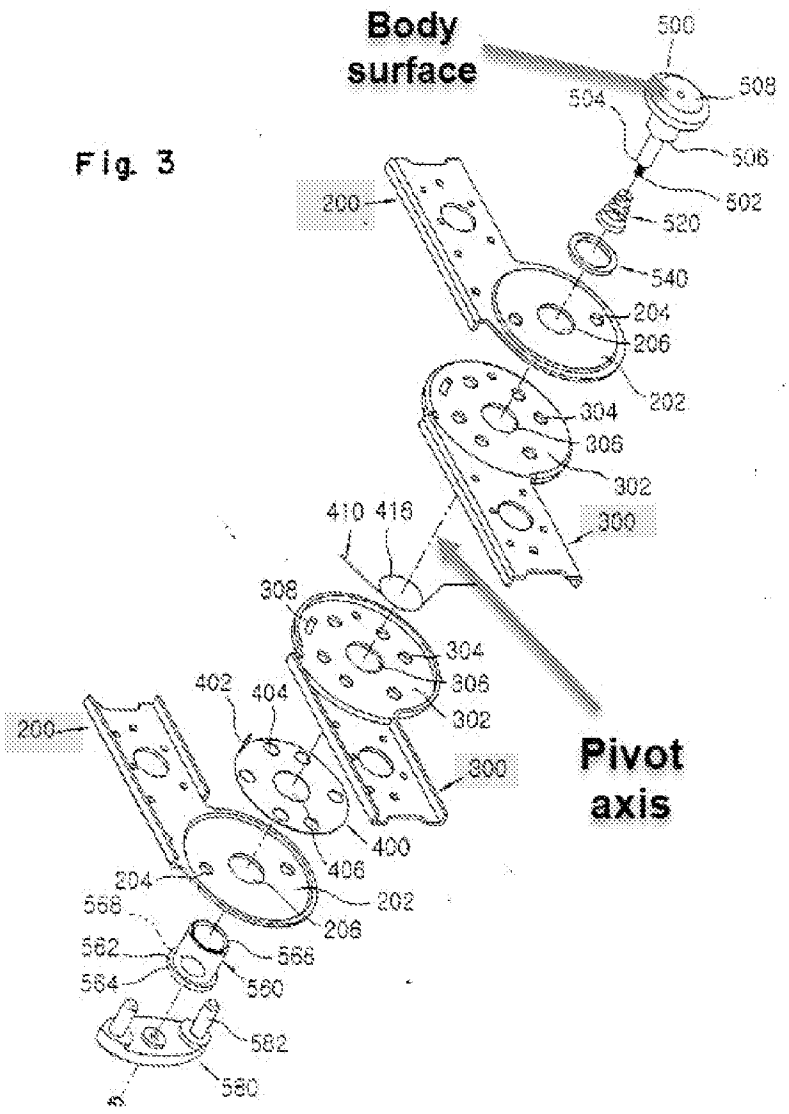
Claims 1-2 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Lee, US (2003/0037412) or, in the alternative, under 35 U.S.C. 103 as obvious over Lee.

In regards to claim 1 Lee discloses:

A ladder (collapsible ladder as described in summary of invention)**, comprising: a first assembly** (per the standard structure of collapsible ladders utilizing the hinge assembly shown in fig. 3)**, including: a first pair of rails** (standard structure of collapsible ladders) **spaced apart from each other; a first set of rungs coupled to and extending between the first pair of rails** (standard structure of collapsible ladders)**; a first pair of hinge portions** (200; with the structure shown in fig. 3 taught at top of each rail of each section of the collapsible ladder, hence making a pair) **coupled to the first pair of rails; a second assembly, including: a second pair of rails** (standard structure of collapsible ladders) **spaced apart from each other; a second pair of hinge portions** (300; with the structure shown in fig. 3 taught at top of each rail of each section of the collapsible ladder, hence making a pair) **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** (pivoting around central axis shown in fig. 3) **to form a pair of hinges** (hinge assembly; fig. 3) **rotatable about a pivot axis**

(central axis; fig. 3; see annotated drawings below)**; and a pair of hinge button assemblies** (500; including 508, 506, 504, 502, 520, 540)**, wherein each hinge button assembly of the pair of hinge button assemblies includes: a first button body** (504) **coupled with a hinge of the pair of hinges (as shown in figs. 3, 4, 5); and a second button body** (508) **fixed to and movable with the first button body** (504; being one piece movable with 508 as shown in fig. 3) **in response to movement of the first button body relative to the hinge** (fig. 3)**, the second button body being partially spaced axially outward from the first button body by at least one gap** (see annotated drawings below) **configured to receive an object hanging from the second button body** (such as a clipping to by hanging on central shaft, a sheet metal clip, a zip tie, etc. – as so broadly claimed the limitation is met by the applied art).





If it was found that the collapsible ladder of Lee does not exhibit the limitations of the first and second assemblies with spaced rails and rungs between the first pair of rails, examiner takes Official Notice that collapsible ladder attached at the top of the sections with hinges such as the ones shown in fig. 3 of Lee are known to have two sets of pairs of rails with rungs extending between at least one/first pair of rails.

In regards to claim 2 Lee discloses the pair of hinge button assemblies (shown in fig. 3-5) is movable between a first axial position (position in fig. 4) along the pivot axis and a second axial position (position in fig. 5) along the pivot axis; the first assembly is rotatable relative to the second assembly while the pair of hinge button assemblies is in the first axial position (paragraph [0006]; see highlighted excerpt below); 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 (paragraph [0006]; see highlighted excerpt below); each hinge button assembly further comprises a pivot pin (either of 502/504/506) coupled to the first button body (as shown in fig. 3), a bracket (580) coupled to the pivot pin (as shown in fig. 3), and at least one locking pin (582) coupled to the bracket (fig. 3); the first pair of hinge portions includes a first opening (204) and the second pair of hinge portions includes a second opening (304); 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 (fig. 5); 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 (fig. 4).

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[0006] To accomplish the above object of the present invention, a hinge for collapsible ladders, includes an external frame including a center aperture and a pair of locking apertures; an inner frame including a center aperture and a plurality of pairs of locking apertures, the inner frame being rotatably movable relative to the external frame around the center apertures; a rotary plate rotatably disposed between the inner frame and the external frame and having locking apertures therein; a substantially flat rotary spring having one end mounted to the inner frame and an opposite end mounted to the rotary plate to impart a turning force to the rotary plate; a hub member rotatably connecting the inner frame and the external frame about the center apertures, and supporting the frames, the hub member including a locking end at one side thereof; a locking part having a locking end for extension into the locking apertures of the external and inner frames to fix an angle of the inner frame and the external frame relative to each other; a press axle connected with the locking part and passing through the hub member, the press axle including a spring bearing end; and a spring positioned between the locking end of the hub member and the bearing end of the press axle.

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis (i.e., changing from AIA to pre-AIA) for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have

> been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 3-11 are rejected under 35 U.S.C. 103 as being unpatentable over Lee, US (2003/0037412) in view of Ng, US (11191373).

In regards to claim 1 Lee *(under an **alternative interpretation** of reference Lee)* discloses:

A ladder (collapsible ladder as described in summary of invention)**, comprising: a first assembly** (per the standard structure of collapsible ladders utilizing the hinge assembly shown in fig. 3)**, including: a first pair of rails** (standard structure of collapsible ladders) **spaced apart from each other; a first set of rungs coupled to and extending between the first pair of rails** (standard structure of collapsible ladders)**; a first pair of hinge portions** (200; with the structure shown in fig. 3 taught at top of each rail of each section of the collapsible ladder, hence making a pair) **coupled to the first pair of rails; a second assembly, including: a second pair of rails** (standard structure of collapsible ladders) **spaced apart from each other; a second pair of hinge portions** (300; with the structure shown in fig. 3 taught at top of each rail of each section of the collapsible ladder, hence making a pair) **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** (pivoting around central axis shown in fig. 3) **to form a pair of hinges** (hinge assembly; fig. 3) **rotatable about a pivot axis** (central axis; fig. 3; see annotated drawings below)**; and a pair of hinge button assemblies** (500; including 508, 506, 504, 502, 520, 540)**, wherein each hinge button**

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assembly of the pair of hinge button assemblies includes: a first button body (508) **coupled with a hinge of the pair of hinges (fig. 3).**

If it was found that the collapsible ladder of Lee does not exhibit the limitations of the first and second assemblies with spaced rails and rungs between the first pair of rails, examiner takes Official Notice that collapsible ladder attached at the top of the sections with hinges such as the ones shown in fig. 3 of Lee are known to have two sets of pairs of rails with rungs extending between at least one/first pair of rails.

In regards to claim 1 Lee does not disclose a second button body.

Ng teaches **a second button body** (10; fig. 1)**.**

Therefore, before the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to teach the second button body taught by Ng onto the hinge button assembly of Lee for the predictable result with reasonable expectation of success and following the teaching of Ng to provide for hanging article. One 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, phone clip, a clip attached to a tool, ID card etc. as non-limiting examples. The teaching of the bracket (second button body) of Ng onto the first button body of Lee consequently teaches **the second button body (10; Ng) fixed to and movable with the first button body (508; Lee) in response to movement of the first button body relative to the hinge (being attached together via apertures 35, 45 of 10; Ng), the second button body being partially spaced axially outward from the first button body by at least one gap (**resulting from the raised center portion 20 of bracket 10; Ng **gap created between surface 24 and first button body which would**

flush with the bottom surface of the bracket 10; Ng) configured to receive an object hanging from the second button body (such as a clipping to by hanging on central shaft, a sheet metal clip, a zip tie, etc.)**.**

In regards to claim 3 Lee as modified by Ng teaches the second button body comprises a substantially flat outward-facing surface (24; Ng) parallel to the first button body (once taught onto button of Lee).

In regards to claim 4 Lee as modified by Ng do not teaches the second button body is integrally formed with the first button body. However, it would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to have the second button body integrally formed with the first button body, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. Howard v. Detroit Stove Works, 150 U.S. 164 (1893). One of ordinary skill in the art before the effective filing date of the claimed invention would have found that having the second button body integrally formed with the first button body would have yielded the predictable result of a more study structure less prone to breaking, cracking with repetitive use over time in a work environment.

In regards to claim 5 Lee as modified by Ng teaches the at least one gap forms a slot elongated along a direction perpendicular to the pivot axis (when bracket 10 of Ng is taught onto the outer surface of the outer button portion of 508 of Lee; gap formed as a result of central raised section 20 of bracket 10).

In regards to claim 6 Lee as modified by Ng teaches the at least one gap includes two open ends (top and bottom).

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In regards to claim 7 Lee as modified by Ng teaches the at least one gap at least opens upward (upper opening) while the pair of hinges is positioned over the first pair of rails and the second pair of rails.

In regards to claim 8 Lee as modified by Ng teaches the second button body is directly coupled to the first button body at opposite ends of the second button body (apertures 35, 45; Ng).

In regards to claim 9 Lee as modified by Ng teaches the second button body (10; Ng) defines a surface (25) facing axially inward toward the pair of hinges and substantially parallel to the first button body (once taught onto first button body of Lee).

In regards to claim 10 Lee as modified by Ng teaches the object is supportable by the second button body by hanging on the second button body while at least partially positioned in the at least one gap (small tools, phone clip, a clip attached to a tool, ID card as non-limiting examples; claim is further limiting non-positively claimed intended use limitation i.e., object).

In regards to claim 11 Lee as modified by Ng teaches the second button body comprises a plate (fig. 1; Ng).

Claims 19-20 are rejected under 35 U.S.C. 103 as being unpatentable over Lee, US (2003/0037412) in view of Ng, US (11191373).

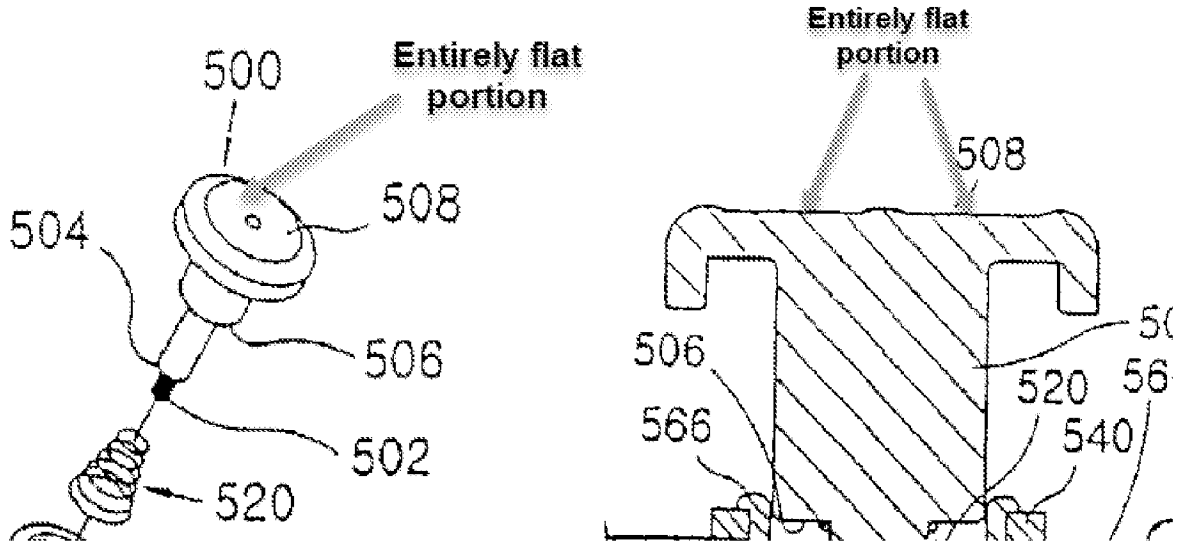
In regards to claim 19 Lee discloses:

A ladder (collapsible ladder as described in summary of invention)**, comprising: a first assembly** (per the standard structure of collapsible ladders utilizing the hinge assembly shown in fig. 3)**, including: a first pair of rails** (standard structure of collapsible ladders) **spaced apart from each other; a first set of rungs coupled to**

and extending between the first pair of rails (standard structure of collapsible ladders)**; a first pair of hinge portions** (200; with the structure shown in fig. 3 taught at top of each rail of each section of the collapsible ladder, hence making a pair) **coupled to the first pair of rails; a second assembly, including: a second pair of rails** (standard structure of collapsible ladders) **spaced apart from each other; a second pair of hinge portions** (300; with the structure shown in fig. 3 taught at top of each rail of each section of the collapsible ladder, hence making a pair) **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** (pivoting around central axis shown in fig. 3) **to form a pair of hinges** (hinge assembly; fig. 3) **rotatable about a pivot axis** (central axis; fig. 3; see annotated drawings below)**; and a pair of retainers** (500; including 508, 506, 504, 502, 520, 540) **movable between a set of first axial positions** (interpreted such that the set of first axial positions are the first axial positions attained by each retainer i.e., the set = two positions, one for each retainer; position in fig. 4; set being the position on the hinge between the other pair of rails) **along the pivot axis (figs. 3-5) and a set of second axial positions** (interpreted such that the set of first axial positions are the first axial positions attained by each retainer i.e., the set = two positions, one for each retainer; position in fig. 5; set being the position on the hinge between the other pair of rails) **along the pivot axis; wherein each retainer of the pair of retainers includes: a body** (508) **having a body surface** (see annotated drawings) **facing axially outward from the pair of hinges** (figs. 3-5) **the body surface having an entirely flat portion** (area surrounding middle bump; see annotated drawings below)**; a pivot pin** (502/ 504/506) **coupled to the body** (fig. 3)**; a bracket**

(580) **coupled to the pivot pin** (as shown in fig. 3)**; and at least one locking pin** (582) **coupled to the bracket; wherein the first assembly is rotatable relative to the second assembly** (paragraph [0006]; see highlighted excerpt below) **while the pair of retainers is in the set of first axial positions** (fig. 4) **and the at least one locking pin is removed from the first opening and from the second opening** (fig. 4)**; 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 set of second axial positions** (fig. 5) **and the at least one locking pin is positioned in the first opening and in the second opening** (fig. 5).

If it was found that the collapsible ladder of Lee does not exhibit the limitations of the first and second assemblies with spaced rails and rungs between the first pair of rails, examiner takes Official Notice that collapsible ladder attached at the top of the sections with hinges such as the ones shown in fig. 3 of Lee are known to have two sets of pairs of rails with rungs extending between at least one/first pair of rails.



[0006] To accomplish the above object of the present invention, a hinge for collapsible ladders, includes an external frame including a center aperture and a pair of locking apertures; an inner frame including a center aperture and a plurality of pairs of locking apertures, the inner frame being rotatably movable relative to the external frame around the center apertures; a rotary plate rotatably disposed between the inner frame and the external frame and having locking apertures therein; a substantially flat rotary spring having one end mounted to the inner frame and an opposite end mounted to the rotary plate to impart a turning force to the rotary plate; a hub member rotatably connecting the inner frame and the external frame about the center apertures, and supporting the frames, the hub member including a locking end at one side thereof; a locking part having a locking end for extension into the locking apertures of the external and inner frames to fix an angle of the inner frame and the external frame relative to each other; a press axle connected with the locking part and passing through the hub member, the press axle including a spring bearing end; and a spring positioned between the locking end of the hub member and the bearing end of the press axle.

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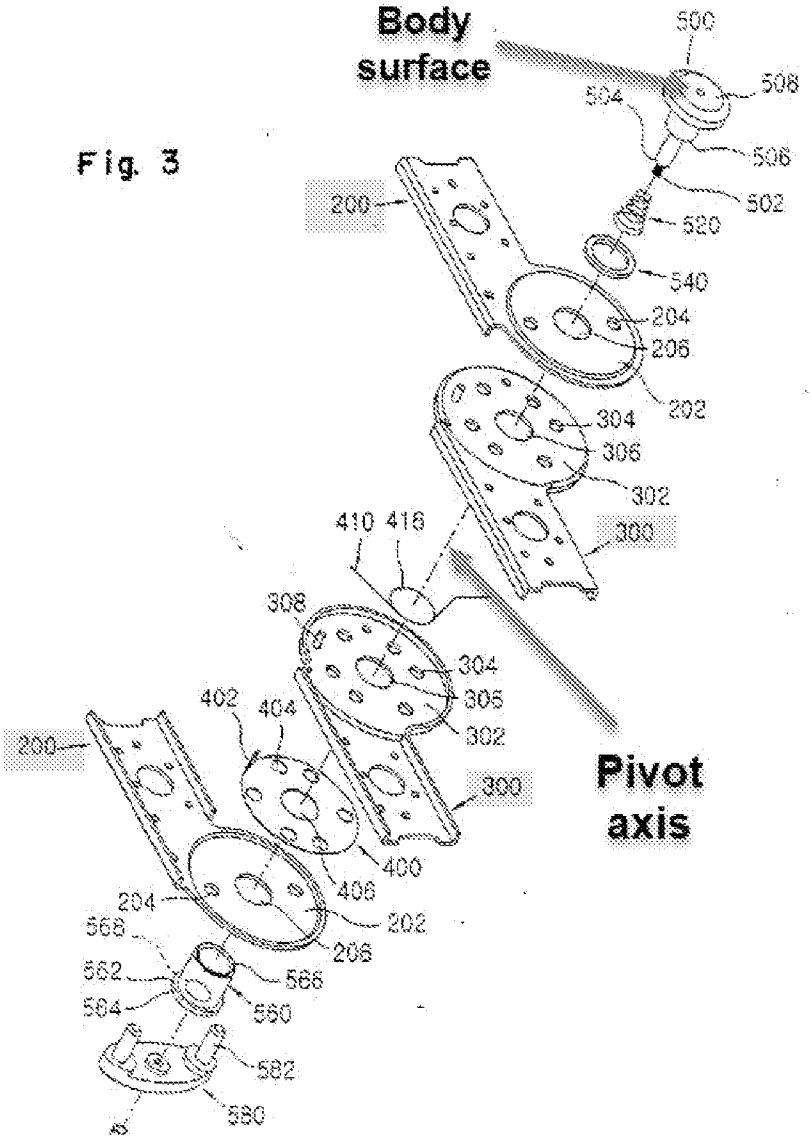

In regards to claim 19 Lee does not disclose **a plate structure spaced axially outward from the body surface by at least one elongated gap.**

Ng teaches **a plate structure (10; fig. 1).**

Therefore, before the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to teach the plate structure taught by Ng onto the retainer body of Lee for the predictable result with reasonable expectation of success and following the teaching of Ng to provide for hanging article. One 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, phone clip, a clip attached to a tool, ID card etc. as non-limiting examples. The teaching of the plate bracket (plate structure) of Ng onto the retainer body of Lee consequently teaches the **pivot pin (502/ 504/506; Lee) coupled to the body on a side of the body opposite the plate structure and the, plate structure attached with the body on at least two ends of the plate structure (via apertures 35, 45 of 10; Ng) on opposite sides of the entirely flat portion of the body surface** (plate 10 of Ng taught onto surface of 508 which would have portions of the entirely flat portion in the middle; overlapping portions of the entirely flat portion in the same manner as in the current invention)**; wherein the plate structure is spaced axially outward from the body surface by at least one elongated gap** (resulting from the raised center portion 20 of bracket 10; Ng)**, 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** (such as a thin sheet metal clip)**.**

Lee as modified by Ng do not teaches the second button body is integrally formed with the first button body. However, it would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to have the second button body integrally formed with the first button body, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. Howard v. Detroit Stove Works, 150 U.S. 164 (1893). One of ordinary skill in the art before the effective filing date of the claimed invention would have found that having the second button body integrally formed with the first button body would have yielded the predictable result of a more

study structure less prone to breaking, cracking with repetitive use over time in a work environment.

In regards to claim 20 Lee discloses 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.

Response to Arguments

Applicant's arguments filed 03/12/2024 have been fully considered but they are not persuasive because:

- Applicant argues "*The "object" of claim 10 is not a feature of the ladder of claim 10 and therefore is not required to be shown in the drawings. Additionally, the present specification provides sufficient support for the relationship between the "object" and the button structures by describing common objects such as a spatula, paper, or end hook portion of a tape measure, so the "object" should not need to be shown in the drawings even if it were part of the ladder*"; examiner respectfully disagrees and presents that the "object" would need to be illustrated since it is a component that is positively recited (in claim 10); e.g., to show the manner of which it is hanging and to illustrated its partial positioning in the at least one gap.
- Applicant argues "*Claim 19 also complies with Rule 1.83. A "pair of retainers" is clearly shown in the drawings as a pair of bodies (e.g., bodies 138 in FIGS. 1 and 4A and body 338 in FIG. 18), and "axial positions" of such bodies are illustrated in FIGS. 3A-3B. The retainers and axial positions are also referred to in the specification, directly or indirectly, in at least paras. 0007-0008, 0059, 0066, 0074, 0078, and 0086. Nevertheless, in order to expedite allowance of the application, Applicant has*

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amended the specification at paragraphs 0059 and 0066 to provide even more clarity regarding these claim limitations"; examiner respectfully disagrees and presents that applicant's amendment to the specification resulted in new matter objection to the specification, since currently the specification refers to mechanism 124, as well as hinge mechanism 126 having a button body 138 and a button plate 140 as being the "retainer". In addition, said amendment raises the indefiniteness for claim 19, where it is currently not clear which of the above-mentioned mechanisms is being recited since both use the same term: "retainer". Furthermore, applicant's argument that "*"axial positions" of such bodies are illustrated in FIGS. 3A-3B*"; examiner clarifies that the claims require: "a set of first axial positions" and "a set of second axial positions" as recited in claim 19, requiring more than one first and more than one second positions i.e., at least four positions.

- Applicant's amendments/arguments to the claims in regards to reference Zhu US (2023/0008962) have been found persuasive, and corresponding rejections have been withdrawn accordingly.
- Applicant argues "*it would not have been obvious to modify Zhu or Lee based on the teachings of Ng identified by the Examiner. First, doing so would change the principle of operation of the bracket 10 of Ng. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. In re Ratti, 270 F.2d 810, 813 (C.C.P.A. 1959); MPEP §2143.01. In the Ng reference, the principle of operation of bracket 10 is not intended for hanging something else from an article (e.g., 500). Rather, the*

reverse is true-the bracket 10 is made for holding an article 500 to a wall. See Ng at Abstract and FIGS. 8-16A. There is no teaching or motivation in the Zhu, Lee, or Ng references to change the principle of operation of the Ng bracket 10, i.e., to use the bracket 10 to hang items from the article 500 rather than using the bracket to hang the article 500 from something else (e.g., a wall). Accordingly, the modification proposed by the Examiner would not have been obvious because modifying the usage of bracket 10 as proposed by the Examiner would change the basic principle of operation of the bracket 10 from its intended function to a completely different function"; examiner respectfully disagrees and presents that firstly, and as applicant states "*If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious*"; therefore, it is submitted that applicant has erred in attacking the rejection since Ng is not a reference that is "*being modified*" instead it is a teaching reference; secondly, to further clarify, examiner is solely teaching the plate of Ng; hence the principle of operation of Ng is not germane to the rejection. Secondly, in regards to applicant's statement that "*the principle of operation of bracket 10 is not intended for hanging something else from an article (e.g., 500). Rather, the reverse is true-the bracket 10 is made for holding an article 500 to a wall*"; examiner, traverses, since it is not clear how or why holding an article is the opposite or "reverse" of hanging or receiving an object as recited in claim 1, line 20. Finally, it is submitted that: a person of ordinary skill in the art would see the notched opening 50 of Ng holding object 120 (nail) and find

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that it would be useful to hold similar objects such as a head of a flathead nail, paper clip, measuring tape clip etc.

- Applicant argues "*It also would not have been obvious to combine a picture-hanging bracket of Ng with a ladder structure of Zhu or Lee because picture-hanging brackets are non- analogous art to ladders…Claims 1 and 19 recite ladders, so the Ng picture-hanging bracket 10 is not from the same field of endeavor as the claims. Specifically, the bracket 10 is related to a field of endeavor of hanging items from a wall rather than a field of endeavor of ladders*"; examiner respectfully disagrees and presents that: "Under the correct analysis, any need or problem known in the field of endeavor at the time of the invention and addressed by the patent [or application at issue] can provide a reason for combining the elements in the manner claimed." KSR International Co. v. Teleflex Inc., 550 U.S. ___, ___, 82 USPQ2d 1385, 1397 (2007). Thus a reference in a field different from that of applicant's endeavor may be reasonably pertinent if it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his or her invention as a whole…Moreover, all the claimed elements are known in the prior art and one skilled in the art would have combined the elements as claimed by known methods with no change to their respective functions, and the combination would have yielded predictable results to one having ordinary skill in the art i.e., providing for hanging articles, and 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, phone clip, a clip attached to a tool, ID card etc. as non-limiting examples.

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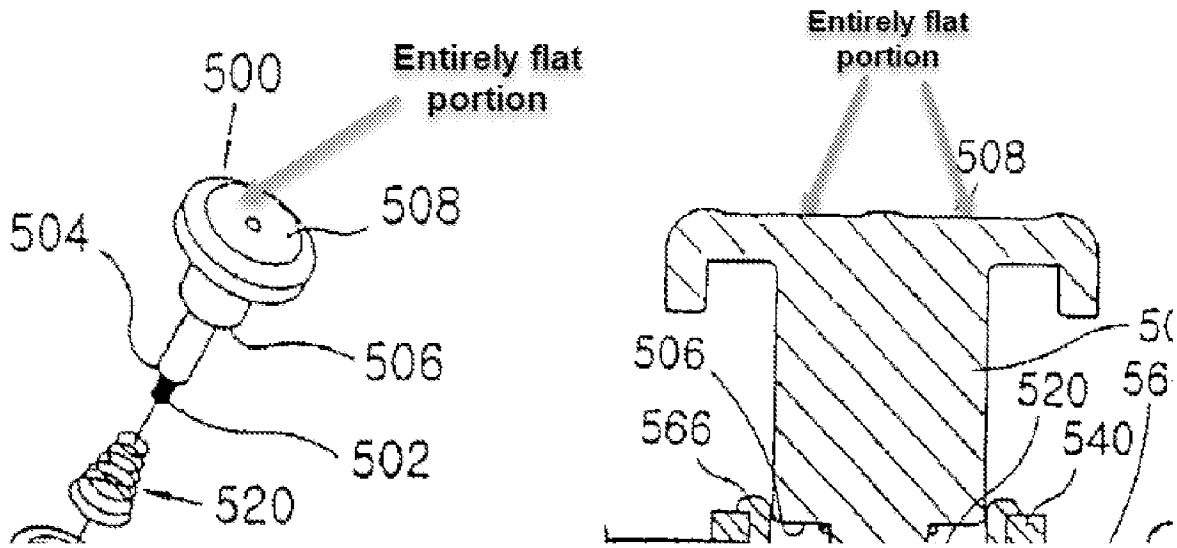
- Applicant argues "*The bracket 10 is configured and intended for "hanging articles on a wall or other mounting surface." Ng at Abstract. A person having ordinary skill in the art would not have found clear and reasonable motivation to modify the Zhu or Lee ladders to mount their ladders to a wall. The hinges (e.g., 51 of Zhu) of a conventional ladder are not constructed or intended to bear the weight of a ladder, let alone to bear the weight of the ladder from a single small control button (e.g., 42 in Zhu or 508 in Lee) laterally extending from the side of a single hinge. Hanging a ladder from a small control knob (e.g., via bracket 10) would apply high loads to the knob (42/508) and its connected control rod, thereby likely causing damage to the hinge (e.g., bending the operating member 42 shaft of Zhu or axle 6 of Lee). It would not have been reasonably obvious or predictable to modify the ladder in a manner likely to cause damage to the ladder by subjecting a hinge pin to a cantilevered load of the rest of the entire ladder*"; examiner respectfully disagrees and presents that applicant appeared to have erred again in the interpretation of the rejection, where there is neither a need to, nor is it claimed or suggested in the rejected that the ladder be hanging or mounted to a wall; applicant is reminded that reference Lee US (2003/0037412) is indeed the primary reference, while reference Ng US (11191373) is only utilized to teach the plate 10; which once taught onto the first body of Lee would function as a holder for small items as explained above; nowhere is it suggested in the rejection or the current application to hang the ladder by its hinge.
- Applicant argues "*By adding the bracket 10 to an operating member 42 of Zhu (or press part 508 of Lee), the bracket 10 would rotate between various hinge positions because the operating member 42 (or press part 508) also needs to rotate between hinge positions. Rotation of the bracket 10 would rotate the slot opening 50 to*

positions where it would be unable to serve its purpose of hanging an article (e.g., the Zhu or Lee ladder) from a wall because a nail would slide out of the slot opening 50 if the bracket 10 is not at the correct rotated orientation relative to gravity"; examiner respectfully disagrees and presents that a paper clip, or a thin sheet metal clip attached to the bracket 10 would remain attached during operation and rotation of member 42, in addition, even if an object such as a nail attached to the bracket and inserted into groove 50, it would remain hanging at least withstanding a tilt of 90 degrees per the design of the notched opening 50.

- Applicant argues "*the alleged at least one elongated gap of the proposed combination is not parallel to an entirely flat portion of the alleged body surface. Instead, Lee discloses a bump on the center of the alleged body surface (i.e., the outer face of press part 508). See Lee at FIGS. 3-5. The bumped surface does not have an "entirely flat portion" that would meet the limitations of claim 19 when a bracket 10 of Ng is integrated with the surface*"; examiner respectfully disagrees and presents that "the body surface having an entirely flat portion" need not require the entirety of the surface to be flat, but only a portion of the surface to be entirely flat, hence Lee discloses the body surface having an entirely flat portion (area surrounding middle bump; see annotated drawings below) and where teaching the plate 10 of Ng onto surface of 508 of the body of Lee which would have portions of the entirely flat portion in the middle; overlapping portions of the entirely flat portion in the same manner as in the current invention.



Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHIREF M MEKHAEIL whose telephone number is (571)270-5334. The examiner can normally be reached 10-7 Mon-Fri.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Cahn can be reached on 571-270-5616. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/S.M.M/
Examiner, Art Unit 3634

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/DANIEL P CAHN/
Supervisory Patent Examiner, Art Unit 3634

Notice of References Cited	Application/Control No. 18/490,715	Applicant(s)/Patent Under Reexamination Maxfield et al.	
	Examiner SHIREF M MEKHAEIL	Art Unit 3634	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-D454481-S	2002-03-19	DeLine; Kenneth E.		D8/373
*	B	US-D272211-S	1984-01-17	Rock; Erich		D8/323
*	C	US-9850936-B2	2017-12-26	Tanabe; Gen	F16B37/02	1/1
*	D	US-8353649-B2	2013-01-15	Csik; Terrence	F16B39/284	411/908
*	E	US-6866940-B1	2005-03-15	Laughlin; Harold Patrick	E06B7/28	248/225.11
*	F	US-6769660-B2	2004-08-03	DeLine; Kenneth E.	A47G1/1633	248/542
*	G	US-6142892-A	2000-11-07	Dennis; John	A63B63/004	473/477
*	H	US-4171117-A	1979-10-16	Prochaska; John J.	A47G1/1613	248/495
*	I	US-20060186304-A1	2006-08-24	McGee; Michael Dale	A47G1/1606	248/476
	J					
	K					
	L					
	M					

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*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
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	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/490,715	Maxfield et al.
	Examiner	Art Unit
	SHIREF M MEKHAEIL	3634

CPC - Searched*		
Symbol	Date	Examiner
E06C 1/ 32, 38, 383 ; 7/ 082, 14, 50 ; 9/ 085	12/02/2023	SM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor name search	12/02/2023	SM
Assignee name search	12/02/2023	SM
Forward and backward citation search of relevant art	12/02/2023	SM
More like this search	12/02/2023	SM
Consulted CAT tool and global dossier	12/02/2023	SM
Class/subclass and text search	12/02/2023	SM
Updated	03/19/2024	SM

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/490,715	Maxfield et al.
	Examiner	Art Unit
	SHIREF M MEKHAEIL	3634

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/S.M.M/ Examiner, Art Unit 3634	

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	25	((("LITTLE") near3 ("GIANT") near3 ("LADDER") near3 ("SYSTEMS") near3 ("LLC"))).AS,AANM.	(USPAT)	OR	ON	ON	2023/11/30 06:24 PM
L2	458	((("MAXFIELD") near3 ("B")) OR (("MOSS") near3 ("N")) OR (("MINER") near3 ("Steven"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2023/11/30 06:25 PM
L3	1216	E06C1/32.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:26 PM
L4	1887	E06C7/14.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:26 PM
L6	411	E06C9/085.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:56 PM
L7	1032	E06C1/383.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:56 PM
L8	764	E06C1/38.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:56 PM
L9	688	E06C7/082.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:58 PM
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		(US-4566150-A OR US-3811151-A OR DE-2732784-C2 OR EP-1020653-A1 OR US-20170145745-A1 OR DE-2931745-A1 OR DE-3900176-A1 OR EP-1020653-B1 OR US-10731413-B2 OR US-5074377-A OR US-6220389-B1 OR US-20180274296-A1 OR WO-2017218672-A1 OR US-20210025230-A1 OR WO-9955997-A1 OR AT-E117046-T1 OR US-10718160-B2 OR US-20180252037-A1 OR CN-107178303-A OR EP-1388309-A1).did.	CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
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		"20170211283" | "20170328131").pn. OR ("10718160").urpn. AND (PGPB | USPT | USOC).dbnm.					
L14	38	(Artificial Intelligence) More like doc: US-10718160-B2 Text: (CA-196181-S OR CA-187083-S OR US-20180252037-A1 OR CN-107178303-A OR US-3912043-A OR AU-734243-B3 OR AU-2013373963-B2 OR AU-2013373963-A1 OR CN-2632283-Y OR US-20190090626-A1 OR AU-2003290755-A1 OR AU-2019282832-A1 OR AU-2003290755-B2 OR CN-2339739-Y OR US-10582766-B2 OR US-20090200113-A1 OR US-11536088-B2 OR CA-1215953-A OR AU-2017202247-A1 OR CA-117047-S).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/01 02:57 PM
L15	62	("3048883" | "3731342" | "3811151" | "3879146" | "4152810" | "4216844" | "4403373" | "4407045" | "4540306" | "4566150" | "4666327" | "4666328" | "4697305" | "4770559" | "4773503" | "4890950" | "4925329" | "4928792" | "5018405" | "5022118" | "5026198" | "5058239" | "5954157" | "6086284" | "6244779" | "6330733" | "6343406" | "6688797" | "20030012595" | "20030037412" | "20040129497" | "20040216277" | "20040226773" | "20050268434").pn. OR ("7140072").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:00 PM
L16	31	("3048883" | "3731342" | "3811151" | "3879146" | "4152810" | "4216844" | "4403373" | "4407045" | "4540306" | "4566150"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:00 PM

		| "4666327" | "4666328" | "4697305" | "4925329" | "5590931" | "6112370" | "6343406" | "6711780" | "6910738" | "20040226773").pn. OR ("7093321").urpn. AND (PGPB | USPT | USOC).dbnm.					
L17	53	("1696357" | "3811151" | "4085899" | "4210224" | "4216844" | "4403373" | "4407045" | "4566150" | "4577986" | "4666327" | "4666328" | "4697305" | "4770559" | "4890950" | "D309502" | "6343406").pn. OR ("6711780").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:01 PM
L18	40	(Artificial Intelligence) More like doc: US-6711780-B2 Text: (US-20030037412-A1 OR US-5142739-A OR KR-200255403-Y1 OR WO-2021109845-A1 OR CN-211819206-U OR US-20150159414-A1 OR DE-4421284-C1 OR US-20180274296-A1 OR US-20230008962-A1 OR US-10145159-B2 OR CN-104691599-A OR EP-0931904-A2 OR DE-202014102891-U1 OR US-20140332044-A1 OR US-20100251871-A1 OR WO-2013087079-A1 OR EP-2791445-A1 OR US-10557227-B2 OR US-20180298547-A1 OR US-20180252037-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/01 03:01 PM
L19	69	("4403373" | "4407045" | "4566150" | "4697305" | "4773503" | "4890950" | "5353892" | "5620272" | "5954157" | "5992566").pn. OR ("6343406").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:02 PM

L20	67	("4290168" | "4407045" | "4602889" | "4614452" | "5219240" | "5265969" | "5353892").pn. OR ("5620272").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:02 PM
L21	71	("0470516" | "0501406" | "0697294" | "0745320" | "0796157" | "1461952" | "1633902" | "1936508" | "2210803" | "2647676" | "2880920" | "3692143" | "3811151" | "4182431" | "4210224" | "4216844" | "4371055" | "4376470" | "4403373" | "4407045" | "4566150").pn. OR ("4697305").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:04 PM
L22	58	("4152810" | "4216844" | "4377020" | "4407045" | "4543007" | "4566150").pn. OR ("4666328").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:05 PM
L23	66	("3731342" | "3924775" | "4202015" | "4666328" | "4718127" | "4718672" | "4832299" | "5428350" | "5687939" | "5713633" | "5805415" | "5813914" | "6019332" | "6068101" | "6112370" | "6128184" | "6135884" | "6164645" | "6254481" | "6266236" | "6357712" | "6475087" | "6512670" | "6532627" | "6590547" | "6623006" | "6644611" | "6665175" | "6682161" | "6711780" | "6758454" | "6997810" | "7059693" | "7147191" | "7267613" | "7283355" | "20020139822" | "20030027627" | "20040018870" | "20050056750" | "20050059496" | "20050121578" | "20060175499").pn. OR ("7540806").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:22 PM

L24	59	("0181305" | "1936508" | "3430972" | "3692143" | "3912043" | "4182431" | "4371055" | "4376470" | "4483415" | "4520896" | "4666328" | "4697305" | "4770559" | "4890950" | "4951780" | "4989692" | "5142739" | "5620272" | "5873433" | "5954157" | "5971102" | "6000497" | "6343406" | "6443261" | "6536557" | "6711780" | "6857503" | "7007344" | "7032711" | "7047597" | "7140072" | "7264082" | "7306075" | "7364017" | "7370726" | "7424933" | "8262124" | "8651259" | "10138680" | "10233692" | "10648234" | "10718160" | "20030012595" | "20030217888" | "20040129497" | "20090078503" | "20140251729" | "20150068842" | "20160153231" | "20170145745" | "20170356244" | "20190136625" | "20190145170" | "20190234144" | "20190368271" | "20190376343").pn. OR ("11505994").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:24 PM
L25	45	("1887878" | "1894489" | "2456054" | "2476427" | "2517125" | "2923565" | "3018122" | "3504569" | "3693469" | "3693770" | "3943794" | "4222473" | "4249799" | "4269422" | "4604910" | "4666328" | "4679756" | "4824278" | "5235867" | "5279387" | "5302039" | "5337869" | "5482144" | "5689999" | "5961220" | "6065897" | "6086284" | "6092778").pn. OR ("6244779").urpn. AND (PGPB | USPT |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:26 PM

		USOC).dbnm.					
L26	76	("0437936" | "3420333" | "3692143" | "3729063" | "3811151" | "3849834" | "D248777" | "4152810" | "4155422" | "4182431" | "4202428" | "4210224" | "4256200" | "4284171" | "4376470" | "4469193" | "4493392" | "4502566" | "4519478" | "4540306" | "4566150" | "4577986" | "4666328" | "4697305" | "4770559" | "4773503" | "4796727" | "4924970" | "4926964" | "4934485" | "D309502" | "4974701" | "5000289" | "5062179" | "5074377" | "5123768" | "5163532" | "5228535" | "5279387" | "5350038" | "5358352" | "5520474" | "5620272" | "5743355" | "5775460" | "5992566" | "6086284" | "6115886" | "6220389" | "6237718" | "6330733" | "6343406").pn. OR ("7424933").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:27 PM
L27	34	(Artificial Intelligence) More like doc: US-7424933-B2 Text: (US-20040129497-A1 OR US-20090200113-A1 OR US-7364017-B2 OR US-8376087-B2 OR JP-2006505726-A OR US-20120160609-A1 OR AU-2003290755-A1 OR WO-2004044365-A2 OR EP-1573166-A2 OR CA-2508885-C OR US-20040140156-A1 OR AU-2003290755-B2 OR US-8069948-B2 OR EP-1573166-B1 OR CA-2508885-A1 OR US-20080257645-A1 OR EP-1473432-A1 OR NZ-540647-A OR CA-3172553-A1 OR CA-2465252-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/01 03:27 PM
L28	20	("4645371" | "4770559" | "4805737" | "4890950"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 03:34 PM

		| "4925329" | "4928792" | "5022118" | "5026198" | "5058239" | "5353892").pn. OR ("6330733").urpn. AND (PGPB | USPT | USOC).dbnm.					
L29	40	(Artificial Intelligence) More like doc: US-6330733-B1 Text: (EP-1020653-B1 OR EP-1020653-A1 OR DE-19901125-C1 OR DE-3937535-C1 OR US-20040108764-A1 OR DE-1938696-A1 OR DE-19633761-A1 OR DE-19633761-C2 OR US-3955240-A OR US-4543006-A OR US-3643292-A OR KR-890003205-Y1 OR NL-2013148-A OR CN-216767249-U OR CZ-327496-A3 OR US-5197817-A OR PT-1020653-E OR US-6045189-A OR US-4612706-A OR US-20060005397-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/01 03:34 PM
L30	48	("4339844" | "4403373" | "4540306" | "4666327").pn. OR ("4890950").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:00 PM
L31	37	("2502641" | "3955240" | "4474264" | "4540306" | "4543006" | "4611945" | "4645371" | "4770559").pn. OR ("4824278").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:04 PM
L32	50	("3517965" | "4087885" | "4447033" | "4474264" | "4697305").pn. OR ("5954157").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:08 PM
L33	16248	E06C$/$.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:10 PM
L34	32	33 AND bracket WITH hold$4 WITH (clip (measuring ADJ tape)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:11 PM

		(screw ADJ drive))					
L35	5	("3029054").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:12 PM
L36	40	("0956835" | "1551243" | "2226228" | "2645443" | "2674427" | "2675982" | "2703215" | "2837306" | "2855170" | "3029054" | "3154282" | "3278148" | "3420486" | "4560127" | "4979710" | "4991808" | "5079795" | "5099952" | "5342008" | "6009976" | "6105911" | "8602365" | "8925683" | "9249003" | "10119332" | "20090147527" | "20140319297").pn. OR ("11661794").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L37	68	33 AND bracket WITH hold$4 WITH (tool)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L38	55	33 AND bracket WITH hold$4 WITH (object)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L39	9	33 AND bracket WITH hold$4 near2 (object)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L40	22	33 AND (bracket plate) WITH (protrud$4 gap) WITH hold$4	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:18 PM
L41	67	(U$2bracket (U ADJ shape$1 ADJ bracket)) WITH hold$4 WITH (clip (measuring ADJ tape) (screw ADJ drive))	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:23 PM
L42	25995	clip ADJ holder WITH (measuring ADJ tape) (screw ADJ drive)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:29 PM
L43	3	clip ADJ holder WITH (measuring ADJ tape)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:29 PM
L44	121	clip ADJ holder WITH (tool)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:29 PM
L45	5	("2003/0159304").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:30 PM
L46	7	("5388741" | "6269993" | "7117566" | "7216788" | "9173475" | "20080283563" | "20200253364").pn. OR ("11559131").urpn. AND (PGPB | USPT |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:30 PM

		USOC).dbnm.					
L47	14	("1519380" | "1980678" | "2995792" | "4757927" | "5026016" | "5054170" | "5201858" | "5622296" | "6233788").pn. OR ("7117566").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:31 PM
L48	6	("2008/0283563").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:32 PM
L49	17	("D196542" | "D221123" | "4598027" | "4821933" | "5213240" | "5388741" | "9173475" | "9248565" | "10182641" | "20030074803" | "20050284909" | "20080283563" | "20120260513" | "20180184791").pn. OR ("10470556").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:33 PM
L50	3	("2018/0184791").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:34 PM
L51	138	("1519380" | "3743147" | "3797717" | "3878589" | "4419794" | "4587818" | "4605335" | "4619020" | "4676420" | "4718586" | "4754528" | "4757927" | "4821934").pn. OR ("5054170").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:36 PM
L52	102	("0D29072" | "0D31665" | "0795553" | "0895846" | "1338154" | "D139216" | "2443149" | "2639109" | "D197188" | "3300173" | "3529799" | "3878589" | "D235308" | "3912216" | "D239593" | "D243190" | "D244508" | "D246346" | "4132335" | "D252851" | "4171117" | "D262688" | "4419794" | "D272044" | "D272211" | "4458872" | "D295369" | "D298604" | "D303716" | "D310479" | "D313740" | "5014892" | "5054170"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:38 PM

		| "D324991" | "D329192" | "5398906" | "5484126" | "5549234" | "5605313" | "5687942" | "D5850954" | "D408267" | "D409079" | "D409663" | "D410032" | "D414207" | "D428058" | "6142892" | "D438536" | "D452081" | "D454591" | "D464993" | "D465147" | "D468357" | "D492187" | "6866940" | "D507959" | "D511088" | "D531223" | "D547637" | "D560221" | "D567740" | "D572117" | "D572122" | "7594632" | "D607711" | "D623046" | "D623507" | "D629293" | "8303226" | "D685991" | "8544805" | "D704035" | "D715859" | "D732929" | "9138082" | "D753982" | "9683696" | "D817152" | "D818801" | "D819428" | "D829079" | "20060186304" | "20070039907" | "20070186384" | "20080209698" | "20080237282" | "20080272257" | "20130168429" | "20130232840" | "20150204366").pn. OR ("11191373").urpn. AND (PGPB | USPT | USOC).dbnm.					
L53	55	("D236855" | "D270120" | "D280466" | "4948022" | "5014892" | "D318949" | "5054170" | "5071049" | "D398835" | "5850954" | "D404038" | "D426701" | "D438536" | "6491194").pn. OR ("D507959").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:41 PM
L54	29	("D139216" | "D244508" | "D246346" | "4132335" | "D272211" | "D295369" | "D298604"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:47 PM

		| "D310479" | "D329192" | "5549234" | "5850954" | "D409079" | "D452081" | "D454591" | "D465147" | "D492187" | "D623507" | "8544805" | "D704035" | "D753982" | "9683696").pn. OR ("D818801").urpn. AND (PGPB | USPT | USOC).dbnm.					
L55	43	("20120267197"|"688364 5"|"8387753"|"212703 5"|"2827216"|"2003001 2595"|"20030062219"|" 20030127288"|"200302 17888"|"20040129497"| "20060155230"|"20070 067957"|"20070201943 "|"20080000723"|"2008 0073150"|"2008010999 4"|"20090050407"|"201 10056764"|"201202671 97"|"20150315844"|"41 52810"|"4376470"|"454 9632"|"4566150"|"4770 559"|"5058239"|"50743 77"|"5142739"|"562027 2"|"5738186"|"5954157" |"5992566"|"6343406"|" 6993808"|"7007344"|"7 047597"|"7140072"|"73 06075"|"7364017"|"834 8015"|"8591444"|"9126 622").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:27 PM
L56	56	("20040020718"|"20100 258379"|"3643292"|"74 24933"|"8104580"|"838 1873"|"8387753"|"2007 0267252"|"4989692"|"2 0060283664"|"2009007 8503"|"20150204138"|" 20030012595"|"200300 62219"|"20030127288"| "20030188923"|"20030 217888"|"20040129497 "|"20050274571"|"2006 0155230"|"2007006795 7"|"20070201943"|"200 80000723"|"200800731 50"|"20080109994"|"20 090050407"|"20110056 764"|"20120267197"|"2 0150315844"|"2127035 "|"2827216"|"4152810"|" 4182431"|"4376470"|"4	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:27 PM

		549632"|"4566150"|"4770559"|"5058239"|"5074377"|"5142739"|"5620272"|"5738186"|"5954157"|"5992566"|"6343406"|"6993808"|"7007344"|"7047597"|"7140072"|"7306075"|"7364017"|"8348015"|"8591444"|"9126622").PN.					
L57	58	("0181305"|"10138680"|"10233692"|"10648234"|"10718160"|"1936508"|"20030012595"|"20030217888"|"20040129497"|"20090078503"|"20140251729"|"20150068842"|"20160153231"|"20170145745"|"20170356244"|"20190136625"|"20190145170"|"20190234144"|"20190368271"|"20190376343"|"3430972"|"3692143"|"3912043"|"4182431"|"4371055"|"4376470"|"4483415"|"4520896"|"4666328"|"4697305"|"4770559"|"4890950"|"4951780"|"4989692"|"5142739"|"5620272"|"5873433"|"5954157"|"5971102"|"6000497"|"6343406"|"6443261"|"6536557"|"6711780"|"6857503"|"7007344"|"7032711"|"7047597"|"7140072"|"7306075"|"7364017"|"7370726"|"7424933"|"8262124"|"8651259").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:27 PM
L58	97	55 56 57	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:27 PM
L59	18	("2005/0274571").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 05:29 PM
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PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

UNITED STATES
PATENT AND TRADEMARK OFFICE

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**03/12/2024 05:47:18 PM Z ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Cristi Bills
PATENT CENTER #	64651166	FILING DATE	10/19/2023
CUSTOMER #	153511	FIRST NAMED INVENTOR	B. Scott Maxfield
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Richard Galati

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
P298048US03_ResponsetoNFOA.pdf	23	Amendment/Request for Reconsideration-After Non-Final Rejection	165 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
P298048US03_ResponsetoNFOA.pdf	A0159D30D9844481BC9BC497847C11A11A23FA6C911FBAD34AE63079109B43101AB49A7447C67BCD82918A606D9EA0520E99199A6BF5899F910681C8CF678EA7

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

REMARKS

This responds to the Office Action dated 12 December 2023. Claims 1, 3, 11, and 19 and paragraphs 0059, 0066, and 0078 of the specification are currently amended. The amendments are supported throughout the specification, drawings and original claims of the application, such as, for example, paragraphs 0079-0080 of the specification and figures 2, 14-15, and 22 and their related descriptions in the specification. No new matter has been added. Thus, claims 1-20 are currently pending (with claims 12-18 withdrawn). Applicant respectfully requests reconsideration of the application in view of the above amendments and the following remarks.

Double Patenting

Claim 1 stands provisionally rejected on the ground of nonstatutory double patenting as allegedly being unpatentable over claims 1 and 15 of co-pending U.S. Patent App. No. 18/324,971. This rejection is currently premature because the claims of the '917 application are not issued. Additionally, the claims of the present application are currently amended. Applicant will address a mature double patenting rejection if/when necessary. Applicant therefore respectfully requests reconsideration of the provisional double patenting rejection.

Objections to the Drawings and Specification

The drawings stand objected to under 37 C.F.R. §1.83(a) as allegedly not showing the "object" of claim 10 or the "pair of retainers," "a set of first axial positions," and "a set of second axial positions" as recited in claim 19. The

specification also stands objected to under 37 C.F.R. §1.75(d)(1) for lacking antecedent basis for the "first set of axial positions" and the "second set of axial positions" of claim 19. Applicant respectfully traverses these objections.

Under Rule 1.83, the drawing in a nonprovisional application must show every feature of *the invention* specified in the claims. The "object" of claim 10 is not a feature of the ladder of claim 10 and therefore is not required to be shown in the drawings. Additionally, the present specification provides sufficient support for the relationship between the "object" and the button structures by describing common objects such as a spatula, paper, or end hook portion of a tape measure, so the "object" should not need to be shown in the drawings even if it were part of the ladder. *See* present specification at at least para. 0078. Accordingly, claim 10 complies with Rule 1.83, and Applicant requests withdrawal of the objection to the drawings related to the "object."

Claim 19 also complies with Rule 1.83. A "pair of retainers" is clearly shown in the drawings as a pair of bodies (*e.g.*, bodies 138 in FIGS. 1 and 4A and body 338 in FIG. 18), and "axial positions" of such bodies are illustrated in FIGS. 3A-3B. The retainers and axial positions are also referred to in the specification, directly or indirectly, in at least paras. 0007-0008, 0059, 0066, 0074, 0078, and 0086. Nevertheless, in order to expedite allowance of the application, Applicant has amended the specification at paragraphs 0059 and 0066 to provide even more clarity regarding these claim limitations. In doing so, Applicant does not concede the propriety of the objections to the drawings or specification, and Applicant asserts that the original specification sufficiently provides support for the objected-to limitations. No new matter has been added. Applicant therefore requests entry of the amendments to the

specification and withdrawal of the objections to the drawings and specification related to claims 10 and 19.

Claim Objections

Claim 3 stands objected to for reciting that "the at least one gap" is defined in part by the "object," which is a non-positively recited limitation. Applicant respectfully traverses this objection. Claim 3 has been amended, and it no longer recites "the at least one gap." The objection of claim 3 is therefore moot and should be withdrawn.

Claim 19 stands objected to for allegedly using inconsistent nomenclature due to using "a pair of retainers" instead of "hinge button assemblies." Office Action at pp. 11-12. No statutes, rules, regulations, or USPTO policies were provided by the Examiner as a basis for this objection. The Examiner contends that "consistent nomenclature is required throughout the claims," but no such requirement has been established by the Examiner as having a basis in the law. Claim 19 is not dependent upon claim 1, and claim 19 can therefore define an invention using entirely different terms from claim 1 at Applicant's discretion.

Furthermore, MPEP §608.01(o) explains, "an applicant is not limited to the nomenclature used in the application as filed," yet also explains that "he or she should make appropriate amendment of the specification whenever this nomenclature is departed from by amendment of the claims so as to have clear support or antecedent basis in the specification for the new terms appearing in the claims." In furtherance of following this MPEP suggestion, and without conceding the propriety of the objection

to claim 19, Applicant has amended the specification at paragraphs 0059 and 0078 to provide even further clarity to the specification regarding "retainers." No new matter has been added.

There should therefore be no confusion regarding how the specification supports claim 19, and, as explained above, claim 19 should not be required to recite the same terms as claim 1. Applicant therefore respectfully requests withdrawal of the objection to claim 19. Applicant invites the Examiner to contact Applicant and/or to identify a law, rule, or regulation violated by claim 19 in a new non-final Office Action if, in the Examiner's opinion, the objection remains unresolved.

Claim Rejections - 35 U.S.C. § 112

Claim 11 stands rejected under 35 U.S.C. §112(b) as allegedly being indefinite. The Examiner argues that there is no standard in the industry nor a separate definition in the disclosure of what constitutes a "plate shape." Applicant respectfully traverses this rejection. Without conceding the propriety of the rejection, Applicant has amended claim 11 to accelerate prosecution toward allowance, and claim 11 no longer recites a "plate shape." Applicant therefore respectfully requests withdrawal of the rejection of claim 11 due to the rejection being moot.

Claim Rejections - 35 U.S.C. §§ 102 and 103

Claim 1 is rejected under 35 U.S.C. §102(a)(2) as being anticipated by U.S. Patent Application Publication No. 2023/0008962 to Zhu. Claims 1-2 are rejected under 35 U.S.C. §102(a)(1) as being anticipated by U.S. Patent Application Publication

No. 2003/0037412 to Lee, or, in the alternative, under 35 U.S.C. §103 as obvious over Lee. Claims 1 and 3-11 are rejected under Section 103 as being unpatentable over Lee in view of U.S. Patent No. 11,191,373 to Ng. Claims 1-11 are further rejected under Section 103 as being unpatentable over Zhu in view of Ng. Claims 19-20 are rejected under Section 103 as being unpatentable over Lee in view of Ng. Applicant respectfully traverses these rejections.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Unless a single prior art reference describes "all of the limitations claimed" and "all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102." *Net MoneyIN Inc. v. VeriSign Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008). A single prior art reference must "clearly and unequivocally" describe the claimed invention "without *any* need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference." *Id.* (*citing In re Arkley*, 455 F.2d 586, 587 (C.C.P.A. 1972)).

To establish a *prima facie* case of obviousness, the prior art reference itself (or references when combined) or "the inferences and creative steps that a person of ordinary skill in the art would [have] employ[ed]" at the time of the invention must teach or suggest all of the claim elements. *K.S.R. Intern. Co. v. Teleflex Inc.*, 550 U.S.

398, 418, 82 U.S.P.Q.2d 1385 (2007); *see also* M.P.E.P. § 2143.03. Additionally, the Examiner must determine whether there is "an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *Id.* "[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *Id.* Further, rejections on obviousness grounds "cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id.* (quoting *In re Kahn*, 441, F.3d 977, 988 (Fed. Cir. 2006)).

To establish a *prima facie* case of obviousness there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant's disclosure. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006); MPEP § 2144. Underlying the obvious determination is the fact that hindsight cannot be used. *K.S.R.*, 550 U.S. at 421; *DyStar*, 464 F.3d at 1367.

Claim 1 as amended recites, *inter alia*, "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 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."

Claim 19 as amended recites, *inter alia*, "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."

Section 102 Rejections

Regarding the Section 102 rejections, the Zhu reference does not teach or suggest the above-indicated limitations of claim 1. The alleged first and second button bodies of Zhu move relative to each other when operated, with the alleged second button body (outer cap of 42) moving through the alleged first button body (center pin 41). Thus, the alleged second button body (outer cap of 42) is not "fixed to and movable with" the alleged first button body (center pin 41) relative to the alleged hinge (*i.e.*, hinge members 1 and 2) in the manner recited in claim 1. Accordingly, Zhu does not teach or suggest the first and second button bodies of claim 1, and Applicant respectfully requests withdrawal of the Section 102 rejections of claim 1 and its dependent claims.

The Lee reference does not teach or suggest the above limitations of claim 1. In Lee, the alleged first button body (locking ring 540) is not "fixed to" the alleged second button body (press part 508) since the press part 508 is moved through the locking ring 540 relative to the hinge 200, 300. The locking ring 540 is also not "movable with" the

press part 508 relative to the hinge 200, 300. Thus, Lee does not teach or suggest the first and second button bodies of claim 1, and Applicant respectfully requests withdrawal of the Section 102 rejections of claim 1 and its dependent claims.

Section 103 Rejections – Proposed combination would non-obviously change principle of operation of cited art

Regarding the Section 103 rejections of claims 1 and 19 based on Zhu in combination with Ng or based on Lee in combination with Ng, the Examiner concedes that Zhu and Lee do not teach or suggest a second button body or a plate structure. Office Action at pp. 26 and 33. However, the Examiner argues that it would have been obvious to modify the Zhu or Lee devices in view of the Ng bracket 10 to implement a second button body or plate structure in the manner recited in claims 1 and 19. *Id.*

However, it would not have been obvious to modify Zhu or Lee based on the teachings of Ng identified by the Examiner. First, doing so would change the principle of operation of the bracket 10 of Ng. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 813 (C.C.P.A. 1959); MPEP §2143.01.

In the Ng reference, the principle of operation of bracket 10 is not intended for hanging something else from an article (*e.g.*, 500). Rather, the reverse is true—the bracket 10 is made for holding an article 500 to a wall. *See* Ng at Abstract and FIGS. 8-16A. There is no teaching or motivation in the Zhu, Lee, or Ng references to change the principle of operation of the Ng bracket 10, *i.e.*, to use the bracket 10 to *hang items from the article 500* rather than using the bracket to *hang the article 500 from*

something else (*e.g.*, a wall). Accordingly, the modification proposed by the Examiner would not have been obvious because modifying the usage of bracket 10 as proposed by the Examiner would change the basic principle of operation of the bracket 10 from its intended function to a completely different function.

Section 103 Rejections – Proposed combination uses non-analogous art

It also would not have been obvious to combine a picture-hanging bracket of Ng with a ladder structure of Zhu or Lee because picture-hanging brackets are non-analogous art to ladders. In order for a reference to be proper for use in an obviousness rejection under 35 U.S.C. §103, the reference must be "analogous" art to the claimed invention. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004); MPEP §2141.01(a). A reference is analogous art to a claimed invention only if: (1) the reference is from the same field of endeavor as the claimed invention (even if it addresses a different problem); or (2) the reference is reasonably pertinent to the problem faced by the inventor (even if it is not in the same field of endeavor as the claimed invention). *Id.*

Claims 1 and 19 recite ladders, so the Ng picture-hanging bracket 10 is not from the same field of endeavor as the claims. Specifically, the bracket 10 is related to a field of endeavor of hanging items from a wall rather than a field of endeavor of ladders (*e.g.*, providing a user with an elevated position) or related hinges. Thus, the Ng reference does not disclose analogous art under part (1) of the *In re Bigio* test because it fails to come from the same field of endeavor as the claimed invention. For at least this reason, the proposed combination of Ng with Zhu or Lee would not have been obvious to a person having ordinary skill in the art, and the Section 103 rejection should be withdrawn.

The Ng reference is also not analogous art because it is not reasonably pertinent to the problems faced by the inventor of the ladder of claims 1 and 19. The second button body or plate structure of claims 1 or 19 address a problem of "receiv[ing] and retain[ing] a thin item such as a spatula, paper, or an end hook portion of a tape measure." Present specification at para. 0078. The bracket 10 of Ng is not pertinent to receiving and retaining tools or papers from a ladder because objects do not hang from the Ng bracket 10. Rather, the reverse is true; the bracket 10 is used to hang something from a wall, as indicated above. Thus, the Ng reference also fails part (2) of the test of *In re Bigio*, and the obviousness rejection is improper because it is based on non-analogous art.

Section 103 Rejections – Proposed combination would not have been predictable

Additionally, even if the Ng bracket 10 *can* be attached to the Zhu or Lee ladders, the mere fact that references *can* be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007) (emphasis added). The alleged button body of Ng (bracket 10) would not have been predictable to use as a "button" body and would not have been predictable to add to the alleged Zhu or Lee button bodies (operating member 42 or press part 508) to "provide for hanging [an] article," despite contention otherwise by the Examiner. Office Action at p. 22. The bracket 10 is configured and intended for "hanging articles on a wall or other mounting surface." Ng at Abstract. A person having ordinary skill in the art would not have found clear and reasonable motivation to modify the Zhu or Lee ladders to mount their ladders to a wall. The hinges (*e.g.*, 51 of Zhu) of a conventional ladder

are not constructed or intended to bear the weight of a ladder, let alone to bear the weight of the ladder from a single small control button (*e.g.*, 42 in Zhu or 508 in Lee) laterally extending from the side of a single hinge. Hanging a ladder from a small control knob (*e.g.*, via bracket 10) would apply high loads to the knob (42/508) and its connected control rod, thereby likely causing damage to the hinge (*e.g.*, bending the operating member 42 shaft of Zhu or axle 6 of Lee). It would not have been reasonably obvious or predictable to modify the ladder in a manner likely to cause damage to the ladder by subjecting a hinge pin to a cantilevered load of the rest of the entire ladder. Thus, it would not have been predictable to add an Ng hanging bracket 10 to the Zhu or Lee ladders even if it were possible to add the bracket 10 to those ladders, and the Section 103 rejection is improper.

Section 103 Rejections – Proposed combinations would be unsuitable for their intended purposes

Also, even if it had been obvious for the proposed modified Zhu or Lee ladders to hang from an added Ng bracket 10, the modification *still* would not have been obvious because the resultant ladders would be rendered unsuitable for their intended purposes. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984); MPEP §2143.01(V). The Ng bracket 10 has a stated intended purpose of receiving and retaining a nail (100) in order to suspend the article 500 against a wall at a predetermined orientation. *See* Ng at FIGS. 8-15C and col. 8, ln. 61 to col. 9, ln. 5. The bracket 10 has a slot opening 50 that needs to remain in a proper orientation

relative to gravity in order for it to serve this purpose. By adding the bracket 10 to an operating member 42 of Zhu (or press part 508 of Lee), the bracket 10 would rotate between various hinge positions because the operating member 42 (or press part 508) also needs to rotate between hinge positions. Rotation of the bracket 10 would rotate the slot opening 50 to positions where it would be unable to serve its purpose of hanging an article (*e.g.,* the Zhu or Lee ladder) from a wall because a nail would slide out of the slot opening 50 if the bracket 10 is not at the correct rotated orientation relative to gravity. In this manner, the proposed combination would not have been obvious because modifying Zhu or Lee in view of Ng would render the modified ladders (each including the bracket 10) unsuitable for hanging on a wall.

Section 103 Rejections – Cited art does not teach or suggest each and every element of claims 1 and 19

Finally, notwithstanding all of the above-indicated arguments, Applicant has amended claim 1 to further define the second button body limitation. The at least one gap spacing the second button body from the first button body is configured to receive an object "hanging from the second button body" (or "hanging from the plate structure") to help identify that the second button body is made to enable *objects* to hang from the second button body rather than to enable the *ladder* to hang from the second button body. A person having ordinary skill in the art would not turn to the Ng bracket 10 to add a button body/plate structure to a body/button body to create a gap to receive an object/tool hanging from the bracket 10 because the bracket 10 is not intended to receive or support other objects hanging from it when it is attached to an article 500. Accordingly, the Section 103 rejection should be withdrawn.

Furthermore, with respect to claim 19, the alleged body (508 of Lee) does not have a body surface having an entirely flat portion with the alleged plate structure (bracket 10 of Ng) 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. Also, the alleged at least one elongated gap of the proposed combination is not parallel to an entirely flat portion of the alleged body surface. Instead, Lee discloses a bump on the center of the alleged body surface (*i.e.*, the outer face of press part 508). *See* Lee at FIGS. 3-5. The bumped surface does not have an "entirely flat portion" that would meet the limitations of claim 19 when a bracket 10 of Ng is integrated with the surface.

For at least these reasons, the cited references do not teach or suggest every limitation of the rejected claims. Applicant therefore respectfully requests withdrawal of the Section 102 and 103 rejections of claims 1 and 19 and any claims dependent upon them.

Conclusion

For at least the foregoing reasons, Applicant believes that each of the presently pending claims in this application is in immediate condition for allowance. Accordingly, Applicant respectfully requests a favorable action on the merits. If the Examiner has any further comments or suggestions, Applicant invites the Examiner to contact the undersigned attorney to expedite the handling of this matter.

Applicant expressly disclaims all arguments, representations, and/or amendments presented or contained in any other patent or patent application, including any patents or patent applications claimed for priority purposes by the present application or any patents or patent applications that claim priority to this patent application. Moreover,

all arguments, representations, and/or amendments presented or contained in the present patent application are only applicable to the present patent application and should not be considered when evaluating any other patent or patent application.

The Commissioner is hereby authorized to charge any additional fees which may be required for this application, or credit any overpayment, to Deposit Account No. 506181. If any extensions of time are needed for timely acceptance of these documents, such an extension is hereby requested and payment of any such extension fees is authorized from Deposit Account No. 506181.

Respectfully submitted,

DORSEY & WHITNEY LLP
Customer No. 145730

Date: 12 March 2024

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Docket No.: P298048.US.03 (506318-576)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Maxfield, B. Scott		
Appln. No.:	18/490,715	Confirmation No.:	5970
Filing Date:	19 October 2023	Examiner:	Mekhaeil, Shiref M.
Title:	Multifunction Button For Ladder Adjustment	Group Art Unit:	3634

RESPONSE AFTER NON-FINAL OFFICE ACTION

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

This responds to the Office Action dated 12 December 2023. Please enter the following amendments and remarks:

Amendments to the Specification begin on page 2 of this document.

Amendments to the Claims are shown in the Listing of Claims beginning on page 4 of this document.

Remarks begin on page 10 of this document.

AMENDMENTS TO THE SPECIFICATION

Please amend paragraphs 0059, 0066, and 0078 of the specification as set forth below in marked-up form:

[0059] The articulating ladder 100 also includes a second rail assembly 114 that includes an inner assembly slidably coupled with an outer assembly. The inner assembly includes a pair of rails 111 coupled with a plurality of rungs and is configured similar to the inner assembly of the first rail assembly described above. Likewise, the outer assembly includes a pair of rails 113 coupled with a plurality of rungs and is configured similar to the outer assembly of the first rail assembly described hereinabove. Locking mechanisms 124 may be associated with inner and outer assemblies and to enable selective positioning of the inner assembly relative to the outer assembly as described above with respect to the first rail assembly 102. In some embodiments, the locking mechanisms 124 (or 112) may be adjustment mechanisms used to adjustably retain components to the ladder 100, such as accessories, tools, and other apparatuses. Locking mechanisms 124 (or 112) can therefore be referred to as "retainers" herein. Thus, the locking mechanisms may be used for purposes other than locking rails or hinges and may be used to adjust the positioning of components on the ladder.

***

[0066] Thus, as shown in the front plan view of FIG. 3A, the hinge mechanism 126 can have a locked position (*e.g.*, a first axial position on an axis of rotation, *e.g.*, axis 135) in which the locking pins (e.g., 146, 148) extend through the locking apertures (e.g., 150, 152) and thereby prevent the rail plates 134 associated with the

first assembly 102 from rotating relative to the rail plates 132 associated with the second assembly 114. As shown in FIG. 3B, the hinge mechanism 126 can be laterally/axially transitioned to an unlocked position (*e.g.*, a second axial position on the axis of rotation, *e.g.*, 135) in which the locking pins 146, 148 are removed from the locking apertures 150, 152 (or at least from the locking apertures in the central rail plates 132 and the laterally outermost rail plate 134, e.g., similar to the pins in U.S. Pat. No. 4,407,045), thereby allowing rotation of the first rail plates 132 relative to the second rail plates 134 about an axis of rotation 135 (i.e., a pivot axis or hinge axis) extending centrally through the shaft of the pivot pin 128.

***

[0078] In some embodiments, the button plate 140 can be included on the laterally outward side 156 of the button body 138. A portion of the button plate 140 (e.g., a middle or central portion) can be spaced away from the axially-facing surface 156, as clearly shown in FIGS. 14-15 . A gap 216 between the button plate 140 and the button body 138 can receive and retain a thin item such as a spatula, paper, or an end hook portion of a tape measure. Thus, in some embodiments, a hinge mechanism 126 having a button body 138 and a button plate 140 can be referred to as a "retainer" herein, and pairs of such structures (*i.e.*, hinge mechanisms 126) can be referred to as pairs of retainers.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) 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~~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.

2. (Original) 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;

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

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;

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;

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

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.

3. (Currently Amended) The ladder of claim 1, wherein

the second button body comprises a substantially flat outward-facing surface parallel to the first button body~~; and~~

~~the at least one gap is sized and shaped to hang the object from the second button body~~.

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

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

6. (Original) The ladder of claim 1, wherein the at least one gap includes two open ends.

7. (Original) 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.

8. (Original) 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.

9. (Original) The ladder of claim 1, wherein the second button body defines a surface facing axially inward toward the pair of hinges and substantially parallel to the first button body.

10. (Original) The ladder of claim 1, wherein the object is supportable by the second button body by hanging on the second button body while at least partially positioned in the at least one gap.

11. (Currently Amended) The ladder of claim 1, wherein the second button body comprises a plate ~~shape~~.

12. (Withdrawn) A button for a locking mechanism, the button comprising:

a button body including a first button body portion and a second button body portion;

a pivot pin coupled with the first button body portion and extending away from the button body; and

a biasing member operable to apply a biasing force to the button body, wherein the biasing force is configured to oppose a force applied to the button body opposite the pivot pin;

wherein the second button body portion includes a width portion and at least two side portions, the at least two side portions connecting the width portion to

the first button body portion, wherein the second button body portion and the first button body portion define an opening.

13. (Withdrawn) The button of claim 12, wherein the second button body portion and the first button body portion are integrally formed as a single piece.

14. (Withdrawn) The button of claim 12, wherein the opening opens radially outward in a first direction.

15. (Withdrawn) The button of claim 14, wherein the opening opens radially outward in a second direction opposite the first direction.

16. (Withdrawn) The button of claim 12, wherein the at least two side portions are coupled to the first button body portion at opposite lateral ends of the width portion.

17. (Withdrawn) The button of claim 12, further comprising:

a bracket coupled with the pivot pin; and

a pair of locking pins coupled with the bracket and oriented substantially parallel to the pivot pin.

18. (Withdrawn) The button of claim 12, wherein the second button body portion comprises a plate shape connected to an opposite side of the first button body portion relative to the pivot pin.

19. (Currently Amended) 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 movable between a set of first axial positions along the pivot axis and a set of second axial positions 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 set of 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 set of second axial positions and the at least one locking pin is positioned in the first opening and in the second opening.

20. (Original) The ladder of claim 19, 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.

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 18/490,715	Filing Date 10/19/2023	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	03/12/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $480 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/SHANDA E ROSS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/490,715	10/19/2023	B. Scott Maxfield	P298048US03 (506318-576)

CONFIRMATION NO. 5970

153511
Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176

PUBLICATION NOTICE

OC000000068074439

Date Mailed: 02/08/2024

Title:MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Publication No.US-2024-0044206-A1
Publication Date:02/08/2024

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/490,715	10/19/2023	B. Scott Maxfield	P298048US03 (506318-576)	5970

153511 7590 12/12/2023

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Salt Lake City, UT 84111-2176

EXAMINER	
MEKHAEIL, SHIREF M	

ART UNIT	PAPER NUMBER
3634	

NOTIFICATION DATE	DELIVERY MODE
12/12/2023	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

davis.ashley@dorsey.com
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mayo.samantha@dorsey.com

Office Action Summary	Application No. 18/490,715	Applicant(s) Maxfield et al.	
	Examiner SHIREF M MEKHAEIL	Art Unit 3634	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 10/19/2023.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☑ An election was made by the applicant in response to a restriction requirement set forth during the interview on 30 November 2023; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) 12-18 is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-11 and 19-20 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☑ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 10/19/2023 is/are: a)☐ accepted or b)☑ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Election/Restriction

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-11 and 19-20, drawn to "A ladder", classified in E06C1.

II. Claims 12-18, drawn to "A button for a locking mechanism", classified in E06C7, E06C79.

The inventions are independent or distinct, each from the other because:

Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the ladder of claims 1 and 19 do not require a button that comprises a biasing member operable to apply a biasing force to the button body, wherein the biasing force is configured to oppose a force applied to the button body opposite the pivot pin. The subcombination has separate utility such as being used on a locking mechanism between two longitudinal members of a scaffold, tent erecting members, two portions of a troller, etc. as none limiting examples; not necessarily between assemblies of a ladder.

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The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Restriction for examination purposes as indicated is proper because all the inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and/or examination burden if restriction were not required because one or more of the following reasons apply:

The invention requires a different field of search (e.g., searching different classes/subclasses or electronic resources, or employing different search strategies or search queries). In this case, see the different class/subclass picture provided above as examples of a burdensome search created without restriction.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of an invention to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected invention**.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly

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and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103 or pre-AIA 35 U.S.C. 103(a) of the other invention.

During a telephone conversation with attorney Richard Galati on 11/29/2023 a provisional election was made without traverse to prosecute the invention of group I, claims 1-11 and 19-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 12-18 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancelation of claims to a non-elected invention, the inventorship must be corrected in compliance with 37 CFR 1.48(a) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. A request to correct inventorship under 37 CFR 1.48(a) must be accompanied by an application data sheet in accordance with 37 CFR 1.76 that

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identifies each inventor by his or her legal name and by the processing fee required under 37 CFR 1.17(i).

The examiner has required restriction between product or apparatus claims and process claims. Where applicant elects claims directed to the product/apparatus, and all product/apparatus claims are subsequently found allowable, withdrawn process claims that include all the limitations of the allowable product/apparatus claims should be considered for rejoinder. All claims directed to a nonelected process invention must include all the limitations of an allowable product/apparatus claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product/apparatus claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product/apparatus are found allowable, an otherwise proper restriction requirement between product/apparatus claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product/apparatus claim will not be rejoined. See MPEP § 821.04. Additionally, in order for rejoinder to occur, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product/apparatus claims. **Failure to do so may result in no rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply

where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP § 2146 *et seq.* for

applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The filing of a terminal disclaimer by itself is not a complete reply to a nonstatutory double patenting (NSDP) rejection. A complete reply requires that the terminal disclaimer be accompanied by a reply requesting reconsideration of the prior Office action. Even where the NSDP rejection is provisional the reply must be complete. See MPEP § 804, subsection I.B.1. For a reply to a non-final Office action, see 37 CFR 1.111(a). For a reply to final Office action, see 37 CFR 1.113(c). A request for reconsideration while not provided for in 37 CFR 1.113(c) may be filed after final for consideration. See MPEP §§ 706.07(e) and 714.13.

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The actual filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/apply/applying-online/eterminal-disclaimer.

Claim 1 is provisionally rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1 and 15 of co-pending Application No. 18/324,971. Although the claims at issue are not identical, they are not patentably distinct from each other as shown below:

Instant App '715	Co-pending App '971
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	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 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	at least one retainer … a body; and a support arm coupled with and extending from the body. + 15. a top surface of the body comprises <u>at least one aperture</u> extending perpendicular to the pivot axis. It would have been obvious to use a retainer

	Note that, as recited in the instant application where the first and second button bodies are integral; examiner presents that the aperture in the body of claim 15 of the co-pending application is equivalent to said gap of App 715 while portion on one side of the aperture is considered the first button body and the portion of the body to the other side of the aperture is the second button body.

The difference between the current application and the co-pending application 18/324,971 is that the current application recites "*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*", while the reference application recites one retainer with the aperture splitting it into two bodies as described in Note above, it would have been obvious to a person of ordinary skill in the art before the effective filing date of the claimed invention to utilize two retainers, one on each connection between the respective legs of the first and second ladder assemblies where both pairs of respective legs are hinged, at least to provide for the predictable advantage of balancing the ladder and the wear and tear on the hinges during folding and unfolding of the ladder.

This is a provisional nonstatutory double patenting rejection because the patentably indistinct claims have not in fact been patented.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "**object**" as recited in claim 10, "**a pair of retainers**", "**a set of first axial positions**" and "**a set of second axial positions**" as recited in claim 19 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Note that the drawings as well as the specification do not illustrate or explain more than one first and one second axial position.

There is not reference numeral for a retainer to be found in the specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

The specification does not provide antecedent basis for: "a set of first axial positions" and "a set of second axial positions" as recited in claim 19.

Claim Objections

Claims 3 and 19 are objected to because of the following informalities:

- Claim 3 recites "the at least one gap is sized and shaped to hang the object from the second button body"; objection is due to that it appears that the claim is limiting a positively recited limitation i.e., "the at least one gap" by a non-positively recited limitation i.e., the "object". Since the "object" is only recited/established in intended use form, this limitation will be interpreted such that the at least one gap has a sized and a shaped capable to hang the object from the second button body.
- Claim 19 recites "a pair of retainers movable between a set of first axial positions along the pivot axis and a set of second axial positions along the pivot axis; wherein each retainer of the pair of retainers includes: a body

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having …"; as best understood as described in the claim, the retainers are the same as the hinge button assemblies, especially with the presence of the limitation: "*wherein the plate structure is spaced axially outward from the body surface by at least one elongated gap*". Consistent nomenclature is required throughout the claims.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 11 is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

- Claim 11 recites "the second button body comprises a plate shape"; indefiniteness arises because there is no standard in the industry nor a separate definition in the disclosure of what constitutes a "plate shape".

Claim Rejections - 35 USC § 102

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any

correction of the statutory basis (i.e., changing from AIA to pre-AIA) for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (a)(2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

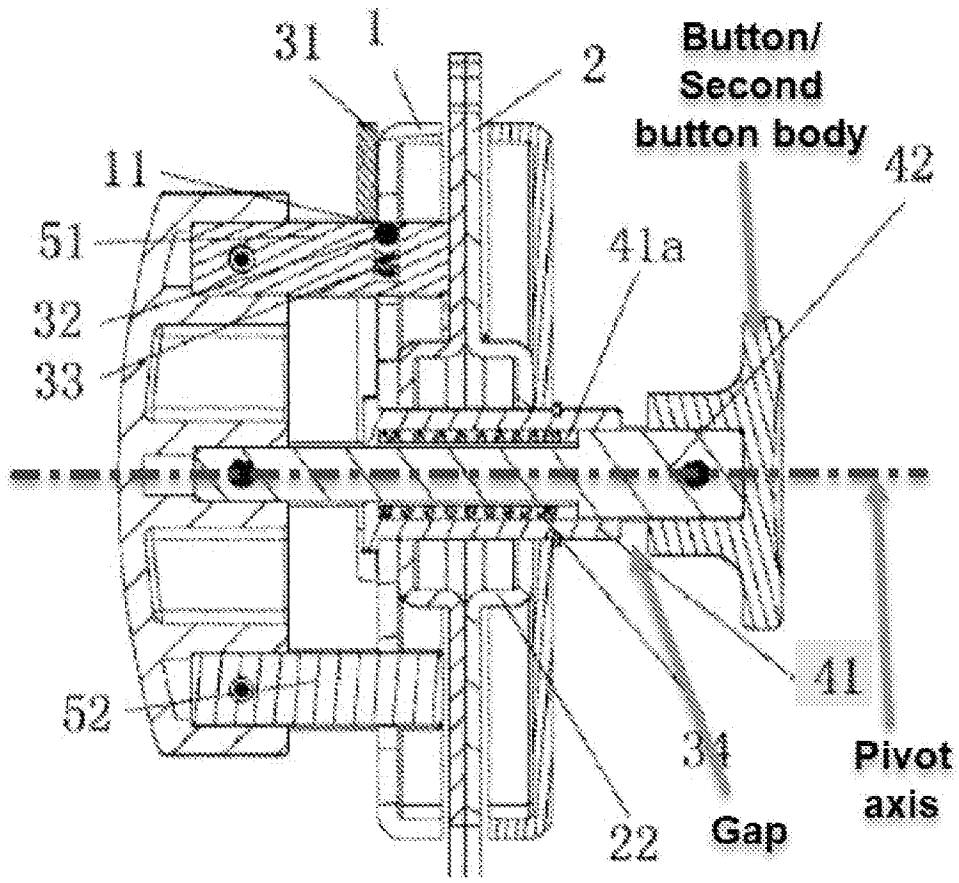
Claim 1 is rejected under 35 U.S.C. 102(a)(2) as being anticipated by ZHU, US (2023/0008962).

In regards to claim 1 ZHU discloses:

A ladder (paragraph [0023], [0024]; see excerpt below)**, comprising: a first assembly** (the one ladder; paragraph [0023])**, including: a first pair of rails** (two ladder legs 62; fig. 4 as described in paragraph [0024]) **spaced apart from each other** (standard ladder)**; a first set of rungs** (steps 61; fig. 4; paragraph [0024]) **coupled to and extending between the first pair of rails** (each step 61 connected to ladder legs 62; fig. 4; paragraph [0024])**; a first pair of hinge portions** (first rotating member 1; fig. 1) **coupled to the first pair of rails** (paragraph [0023])**; a second assembly** (the other ladder; paragraph [0023])**, including: a second pair of rails** (two ladder legs 62; fig. 4 as described in paragraph [0024]) **spaced apart from each other** (standard ladder)**; a second pair of hinge portions** (second rotating member 2; fig. 1) **coupled to the second pair of rails** (paragraph [0023])**; 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** (two rotation control mechanisms; fig. 1) **rotatable about a pivot axis**

(axis passing through shaft of member 42; fig. 2; see annotated drawings)**; and a pair of hinge button assemblies** (cap of member 42; see annotated drawings)**, wherein each hinge button assembly of the pair of hinge button assemblies includes: a first button body** (41) **coupled with a hinge of the pair of hinges** (fig. 2, 3)**; and a second button body** (outer cap see annotated drawings below) **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** (such as a clipping to by hanging on central shaft 42, a sheet metal clip, a zip tie, etc.)**.**

> **[0023]** Another technical solution adopted by the invention to fulfill the above objective is as follows: a folding ladder comprises two ladders, and two rotation control mechanisms for a folding ladder, wherein a top of one ladder is connected to the first rotating member, and a top end of the other ladder is connected to the second rotating member.
>
> **[0024]** Wherein, each ladder comprises steps and two ladder legs, wherein two ends of each step are connected to the ladder legs, and the steps are hollow isosceles trapezoid profiles.



Claim Rejections - 35 USC § 102/103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Lee, US (2003/0037412) or, in the alternative, under 35 U.S.C. 103 as obvious over Lee.

In regards to claim 1 Lee discloses:

A ladder (collapsible ladder as described in summary of invention)**, comprising: a first assembly** (per the standard structure of collapsible ladders utilizing the hinge assembly shown in fig. 3)**, including: a first pair of rails** (standard structure of collapsible ladders) **spaced apart from each other; a first set of rungs coupled to and extending between the first pair of rails** (standard structure of collapsible ladders)**; a first pair of hinge portions** (200; with the structure shown in fig. 3 taught at top of each rail of each section of the collapsible ladder, hence making a pair) **coupled to the first pair of rails; a second assembly, including: a second pair of rails** (standard structure of collapsible ladders) **spaced apart from each other; a second pair of hinge portions** (300; with the structure shown in fig. 3 taught at top of each rail of each section of the collapsible ladder, hence making a pair) **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** (pivoting around central axis shown in fig. 3) **to form a pair of hinges** (hinge assembly; fig. 3) **rotatable about a pivot axis**

(central axis; fig. 3; see annotated drawings below)**; and a pair of hinge button assemblies** (500; including 508, 506, 504, 502, 520, 540)**, wherein each hinge button assembly of the pair of hinge button assemblies includes: a first button body** (540) **coupled with a hinge of the pair of hinges (as shown in figs. 3, 4, 5); and a second button body** (508) **coupled with the first button body and spaced axially outward** (at least in the position shown in fig. 4) **from the first button body by at least one gap** (see annotated drawings) **configured to receive an object** (such as a clipping to by hanging on central shaft, a sheet metal clip, a zip tie, etc.).

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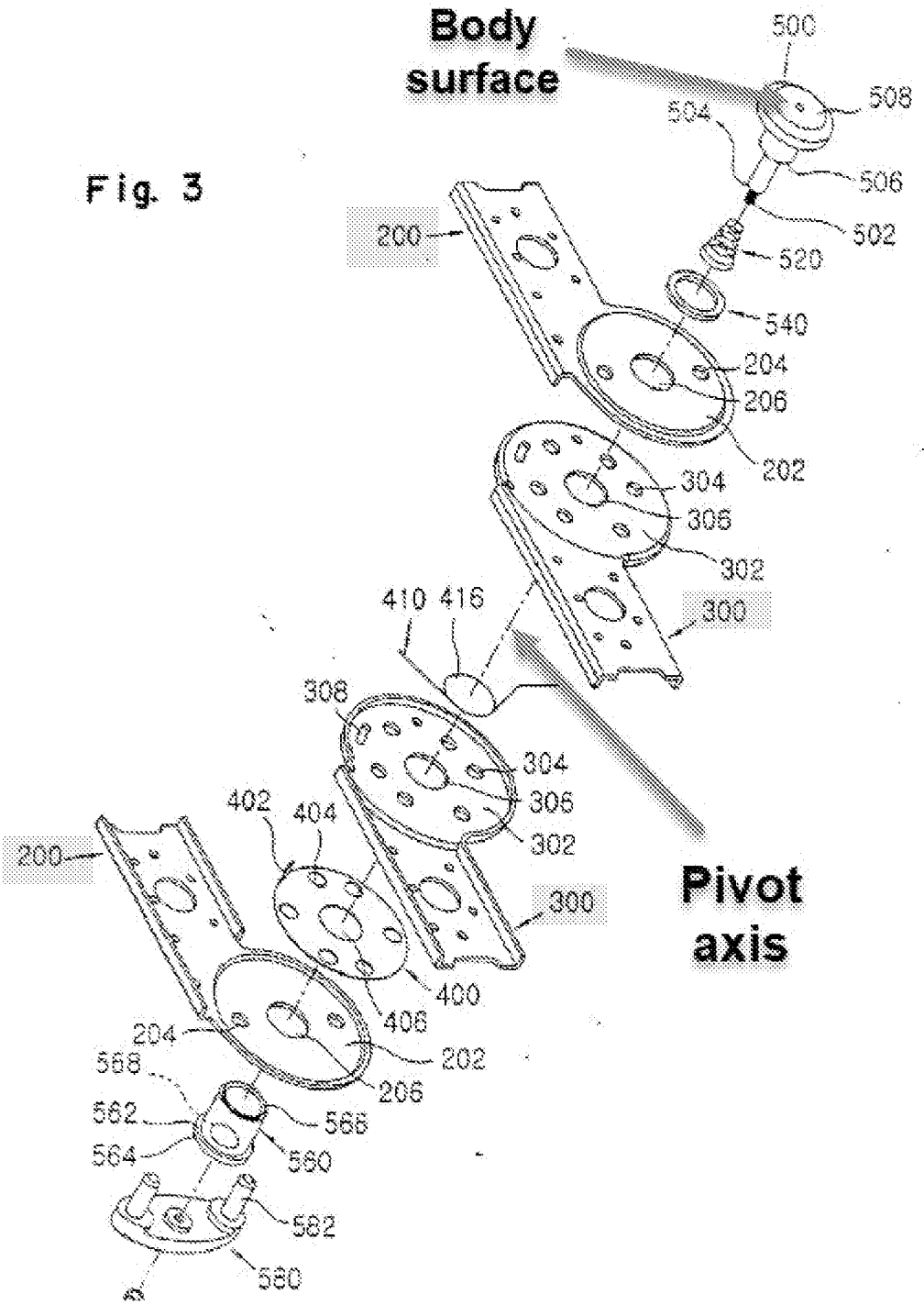
Fig. 3



If it was found that the collapsible ladder of Lee does not exhibit the limitations of the first and second assemblies with spaced rails and rungs between the first pair of rails, examiner takes Official Notice that collapsible ladder attached at the top of the

sections with hinges such as the ones shown in fig. 3 of Lee are known to have two sets of pairs of rails with rungs extending between at least one/first pair of rails.

In regards to claim 2 Lee discloses the pair of hinge button assemblies (shown in fig. 3-5) is movable between a first axial position (position in fig. 4) along the pivot axis and a second axial position (position in fig. 5) along the pivot axis; the first assembly is rotatable relative to the second assembly while the pair of hinge button assemblies is in the first axial position (paragraph [0006]; see highlighted excerpt below); 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 (paragraph [0006]; see highlighted excerpt below); each hinge button assembly further comprises a pivot pin (either of 502/504/506) coupled to the first button body (as shown in fig. 3), a bracket (580) coupled to the pivot pin (as shown in fig. 3), and at least one locking pin (582) coupled to the bracket (fig. 3); the first pair of hinge portions includes a first opening (204) and the second pair of hinge portions includes a second opening (304); 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 (fig. 5); 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 (fig. 4).

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[0006] To accomplish the above object of the present invention, a hinge for collapsible ladders, includes an external frame including a center aperture and a pair of locking apertures; an inner frame including a center aperture and a plurality of pairs of locking apertures, the inner frame being rotatably movable relative to the external frame around the center apertures; a rotary plate rotatably disposed between the inner frame and the external frame and having locking apertures therein; a substantially flat rotary spring having one end mounted to the inner frame and an opposite end mounted to the rotary plate to impart a turning force to the rotary plate; a hub member rotatably connecting the inner frame and the external frame about the center apertures, and supporting the frames, the hub member including a locking end at one side thereof; a locking part having a locking end for extension into the locking apertures of the external and inner frames to fix an angle of the inner frame and the external frame relative to each other; a press axle connected with the locking part and passing through the hub member, the press axle including a spring bearing end; and a spring positioned between the locking end of the hub member and the bearing end of the press axle.

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis (i.e., changing from AIA to pre-AIA) for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have

> been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 3-11 are rejected under 35 U.S.C. 103 as being unpatentable over Lee, US (2003/0037412) in view of Ng, US (11191373).

In regards to claim 1 Lee *(under an **alternative interpretation** of reference Lee)* discloses:

A ladder (collapsible ladder as described in summary of invention)**, comprising: a first assembly** (per the standard structure of collapsible ladders utilizing the hinge assembly shown in fig. 3)**, including: a first pair of rails** (standard structure of collapsible ladders) **spaced apart from each other; a first set of rungs coupled to and extending between the first pair of rails** (standard structure of collapsible ladders)**; a first pair of hinge portions** (200; with the structure shown in fig. 3 taught at top of each rail of each section of the collapsible ladder, hence making a pair) **coupled to the first pair of rails; a second assembly, including: a second pair of rails** (standard structure of collapsible ladders) **spaced apart from each other; a second pair of hinge portions** (300; with the structure shown in fig. 3 taught at top of each rail of each section of the collapsible ladder, hence making a pair) **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** (pivoting around central axis shown in fig. 3) **to form a pair of hinges** (hinge assembly; fig. 3) **rotatable about a pivot axis** (central axis; fig. 3; see annotated drawings below)**; and a pair of hinge button assemblies** (500; including 508, 506, 504, 502, 520, 540)**, wherein each hinge button**

assembly of the pair of hinge button assemblies includes: a first button body (508) **coupled with a hinge of the pair of hinges (fig. 3).**

If it was found that the collapsible ladder of Lee does not exhibit the limitations of the first and second assemblies with spaced rails and rungs between the first pair of rails, examiner takes Official Notice that collapsible ladder attached at the top of the sections with hinges such as the ones shown in fig. 3 of Lee are known to have two sets of pairs of rails with rungs extending between at least one/first pair of rails.

In regards to claim 1 Lee does not disclose a second button body.

Ng teaches **a second button body** (10; fig. 1)**.**

Therefore, before the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to teach the second button body taught by Ng onto the hinge button assembly of Lee for the predictable result with reasonable expectation of success and following the teaching of Ng to provide for hanging article. One 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, phone clip, a clip attached to a tool, ID card etc. as non-limiting examples. The teaching of the bracket (second button body) of Ng onto the first button body of Lee consequently teaches the second button body **coupled with the first button body (via apertures 35, 45 of 10; Ng) and spaced axially outward from the first button body by at least one gap** (resulting from the raised center portion 20 of bracket 10; Ng) **configured to receive an object**.

In regards to claim 3 Lee as modified by Ng teaches the second button body comprises a substantially flat outward-facing surface (24; Ng) parallel to the first button

body (once taught onto button of Lee); and the at least one gap is sized and shaped to hang the object from the second button body (such as a thin sheet metal clip).

In regards to claim 4 Lee as modified by Ng do not teaches the second button body is integrally formed with the first button body. However, it would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to have the second button body integrally formed with the first button body, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. Howard v. Detroit Stove Works, 150 U.S. 164 (1893). One of ordinary skill in the art before the effective filing date of the claimed invention would have found that having the second button body integrally formed with the first button body would have yielded the predictable result of a more study structure less prone to breaking, cracking with repetitive use over time in a work environment.

In regards to claim 5 Lee as modified by Ng teaches the at least one gap forms a slot elongated along a direction perpendicular to the pivot axis (when bracket 10 of Ng is taught onto the outer surface of the outer button portion of 508 of Lee; gap formed as a result of central raised section 20 of bracket 10).

In regards to claim 6 Lee as modified by Ng teaches the at least one gap includes two open ends (top and bottom).

In regards to claim 7 Lee as modified by Ng teaches the at least one gap at least opens upward (upper opening) while the pair of hinges is positioned over the first pair of rails and the second pair of rails.

In regards to claim 8 Lee as modified by Ng teaches the second button body is directly coupled to the first button body at opposite ends of the second button body (apertures 35, 45; Ng).

In regards to claim 9 Lee as modified by Ng teaches the second button body (10; Ng) defines a surface (25) facing axially inward toward the pair of hinges and substantially parallel to the first button body (once taught onto first button body of Lee).

In regards to claim 10 Lee as modified by Ng teaches the object is supportable by the second button body by hanging on the second button body while at least partially positioned in the at least one gap (small tools, phone clip, a clip attached to a tool, ID card as non-limiting examples; claim is further limiting non-positively claimed intended use limitation i.e., object).

In regards to claim 11 Lee as modified by Ng teaches the second button body comprises a plate shape (fig. 1; Ng).

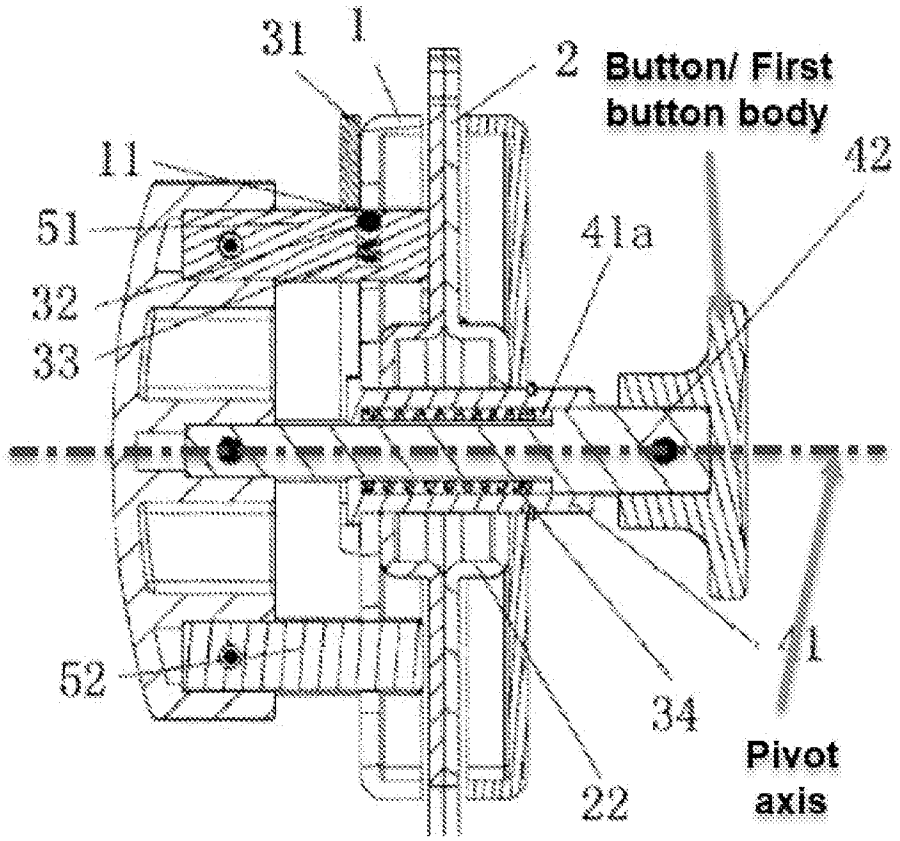
Claims 1-11 are further rejected under 35 U.S.C. 103 as being unpatentable over ZHU, US (2023/0008962) in view of Ng, US (11191373).

In regards to claim 1 ZHU *(under an **alternative interpretation** of reference ZHU)* discloses:

A ladder (paragraph [0023], [0024]; see excerpt below)**, comprising: a first assembly** (the one ladder; paragraph [0023])**, including: a first pair of rails** (two ladder legs 62; fig. 4 as described in paragraph [0024]) **spaced apart from each other** (standard ladder)**; a first set of rungs** (steps 61; fig. 4; paragraph [0024]) **coupled to and extending between the first pair of rails** (each step 61 connected to ladder legs 62; fig. 4; paragraph [0024])**; a first pair of hinge portions** (first rotating member 1; fig.

1) **coupled to the first pair of rails** (paragraph [0023])**; a second assembly** (the other ladder; paragraph [0023])**, including: a second pair of rails** (two ladder legs 62; fig. 4 as described in paragraph [0024]) **spaced apart from each other** (standard ladder)**; a second pair of hinge portions** (second rotating member 2; fig. 1) **coupled to the second pair of rails** (paragraph [0023])**; 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** (two rotation control mechanisms; fig. 1) **rotatable about a pivot axis** (axis passing through shaft of member 42; fig. 2; see annotated drawings)**; and a pair of hinge button assemblies** (cap of member 42; see annotated drawings)**, wherein each hinge button assembly of the pair of hinge button assemblies includes: a first button body** (see annotated drawings) **coupled with a hinge of the pair of hinges (fig. 1, 2).**

> **[0023]** Another technical solution adopted by the invention to fulfill the above objective is as follows: a folding ladder comprises two ladders, and two rotation control mechanisms for a folding ladder, wherein a top of one ladder is connected to the first rotating member, and a top end of the other ladder is connected to the second rotating member.
>
> **[0024]** Wherein, each ladder comprises steps and two ladder legs, wherein two ends of each step are connected to the ladder legs, and the steps are hollow isosceles trapezoid profiles.



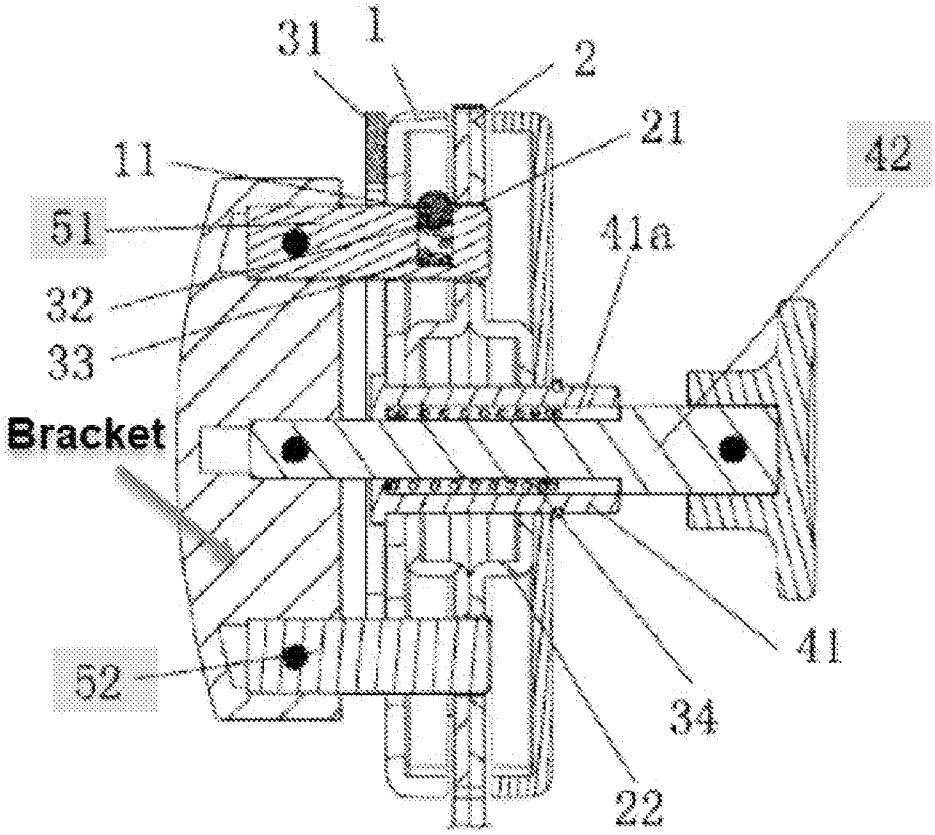
In regards to claim 1 ZHU does not disclose a second button body.

Ng teaches **a second button body** (10; fig. 1)**.**

Therefore, before the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to teach the second button body taught by Ng onto the hinge button assembly of ZHU for the predictable result with reasonable expectation of success and following the teaching of Ng to provide for hanging article. One 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, phone clip, a clip attached to a tool, ID card etc. as non-limiting examples. The teaching of the bracket (second button body) of Ng onto the first button body of ZHU consequently teaches the second button body **coupled with the first button body (via apertures 35, 45 of 10; Ng) and spaced axially outward from the**

first button body by at least one gap (resulting from the raised center portion 20 of bracket 10; Ng) **configured to receive an object**.

In regards to claim 2 ZHU discloses the pair of hinge button assemblies (42) is movable between a first axial position (position in fig. 3) along the pivot axis and a second axial position (position in fig. 2) along the pivot axis; the first assembly is rotatable relative to the second assembly while the pair of hinge button assemblies is in the first axial position (when first and second locking pins 51 and 52 are retracted; fig. 3); 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 (when first and second locking pins 51 and 52 are extended; fig. 2); each hinge button assembly further comprises a pivot pin (central shaft of 42) coupled to the first button body (as shown in figs. 2, 3), a bracket (left hand side bracket holding locking pins 51, 52; see annotated drawings below) coupled to the pivot pin (as shown in figs. 2, 3), and at least one locking pin (51, 52) coupled to the bracket (figs. 2, 3); the first pair of hinge portions includes a first opening (opening in portion 1 through which 51, 52 passes as shown in fig. 2, 3) and the second pair of hinge portions includes a second opening (21); 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 (fig. 2); 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 (fig. 3).



In regards to claim 3 ZHU as modified by Ng teaches the second button body comprises a substantially flat outward-facing surface (24) parallel to the first button body (once taught onto button of ZHU); and the at least one gap is sized and shaped to hang the object from the second button body (such as a thin sheet metal clip).

In regards to claim 4 ZHU as modified by Ng do not teaches the second button body is integrally formed with the first button body. However, it would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to have the second button body integrally formed with the first button body, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. Howard v. Detroit Stove Works, 150 U.S. 164 (1893). One of ordinary skill in the art before the effective filing date of the claimed invention would have found that having the second

button body integrally formed with the first button body would have yielded the predictable result of a more study structure less prone to breaking, cracking with repetitive use over time in a work environment.

In regards to claim 5 ZHU as modified by Ng teaches the at least one gap forms a slot elongated along a direction perpendicular to the pivot axis (when bracket 10 of Ng is taught onto the outer surface of the outer button portion of 42 of ZHU; gap formed as a result of central raised section 20 of bracket 10).

In regards to claim 6 ZHU as modified by Ng teaches the at least one gap includes two open ends (top and bottom).

In regards to claim 7 ZHU as modified by Ng teaches the at least one gap at least opens upward (upper opening) while the pair of hinges is positioned over the first pair of rails and the second pair of rails.

In regards to claim 8 ZHU as modified by Ng teaches the second button body is directly coupled to the first button body at opposite ends of the second button body (apertures 35, 45; Ng).

In regards to claim 9 ZHU as modified by Ng teaches the second button body (10; Ng) defines a surface (25) facing axially inward toward the pair of hinges and substantially parallel to the first button body (once taught onto first button body of ZHU).

In regards to claim 10 ZHU as modified by Ng teaches the object is supportable by the second button body by hanging on the second button body while at least partially positioned in the at least one gap (small tools, phone clip, a clip attached to a tool, ID card as non-limiting examples; further limiting non-positively claimed intended use limitation i.e., object).

In regards to claim 11 ZHU as modified by Ng teaches the second button body comprises a plate shape (fig. 1; Ng).

Claims 19-20 are rejected under 35 U.S.C. 103 as being unpatentable over Lee, US (2003/0037412) in view of Ng, US (11191373).

In regards to claim 19 Lee discloses:

A ladder (collapsible ladder as described in summary of invention)**, comprising: a first assembly** (per the standard structure of collapsible ladders utilizing the hinge assembly shown in fig. 3)**, including: a first pair of rails** (standard structure of collapsible ladders) **spaced apart from each other; a first set of rungs coupled to and extending between the first pair of rails** (standard structure of collapsible ladders)**; a first pair of hinge portions** (200; with the structure shown in fig. 3 taught at top of each rail of each section of the collapsible ladder, hence making a pair) **coupled to the first pair of rails; a second assembly, including: a second pair of rails** (standard structure of collapsible ladders) **spaced apart from each other; a second pair of hinge portions** (300; with the structure shown in fig. 3 taught at top of each rail of each section of the collapsible ladder, hence making a pair) **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** (pivoting around central axis shown in fig. 3) **to form a pair of hinges** (hinge assembly; fig. 3) **rotatable about a pivot axis** (central axis; fig. 3; see annotated drawings below)**; and a pair of retainers** (500; including 508, 506, 504, 502, 520, 540) **movable between a set of first axial positions** (interpreted such that the set of first axial positions are the first axial positions attained by each retainer i.e., the set = two positions, one for each retainer; position in

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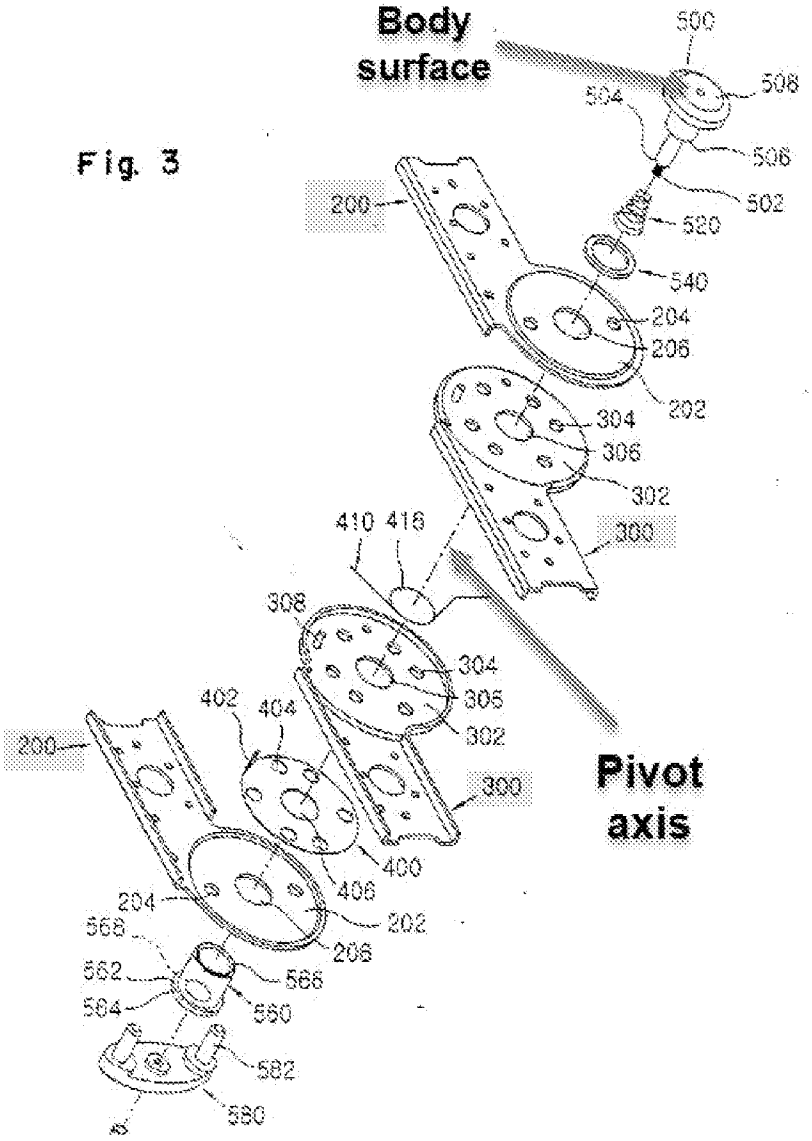
fig. 4; set being the position on the hinge between the other pair of rails) **along the pivot axis (figs. 3-5) and a set of second axial positions** (interpreted such that the set of first axial positions are the first axial positions attained by each retainer i.e., the set = two positions, one for each retainer; position in fig. 5; set being the position on the hinge between the other pair of rails) **along the pivot axis; wherein each retainer of the pair of retainers includes: a body** (508) **having a body surface** (see annotated drawings) **facing axially outward from the pair of hinges** (figs. 3-5)**; a pivot pin** (502/504/506) **coupled to the body** (fig. 3)**; a bracket** (580) **coupled to the pivot pin** (as shown in fig. 3)**; and at least one locking pin** (582) **coupled to the bracket; wherein the first assembly is rotatable relative to the second assembly** (paragraph [0006]; see highlighted excerpt below) **while the pair of retainers is in the set of first axial positions** (fig. 4) **and the at least one locking pin is removed from the first opening and from the second opening** (fig. 4)**; 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 set of second axial positions** (fig. 5) **and the at least one locking pin is positioned in the first opening and in the second opening** (fig. 5).

If it was found that the collapsible ladder of Lee does not exhibit the limitations of the first and second assemblies with spaced rails and rungs between the first pair of rails, examiner takes Official Notice that collapsible ladder attached at the top of the sections with hinges such as the ones shown in fig. 3 of Lee are known to have two sets of pairs of rails with rungs extending between at least one/first pair of rails.

[0006] To accomplish the above object of the present invention, a hinge for collapsible ladders, includes an external frame including a center aperture and a pair of locking apertures; an inner frame including a center aperture and a plurality of pairs of locking apertures, the inner frame being rotatably movable relative to the external frame around the center apertures; a rotary plate rotatably disposed between the inner frame and the external frame and having locking apertures therein; a substantially flat rotary spring having one end mounted to the inner frame and an opposite end mounted to the rotary plate to impart a turning force to the rotary plate; a hub member rotatably connecting the inner frame and the external frame about the center apertures, and supporting the frames, the hub member including a locking end at one side thereof; a locking part having a locking end for extension into the locking apertures of the external and inner frames to fix an angle of the inner frame and the external frame relative to each other; a press axle connected with the locking part and passing through the hub member, the press axle including a spring bearing end; and a spring positioned between the locking end of the hub member and the bearing end of the press axle.



In regards to claim 19 Lee does not disclose **a plate structure spaced axially outward from the body surface by at least one elongated gap.**

Ng teaches **a plate structure (10; fig. 1).**

Therefore, before the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to teach the plate structure taught by Ng onto the retainer body of Lee for the predictable result with reasonable expectation of success and following the teaching of Ng to provide for hanging article. One 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, phone clip, a clip attached to a tool, ID card etc. as non-limiting examples. The teaching of the plate bracket (plate structure) of Ng onto the retainer body of Lee consequently teaches the **pivot pin (502/ 504/506; Lee) coupled to the body on a side of the body opposite the plate structure and the, plate structure attached with the body on at least two ends of the plate structure (via apertures 35, 45 of 10; Ng); wherein the plate structure is spaced axially outward from the body surface by at least one elongated gap** (resulting from the raised center portion 20 of bracket 10; Ng)**, wherein the at least one elongated gap is parallel to the body surface and configured to receive and support a tool** (such as a thin sheet metal clip)**.**

Lee as modified by Ng do not teaches the second button body is integrally formed with the first button body. However, it would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to have the second button body integrally formed with the first button body, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. Howard v. Detroit Stove Works, 150 U.S. 164 (1893). One of ordinary skill in the art before the effective filing date of the claimed invention would have found that having the second button body integrally formed with the first button body would have yielded the predictable result of a more study structure less prone to breaking, cracking with repetitive use over time in a work environment.

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In regards to claim 20 Lee discloses 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.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please refer to PTO-892 form for list of cited references.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHIREF M MEKHAEIL whose telephone number is (571)270-5334. The examiner can normally be reached 10-7 Mon-Fri.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Cahn can be reached on 571-270-5616. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/S.M.M/
Examiner, Art Unit 3634

/DANIEL P CAHN/
Supervisory Patent Examiner, Art Unit 3634

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	Examiner SHIREF M MEKHAEIL	Art Unit 3634	Page 5 of 5

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*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-D492187-S	2004-06-29	Mottini; Phillip J.		D8/354
*	B	US-5026016-A	1991-06-25	Lisowski; Walter E.	F16B21/09	248/314
*	C	US-6866940-B1	2005-03-15	Laughlin; Harold Patrick	E06B7/28	248/225.11
*	D	US-D818801-S	2018-05-29	Ng; Kimkie		D8/354
*	E	US-D560221-S	2008-01-22	Hoglan; Korry		D14/451
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/490,715	Maxfield et al.
	Examiner	Art Unit
	SHIREF M MEKHAEIL	3634

CPC - Searched*		
Symbol	Date	Examiner
E06C 1/ 32, 38, 383 ; 7/ 082, 14, 50 ; 9/ 085	12/02/2023	SM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor name search	12/02/2023	SM
Assignee name search	12/02/2023	SM
Forward and backward citation search of relevant art	12/02/2023	SM
More like this search	12/02/2023	SM
Consulted CAT tool and global dossier	12/02/2023	SM
Class/subclass and text search	12/02/2023	SM

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/S.M.M/ Examiner, Art Unit 3634	

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	25	((("LITTLE") near3 ("GIANT") near3 ("LADDER") near3 ("SYSTEMS") near3 ("LLC"))).AS,AANM.	(USPAT)	OR	ON	ON	2023/11/30 06:24 PM
L2	458	((("MAXFIELD") near3 ("B")) OR (("MOSS") near3 ("N")) OR (("MINER") near3 ("Steven"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2023/11/30 06:25 PM
L3	1216	E06C1/32.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:26 PM
L4	1887	E06C7/14.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:26 PM
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L7	1032	E06C1/383.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:56 PM
L8	764	E06C1/38.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:56 PM
L9	688	E06C7/082.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AT, AU, CA, CN, EP, GB, KR, WO); EPO; JPO)	OR	ON	ON	2023/11/30 06:58 PM
L10	4	("20050252721" OR "4210224" OR "4407045" OR "8186481").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/01 01:50 PM
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		3811151-A OR DE-2732784-C2 OR EP-1020653-A1 OR US-20170145745-A1 OR DE-2931745-A1 OR DE-3900176-A1 OR EP-1020653-B1 OR US-10731413-B2 OR US-5074377-A OR US-6220389-B1 OR US-20180274296-A1 OR WO-2017218672-A1 OR US-20210025230-A1 OR WO-9955997-A1 OR AT-E117046-T1 OR US-10718160-B2 OR US-20180252037-A1 OR CN-107178303-A OR EP-1388309-A1).did.	EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
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L33	16248	E06C$/$.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:10 PM
L34	32	33 AND bracket WITH hold$4 WITH (clip (measuring ADJ tape) (screw ADJ drive))	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:11 PM

L35	5	("3029054").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:12 PM
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L37	68	33 AND bracket WITH hold$4 WITH (tool)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L38	55	33 AND bracket WITH hold$4 WITH (object)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L39	9	33 AND bracket WITH hold$4 near2 (object)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:14 PM
L40	22	33 AND (bracket plate) WITH (protrud$4 gap) WITH hold$4	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:18 PM
L41	67	(U$2bracket (U ADJ shape$1 ADJ bracket)) WITH hold$4 WITH (clip (measuring ADJ tape) (screw ADJ drive))	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:23 PM
L42	25995	clip ADJ holder WITH (measuring ADJ tape) (screw ADJ drive)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:29 PM
L43	3	clip ADJ holder WITH (measuring ADJ tape)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:29 PM
L44	121	clip ADJ holder WITH (tool)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/01 04:29 PM
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PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Bibliographic Data

Application No: 18/490,715

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /SHIREF M MEKHAEIL/ Examiner's Signature | Initials

Title: MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
10/19/2023	182	3634	
RULE			

APPLICANTS

LITTLE GIANT LADDER SYSTEMS, LLC, Springville, UT, UNITED STATES

INVENTORS

B. Scott Maxfield, Mapleton, UT, UNITED STATES

N. Ryan Moss, Mapleton, UT, UNITED STATES

Steven S. Miner, Springville, UT, UNITED STATES

CONTINUING DATA

This application is a CON of 18324971 05/27/2023

18324971 has PRO of 63346420 05/27/2022

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

10/31/2023

STATE OR COUNTRY

UNITED STATES

ADDRESS

FILING FEE RECEIVED

$6,160

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18490715
Filing Date	2023-10-19
First Named Inventor	B Scott Maxfield
Art Unit	3634
Examiner Name	SHIREF M MEKHAEIL
Attorney Docket Number	P298048.US.03_506318-576

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4210224	A	1980-07-01	KUMMERLIN, et al.	
	2	4407045	A	1983-10-04	BOOTHE	
	3	8186481	B2	2012-05-29	MOSS, et al.	

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	1	20050252721	A1	2005-11-17	PARKER, et al.	

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	1	1063387	EP	A2	2000-12-27	LEE, IK WOO		☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18490715
	Filing Date	2023-10-19
	First Named Inventor	B Scott Maxfield
	Art Unit	3634
	Examiner Name	SHIREF M MEKHAEIL
	Attorney Docket Number	P298048.US.03_506318-576

	2	104986086	CN	A	2015-10-21	HAN BAIXIANG		☒

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	International Search Report and Written Opinion mailed 18 August 2023 as received in PCT/US2023/023784	☐

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EXAMINER SIGNATURE

Examiner Signature	/SHIREF M MEKHAEIL/	Date Considered	12/02/2023

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18490715
Filing Date	2023-10-19
First Named Inventor	B Scott Maxfield
Art Unit	3634
Examiner Name	SHIREF M MEKHAEIL
Attorney Docket Number	P298048.US.03_506318-576

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☑ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Richard C. Galati/	Date (YYYY-MM-DD)	2023-11-30
Name/Print	Richard C. Galati	Registration Number	66759

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 063 387 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
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(51) Int Cl.[7]: **E06C 1/32**, E06C 7/08, E06C 7/50

(21) Application number: **99310087.4**

(22) Date of filing: **15.12.1999**

(84) Designated Contracting States:
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Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **22.06.1999 KR 9923544**
03.11.1999 KR 9948423

(71) Applicant: **Lee, Ik Woo**
Youngdeungpo-gu (KR)

(72) Inventor: **Lee, Ik Woo**
Youngdeungpo-gu (KR)

(74) Representative: **Mounteney, Simon James**
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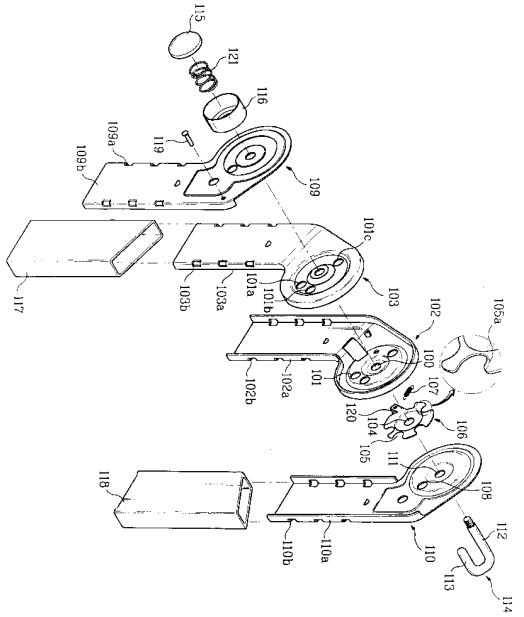
57-60 Lincoln's Inn Fields
London WC2A 3LS (GB)

(54) Ladder having locking device and method for manufacturing the same

(57) A ladder with a locking device comprises a pair of inner rotating plates (102, 103) provided with a plurality of hinge holes spaced apart at predetermined angles; a rotating plate (106) with notch portions (105) corresponding to the hinge holes, said rotating plate rotating on an outer surface of the inner rotating plates (102, 103) to selectively open the hinge holes; a resilient member (107) biasing the rotating plate (106) to an initial state of closing the hinge holes, one end of said resilient member (107) being secured to the rotating plate (106) and the other end secured to one of the inner rotating plates (102); a pair of outer rotating plates (109, 110) with fixing holes formed on one side and supporting said inner rotating plates (102, 103) rotatably; and a locking key (114) including a guide pin (112) for securing the rotating plate (106), inner rotating plates (102, 103) and outer rotating plates (109, 110), and a fixing pin (113) for selective insertion into the hinge holes, said locking key (114) being adapted to lock after the ladder has been spread by rotating the inner rotating plates (102, 103) with respect to the outer rotating plates (109, 110), this being possible when the fixing pin (113) has been released from the hinge holes by the pressing of a push cover (115). The releasing of the hinge assembly due to an external force is prevented, thereby preventing accidents whilst facilitating the use of the ladder by enabling easy control of the locking and releasing of the assembly. Furthermore, the number of operations for assembling the ladder is reduced, thereby increasing the workability. Also, clearance between hollow beams of the ladder and the hinge assembly is obviated, thereby increasing the durability of the ladder. Furthermore, the number of parts for assembling the ladder is reduced, which in turn reduces the cost for manufacturing the ladder considerably.

FIG. 4



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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a ladder having a locking device and a method for manufacturing the same. Specifically, the present invention relates to a ladder obviating separate engaging members needed for connecting hollows beams to hinge assemblies of the ladder and further comprising a locking device preventing the hinge assemblies from being released due to external forces while the ladder is spread for a certain angle for use. The present invention also relates to a method of manufacturing the same ladder

[0002] Fig. 1 is a schematic perspective view of a prior art ladder. As can be seen, the ladder comprises a hinge assembly 6 composed of a pair of outer rotation plates 1 & 2, a pair of inner rotation plates 4 & 5 inserted rotatably between the outer rotation plates 1 & 2 and hinged by means of a fixing pin 3, and hollow beams 7 & 8 extending from the inner and outer rotation plates 1, 2, 4 & 5 to which foot plates (not shown) are attached. In order to connect beams 7 & 8 to the rotation plates 1, 2, 4 & 5, through holes 11 & 12 for receiving rivets (or other engaging members) 9 & 10 are formed on the rotation plates 1, 2, 4 & 5. Correspondingly, through holes 13 & 14 are formed on the hollow beams 7 & 8 to which rivets 9 & 10 are inserted.

[0003] However, clearance occurring between the beams 7 & 8 and the rotation plates 1, 2, 4 & 5 and clearance formed between the through holes 11 & 12 and the through holes 13, 14 receiving the rivets 9 & 10, deteriorates tight fits between the rotation plates 1, 2, 4 & 5 and the beams 7 & 8. Therefore, clattering may occur between these elements, which reduces endurance of the ladder. Furthermore, a plurality of rivets 9 & 10 are required to secure the rotating plates 1, 2, 4 & 5 and the beams 7 & 8, which increases the parts required for the assembly and raises the production cost. Also, this increases number of operations since it involves insertion of the rivets 9 & 10 into the through holes 11, 12, 13 & 14 after assembling the rotation plates 1, 2, 4 & 5, making the assembly procedure cumbersome.

[0004] Fig. 2 is a schematic exploded view of a hinge assembly of the ladder according to the prior art, and Fig. 3 is a schematic sectional view showing the locking state of the assembly.

[0005] As shown in Fig. 2 & 3, the ladder comprises a hinge assembly A rotating freely when released, a pressing member B and a stopper member C. The hinge assembly A comprises a pair of outer rotation plates 1 & 2, and a pair of inner rotation plates 4 & 5 inserted between the outer rotation plates 1 & 2 in a rotatable manner.

[0006] An elongated hole 19 connected to a hole 18 for receiving a stopper protrusion 16 of the stopper member C is formed on the outer rotation plates 1 & 2 of the hinge assembly A. A through hole 20 for receiving a bush 15 supported by the stopper member C is formed at a center portion of the outer rotation plates 1 & 2. A through hole 21, which receives the bush 15, is also formed at the center portion of the inner rotation plates 4 & 5. A plurality of shaft hole 22 & 23 are formed on the inner rotation plates 1 & 2 at locations radially outward with regard to the through hole 21.

[0007] The pressing member B comprises a pressing plate 24 and a pressing shaft 25 connected to the plate 24. A spring 26 is mounted on the pressing shaft 25.

[0008] Slider protrusions 30 & 31 with stopper shoulders 28 & 29 on the stopper protrusions 16 & 17 of right and left ends of the stopper handle 27 are protrudingly formed on the stopper member C which is secured to the pushing shaft 25 of the pressing portion B by means of a pin 32.

[0009] When using the above-described ladder, a user presses the pressing plate 24 of the pressing member B which causes the slider protrusions 30 of the stopper member C to reposition itself from the hole 18 to the elongated hole 19. This enables the inner rotating plates 4 & 5 to rotate with respect to the outer rotating plates 1 & 2. After the inner plates 4 & 5 are rotated so that the hole 18 of the outer rotating plates 1 & 2 moves into alignment with the corresponding holes of the inner plates 4 & 5, the stopper protrusions 16 & 17 repositions themselves into the holes of the plates. As can be seen in Fig. 3, the stopper protrusions 16 & 17 are of slanted form which enables a stable securing of the inner rotation plates 4 & 5 and the outer rotation plates 1 & 2.

[0010] However, since the pressing plate 24 of the pressing portion B protrudes from the outer rotation plate 1 and is thereby exposed, when the pressing plate 24 of the pressing portion B is pressed in axial direction of the pressing shaft 25 occurring in occasions such as when contacting with external structures, the stopper member C is released from the hole 18 of the outer rotating plates 1 & 2. Therefore, the locking of the ladder is released, rendering the inner rotation plates 4 & 5 to rotate freely with respect to the outer rotation plates 1 & 2. Hence, exposing the user to dangers of accidental falls from the ladder.

SUMMARY OF THE INVENTION

[0011] It is an object of the present invention to provide a ladder comprising a locking device preventing the hinge assembly from being released due to contact with external materials which can prevent accidental fall of a user, and a method for manufacturing the same.

[0012] It is another object of the present invention to provide a ladder comprising a locking device which can be easily released by the user to facilitated the use of the ladder, and a method for manufacturing the same.

[0013] It is still another object of the present invention to provide a ladder comprising a locking device with a simple structure reducing number of operations needed for assembling, and a method for manufacturing the

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same.

[0014] It is still another object of the present invention to provide a ladder, which does not result in clearance between hollow beams and the hinge assembly in order to maintain tight fits.

[0015] It is still another object of the present invention to provide a ladder with reduced number of parts in order to reduce the cost for manufacturing the ladder, and a method for manufacturing the same

[0016] In order to achieve the above objects, a ladder with a locking device according to the present invention comprises, a pair of inner rotating plates with a plurality of hinge holes spaced apart for predetermined angles; a rotating plate with notch portions corresponding to the hinge holes, said rotating plate rotating on an outer surface of the inner rotating plates to selectively open the hinge holes; a resilient member biasing the rotating plate to an initial state of closing the hinge holes, one end of said resilient member secured to the rotating plate and the other end secured to the inner rotational plate; a pair of outer rotating plate with fixing holes formed on a side and supporting said inner rotating plates rotatably; and a locking key including a guide pin securing the rotating plate, inner rotating plates and outer rotating plates, and a fixing pin selectively inserted into the hinge holes, said locking key locking after spreading the ladder by rotating the inner rotating plates with respect to the outer rotating plates when the fixing pin is released from the hinge holes by pressing of a push cover.

[0017] Above stated objects are accomplished by a method of manufacturing a ladder with a locking device according to the present invention comprising, a first step of securing a pair of inner rotating plates into a symmetrical outer rotating plates in a hinged manner; a second step of forming a securing groove at left and right corners of the elongated portion of the pair of inner rotating plates and the rotating plates forming a hinge assembly; and a third step of engaging a mold with shape identical to the sectional shape of the elongated portion having the securing groove to an outer side of the beam to engross the corners of the beams to the securing groove by press working after securing the hollow beams to elongated portions.

[0018] Preferably, the push cover is engrossed within a safety cover mounted on the outer rotating plate in order to prevent the locking key from being released and the ladder from spreading.

[0019] Preferably, a slanted surface is formed at one side of the notch portion, and further comprises another slanted surface guiding said fixing pin of the fixing key sliding along the slanted surface to the hinge holes when the fixing pin is released to spread the ladder.

[0020] Preferably, said hinge holes are formed at 40, 105 and 180 degrees and the inner rotating plates being rotated with respect to the outer rotating plates and locked thereto at said angles.

[0021] Preferably, a stopper is provided which configures the engaging location of the beam to the outer rotating plates and the inner rotating plates.

BRIEF DESCRIPTION OF DRAWINGS

[0022] FIG. 1 is a schematic perspective view showing a ladder according to the prior art.

[0023] FIG. 2 is a schematic drawing showing a hinge assembly of the ladder according to the prior art.

[0024] FIG. 3 is a schematic sectional view showing the use of the locking device of Fig. 2.

[0025] FIG. 4 is a schematic exploded view of the locking portions of the ladder comprising a locking device according to the present invention.

[0026] Fig. 5 shows a ladder according to the present invention assembled.

[0027] Fig. 6a & 6b is a schematic view showing the locking device according to the present invention locked and released.

[0028] Fig. 7 shows the ladder including a locking device being used.

[0029] Fig. 8 is a flow chart showing a method of manufacturing the ladder with the locking device according to the present invention.

[0030] Fig. 9 is a sectional view of the connecting portion of the hinge assembly and the hollow beams according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0031] A preferred embodiment of the present invention will be described hereafter in detail for illustrative sense only, and this embodiment should not be in any sense be interpreted as restricting the scope of the present invention.

[0032] In FIG. 4 to 7, an embodiment according to the present invention comprises a pair of symmetric inner rotation plates 102 & 103 where a plurality of hinge holes are formed at 40 degrees, 105 degrees and 180 degrees locations, and a pair of outer rotating plates 109 & 110 where a fixing hole is formed on a location corresponding to the hinge holes and a engaging hole 111 is formed at a center portion thereof. The outer rotating plates 109 & 110 support the inner rotating plates 102 & 103 in a rotatable manner.

[0033] The embodiment further comprises a rotating plate 106 and a resilient member 107. On the rotating plate 106, a fixing hole 104, notch portions 105 corresponding to the hinge holes 101 are formed. The rotating plate 106 selectively opens the hinge holes 101 and is rotatably mounted on the outer surface of the inner rotating plate 102. One end of the resilient member 107 is fixed onto the rotating plate 106 while the other end is fixed to the inner rotating plate 102, thereby resiliently biasing the rotating plate 106 to close the hinge holes 101 when external force is not exerted.

[0034] A guide pin 112 fixing the inner and outer rotating plates 109 & 110 and the rotating plate 106 and

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a fixing key 114 are provided. The guide pin 112 comprises a fixing pin 113. The fixing key 114 fixes the ladder after it rotates by moving the inner rotating plates 102 & 103 with respect to the outer rotating plates 109 & 110 when the fixing pin 113 is released from the hinge holes 101 by pressing a push cover 115 provided at one end of the guide pin 112.

[0035] In order to prevent the ladder from released from the locked state when the push cover 115 is pressed unintentionally which can release the fixing key 114, the push cover 115 is engrossed in a safety cover 116 mounted on the outer rotating plate 109.

[0036] When the fixing key 113 of the fixing key 114 is released from the hinge holes 101 by pressing the push cover 115, slanted surfaces 105a are formed on the notch portions 105 in order to guide the fixing pin 113 into the hinge holes 101 after rotating the inner rotating plate 102 & 103 with respect to the outer rotating plates 109 & 110. The reference numerals 117 & 118 denotes beams connected to lower portions of the inner and outer rotating plates 102, 103, 109 & 110 while the reference numeral 119 denotes a rivet securing the outer rotating plates 109 & 110. The reference numeral 120 denotes a locking knob which shows the user if the locking key 121 is in a locked or a released state. The reference numeral 114 denotes a resilient member securing the fixing key 114.

[0037] Hereinafter, a method of manufacturing the ladder will be described in detail.

[0038] As shown in the flow chart of Fig. 8, a pair of outer rotating plates 109 & 110 and inner rotating plates 102 & 103 which form the hinge assembly are bent in symmetrical manner(S10).

[0039] Within the spacing formed between the outer rotating plates 109 & 110, the inner rotating plates 102 & 103 are inserted and fixed so that they can make relative rotations(S20).

[0040] Fixing grooves 102b, 103b, 109b & 110b are formed on the left and right corners of the extending portions 102a & 103a of the inner rotating plates 102 & 103 and the extending portions 109a & 110a of the outer rotating plates 109 & 110(S20).

[0041] After securing the hollow beams 117 & 118 to the extended portions 102a, 103a, 109a & 110a, press molds(not shown) having identical shape as the sectional shape of the extended portions 102a, 103a, 109a & 110a with fixing grooves 102b, 103b, 109b & 110b are placed at sides of the beams 117 & 118(S40).

[0042] By pressing the press mold using a press machine, the corners of the beams 117 & 118 are engrossed within the fixing holes 102b, 103b, 109b & 110b (S50).

[0043] Therefore, as shown in Fig. 9, the method according to the present invention does not require any rivet or bolt to secure the hollow beams 117 & 118 to the inner rotating plates 102 & 103 and outer rotating plates 109 & 110.

[0044] Furthermore, since the extending portions 102a, 103a, 109a & 110a of the hinge assembly and the beam 117 & 119 are tightly connected, clearance between these parts does not occur, thereby enhancing the durability of the ladder.

[0045] Hereinafter, the method of using the ladder with the locking device according to the present invention will be described in detail.

[0046] As shown in Fig. 6a and Fig. 7, the ladder is initially collapsed for storing when not in use. Here, the fixing pin 113 of the fixing key 114 is inserted into the hinge hole 101 a on the inner rotating plates 102 & 103.

[0047] As shown in Fig. 6b, when expanding the ladder 40 degrees for use, the user presses the push cover 115 and engrosses it into the safety cover 116. This releases the fixing pin 113 of the fixing key 114 from the hinge hole 101. Simultaneously, by moving the locking knob 120 fixed on the rotating plate 106 mounted on outer side of the inner rotating plate 102, the hinge hole 101 is closed by the rotating pin 106, thereby releasing the fixing key 114 from the locking state.

[0048] At this time, the front end of the fixing pin 113 is located at upper surface of the rotating plate 106 which enables the inner rotating plates 102 & 103 to rotate with respect to the outer rotating plates 109 & 110. When spreading the ladder by rotating the inner rotating plates 102 & 103 with respect to the outer rotating plates 109 & 110, the locking pin 113 rotates along the upper surface of the rotating plate 106 and slides into the hinge holes 101b along the slanted surface 105a of the notch portion 105. Thereafter, releasing of the fixing pin 113 of the fixing key 114 from the hinge hole 101b is prevented by the resilient force of the resilient member 121 provided on the fixing pin 113. That is, the locking key 114 locks the inner rotating plates 102 & 103 and the outer rotating plates 109 & 110 at 40 degrees.

[0049] Since the push button 115 releasing the fixing key 114 from the locking state is engrossed within the safety cover 116 mounted on the outer rotating plate 109, the locking of the locking key 114 can be maintained. That is, when the user is operating on the ladder, the releasing of the fixing key 114 due to external force is prevented, thereby preventing accidents.

[0050] As can be seen in the preferred embodiment, the locking of the hinge assembly due to external force is prevented, thereby preventing the safety accidents. However, intentional control of the locking and releasing of the assembly is easy, facilitating the use of the ladder.

[0051] Furthermore, the number of operations for assembling the ladder is reduced, thereby increasing the workability.

[0052] Also, clearance between the hollow beams and the hinge assembly is prevented, thereby increasing the durability of the ladder. Furthermore, the number of parts for assembling the ladder is reduced, which in turn reduces the cost for manufacturing the ladder considerably.

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Claims

1. A ladder with a locking device comprising:

   a pair of inner rotating plates with a plurality of hinge holes spaced apart for predetermined angles;
   a rotating plate with notch portions corresponding to the hinge holes, said rotating plate rotating on an outer surface of the inner rotating plates to selectively open the hinge holes;
   a resilient member biasing the rotating plate to an initial state of closing the hinge holes, one end of said resilient member secured to the rotating plate and the other end secured to the inner rotational plate;
   a pair of outer rotating plate with fixing holes formed on a side and supporting said inner rotating plates rotatably; and
   a locking key including a guide pin securing the rotating plate, the inner rotating plates and the outer rotating plates, and a fixing pin selectively inserted into the hinge holes, said locking key locking the ladder after spreading the ladder by rotating the inner rotating plates with respect to the outer rotating plates when the fixing pin is released from the hinge holes by pressing of a push cover.

2. The apparatus of claim 1, wherein the push cover is engrossed within a safety cover mounted on the outer rotating plate in order to prevent the locking key from being released and the ladder spreading.

3. The apparatus of claim 2, a slanted surface is formed at one side of the notch portion, and further comprising another slanted surface guiding said fixing pin of the fixing key sliding along the slanted surface to the hinge holes when the fixing pin is released to spread the ladder.

4. The apparatus of claim 1, wherein said hinge holes are formed at 40, 105 and 180 degrees and the inner rotating plates being rotated with respect to the outer rotating plates and locked thereto at said angles.

5. A method of manufacturing a ladder with a locking device comprising:

   a first step of hinge securing a pair of inner rotating plates into a symmetrical outer rotating plates in a hinged manner;
   a second step of forming a securing groove at left and right corners of the elongated portion of the pair of inner rotating plates and the rotating plates forming a hinge assembly; and
   a third step of engaging a press mold with shape identical to the sectional shape of the elongated portion having the securing groove to an outer side of the beam to engross the corners of the beams to the securing groove by press working after securing the hollow beams to elongated portions.

6. The method of claim 5, a stopper configuring the engaging location of the beam to the outer rotating plates and the inner rotating plates.

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FIG. 1

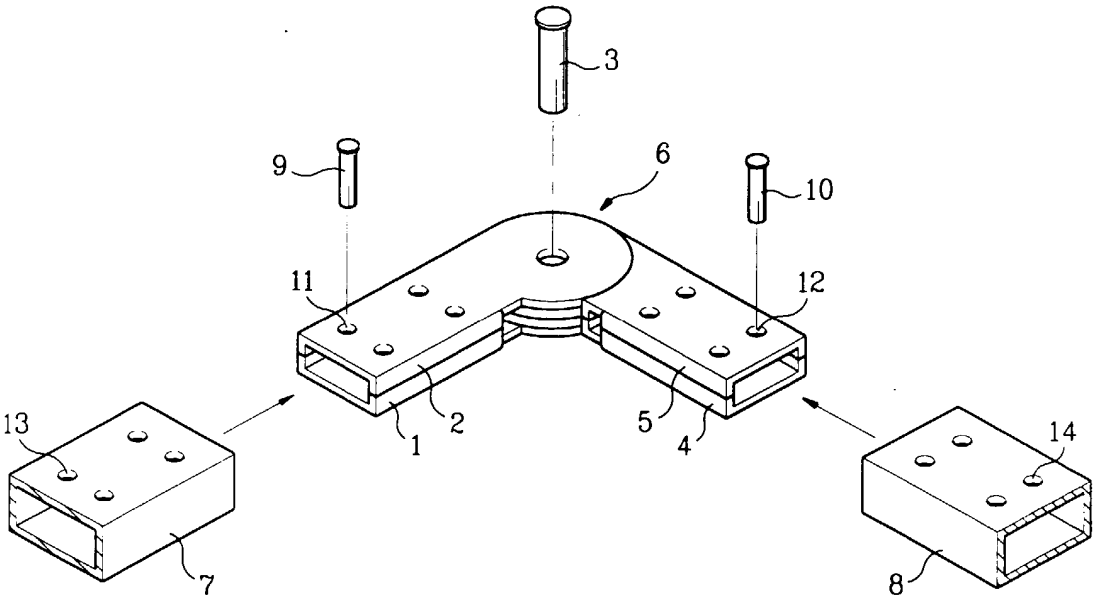

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FIG. 2

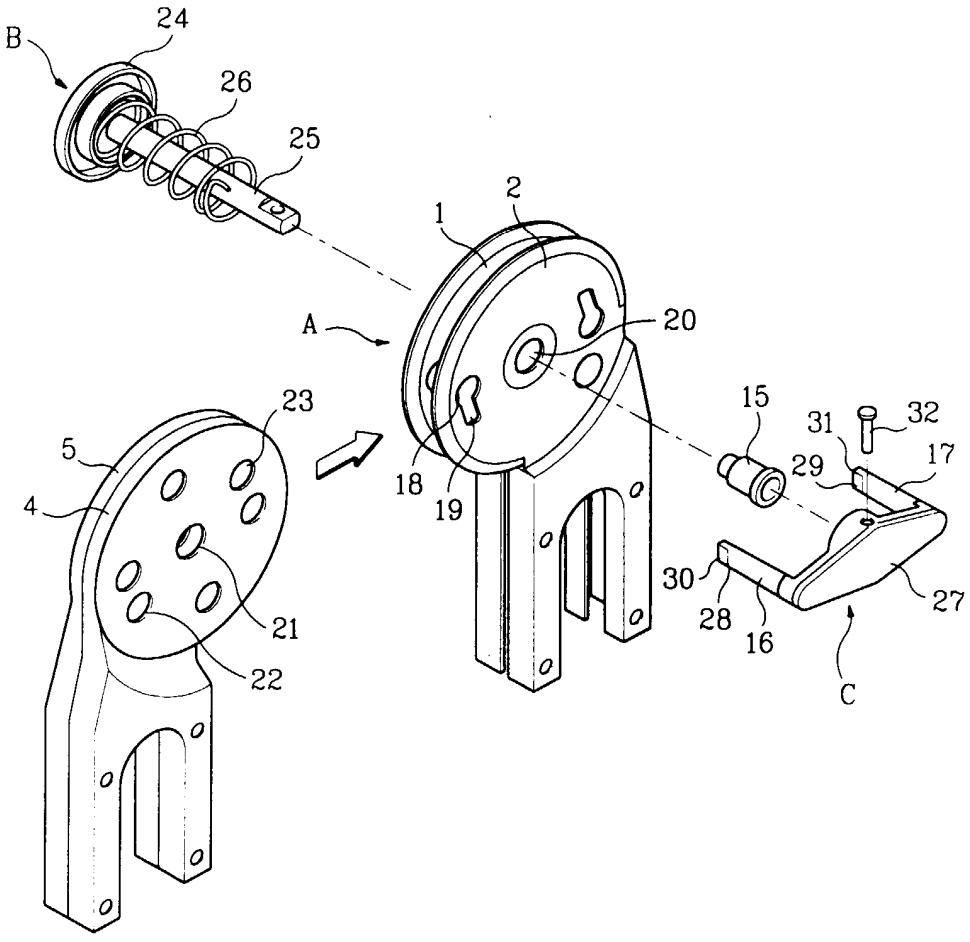

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FIG. 3

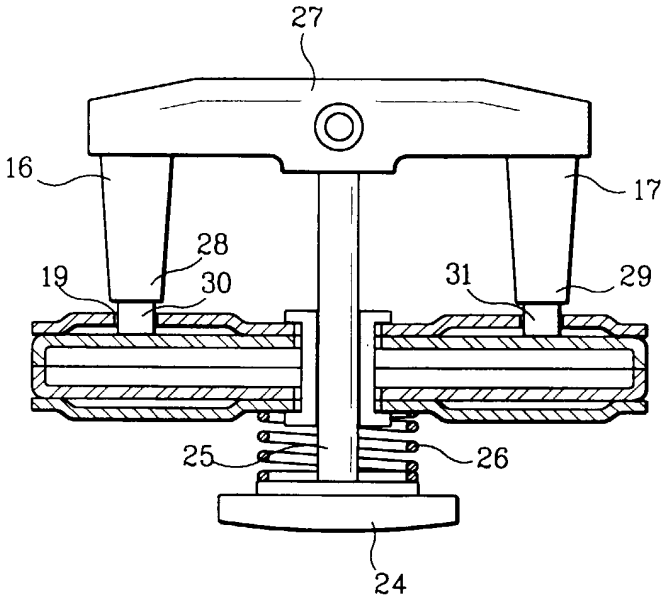

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FIG. 4

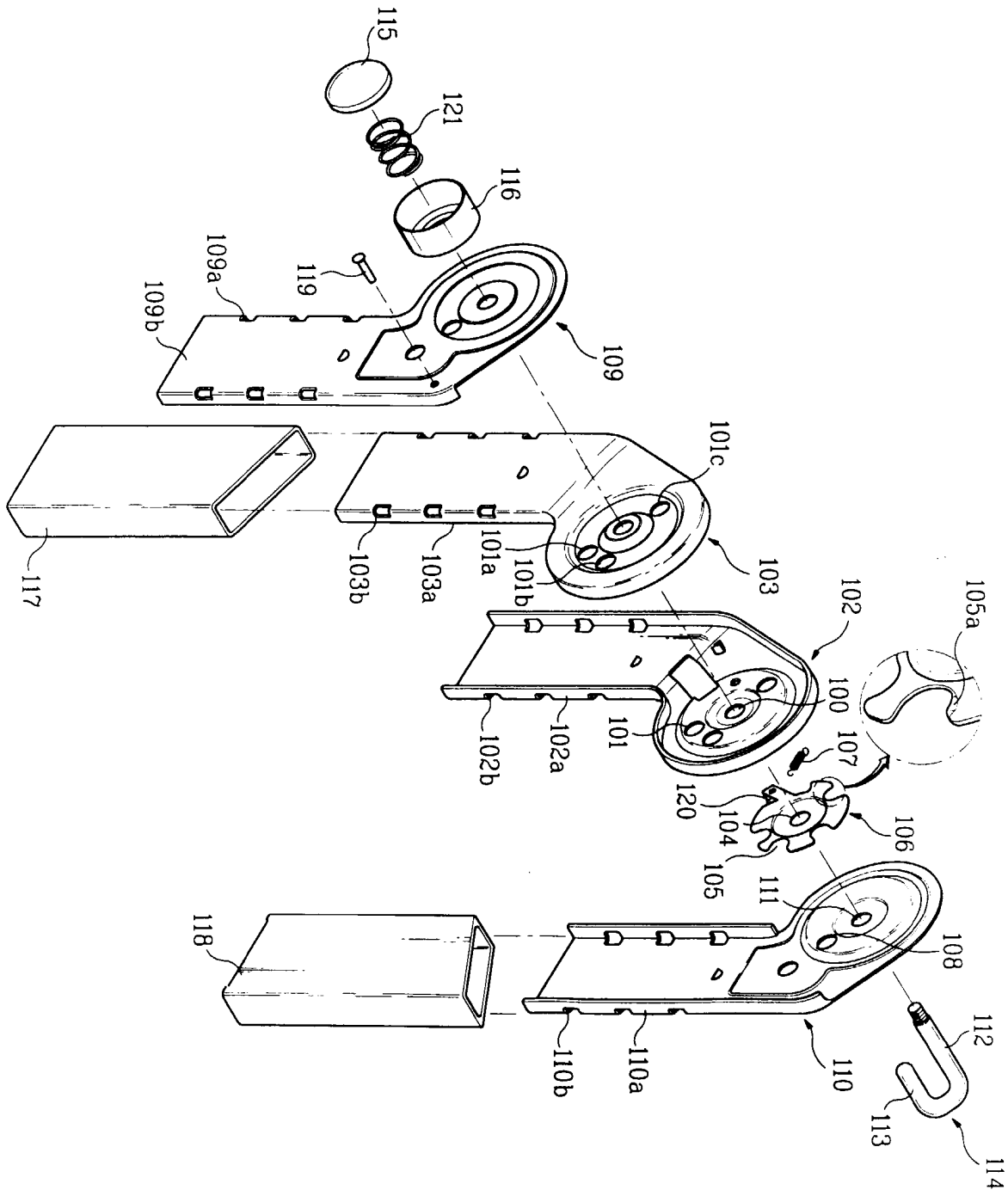

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FIG. 5

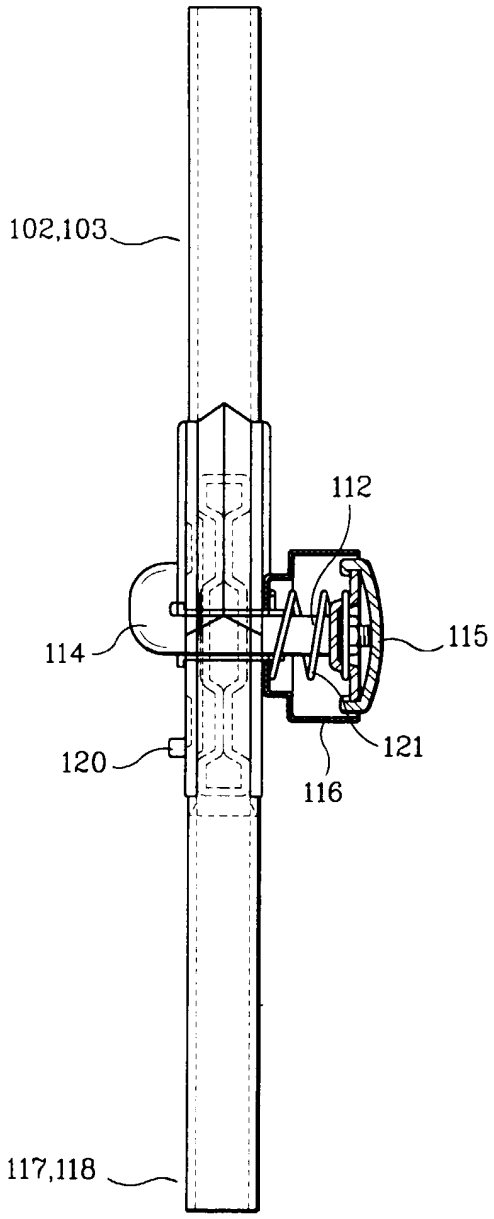

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FIG. 6A

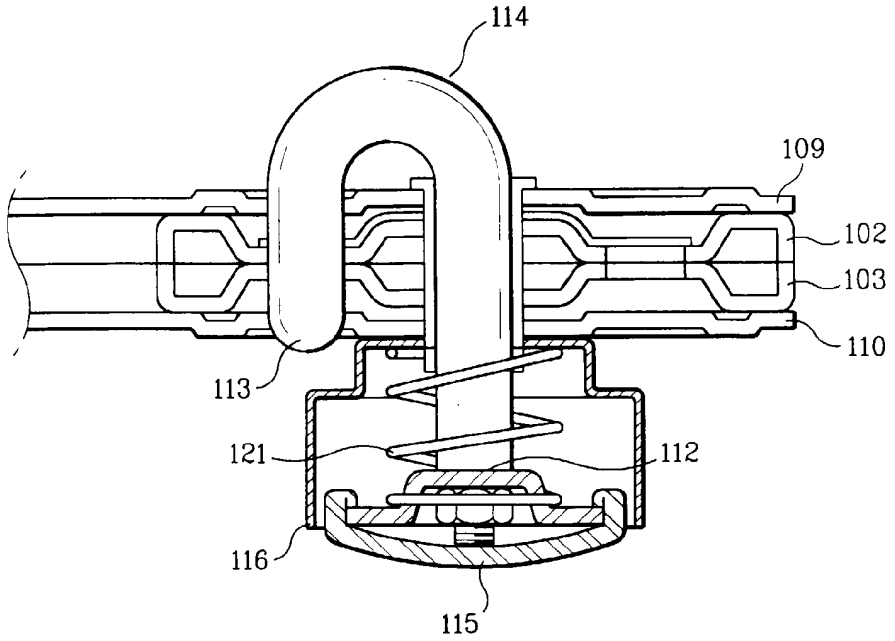

FIG. 6B

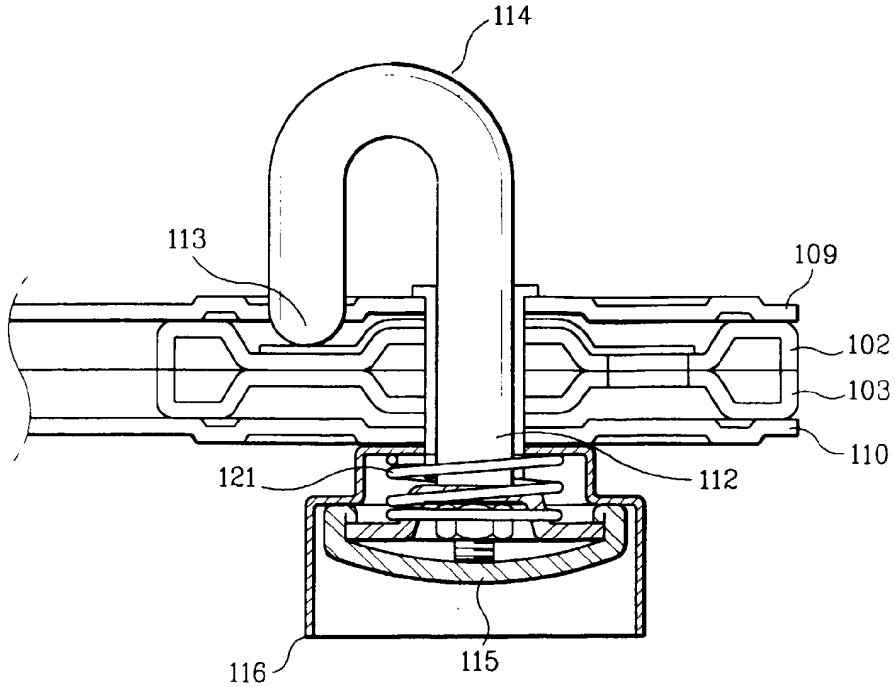

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FIG. 7

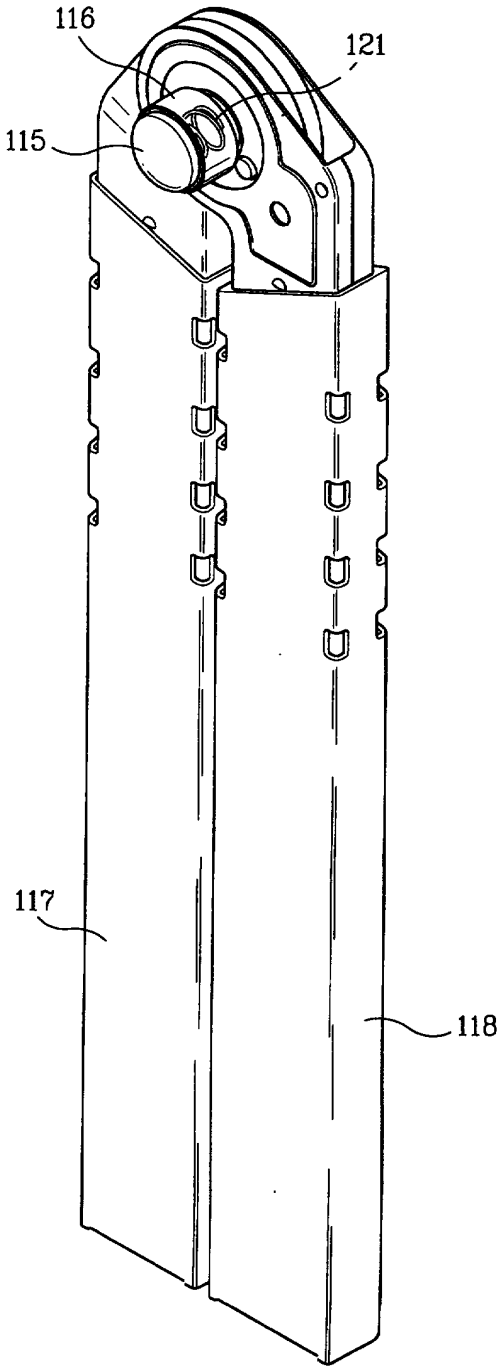

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FIG. 8

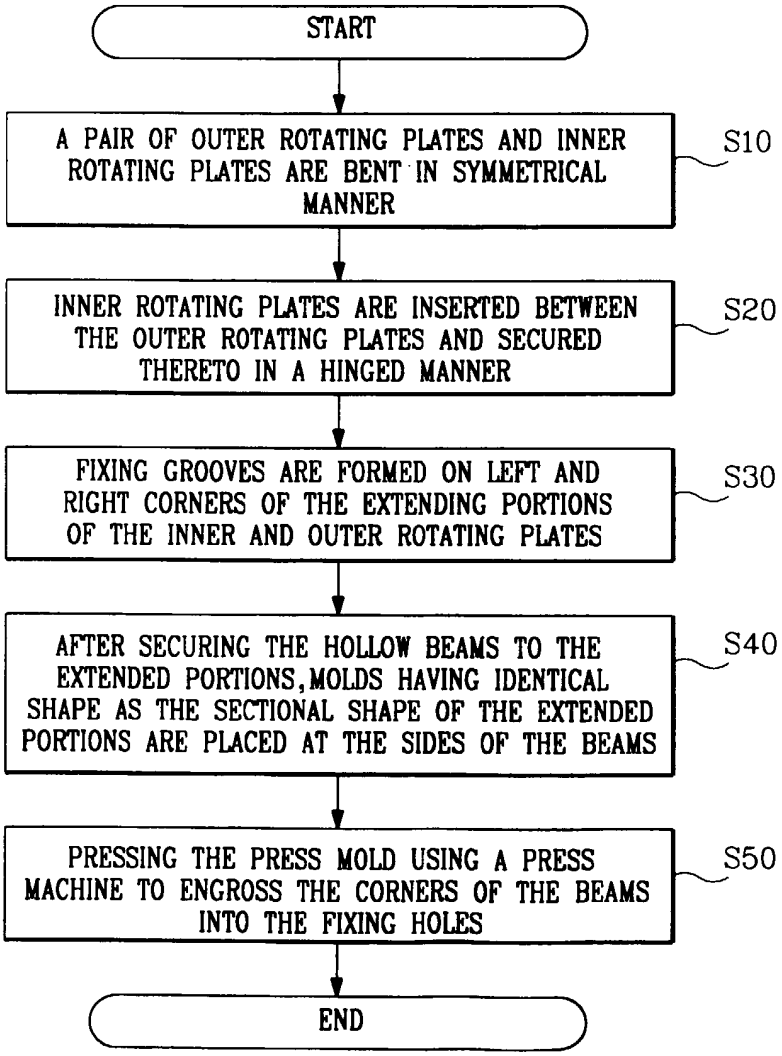

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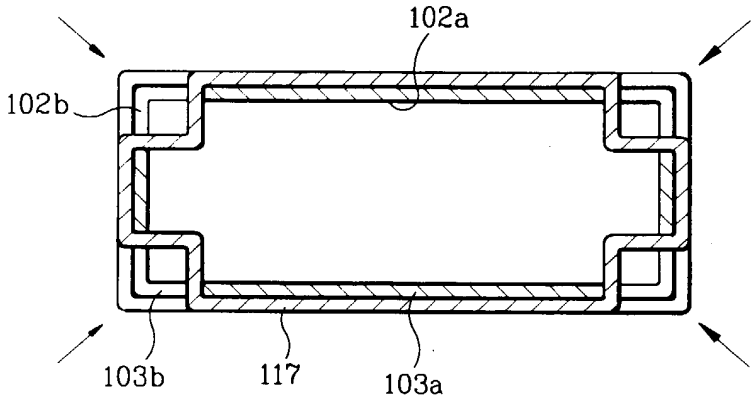
FIG. 9



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PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
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ETATS-UNIS D'AMERIQUE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)*: 18 August 2023 (18-08-2023)
Applicant's or agent's file reference: P298048WO01-506318-552	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No.: PCT/US2023/023784	International filing date *(day/month/year)*: 27 May 2023 (27-05-2023)
Applicant: LITTLE GIANT LADDER SYSTEMS, LLC	

1. [X] The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau preferably through ePCT, or on paper to:
   The International Bureau of WIPO, 34 chemin des Colombettes, 1211 Geneva 20, Switzerland

   For more detailed instructions, see the *PCT Applicant's Guide*, International Phase, paragraphs 9.004 - 9.011.

2. [ ] The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. [ ] **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   [ ] the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   [ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **22 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the International Searching Authority: European Patent Office, P.B. 5818 Patentlaan 2, NL-2280 HV Rijswijk, Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer: CARL, Iris, Tel: +31 (0)70 340-3672

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Form PCT/ISA/220 (revised January 2020)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
P298048WO01-506318-552		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2023/023784	27 May 2023 (27-05-2023)	27 May 2022 (27-05-2022)
Applicant		
LITTLE GIANT LADDER SYSTEMS, LLC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language,** the international search was carried out on the basis of:
      [X] the international application in the language in which it was filed
      [ ] a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. [ ] This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. [ ] **Certain claims were found unsearchable** (See Box No. II)

3. [ ] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [ ] the text is approved as submitted by the applicant
   [X] the text has been established by this Authority to read as follows:

   MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

5. With regard to the **abstract,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings,**
   a. the figure of the **drawings** to be published with the abstract is Figure No. 1
      [X] as suggested by the applicant
      [ ] as selected by this Authority, because the applicant failed to suggest a figure
      [ ] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2023/023784

A. CLASSIFICATION OF SUBJECT MATTER
INV. E06C1/18 E06C7/14
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E06C B60N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/252721 A1 (PARKER THOMAS W [US] ET AL) 17 November 2005 (2005-11-17) figures 1-21	1-20
X	EP 1 063 387 A2 (LEE IK WOO [KR]) 27 December 2000 (2000-12-27) figures 1-9	1-20
A	CN 104 986 086 A (HAN BAIXIANG) 21 October 2015 (2015-10-21) figures 1-8	1-20

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
9 August 2023	18/08/2023

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Petrinja, Etiel

PGR2026-00044
TRICAM EX1002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005252721 A1	17-11-2005	US 2005252721 A1	17-11-2005
		US 2006070801 A1	06-04-2006
		US 2008066261 A1	20-03-2008
EP 1063387 A2	27-12-2000	NONE	
CN 104986086 A	21-10-2015	NONE	

Information on Search Strategy

The type of information contained in this sheet may change during the pilot for improving the usefulness of this new service.

Application Number

PCT/US2023/023784

TITLE: MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

APPLICANT: LITTLE GIANT LADDER SYSTEMS, LLC

IPC CLASSIFICATION: E06C1/18, E06C7/14

EXAMINER: Petrinja, Etiel

CONSULTED DATABASES: EPODOC, WPI

CLASSIFICATION SYMBOLS DEFINING EXTENT OF THE SEARCH:

IPC:

CPC: E06C1/18, E06C7/146, E06C7/14/LOW, E06C1/16/LOW, B60N3/102

FI/F-TERMS:

KEYWORDS OR OTHER ELEMENTS FEATURING THE INVENTION:
ladder, rail, rung, hinge,pivot, rotatable, retainer

EPO FORM P04A42

PGR2026-00044
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IPPH

SUBJECT OF THE INVENTION
One is automobile-used can folding and unfolding saucer structure

[0001] Technical field

[0002] The invention belongs to technical field of automobile, be specifically related to a kind of retractable cup holder that can be fixed on automotive interior.

[0003] Background technology

[0004] Universal along with automobile, sails and takes advantage of people to have higher requirement for automobile, not only requires that automobile provides comfortable and takes environment, also requires to increase some convenience apparatus of configuration in car.These convenience apparatus just comprise conveniently chaufeur and/or passenger's holding cup and the saucer arranged in automobile.

[0005] But the saucer of prior art, be generally fixing structure design, and be fixed in car for hang; Draw through inspection information, current hang comprises air-conditioner air outlet and links up with hook suspension inside suspension, car door, rear deck seat hook suspension these three kinds suspension fixed forms.But this hang Problems existing is: the first, and complex structure, takies interior space large; The second, when saucer leaves unused, also cannot fold up, can not utilize by available space like this, cause the waste of usage space, also cause in car unsightly simultaneously, inharmonious; 3rd, when generation in driving process is jolted with sudden stop, saucer easily waves and rocks the phenomenon that even breaks off relations, thus causes unnecessary trouble, even occurs potential safety hazard.

[0006] Therefore, for Cup holder structure for vehicle of the prior art, how effectively to overcome technological deficiency, the automobile cup holder realizing more simple and convenient practicality then becomes problem demanding prompt solution.

[0007] Summary of the invention

[0008] In order to solve the problems referred to above that prior art exists, the invention provides a kind of automobile-used can folding and unfolding saucer structure, this automobile-used can folding and unfolding saucer structure structure, its structure is simple, can fold up thus take up room little.

[0009] The technical solution adopted in the present invention is: a kind of automobile-used can folding and unfolding saucer structure, comprise connecting rod, cup ring and cup holding ring; Connecting rod is made up of a strip steel plate, and the upper end of steel plate is through inwardly curling into upper clamping ring, and the lower end of steel plate is through inwardly curling into lower clamping ring; The shape of cup ring is convex shape, and the part of protrusion forms the outer connecting portion of circle, leaves opening, enclose outer connecting portion and be arranged on rotationally in clamping ring in the middle of the outer connecting portion of circle; Cup holding ring comprises the outer connecting portion of outwardly holder and to projecting inward and to the holder portion of lower recess, ask the middle of outer connecting portion to leave opening, ask outer connecting portion to be arranged in lower clamping ring rotationally, holder portion is for holding cup.

[0010] The opening enclosed in the middle of outer connecting portion is conveniently connected on upper clamping ring by cup ring, only need pull open the open card of glass ring gently during connection on upper clamping ring; Ask the opening in the middle of outer connecting portion to be conveniently be connected to by cup holding ring on lower clamping ring, only need pull open the open card of cup holding ring during connection gently on lower clamping ring.

[0011] Further preferred technical scheme is, describedly automobile-usedly folding and unfolding saucer structure can also comprise shell and buckle closure; The left surface of shell and right flank are equipped with superposed shell upper shed and are positioned at the shell under shed of bottom; The left surface of buckle closure and right flank are equipped with the upper rib matched with shell upper shed, and the left surface of buckle closure and right flank are equipped with the lower rib matched with shell under shed; Shell and buckle closure fasten and form container cavity, and connecting rod is arranged in container cavity; Cup ring is through shell upper shed, and the sidewall of the shell of shell upper shed place forms the fulcrum of cup ring; Cup holding ring is through shell under shed, and the sidewall of the shell of shell lower opening forms the fulcrum of cup holding ring; The upper side of shell and downside are the dip plane of outward-dipping setting.

[0012] Shell upper shed can sliding plug on upper rib, shell under shed can sliding plug on lower rib; Upper rib and lower rib are used for shell and buckle closure to link together securely also have positioning action.

[0013] More preferred technical scheme is, when cup ring and cup holding ring are in vertical state, lower clamping ring is against on the downside of shell; When cup ring and cup holding ring are in horizontality, upper clamping ring is against on the upper side of shell.

[0014] Preferred technical scheme is that shell is provided with screw further, and screw is fixed in automobile through screw.

[0015] Further illustrate principle of the present invention, because cup ring and cup holding ring are linked together by connecting rod, and cup ring leaves the outer connecting portion of circle, cup holding ring leaves the outer connecting portion of holder, distance the fulcrum contacted with the side wall of outer shell of shell upper shed from the point that contacts with upper clamping ring of the outer connecting portion of circle to cup ring is resistance arm, and the distance between the fulcrum that the power in glass ring of putting on contacts with the side wall of outer shell of shell upper shed place to cup ring is power arm; Therefore by pulling a glass ring, cup ring around fulcrum, thus drives upper clamping ring, connecting rod, lower clamping ring to move in container cavity, and lower clamping ring will drive cup holding ring to move, thus achieves the effect that glass ring and cup holding ring be synchronized with the movement.

[0016] When cup ring and cup holding ring are in vertical state, namely when cup ring and cup holding ring are accepted, lower clamping ring is against on the downside of shell, and connecting rod can not move owing to being subject to the resistance of the downside of shell; When cup ring and cup holding ring are in horizontality, namely when cup ring and cup holding ring support cup, upper clamping ring is against on the upper side of shell, connecting rod can not move owing to being subject to the resistance of the upper side of shell, thus keeps cup ring and cup holding ring to be horizontal state support cup.

[0017] Beneficial effect of the present invention is:

[0018] 1) be arranged in car by screw and screw, sound construction is reliable, improves the safety of the original safety of saucer and driver and crew significantly;

[0019] 2) structure is simple, and volume is little, thus has saved interior space, greatly improves and takes advantage of the traveling comfort driven;

[0020] 3) easy to use, bar linkage structure realizes interlock effect, greatly reduces the triviality of operation, thus brings more high-end experience to enjoy to driver and crew;

[0021] 4) structure is simple, saves material, cost-saving to a certain extent, can promote the market competitiveness by actv..

[0022] Accompanying drawing explanation

[0023] Fig. 1 is integral structure schematic diagram of the present invention;

[0024] Fig. 2 is the structural representation after housing lower part of the present invention is cut;

[0025] Fig. 3 is the schematic diagram that cup ring of the present invention and cup holding ring are in vertical state;

[0026] Fig. 4 is the structural representation of connecting rod of the present invention;

[0027] Fig. 5 is cup ring structural representation of the present invention;

[0028] Fig. 6 is the structural representation of cup holding ring of the present invention;

[0029] Fig. 7 is the structural representation of shell of the present invention;

[0030] Fig. 8 is the structural representation of buckle closure of the present invention.

[0031] Description of reference numerals is as follows: 1-shell, 101-screw, the upper shed of 102-shell, 103-dip plane, 104-shell under shed; 2-buckle closure, the upper rib of 201-, rib under 202-; 3-connecting rod, the upper clamping ring of 301-, clamping ring under 302-; 4-cup ring, 401-encloses outer connecting portion; 5-cup holding ring, 501-holds in the palm outer connecting portion, 502-holder portion.

[0032] Detailed description of the invention

[0033] As shown in Figure 1, provided by the invention automobile-used can folding and unfolding saucer structure in running order, namely cup ring 4 and cup holding ring 5 are in horizontal positioned, the inside of shell 1 is provided with the connecting rod that upper end connects cup ring 4, lower end connects cup holding ring 5, cup ring 4 and cup holding ring 5 all pass and by the left side wall (also claiming left surface) of shell and right side wall (also claiming right flank) support in shell 1, relative to fulcrum.

[0034] As shown in Figure 4, Figure 5 and Figure 6, the present invention also comprises a kind of embodiment of simple structure form.This simple structure form comprises connecting rod 3, cup

ring 4 and cup holding ring 5; Connecting rod 3 is made up of a strip steel plate, and the upper end of steel plate is through inwardly curling into upper clamping ring 301, and the lower end of steel plate is through inwardly curling into lower clamping ring 302; The shape of cup ring 4 is convex shape, and the part of protrusion forms the outer connecting portion 401 of circle, leaves opening, enclose outer connecting portion 401 and be arranged in clamping ring 301 rotationally in the middle of the outer connecting portion 401 of circle; Cup holding ring 5 comprises the outer connecting portion 501 of outwardly holder and to projecting inward and to the holder portion 502 of lower recess, ask the middle of outer connecting portion 501 to leave opening, ask outer connecting portion 501 to be arranged on rotationally in lower clamping ring 302, holder portion 502 is for holding cup.

[0035] The opening enclosed in the middle of outer connecting portion 401 conveniently cup ring 4 is connected on upper clamping ring 301, only need pull open the open card of glass ring 4 gently during connection on upper clamping ring 301; Ask the opening in the middle of outer connecting portion 501 to be conveniently be connected to by cup holding ring 5 on lower clamping ring 302, only need pull open the open card of cup holding ring 5 during connection gently on lower clamping ring 302.

[0036] As shown in Figure 7 and Figure 8, the present invention includes shell 1 and buckle closure 2, the left surface of shell 1 and right flank are equipped with superposed shell upper shed 102 and are positioned at the shell under shed 104 of bottom; The left surface of buckle closure 2 and right flank are equipped with the upper rib 201 matched with shell upper shed 102, and the left surface of buckle closure 2 and right flank are equipped with the lower rib 202 matched with shell under shed 104.

[0037] As shown in Figure 2, shell upper shed 102 can sliding plug on upper rib 201, shell under shed 202 can sliding plug on lower rib 202; Upper rib 201 and lower rib 202 also have positioning action for shell 1 and buckle closure 2 being linked together securely; Thus shell 1 and buckle closure 2 fasten formation container cavity, connecting rod 3 is arranged in container cavity; Cup ring 4 is through shell upper shed 102, and the sidewall of the shell 1 at shell upper shed 102 place forms the fulcrum of cup ring 4; Cup holding ring 5 is through shell under shed 104, and the sidewall of the shell 1 at shell under shed 104 place forms the fulcrum of cup holding ring 5; The upper side of shell 1 and downside are the dip plane 103 of outward-dipping setting; Shell 1 is provided with screw 101, and screw is fixed in automobile by screw 101.

[0038] When cup ring 4 and cup holding ring 5 are in vertical state (as shown in Figure 3), lower clamping ring 302 is against on the downside (dip plane 103 below) of shell 1; When cup ring 4 and cup

holding ring 5 are in horizontality (as shown in Figure 1 or 2), upper clamping ring 301 is against on the upper side (dip plane 103 above) of shell.

[0039] Principle of the present invention is, because cup ring 4 and cup holding ring 5 are linked together by connecting rod 3, and cup ring 4 leaves the outer connecting portion 401 of circle, cup holding ring 5 leaves the outer connecting portion 501 of holder, be resistance arm from the point that contacts with upper clamping ring 301 of the outer connecting portion 401 of circle to the distance the fulcrum of shell 1 sidewall contact of cup ring 4 and shell upper shed 102, and put on power in glass ring 4 to shell 1 sidewall contact at cup ring 4 and shell upper shed 102 place fulcrum between distance be power arm; Therefore by pulling glass ring 4, cup ring 4 is around fulcrum, thus driving upper clamping ring 301, connecting rod 3, lower clamping ring 302 to move in container cavity, lower clamping ring 302 will drive cup holding ring 5 to move, thus achieves the effect that glass ring 4 and cup holding ring 5 be synchronized with the movement.

[0040] When cup ring 4 and cup holding ring 5 are in vertical state, namely when cup ring 4 and cup holding ring 5 are accepted, lower clamping ring 302 is against on the downside (dip plane 103 below) of shell, and connecting rod 3 can not move owing to being subject to the resistance of the downside (dip plane 103 below) of shell 1; When cup ring 4 and cup holding ring 5 are in horizontality, namely when cup ring 4 and cup holding ring 5 support cup, upper clamping ring 301 is against on the upper side (dip plane 103 above) of shell 1, connecting rod 3 can not move owing to being subject to the resistance of the upper side (dip plane 103 above) of shell 1, thus keeps cup ring 4 and cup holding ring 5 to be horizontal state support cup.

[0041] The present invention is not limited to above-mentioned preferred forms; anyone can draw other various forms of products under enlightenment of the present invention; no matter but any change is done in its shape or structure; every have identical with the application or akin technical scheme, all drops within protection scope of the present invention.

1. automobile-used can a folding and unfolding saucer structure, it is characterized in that, comprise connecting rod, cup ring and cup holding ring; Connecting rod is made up of a strip steel plate, and the upper end of steel plate is through inwardly curling into upper clamping ring, and the lower end of steel plate is through inwardly curling into lower clamping ring; The shape of cup ring is convex shape, and the part of protrusion forms the outer connecting portion of circle, leaves opening, enclose outer connecting portion and be arranged on rotationally in clamping ring in the middle of the outer connecting portion of circle; Cup holding ring comprises the outer connecting portion of outwardly holder and to projecting inward and to the holder portion of lower recess, ask the middle of outer

connecting portion to leave opening, ask outer connecting portion to be arranged in lower clamping ring rotationally, holder portion is for holding cup.

2. according to claim 1 automobile-used can folding and unfolding saucer structure, it is characterized in that, also comprise shell and buckle closure; The left surface of shell and right flank are equipped with superposed shell upper shed and are positioned at the shell under shed of bottom; The left surface of buckle closure and right flank are equipped with the upper rib matched with shell upper shed, and the left surface of buckle closure and right flank are equipped with the lower rib matched with shell under shed; Shell and buckle closure fasten and form container cavity, and connecting rod is arranged in container cavity; Cup ring is through shell upper shed, and the sidewall of the shell of shell upper shed place forms the fulcrum of cup ring; Cup holding ring is through shell under shed, and the sidewall of the shell of shell lower opening forms the fulcrum of cup holding ring; The upper side of shell and downside are the dip plane of outward-dipping setting.

3. according to claim 2 automobile-used can folding and unfolding saucer structure, it is characterized in that, when cup ring and cup holding ring are in vertical state, lower clamping ring is against on the downside of shell; When cup ring and cup holding ring are in horizontality, upper clamping ring is against on the upper side of shell.

4. automobile-used according to Claims 2 or 3 can folding and unfolding saucer structure, and it is characterized in that, shell is provided with screw, and screw is fixed in automobile through screw.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2023/023784	27.05.2023	27.05.2022

International Patent Classification (IPC) or both national classification and IPC
INV. E06C1/18 E06C7/14

Applicant
LITTLE GIANT LADDER SYSTEMS, LLC

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Petrinja, Etiel Telephone No. -0

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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed.

   b. ☐ furnished subsequent to the international filing date for the purposes of international search (Rule 13*ter*.1(a)),

      ☐ accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.

4. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.

5. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-20
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-20
Industrial applicability (IA)	Yes:	Claims	1-20
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1 US 2005/252721 A1 (PARKER THOMAS W [US] ET AL) 17 November 2005 (2005-11-17)

D2 EP 1 063 387 A2 (LEE IK WOO [KR]) 27 December 2000 (2000-12-27)

2 **Independent product claim 1 - Lack of novelty**

The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 1 is not new.

2.1 Document **D1** (see fig. 1-21) discloses

a ladder (100), comprising:

a first assembly, including:

a first pair of rails (40 ,41) spaced apart from each other;

a first set of rungs (4, 5, 47) coupled to and extending between the pair of rails;

a first pair of hinge portions (10, 35) coupled to the first pair of rails;

a second assembly, including:

a second pair of rails (42, 43 or also 44, 45) spaced apart from each other;

a second pair of hinge portions (10, 35) 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

at least one retainer (28-33) movable between a first axial position along the pivot axis and a second axial position along the pivot axis (see fig. 15),

the first assembly being rotatable relative to the second assembly while the at least one retainer (28-33) is in the first axial position ("FAP"; when button 32 is pressed),

the first assembly being prevented from rotation relative to the second assembly by the at least one retainer (28-33) while the at least one retainer is in the second axial position ("SAP"; when button 32 is not pressed);

wherein the at least one retainer (28-33) includes:

a body ("B"; see for ex. part of element 29 between the central hole and hole 29A); and

a support arm (31) coupled with and extending from the body.

2.2 Moreover, also document **D2** (see fig. 1-9) discloses a ladder according to claim 1.

3 **Independent product claim 18 - Lack of novelty**

The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 18 is not new.

3.1 Document **D1** (see fig. 1-21) discloses

a button (28-33)

for a locking mechanism,

the button comprising:

a body (B) having a first side surface, a second side surface positioned opposite the first side surface, and at least one lateral surface extending between the first side surface and the second side surface (see fig. 15);

a support arm (31) coupled with the body (B) and pivotable relative to the body about a pivot axis (see the axis going through the central opening visible on fig. 15) intersecting the at least one lateral surface (see the body B as defined before), the support arm (31) being pivotable about the pivot axis between a deployed position (SAP) and a collapsed position (FAP);

wherein in the collapsed position (FAP), the support arm (31) lies between a first plane defined by the first side surface of the body and a second plane defined by the second side surface of the body (part of element 31 is always between the two specified surfaces); and

wherein in the deployed position (SAP), the support arm (31) extends from the second side surface in a direction extending away from the first side surface.

3.2 Moreover, also document **D2** (see fig. 1-9) discloses a button according to claim 18.

4 Independent product claim 20 - Lack of novelty

The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 20 is not new.

4.1 Document **D1** (see fig. 1-21) discloses

a button (28-33)

for a locking mechanism,

the button comprising:

a body (B) having a first side surface attachable to a shaft (for ex. 40), a second side surface positioned opposite the first side surface, and at least one lateral surface extending between the first side surface and the second side surface (see fig. 15);

a support arm (31) coupled with the body (B) and pivotable relative to the body about a pivot axis (see the axis going through the central opening visible on fig. 15) intersecting the at least one lateral surface (see the body B as defined before), the support arm (31) being pivotable about the pivot axis between a deployed position (SAP) and a collapsed position (FAP);

wherein in the deployed position (SAP), a substantially upward-facing portion of the at least one lateral surface limits rotation (when pin 31A is inserted into opening 29A the side surfaces of plate 29 block the rotation of 31) of the support arm (31) about the pivot axis.

4.2 Moreover, also document **D2** (see fig. 1-9) discloses a button according to claim 20.

5 Dependent claims 2-17 and 19 - Lack of novelty

Dependent claims 2-17 and 19 do not contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to novelty (Articles 33(2), PCT), see:

- Claim 2: **D1** (see fig. 1-21) discloses a ladder, wherein the at least one retainer (28-33) comprises a pin portion (31A) extending from the body (B) into at least one of the pair of hinges (29).

- Claim 3: **D1** (see fig. 1-21) discloses a ladder, wherein the body (B) is reversibly removable (31A can be removed from opening 29A) from the pin portion (31A).

- Claim 4: **D1** (see fig. 1-21) discloses a ladder, wherein the support arm (31) is pivotable relative to the body (B) between a deployed position (SAP) and a collapsed position (FAP).

- Claim 5: **D1** (see fig. 1-21) discloses a ladder, wherein the support arm (31) is selectively biased (see 33) into the deployed position (SAP) and into the collapsed position (FAP).

- Claim 6: **D1** (see fig. 1-21) discloses a ladder, wherein the deployed position (SAP; see fig. 8) is substantially perpendicularly offset from the collapsed position (FAP; see fig. 10).

- Claim 7: **D1** (see fig. 1-21) discloses a ladder, wherein the body (B) comprises a protrusion (for ex. portion 28 blocks the opening 29A) limiting rotation away from the deployed position (SAP) while the support arm (31) is in the collapsed position (FAP).

- Claim 8: **D1** (see fig. 1-21) discloses a ladder, wherein the support arm (31; See in particular the portion located between 31A and 31B) is substantially aligned with a plane perpendicular to the pivot axis while in the collapsed position (FAP).

- Claim 9: **D1** (see fig. 1-21) discloses a ladder, wherein the support arm (31) forms a loop with the body (B) while in the deployed position (SAP).

- Claim 10: **D1** (see fig. 1-21) discloses a ladder, wherein the loop includes at least three linear segments (31A, 31B and the portion between 31A and 31B).

- Claim 11: **D1** (see fig. 1-21) discloses a ladder, wherein the body (B) comprises at least one support surface (see the external surface of plate 29) engaging a downward-facing surface (see the internal surface between portions 31A and 31B of fig. 15) the support arm (31) while the support arm is in the deployed position (SAP).

- Claim 12: **D1** (see fig. 1-21) discloses a ladder, wherein the at least one support surface is pitched (see for ex. the flat part of 29 in comparison with the round part of 29) toward a centerline of the body (B).

- Claim 13: **D1** (see fig. 1-21) discloses a ladder, wherein the first pair of rails (40, 41) and the second pair of rails (42, 43 or also 44, 45) are movable relative to the pivot axis between at least a freestanding configuration (see fig. 8) and a collapsed configuration (see fig. 10).

- Claim 14: **D1** (see fig. 1-21) discloses a ladder, wherein while the first pair of rails (40, 41) and the second pair of rails (42, 43 or also 44, 45) are in the freestanding configuration on a substantially horizontal support surface, the support arm (31) extends substantially horizontally (see the protions 31A and 31C) relative to the substantially horizontal support surface.

- Claim 15: **D1** (see fig. 1-21) discloses a ladder, wherein a top surface of the body (B) comprises at least one aperture (see for ex. the many top openings visible on fig. 14) extending perpendicular to the pivot axis.

- Claim 16: **D1** (see fig. 1-21) discloses a ladder, wherein the support arm (31) is pivotable (*a) about an axis perpendicular to the pivot axis.

> *a: Claim 16 is not defined in a way to exclude the possibility of, for example, rotating the whole ladder around its central vertical axis. When the ladder is rotated the support arm (31) rotates about an axis perpendicular to the pivot axis.

- Claim 17: **D1** (see fig. 1-21) discloses a ladder, wherein the at least one retainer (28-33) is movable between the first axial position (FAP) and the second axial position (SAP) in response to application of an axially-oriented force (by pressing button 32) to substantially axially-facing surface of the body (B).

- Claim 19: **D1** (see fig. 1-21) discloses a button, wherein the body (B) is directly coupled with an adjustment mechanism (28-33) of a rail (40-45) of a ladder (100).

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO/ISA)

General information

For all international applications, the competent International Searching Authority (ISA) will establish an international search report (ISR) accompanied by a written opinion of the International Searching Authority (WO/ISA). The WO/ISA may be responded to by

- filing informal comments with the International Bureau of WIPO (IB) (where no demand for international preliminary examination (demand) is filed)
- filing amendments under Art. 19 PCT (this can be done whether or not a demand is filed)
- filing amendments under Art. 34 PCT and/or formal observations in response to objections raised in the WO/ISA (where a demand *is* actually filed)

This document explains these possibilities.

Filing informal comments

After receipt of the ISR and WO/ISA, the applicant may file informal comments on the WO/ISA, directly with the IB (see International Search and Preliminary Examination Guidelines 2.15). These will be communicated to the designated/elected Offices, together with the International Preliminary Report on Patentability (IPRP) at 30 months from the priority date.

Amending claims under Art. 19 PCT

The applicant may file amended claims under Art. 19 PCT, directly with the IB by the later of the following dates:

- 2 months from the date of mailing of the ISR and the WO/ISA
- 16 months from the priority date

However, any such amendment received by the IB after the expiration of the applicable time limit shall be considered to have been received on time by the IB, if it reaches it before the technical preparations for international publication have been completed (the 15th day prior to the date of publication, see PCT Applicant's Guide, International Phase, 9.013).

For further information, please see Rule 46 PCT as well as form PCT/ISA/220.

Please also note that, when filing amended claims under Art. 19 PCT, such amendments shall be accompanied by a letter identifying the amendments made and also the basis for the amendments in the application as originally filed (Rule 46.5(b) PCT). Where a demand is filed, failure to comply with this requirement may result in the amendments being ignored in the International Preliminary Examination Report (IPER), see Rule 70.2(c-*bis*) PCT.

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Filing a demand for international preliminary examination

In principle, the WO/ISA will be considered to be the written opinion of the International Preliminary Examining Authority (IPEA). Where the WO/ISA issued by the EPO as ISA gives a positive opinion on the international application and the invention to which it relates, filing a demand with the EPO as IPEA would normally be unnecessary, since a positive IPRP would anyway be established by the IB based on the WO/ISA (see also further below).

If the applicant wishes to file a demand (for example, to allow him to argue his case in international preliminary examination with regard to objections raised in a negative WO/ISA before the IPEA issues an IPER), this must be done before expiration of **3 months after the date of mailing of the ISR and WO/ISA** or **22 months after priority date**, whichever expires later (Rule 54*bis* PCT). Amendments under Art. 34 PCT can be filed with the IPEA, normally at the same time as filing the demand (Rule 66.1(b) PCT) or within the time limit set for reply to any written opinion issued during international preliminary examination by the IPEA.

If a demand is filed at the EPO as IPEA and no comments/amendments have been received by the time the EPO starts drawing up the IPER (Rule 66.4*bis* PCT), the WO/ISA will be transformed by the IPEA into an IPER (also called the IPRP (Chapter II) which would merely reflect the content of the WO/ISA (OJ 10/2011, 532). The demand can still be withdrawn (Art. 37 PCT).

Please also note that, when filing amendments under Art. 34 PCT, such amendments shall be accompanied by a letter which identifies the amendments made and also the basis for the amendments in the application as originally filed (Rule 66.8(a) PCT). Failure to comply with this requirement may result in the amendments being ignored in the IPER (IPRP (Chapter II)), see Rule 70.2(c-*bis*) PCT.

Filing a request for supplementary international search

The applicant may, with the IB, file a request for supplementary international search under Rule 45*bis*.1 PCT. The present ISR and WO/ISA may also be taken into account in the execution of that supplementary international search, provided that these are available to the Authority charged with this task before it starts the supplementary search (Rule 45*bis*.5 PCT).

This kind of request cannot be filed specifying the ISA who did the international search.

More information on this topic can be found in the PCT Applicant's Guide, Chapter 8 (http://www.wipo.int/pct/en/guide/ip08.html).

End of the international phase

Where no demand is filed, at the end of the international phase, the IB will transform the WO/ISA into the IPRP (PCT Chapter I) (Rule 44*bis* PCT), which will then be transmitted together with possible informal comments to the designated Offices. Where a demand is filed, the WO/ISA is not transformed into an IPRP (Chapter I) by the IB, but rather the IPEA will establish an IPER, (the IPER is the same as the IPRP (PCT Chapter II), see Rule 70.15 PCT).

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UNITED STATES
PATENT AND TRADEMARK OFFICE

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**11/30/2023 07:54:44 PM Z ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Nicole McKean
PATENT CENTER #	63448870	FILING DATE	10/19/2023
CUSTOMER #	153511	FIRST NAMED INVENTOR	B. Scott Maxfield
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Richard Galati

Documents

TOTAL DOCUMENTS: 4

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
20231130_P298048US03_506318-576_IDS.pdf	4	Information Disclosure Statement (IDS) Form (SB08)	1011 KB
NPL_20230818_PCTUS2023023784_ISRWO_.pdf	22	Non Patent Literature	8113 KB
FOR_CN104986086A.pdf	14	Foreign Reference	6686 KB
FOR_EP_1063387_A2.pdf	14	Foreign Reference	217 KB

Digest

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20231130_P298048US03_506318-576_IDS.pdf	D5E0CFE56CE7159A855E4B4FC4550FBDA3F9F4FE664BB6E1FC9965BFB4676C3D591719C4F43A065125C776E1EFA0ED30597881DEDAB2DEB759C66E9BC803C1ED
NPL_20230818_PCTUS2023023784_ISRWO_.pdf	89D428FDCB784AFC35A4FBAC76BB9E38C7E78D92DF9606CB50F73BD7E35A0566CD2553F566C44D0A09C429F1D5D365183165ECE9179E703742FAB250CEFCA92D
FOR_CN104986086A.pdf	318A7B76AB3B506E7080542A523374D859F3E81F1AA6CFFD0D5C194F0D6D6C85760954DD68B2BFD2E8F3A592DD414A7D46D4FB23062BD8F5C2C3348D7A8EDB84
FOR_EP_1063387_A2.pdf	5A2C3A781511F0E97CDAE0D3E458AB8BD1763C0B77AD5D2BAF682D8EE246FDD538349D06E756CC2B269FA4CA0AA5D3A0631BF8D791418A19B9AC9E5498790AF7

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If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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PTO/SB/08a (02-18)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18490715
Filing Date	2023-10-19
First Named Inventor	B Scott Maxfield
Art Unit	3634
Examiner Name	SHIREF M MEKHAEIL
Attorney Docket Number	P298048.US.03_506318-576

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	2	4407045	A	1983-10-04	BOOTHE	
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	1	1063387	EP	A2	2000-12-27	LEE, IK WOO		☐

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	Application Number	18490715
	Filing Date	2023-10-19
	First Named Inventor	B Scott Maxfield
	Art Unit	3634
	Examiner Name	SHIREF M MEKHAEIL
	Attorney Docket Number	P298048.US.03_506318-576

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	1	International Search Report and Written Opinion mailed 18 August 2023 as received in PCT/US2023/023784	☐

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Examiner Signature		Date Considered	

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18490715
	Filing Date	2023-10-19
	First Named Inventor	B Scott Maxfield
	Art Unit	3634
	Examiner Name	SHIREF M MEKHAEIL
	Attorney Docket Number	P298048.US.03_506318-576

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☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☑ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Richard C. Galati/	Date (YYYY-MM-DD)	2023-11-30
Name/Print	Richard C. Galati	Registration Number	66759

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8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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Foldable saucer structure for vehicle

Abstract

The invention relates to a foldable saucer structure for a vehicle. The foldable saucer structure comprises a connecting rod, a cup loop, a saucer ring, a housing and a cap. The connecting rod is made from strip steel, the upper end of the strip steel curls inwards to form an upper connecting ring, and the lower end of the strip steel curls inwards to form a lower connecting ring. The cup loop is in the shape of a Chinese character 'tu', a protruding portion forms an out-ring connection portion, the middle portion of the out ring connection portion is provided with a gap, and the out ring connection portion is rotatingly disposed in the upper connecting ring. The saucer ring comprises a convex connecting out-saucer connecting portion and a concave and sunk holding portion, the middle portion of an out-saucer connecting portion is provided with an opening, the out-saucer connecting portion is rotatingly disposed in the lower connecting ring, and the holding portion is used for holding a cup. The housing and the cap form a containing cavity, and the cup loop and the saucer ring are connected through the connecting rod to form a whole structure which are disposed in the containing cavity. The foldable saucer structure for the vehicle is simple in structure and can be folded, and the occupation space is small.

Classifications

- B60N3/102 Arrangements or adaptations of other passenger fittings, not otherwise provided for of receptacles for food or beverages, e.g. refrigerated storable or foldable in a non-use position

CN104986086A
China

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Other languages: Chinese

Inventor: [redacted]

Worldwide applications

2015 CN

Application CN201510445496.8A events

2015-07-27 Application filed by [redacted]
2015-07-27 Priority to CN201510445496.8A
2015-10-21 Publication of CN104986086A
Status Pending

Info: Patent citations (6), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (4)

Hide Dependent

1. automobile-used can a folding and unfolding saucer structure, it is characterized in that, comprise connecting rod, cup ring and cup holding ring; Connecting rod is made up of a strip steel plate, and the upper end of steel plate is through inwardly curling into upper clamping ring, and the lower end of steel plate is through inwardly curling into lower clamping ring; The shape of cup ring is convex shape, and the part of protrusion forms the outer connecting portion of circle, leaves opening, enclose outer connecting portion and be arranged on rotationally in clamping ring in the middle of the outer connecting portion of circle; Cup holding ring comprises the outer connecting portion of outwardly holder and to projecting inward and to the holder portion of lower recess, ask the middle of outer connecting portion to leave opening, ask outer connecting portion to be arranged in lower clamping ring rotationally, holder portion is for holding cup.

2. according to claim 1 automobile-used can folding and unfolding saucer structure, it is characterized in that, also comprise shell and buckle closure; The left surface of shell and right flank are equipped with superposed shell upper shed and are positioned at the shell under shed of bottom; The left surface of buckle closure and right flank are equipped with the upper rib matched with shell upper shed, and the left surface of buckle closure and right flank are equipped with the lower rib matched with shell under shed; Shell and buckle closure fasten and form container cavity, and connecting rod is arranged in container cavity; Cup ring is through shell upper shed, and the sidewall of the shell of shell upper shed place forms the fulcrum of cup ring; Cup holding ring is through shell under shed, and the sidewall of the shell of shell lower opening forms the fulcrum of cup holding ring; The upper side of shell and downside are the dip plane of outward-dipping setting.

3. according to claim 2 automobile-used can folding and unfolding saucer structure, it is characterized in that, when cup ring and cup holding ring are in vertical state, lower clamping ring is against on the downside of shell; When cup ring and cup holding ring are in horizontality, upper clamping ring is against on the upper side of shell.

4. automobile-used according to Claims 2 or 3 can folding and unfolding saucer structure, and it is characterized in that, shell is provided with screw, and screw is fixed in automobile through screw.

Description

One is automobile-used can folding and unfolding saucer structure

Technical field

The invention belongs to technical field of automobile, be specifically related to a kind of retractable cup holder that can be fixed on automotive interior.

Background technology

Universal along with automobile, sails and takes advantage of people to have higher requirement for automobile, not only requires that automobile provides comfortable and takes environment, also requires to increase some convenience apparatus of configuration in car.These convenience apparatus just comprise conveniently chauffeur and/or passenger's holding cup and the saucer arranged in automobile.

But the saucer of prior art, be generally fixing structure design, and be fixed in car for hang; Draw through inspection information, current hang comprises air-conditioner air outlet and links up with hook suspension inside suspension, car door, rear deck seat hook suspension these three kinds suspension fixed forms.But this hang Problems existing is: the first, and complex structure, takies interior space large; The second, when saucer leaves unused, also cannot fold up, can not utilize by available

space like this, cause the waste of usage space, also cause in car unsightly simultaneously, inharmonious; 3rd, when generation in driving process is jolted with sudden stop, saucer easily waves and rocks the phenomenon that even breaks off relations, thus causes unnecessary trouble, even occurs potential safety hazard.

Therefore, for Cup holder structure for vehicle of the prior art, how effectively to overcome technological deficiency, the automobile cup holder realizing more simple and convenient practicality then becomes problem demanding prompt solution.

Summary of the invention

In order to solve the problems referred to above that prior art exists, the invention provides a kind of automobile-used can folding and unfolding saucer structure, this automobile-used can folding and unfolding saucer structure structure, its structure is simple, can fold up thus take up room little.

The technical solution adopted in the present invention is: a kind of automobile-used can folding and unfolding saucer structure, comprise connecting rod, cup ring and cup holding ring; Connecting rod is made up of a strip steel plate, and the upper end of steel plate is through inwardly curling into upper clamping ring, and the lower end of steel plate is through inwardly curling into lower clamping ring; The shape of cup ring is convex shape, and the part of protrusion forms the outer connecting portion of circle, leaves opening, enclose outer connecting portion and be arranged on rotationally in clamping ring in the middle of the outer connecting portion of circle; Cup holding ring comprises the outer connecting portion of outwardly holder and to projecting inward and to the holder portion of lower recess, ask the middle of outer connecting portion to leave opening, ask outer connecting portion to be arranged in lower clamping ring rotationally, holder portion is for holding cup.

The opening enclosed in the middle of outer connecting portion is conveniently connected on upper clamping ring by cup ring, only need pull open the open card of glass ring gently during connection on upper clamping ring; Ask the opening in the middle of outer connecting portion to be conveniently be connected to by cup holding ring on lower clamping ring, only need pull open the open card of cup holding ring during connection gently on lower clamping ring.

Further preferred technical scheme is, describedly automobile-usedly folding and unfolding saucer structure can also comprise shell and buckle closure; The left surface of shell and right flank are equipped with superposed shell upper shed and are positioned at the shell under shed of bottom; The left surface of buckle closure and right flank are equipped with the upper rib matched with shell upper shed, and the left surface of buckle closure and right flank are equipped with the lower rib matched with shell under shed; Shell and buckle closure fasten and form container cavity, and connecting rod is arranged in container cavity; Cup ring is through shell upper shed, and the sidewall of the shell of shell upper shed place forms the fulcrum of cup ring; Cup holding ring is through shell under shed, and the sidewall of the shell of shell lower opening forms the fulcrum of cup holding ring; The upper side of shell and downside are the dip plane of outward-dipping setting.

Shell upper shed can sliding plug on upper rib, shell under shed can sliding plug on lower rib; Upper rib and lower rib are used for shell and buckle closure to link together securely also have positioning action.

More preferred technical scheme is, when cup ring and cup holding ring are in vertical state, lower clamping ring is against on the downside of shell; When cup ring and cup holding ring are in horizontality, upper clamping ring is against on the upper side of shell.

Preferred technical scheme is that shell is provided with screw further, and screw is fixed in automobile through screw.

Further illustrate principle of the present invention, because cup ring and cup holding ring are linked together by connecting rod, and cup ring leaves the outer connecting portion of circle, cup holding ring leaves the outer connecting portion of holder, distance the fulcrum contacted with the side wall of outer shell of shell upper shed from the point that contacts with upper clamping ring of the outer connecting portion of circle to cup ring is resistance arm, and the distance between the fulcrum that the power in glass ring of putting on contacts with the side wall of outer shell of shell upper shed place to cup ring is power arm; Therefore by pulling a glass ring, cup ring around fulcrum, thus drives upper clamping ring, connecting rod, lower clamping ring to move in container cavity, and lower clamping ring will drive cup holding ring to move, thus achieves the effect that glass ring and cup holding ring be synchronized with the movement.

When cup ring and cup holding ring are in vertical state, namely when cup ring and cup holding ring are accepted, lower clamping ring is against on the downside of shell, and connecting rod can not move owing to being subject to the resistance of the downside of shell; When cup ring and cup holding ring are in horizontality, namely when cup ring and cup holding ring support cup, upper clamping ring is against on the upper side of shell, connecting rod can not move owing to being subject to the resistance of the upper side of shell, thus keeps cup ring and cup holding ring to be horizontal state support cup.

Beneficial effect of the present invention is:

1) be arranged in car by screw and screw, sound construction is reliable, improves the safety of the original safety of saucer and driver and crew significantly;

2) structure is simple, and volume is little, thus has saved interior space, greatly improves and takes advantage of the traveling comfort driven;

3) easy to use, bar linkage structure realizes interlock effect, greatly reduces the triviality of operation, thus brings more high-end experience to enjoy to driver and crew;

4) structure is simple, saves material, cost-saving to a certain extent, can promote the market competitiveness by actv..

Accompanying drawing explanation

Fig. 1 is integral structure schematic diagram of the present invention;

Fig. 2 is the structural representation after housing lower part of the present invention is cut;

Fig. 3 is the schematic diagram that cup ring of the present invention and cup holding ring are in vertical state;

Fig. 4 is the structural representation of connecting rod of the present invention;

Fig. 5 is cup ring structural representation of the present invention;

Fig. 6 is the structural representation of cup holding ring of the present invention;

Fig. 7 is the structural representation of shell of the present invention;

Fig. 8 is the structural representation of buckle closure of the present invention.

Description of reference numerals is as follows: 1-shell, 101-screw, the upper shed of 102-shell, 103-dip plane, 104-shell under shed; 2-buckle closure, the upper rib of 201-, rib under 202-; 3-connecting rod, the upper clamping ring of 301-, clamping ring under 302-; 4-cup ring, 401-encloses outer connecting portion; 5-cup holding ring, 501-holds in the palm outer connecting portion, 502-holder portion.

Detailed description of the invention

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As shown in Figure 1, provided by the invention automobile-used can folding and unfolding saucer structure in running order, namely cup ring 4 and cup holding ring 5 are in horizontal positioned, the inside of shell 1 is provided with the connecting rod that upper end connects cup ring 4, lower end connects cup holding ring 5, cup ring 4 and cup holding ring 5 all pass and by the left side wall (also claiming left surface) of shell and right side wall (also claiming right flank) support in shell 1, relative to fulcrum.

As shown in Figure 4, Figure 5 and Figure 6, the present invention also comprises a kind of embodiment of simple structure form.This simple structure form comprises connecting rod 3, cup ring 4 and cup holding ring 5; Connecting rod 3 is made up of a strip steel plate, and the upper end of steel plate is through inwardly curling into upper clamping ring 301, and the lower end of steel plate is through inwardly curling into lower clamping ring 302; The shape of cup ring 4 is convex shape, and the part of protrusion forms the outer connecting portion 401 of circle, leaves opening, enclose outer connecting portion 401 and be arranged in clamping ring 301 rotationally in the middle of the outer connecting portion 401 of circle; Cup holding ring 5 comprises the outer connecting portion 501 of outwardly holder and to projecting inward and to the holder portion 502 of lower recess, ask the middle of outer connecting portion 501 to leave opening, ask outer connecting portion 501 to be arranged on rotationally in lower clamping ring 302, holder portion 502 is for holding cup.

The opening enclosed in the middle of outer connecting portion 401 conveniently cup ring 4 is connected on upper clamping ring 301, only need pull open the open card of glass ring 4 gently during connection on upper clamping ring 301; Ask the opening in the middle of outer connecting portion 501 to be conveniently be connected to by cup holding ring 5 on lower clamping ring 302, only need pull open the open card of cup holding ring 5 during connection gently on lower clamping ring 302.

As shown in Figure 7 and Figure 8, the present invention includes shell 1 and buckle closure 2, the left surface of shell 1 and right flank are equipped with superposed shell upper shed 102 and are positioned at the shell under shed 104 of bottom; The left surface of buckle closure 2 and right flank are equipped with the upper rib 201 matched with shell upper shed 102, and the left surface of buckle closure 2 and right flank are equipped with the lower rib 202 matched with shell under shed 104.

As shown in Figure 2, shell upper shed 102 can sliding plug on upper rib 201, shell under shed 202 can sliding plug on lower rib 202; Upper rib 201 and lower rib 202 also have positioning action for shell 1 and buckle closure 2 being linked together securely; Thus shell 1 and buckle closure 2 fasten formation container cavity, connecting rod 3 is arranged in container cavity; Cup ring 4 is through shell upper shed 102, and the sidewall of the shell 1 at shell upper shed 102 place forms the fulcrum of cup ring 4; Cup holding ring 5 is through shell under shed 104, and the sidewall of the shell 1 at shell under shed 104 place forms the fulcrum of cup holding ring 5; The upper side of shell 1 and downside are the dip plane 103 of outward-dipping setting; Shell 1 is provided with screw 101, and screw is fixed in automobile by screw 101.

When cup ring 4 and cup holding ring 5 are in vertical state (as shown in Figure 3), lower clamping ring 302 is against on the downside (dip plane 103 below) of shell 1; When cup ring 4 and cup holding ring 5 are in horizontality (as shown in Figure 1 or 2), upper clamping ring 301 is against on the upper side (dip plane 103 above) of shell.

Principle of the present invention is, because cup ring 4 and cup holding ring 5 are linked together by connecting rod 3, and cup ring 4 leaves the outer connecting portion 401 of circle, cup holding ring 5 leaves the outer connecting portion 501 of holder, be resistance arm from the point that contacts with upper clamping ring 301 of the outer connecting portion 401 of circle to the distance the fulcrum of shell 1 sidewall contact of cup ring 4 and shell upper shed 102, and put on power in glass ring 4 to shell 1 sidewall contact at cup ring 4 and shell upper shed 102 place fulcrum between distance be power arm; Therefore by pulling glass ring 4, cup ring 4 is around fulcrum, thus driving upper clamping ring 301, connecting rod 3, lower clamping ring 302 to move in container cavity, lower clamping ring 302 will drive cup holding ring 5 to move, thus achieves the effect that glass ring 4 and cup holding ring 5 be synchronized with the movement.

When cup ring 4 and cup holding ring 5 are in vertical state, namely when cup ring 4 and cup holding ring 5 are accepted, lower clamping ring 302 is against on the downside (dip plane 103 below) of shell, and connecting rod 3 can not move owing to being subject to the resistance of the downside (dip plane 103 below) of shell 1; When cup ring 4 and cup holding ring 5 are in horizontality, namely when cup ring 4 and cup holding ring 5 support cup, upper clamping ring 301 is against on the upper side (dip plane 103 above) of shell 1, connecting rod 3 can not move owing to being subject to the resistance of the upper side (dip plane 103 above) of shell 1, thus keeps cup ring 4 and cup holding ring 5 to be horizontal state support cup.

The present invention is not limited to above-mentioned preferred forms; anyone can draw other various forms of products under enlightenment of the present invention; no matter but any change is done in its shape or structure; every have identical with the application or akin technical scheme, all drops within protection scope of the present invention.

Patent Citations (6)

Publication number	Priority date	Publication date	Assignee	Title
JPS611033882 *	1981-02-18	1986-03-28	Nissan Motor	
CN2117771U *	1992-03-03	1992-10-07	江兴隆	Bracket for travelling cup
CN2164378Y *	1993-05-29	1994-05-11	李良义	Cup holder for vehicle
WO2002030703A1 *	2000-10-07	2002-04-18	Collins & Aikman Plastics, Inc.	Container holding assembly
CN2908232Y *	2005-08-05	2007-06-06	常州隆翔汽车零部件有限公司	Cup holder on back of vehicle seat
CN204821253U *	2015-07-27	2015-12-02	蔡百善	Automobile -used saucer structure of receiving and releasing
Family To Family Citations				

* Cited by examiner, † Cited by third party

Similar Documents

Publication	Publication Date	Title
CN202006717U	2011-10-12	Tensile sunshading board
CN204821253U	2015-12-02	Automobile -used saucer structure of receiving and releasing
CN104986086A	2015-10-21	Foldable saucer structure for vehicle

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CN205326932U	2016-06-22	Rear -view mirror structure of car B post
CN203698023U	2014-07-09	Automobile back-row seat headrest with foldable wings
CN207902336U	2018-09-25	Outside rear view mirror harness sealing structure
CN203713799U	2014-07-16	Flexible plastic hidden type auxiliary airbag cover plate hinge structure
CN207089138U	2018-03-13	Rearview mirror and the vehicle with the rearview mirror
CN207466311U	2018-06-08	The sunshading board of integrated retracting sunshade
CN208271533U	2018-12-21	A kind of vehicle-mounted advertisement machine
CN203228682U	2013-10-09	Car adjustable beverage rack
CN202863195U	2013-04-10	Connecting structure of child car seat and car chair
CN205239347U	2016-05-18	Car seat with hooks
CN204547931U	2015-08-12	A kind of full-sized car back mirror of the wide visual field
CN205168245U	2016-04-20	But hook formula car seat
CN205440646U	2016-08-10	Back is folded to motorcycle
CN204674408U	2015-09-30	Collapsible bar desk seat
CN203449989U	2014-02-26	Turnover sleeping berth
CN203237297U	2013-10-16	Oil filler cap assembly
CN208714927U	2019-04-09	A kind of convenient mobile hood of storage
CN211442145U	2020-09-08	Vehicle-mounted glasses box and automobile
CN211691963U	2020-10-16	Rubber hinge of passenger car side cabin door
CN209159364U	2019-07-26	A kind of foldable vehicle sunshading board
CN206954065U	2018-02-02	A kind of mounting structure of roof of the vehicle safety handle
CN208306552U	2019-01-01	A kind of hardened structure of the rear side wall of electric car

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
CN201510445496.8A	2015-07-27	2015-07-27	Foldable saucer structure for vehicle

Applications Claiming Priority (1)

Application	Filing date	Title
CN201510445496.8A	2015-07-27	Foldable saucer structure for vehicle

Legal Events

Date	Code	Title	Description
2015-10-21	C06	Publication	
2015-10-21	PB01	Publication	
2015-11-18	C10	Entry into substantive examination	
2015-11-18	SE01	Entry into force of request for substantive examination	
2017-12-26	RJ01	Rejection of invention patent application after publication	**Application publication date:** 20151021

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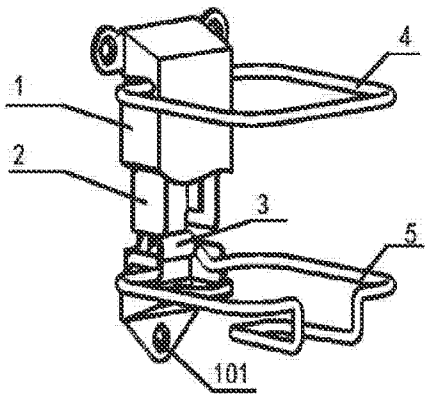
权利要求书1页 说明书4页 附图3页

(54)发明名称

一种车用可收放杯托结构

(57)摘要

本发明涉及一种车用可收放杯托结构，包括连杆、杯圈环、杯托环、外壳和扣盖；连杆是由一条状钢板制成的，钢板的上端经过向内卷曲形成上连接圈，钢板的下端经过向内卷曲形成下连接圈；杯圈环的形状为凸字形，凸出的部分构成圈外连接部，在圈外连接部的中间处留有开口，圈外连接部可转动地设置在上连接圈内；杯托环包括向外凸出的托外连接部和向内凸出并向下凹陷的托部，托外连接部的中间处留有开口，托外连接部可转动地设置在下连接圈内，托部用于托持杯子；外壳和扣盖组成容纳腔，通过连杆相连接的杯圈环和杯托环的整体，设置在容纳腔内。本发明结构简单、能够折叠起来从而占用空间小。



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1. 一种车用可收放杯托结构，其特征在于，包括连杆、杯圈环和杯托环；连杆是由一条状钢板制成的，钢板的上端经过向内卷曲形成上连接圈，钢板的下端经过向内卷曲形成下连接圈；杯圈环的形状为凸字形，凸出的部分构成圈外连接部，在圈外连接部的中间处留有开口，圈外连接部可转动地设置在上连接圈内；杯托环包括向外凸出的托外连接部和向内凸出并向下凹陷的托部，托外连接部的中间处留有开口，托外连接部可转动地设置在下连接圈内，托部用于托持杯子。

2. 根据权利要求 1 所述的车用可收放杯托结构，其特征在于，还包括外壳和扣盖；外壳的左侧面和右侧面均设有位于上部的外壳上开口和位于下部的外壳下开口；扣盖的左侧面和右侧面均设有与外壳上开口相匹配的上筋条，扣盖的左侧面和右侧面均设有与外壳下开口相匹配的下筋条；外壳和扣盖扣合形成容纳腔，连杆设置在容纳腔内；杯圈环穿过外壳上开口，外壳上开口处的外壳的侧壁构成杯圈环的支点；杯托环穿过外壳下开口，外壳下开口处的外壳的侧壁构成杯托环的支点；外壳的上侧面和下侧面均为向外倾斜设置的倾斜面。

3. 根据权利要求 2 所述的车用可收放杯托结构，其特征在于，当杯圈环和杯托环处于竖直状态时，下连接圈抵在外壳的下侧面上；当杯圈环和杯托环处于水平状态时，上连接圈抵在外壳的上侧面上。

4. 根据权利要求 2 或 3 所述的车用可收放杯托结构，其特征在于，外壳上设有螺孔，螺钉穿过螺孔固定到汽车内。

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一种车用可收放杯托结构

技术领域

[0001] 本发明属于汽车配件技术领域，具体涉及一种能够固定在汽车内部的可收放的杯子托架。

背景技术

[0002] 随着汽车的普及，驶乘人对于汽车提出了更高的要求，不仅要求汽车提供舒适的乘坐环境，还要求车内增加配置一些便利设备。这些便利设备就包括为了方便驾驶员和/或乘客放置杯子而在汽车内设置的杯托。

[0003] 然而现有技术的杯托，通常为固定的结构设计，且为悬挂方式固定在车内；经过查阅资料得出，当前的悬挂方式包括空调出风口挂钩悬挂、车门内侧挂钩悬挂、车后座挂钩悬挂这三种悬挂固定方式。但是这种悬挂方式存在的问题是：第一，结构复杂，占用车内空间大；第二，杯托闲置时，也无法折叠起来，这样不能有效空间利用，造成了使用空间的浪费，同时也造成车内不美观、不协调；第三，当行驶过程中产生颠簸和急刹车时，杯托容易发生摇摆晃动甚至脱钩现象，从而造成不必要的麻烦，甚至出现安全隐患。

[0004] 因此，针对现有技术中的车用杯托结构，如何有效克服技术缺陷，实现更简单方便实用的车用杯托则成为亟待解决的问题。

发明内容

[0005] 为了解决现有技术存在的上述问题，本发明提供了一种车用可收放杯托结构，该车用可收放杯托结构结构，其结构简单、能够折叠起来从而占用空间小。

[0006] 本发明所采用的技术方案为：一种车用可收放杯托结构，包括连杆、杯圈环和杯托环；连杆是由一条状钢板制成的，钢板的上端经过向内卷曲形成上连接圈，钢板的下端经过向内卷曲形成下连接圈；杯圈环的形状为凸字形，凸出的部分构成圈外连接部，在圈外连接部的中间处留有开口，圈外连接部可转动地设置在上连接圈内；杯托环包括向外凸出的托外连接部和向内凸出并向下凹陷的托部，托外连接部的中间处留有开口，托外连接部可转动地设置在下连接圈内，托部用于托持杯子。

[0007] 圈外连接部中间的开口是为了方便将杯圈环连接到上连接圈上，连接时只需轻轻拉开杯圈环的开口卡在上连接圈上即可；托外连接部中间的开口是为了方便将杯托环连接到下连接圈上，连接时只需轻轻拉开杯托环的开口卡在下连接圈上即可。

[0008] 进一步优选的技术方案是，所述车用可收放杯托结构还包括外壳和扣盖；外壳的左侧面和右侧面均设有位于上部的外壳上开口和位于下部的外壳下开口；扣盖的左侧面和右侧面均设有与外壳上开口相匹配的上筋条，扣盖的左侧面和右侧面均设有与外壳下开口相匹配的下筋条；外壳和扣盖扣合形成容纳腔，连杆设置在容纳腔内；杯圈环穿过外壳上开口，外壳上开口处的外壳的侧壁构成杯圈环的支点；杯托环穿过外壳下开口，外壳下开口处的外壳的侧壁构成杯托环的支点；外壳的上侧面和下侧面均为向外倾斜设置的倾斜面。

[0009] 外壳上开口能够滑动插接到上筋条上，外壳下开口能够滑动插接到下筋条上；上

筋条和下筋条用于将外壳和扣盖牢固地连接在一起也具有定位作用。

[0010] 更为优选的技术方案是，当杯圈环和杯托环处于竖直状态时，下连接圈抵在外壳的下侧面上；当杯圈环和杯托环处于水平状态时，上连接圈抵在外壳的上侧面上。

[0011] 进一步优选的技术方案是，外壳上设有螺孔，螺钉穿过螺孔固定到汽车内。

[0012] 进一步说明本发明的原理，由于杯圈环和杯托环通过连杆连接在一起，且杯圈环留有圈外连接部，杯托环留有托外连接部，从圈外连接部与上连接圈接触的点到杯圈环与外壳上开口处的外壳侧壁接触的支点之间的距离即为阻力臂，而施加于杯圈环上的力到杯圈环与外壳上开口处的外壳侧壁接触的支点之间的距离即为动力臂；因此通过扳动杯圈环，杯圈环绕支点转动，从而带动上连接圈、连杆、下连接圈在容纳腔内运动，下连接圈就会带动杯托环运动，从而实现了杯圈环和杯托环同步运动的效果。

[0013] 当杯圈环和杯托环处于竖直状态，即在杯圈环和杯托环收起来的情况下，下连接圈抵在外壳的下侧面上，连杆由于受到外壳的下侧面的阻力而不能移动；当杯圈环和杯托环处于水平状态，即在杯圈环和杯托环承托杯子的情况下，上连接圈抵在外壳的上侧面上，连杆由于受到外壳的上侧面的阻力而不能移动，从而保持杯圈环和杯托环处于水平位置状态承托杯子。

[0014] 本发明的有益效果为：

[0015] 1) 通过螺孔和螺钉安装在车内，结构牢固可靠，很大程度的提高了杯托本来的安全性及驾乘人员的安全性；

[0016] 2) 结构简单，体积小，从而节约了车内空间，大大提高乘驾的舒适性；

[0017] 3) 使用方便，连杆结构实现联动效果，大大降低了操作的繁琐性，从而给驾乘人员带来更加高端的体验享受；

[0018] 4) 结构简单，在一定程度上节省材料、节约成本，可有效的提升市场竞争力。

附图说明

[0019] 图 1 是本发明的整体结构示意图；

[0020] 图 2 是本发明的壳体下半部被切割后的结构示意图；

[0021] 图 3 是本发明的的杯圈环和杯托环处于竖直状态的示意图；

[0022] 图 4 是本发明的连杆的结构示意图；

[0023] 图 5 是本发明的杯圈环结构示意图；

[0024] 图 6 是本发明的杯托环的结构示意图；

[0025] 图 7 是本发明的外壳的结构示意图；

[0026] 图 8 是本发明的扣盖的结构示意图。

[0027] 附图标记说明如下：1- 外壳，101- 螺孔，102- 外壳上开口，103- 倾斜面，104- 外壳下开口；2- 扣盖，201- 上筋条，202- 下筋条；3- 连杆，301- 上连接圈，302- 下连接圈；4- 杯圈环，401- 圈外连接部；5- 杯托环，501- 托外连接部，502- 托部。

具体实施方式

[0028] 如图 1 所示，本发明提供的车用可收放杯托结构处于工作状态，即杯圈环 4 和杯托环 5 处于水平放置，外壳 1 的内部设有上端连接杯圈环 4、下端连接杯托环 5 的连杆，杯圈

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环 4 和杯托环 5 均从外壳 1 内穿出并由外壳的左侧壁（也称左侧面）和右侧壁（也称右侧面）支撑，相对于支点。

[0029] 如图 4、图 5 和图 6 所示，本发明还包括一种最简结构形式的实施方式。该最简结构形式包括连杆 3、杯圈环 4 和杯托环 5；连杆 3 是由一条状钢板制成的，钢板的上端经过向内卷曲形成上连接圈 301，钢板的下端经过向内卷曲形成下连接圈 302；杯圈环 4 的形状为凸字形，凸出的部分构成圈外连接部 401，在圈外连接部 401 的中间处留有开口，圈外连接部 401 可转动地设置在上连接圈 301 内；杯托环 5 包括向外凸出的托外连接部 501 和向内凸出并向下凹陷的托部 502，托外连接部 501 的中间处留有开口，托外连接部 501 可转动地设置在下连接圈 302 内，托部 502 用于托持杯子。

[0030] 圈外连接部 401 中间的开口是为了方便将杯圈环 4 连接到上连接圈 301 上，连接时只需轻轻拉开杯圈环 4 的开口卡在上连接圈 301 上即可；托外连接部 501 中间的开口是为了方便将杯托环 5 连接到下连接圈 302 上，连接时只需轻轻拉开杯托环 5 的开口卡在下连接圈 302 上即可。

[0031] 如图 7 和图 8 所示，本发明包括外壳 1 和扣盖 2，外壳 1 的左侧面和右侧面均设有位于上部的外壳上开口 102 和位于下部的外壳下开口 104；扣盖 2 的左侧面和右侧面均设有与外壳上开口 102 相匹配的上筋条 201，扣盖 2 的左侧面和右侧面均设有与外壳下开口 104 相匹配的下筋条 202。

[0032] 如图 2 所示，外壳上开口 102 能够滑动插接到上筋条 201 上，外壳下开口 202 能够滑动插接到下筋条 202 上；上筋条 201 和下筋条 202 用于将外壳 1 和扣盖 2 牢固地连接在一起也具有定位作用；从而外壳 1 和扣盖 2 扣合形成容纳腔，连杆 3 设置在容纳腔内；杯圈环 4 穿过外壳上开口 102，外壳上开口 102 处的外壳 1 的侧壁构成杯圈环 4 的支点；杯托环 5 穿过外壳下开口 104，外壳下开口 104 处的外壳 1 的侧壁构成杯托环 5 的支点；外壳 1 的上侧面和下侧面均为向外倾斜设置的倾斜面 103；外壳 1 上设有螺孔 101，螺钉通过螺孔 101 固定到汽车内。

[0033] 当杯圈环 4 和杯托环 5 处于竖直状态时（如图 3 所示），下连接圈 302 抵在外壳 1 的下侧面（下面的倾斜面 103）上；当杯圈环 4 和杯托环 5 处于水平状态时（如图 1 或图 2 所示），上连接圈 301 抵在外壳的上侧面（上面的倾斜面 103）上。

[0034] 本发明的原理是，由于杯圈环 4 和杯托环 5 通过连杆 3 连接在一起，且杯圈环 4 留有圈外连接部 401，杯托环 5 留有托外连接部 501，从圈外连接部 401 与上连接圈 301 接触的点到杯圈环 4 与外壳上开口 102 处的外壳 1 侧壁接触的支点之间的距离即为阻力臂，而施加于杯圈环 4 上的力到杯圈环 4 与外壳上开口 102 处的外壳 1 侧壁接触的支点之间的距离即为动力臂；因此通过扳动杯圈环 4，杯圈环 4 绕支点转动，从而带动上连接圈 301、连杆 3、下连接圈 302 在容纳腔内运动，下连接圈 302 就会带动杯托环 5 运动，从而实现了杯圈环 4 和杯托环 5 同步运动的效果。

[0035] 当杯圈环 4 和杯托环 5 处于竖直状态，即在杯圈环 4 和杯托环 5 收起来的情况下，下连接圈 302 抵在外壳的下侧面（下面的倾斜面 103）上，连杆 3 由于受到外壳 1 的下侧面（下面的倾斜面 103）的阻力而不能移动；当杯圈环 4 和杯托环 5 处于水平状态，即在杯圈环 4 和杯托环 5 承托杯子的情况下，上连接圈 301 抵在外壳 1 的上侧面（上面的倾斜面 103）上，连杆 3 由于受到外壳 1 的上侧面（上面的倾斜面 103）的阻力而不能移动，从而保持杯

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圈环 4 和杯托环 5 处于水平位置状态承托杯子。

[0036] 本发明不局限于上述最佳实施方式，任何人在本发明的启示下都可得出其他各种形式的产品，但不论在其形状或结构上作任何变化，凡是具有与本申请相同或相近似的技术方案，均落在本发明的保护范围之内。

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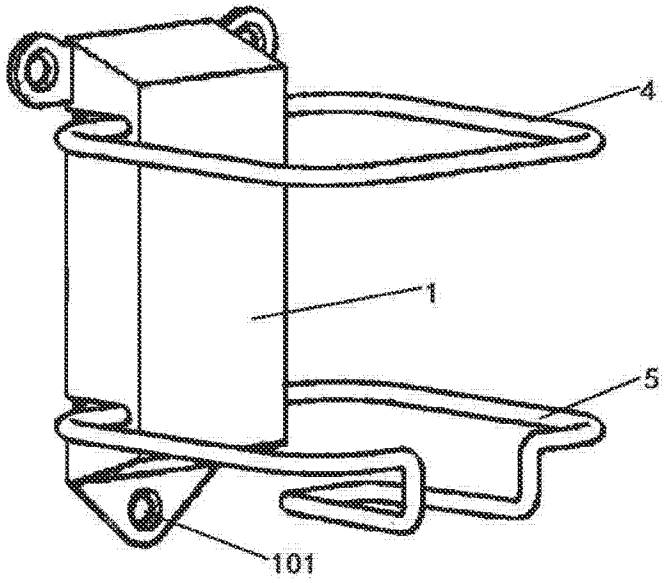

图 1

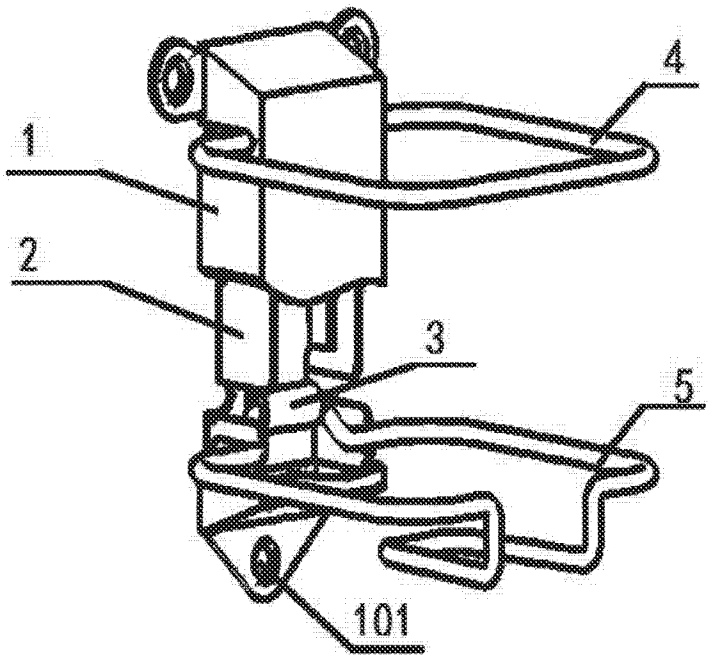

图 2

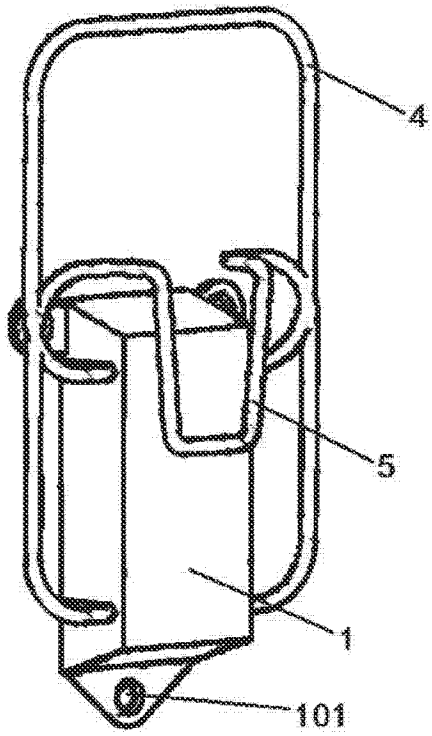

图 3

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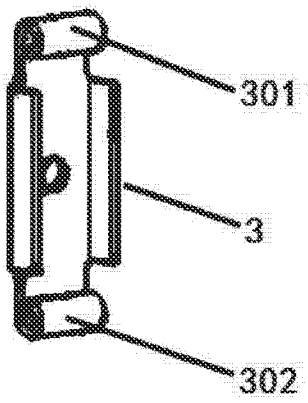

图 4

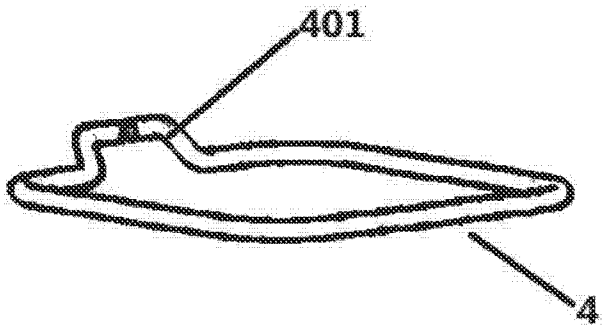

图 5

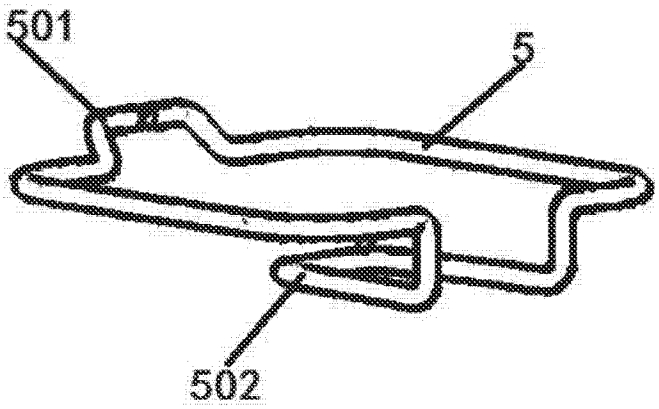

图 6

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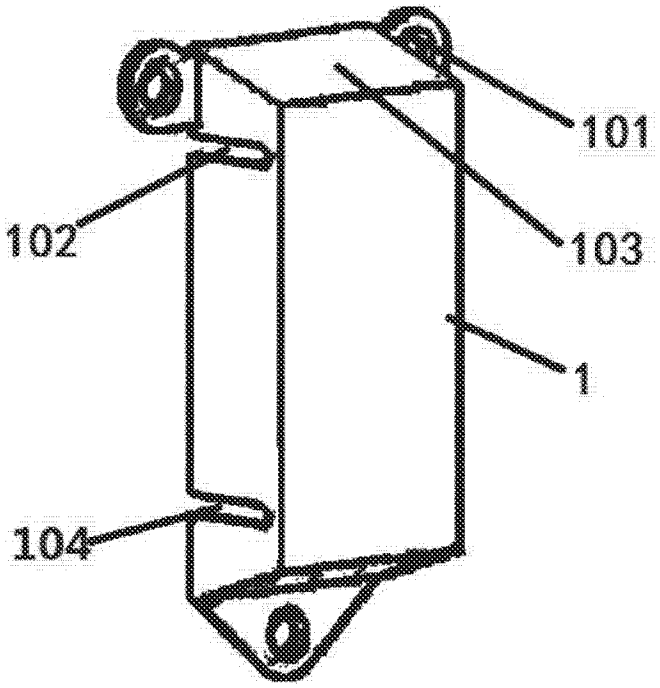

图 7

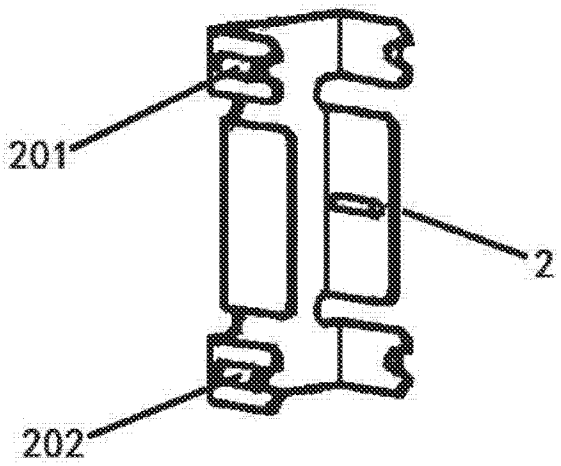

图 8

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/490,715	10/19/2023	B. Scott Maxfield	P298048US03 (506318-576)	5970

153511 7590 11/20/2023

Dorsey & Whitney - SLC
111 South Main Street
21st Floor
Salt Lake City, UT 84111-2176

EXAMINER	
CENTRAL, DOCKET	

ART UNIT	PAPER NUMBER
OPAP	

NOTIFICATION DATE	DELIVERY MODE
11/20/2023	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

davis.ashley@dorsey.com
ip.docket.slc@dorsey.com
mayo.samantha@dorsey.com

Decision Granting Request for Prioritized Examination (Track I)	**Application No.** 18/490,715	**Applicant(s)** Maxfield et al.	
	Examiner CHERYL P GIBSON BAYLOR	**Art Unit** OPET	**AIA (FITF) Status** Yes

1. THE REQUEST FILED 19 October 2023 IS **GRANTED** .

   The above-identified application has met the requirements for prioritized examination
   - A. ☑ for an original nonprovisional application (Track I).
   - B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination**. The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:
   - A. filing a **petition for extension of time** to extend the time period for filing a reply;
   - B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims** , or a multiple dependent claim;
   - C. filing a **request for continued examination** ;
   - D. filing a notice of appeal;
   - E. filing a request for suspension of action;
   - F. mailing of a notice of allowance;
   - G. mailing of a final Office action;
   - H. completion of examination as defined in 37 CFR 41.102; or
   - I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to CHERYL GIBSON BAYLOR at (571)272-3213. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.

/CHERYL GIBSON BAYLOR/ Paralegal Specialist, OPET	

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
18/490,715	10/19/2023		1820	P298048US03 (506318-576)	20	3

CONFIRMATION NO. 5970

FILING RECEIPT

153511
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21st Floor
Salt Lake City, UT 84111-2176

OC00000006397058Z

Date Mailed: 11/03/2023

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

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Inventor(s)

B. Scott Maxfield, Mapleton, UT;
N. Ryan Moss, Mapleton, UT;
Steven S. Miner, Springville, UT;

Applicant(s)

LITTLE GIANT LADDER SYSTEMS, LLC, Springville, UT;

Power of Attorney: The patent practitioners associated with Customer Number 153511

Domestic Priority data as claimed by applicant

This application is a CON of 18/324,971 05/27/2023
which claims benefit of 63/346,420 05/27/2022

Foreign Applications for which priority is claimed (You may be eligible to benefit from the Patent Prosecution Highway program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

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If Required, Foreign Filing License Granted: 10/31/2023
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/490,715**
Projected Publication Date: 02/08/2024
Non-Publication Request: No
Early Publication Request: No
Title

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 18/490,715

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	320
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	700
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	800
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	* 0			OR	x =	0
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x =	0
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1820

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

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Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (04-14)

CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	B. Scott Maxfield	Nonprovisional Application Number (if known):	Not yet assigned
Title of Invention:	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.

2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.

3. The applicable box is checked below:

I. ☑ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, **or** the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /Richard C. Galati/	Date 2023-10-19
Name (Print/Typed) Richard C. Galati	Practitioner Registration Number 66759

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.**

☑ *Total of 1 forms are submitted.

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MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent Application No. 18/324,971, filed on 27 May 2023 and entitled, "MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT," which claims priority to U.S. Provisional Patent Application No. 63/346,420, filed on 27 May 2022 and entitled, "MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT," the disclosure of which is incorporated herein in its entirety by this reference.

TECHNICAL FIELD

[0002] The present disclosure generally relates to ladders and, more particularly, components for adjusting ladders while also providing other functionality.

BACKGROUND

[0003] Ladders are conventionally utilized to provide a user with improved access to elevated locations that might otherwise be inaccessible. Ladders come in many shapes and sizes, such as straight ladders, extension ladders, stepladders, and combination step and extension ladders. Combination ladders and articulating ladders may incorporate, in a single ladder, many of the benefits of multiple types of ladder designs.

[0004] Straight ladders, extension ladders or combination ladders (when configured as straight or an extension ladder), are ladders that are conventionally positioned against an elevated surface, such as a wall or the edge of a roof, to support the ladder at a desired angle. A user then ascends the ladder to obtain access to an elevated area, such as to an upper area of the wall or

access to the roof. A pair of feet or pads, one being coupled to the bottom of each side rail, is conventionally used to engage the ground, a floor or some other supporting surface.

[0005] Step ladders/freestanding ladders and combination ladders (when configured as a step ladder/freestanding ladder) are generally considered to be self-supporting in that they include a first rail assembly which includes steps or rungs that is coupled to a second rail assembly or other support structure. The first and second rail assemblies are typically positioned at an acute angle relative to each other so that there are multiple feet or support members—at least three, but typically four—to support the ladder in a free standing position. Thus, the ladder rungs may be climbed to an elevated position without the need to lean the ladder against a wall or other vertical support structure.

[0006] There is a constant need for improvements to the utility and user experience provided by ladders, scaffolds, and related assemblies.

SUMMARY

[0007] One aspect of the present disclosure relates to 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 pair of rails; a first pair of hinge portions coupled to the first pair of rails; and 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 at least one retainer movable between a first axial position along the pivot axis and a second axial position along the pivot axis, the first assembly being rotatable relative to the second assembly while the at least one retainer is in the first axial position,

the first assembly being prevented from rotation relative to the second assembly by the at least one retainer while the at least one retainer is in the second axial position; wherein the at least one retainer includes: a body; and a support arm coupled with and extending from the body.

[0008] In some embodiments, the at least one retainer comprises a pin portion extending from the body into at least one of the pair of hinges.

[0009] In some embodiments, the body is reversibly removable from the pin portion.

[0010] In some embodiments, the support arm is pivotable relative to the body between a deployed position and a collapsed position.

[0011] In some embodiments, the support arm is selectively biased into the deployed position and into the collapsed position.

[0012] In some embodiments, the deployed position is substantially perpendicularly offset from the collapsed position.

[0013] In some embodiments, the body comprises a protrusion limiting rotation away from the deployed position while the support arm is in the collapsed position.

[0014] In some embodiments, the support arm is substantially aligned with a plane perpendicular to the pivot axis while in the collapsed position.

[0015] In some embodiments, the at least one retainer is movable between the first axial position and the second axial position in response to application of an axially-oriented force to a substantially axially-facing surface of the body.

[0016] In some embodiments, the support arm forms a loop with the body while in the deployed position.

[0017] In some embodiments, the loop includes at least three linear segments.

[0018] In some embodiments, the body comprises at least one support surface engaging a downward-facing surface the support arm while the support arm is in the deployed position.

[0019] In some embodiments, the at least one support surface is pitched toward a centerline of the body.

[0020] In some embodiments, the first pair of rails and the second pair of rails are movable relative to the pivot axis between at least a freestanding configuration and a collapsed configuration.

[0021] In some embodiments, while the first pair of rails and the second pair of rails are in the freestanding configuration on a substantially horizontal support surface, the support arm extends substantially horizontally relative to the substantially horizontal support surface.

[0022] In some embodiments, a top surface of the body comprises at least one aperture extending perpendicular to the pivot axis.

[0023] In some embodiments, the support arm is pivotable about an axis perpendicular to the pivot axis.

[0024] Another aspect of the disclosure relates to a button for a locking mechanism, the button comprising: a body having a first side surface, a second side surface positioned opposite the first side surface, and at least one lateral surface extending between the first side surface and the second side surface; a support arm coupled with the body and pivotable relative to the body about a pivot axis intersecting the at least one lateral surface, the support arm being pivotable about the pivot axis between a deployed position and a collapsed position; wherein in the collapsed position, the support arm lies between a first plane defined by the first side surface of the body and a second plane defined by the second side surface of the body; and wherein in the deployed position, the support arm extends from the second side surface in a direction extending away from

the first side surface. The button may be directly coupled with an adjustment mechanism of a ladder.

[0025] Another aspect of the disclosure relates to a button for a locking mechanism, the button comprising: a body having a first side surface attachable to a shaft, a second side surface positioned opposite the first side surface, and at least one lateral surface extending between the first side surface and the second side surface; a support arm coupled with the body and pivotable relative to the body about a pivot axis intersecting the at least one lateral surface, the support arm being pivotable about the pivot axis between a deployed position and a collapsed position; wherein in the deployed position, a substantially upward-facing portion of the at least one lateral surface limits rotation of the support arm about the pivot axis.

[0026] The above summary of the present invention is not intended to describe each embodiment or every implementation of the present invention. The figures and the detailed description that follow more particularly exemplify one or more preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] The accompanying drawings and figures illustrate a number of exemplary embodiments and are part of the specification. Together with the present description, these drawings demonstrate and explain various principles of this disclosure. A further understanding of the nature and advantages of the present invention may be realized by reference to the following drawings. In the appended figures, similar components or features may have the same reference label.

[0028] FIG. 1 is a perspective view of a ladder in a freestanding configuration.

[0029] FIG. 2 is an exploded view of a hinge mechanism of the ladder of FIG. 1.

[0030] FIG. 3A is a front view of the hinge mechanism of FIG. 2 in a locked condition.

[0031] FIG. 3B is a front view of the hinge mechanism of FIG. 3A in an unlocked condition.

[0032] FIG. 4 is a perspective view of the ladder of FIG. 1 in an extended configuration.

[0033] FIG. 4A is a front view of the hinges of the ladder of FIG. 4.

[0034] FIG. 5 is a perspective view of a button of the ladder of FIG. 1 with the support arm in a collapsed configuration.

[0035] FIG. 6 is a perspective view of the button of FIG. 5 with the support arm in a deployed configuration.

[0036] FIG. 7 is a front view of the button of FIG. 5.

[0037] FIG. 8 is a front view of the button of FIG. 6.

[0038] FIG. 9 is a front section view of the button of FIG. 8, as indicated by box 9 in FIG. 8.

[0039] FIG. 10 is a front section view of the button of FIG. 9 with the support arm loaded.

[0040] FIG. 11 is a right side view of the button of FIG. 5.

[0041] FIG. 12 is a right side view of the button of FIG. 6.

[0042] FIG. 13 is a detail perspective view of a portion of the button body of the button of FIG. 5.

[0043] FIG. 14 is a top view of the button of FIG. 5.

[0044] FIG. 15 is a top view of the button of FIG. 6.

[0045] FIG. 16 is a rear perspective view of the button of FIG. 5.

[0046] FIG. 17 is a rear perspective section view taken through section plane 17 in FIG. 15.

[0047] FIG. 18 is a perspective view of another button for a ladder with a support arm in a storage position.

[0048] FIG. 19 is a right side view of the button of FIG. 18.

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[0050] IG. 20 is a perspective view of the button of FIG. 18 with the support arm in a deployed position.

[0051] FIG. 21 is a right side view of the button of FIG. 20.

[0052] FIG. 22 is a top view of the button of FIG. 20.

[0053] While the embodiments described herein are susceptible to various modifications and alternative forms, specific embodiments have been shown by way of example in the drawings and will be described in detail herein. However, the exemplary embodiments described herein are not intended to be limited to the particular forms disclosed. Rather, the instant disclosure covers all modifications, equivalents, and alternatives falling within the scope of the appended claims.

DETAILED DESCRIPTION

[0054] Users of a ladder often carry tools and other objects to be used in an elevated position. For example, painters often carry brushes, paint cans, knives, power tools, and similar objects for use while standing on the rungs. Construction workers often carry power tools, fasteners, and other materials with them on the ladder.

[0055] Articulating ladders and convertible/combination-type ladders typically lack convenient areas for supporting these objects, especially if there is no top cap or other platform area extending between the rail assemblies or rungs. However, the hinges and locking mechanisms of adjustable ladders and combination ladders are typically within reach of the user while in the elevated position due to their positioning near the top end of the ladder when in a step ladder/freestanding ladder state and due to their positioning near the center of the ladder's vertical length when in an extension ladder/straight ladder state. Furthermore, locking mechanisms that secure inner rails relative to outer rails of a front assembly or rear assembly are often also user accessible while in an elevated position.

[0056] Aspects 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.

[0057] The support arm can be configured to resist detachment from the body of the button and can be configured to minimize breakage of the support arm if the ladder tips over onto the support arm or button. The support arm can also provide features for biasing the support arm in the collapsed and deployed positions to improve stability of the support arm and to help guide the user. Other features of the button can ease in the assembly and durability of the body and support arm.

[0058] The present description provides examples, and is not limiting of the scope, applicability, or configuration set forth in the claims. Thus, it will be understood that changes may be made in the function and arrangement of elements discussed without departing from the spirit and scope of the disclosure, and various embodiments may omit, substitute, or add other procedures or components as appropriate. For instance, the methods described may be performed in an order different from that described, and various steps may be added, omitted, or combined. Also, features described with respect to certain embodiments may be combined in other embodiments.

[0059] Referring to FIG. 1, an articulating ladder 100 is shown. The articulating ladder 100 includes a first rail assembly 102 including an inner assembly slidably coupled with an outer assembly. The inner assembly includes a pair of spaced apart rails 104 coupled with a plurality of rungs 106. Likewise, the outer assembly includes a pair of spaced apart rails 108 coupled to a plurality of rungs 110. The rails 104 of the inner assembly are slidably coupled with the rails 106 of the outer assembly. The inner and outer assemblies and may be selectively locked relative to each other via locking mechanisms 112 such that one or more of their respective rungs 106 and 110 are aligned with each other. A locking mechanism 112 may be configured to engage a portion of the inner rail assembly and the outer rail assembly so as to selectively lock the two assemblies

relative to each other. While a locking mechanism 112 may be provided on each side of the ladder 100, and, in some cases, both locking mechanisms 112 may need to be unlocked to move rails of the inner assembly relative to rails of the outer assembly. Buttons and related assemblies described herein may be used with locking mechanisms 112.

[0060] The articulating ladder 100 also includes a second rail assembly 114 that includes an inner assembly slidably coupled with an outer assembly. The inner assembly includes a pair of rails 111 coupled with a plurality of rungs and is configured similar to the inner assembly of the first rail assembly described above. Likewise, the outer assembly includes a pair of rails 113 coupled with a plurality of rungs and is configured similar to the outer assembly of the first rail assembly described hereinabove. Locking mechanisms 124 may be associated with inner and outer assemblies and to enable selective positioning of the inner assembly relative to the outer assembly as described above with respect to the first rail assembly 102. In some embodiments, the locking mechanisms 124 (or 112) may be adjustment mechanisms used to adjustably retain components to the ladder 100, such as accessories, tools, and other apparatuses. Thus, the locking mechanisms may be used for purposes other than locking rails or hinges and may be used to adjust the positioning of components on the ladder.

[0061] One exemplary locking mechanism that may be used with the first and second rail assemblies 102 and 114 is described in U.S. Pat. No. 8,186,481, issued May 29, 2012, the disclosure of which is incorporated by reference herein in its entirety. While the locking mechanism described in U.S. Pat. No. 8,186,481 is generally described in conjunction with an embodiment of an adjustable step ladder, such a locking mechanism may by readily used with an embodiment such as the presently described combination ladder as well. It is additionally noted that, in one embodiment, the rail assemblies 102 and 114 may be configured similar to those which

are described in U.S. Pat. No. 4,210,224 to Kummerlin, the disclosure of which is incorporated by reference in its entirety. Other configurations of rail assemblies may be utilized.

[0062] The first rail assembly 102 and the second rail assembly 114 are coupled to each other by way of a pair hinge mechanisms 126. Each hinge mechanism 126 may include a first hinge component (e.g., 132) coupled with a rail 104 of the first rail assembly's inner assembly and a second hinge component (e.g., 134) coupled with a corresponding rail of the second rail assembly's inner assembly. The hinge components of each hinge mechanism 126 rotate about a pivot member (e.g., pivot pin 128 or sleeve 130 having a central longitudinal pivot axis extending laterally through the hinge mechanisms 126 in FIGS. 2, 4, and 5) such that the first rail assembly 102 and the second rail assembly 114 may pivot relative to each other between different angles defined between the first and second rail assemblies. Additionally, the hinge mechanisms 126 may be configured to lock their respective hinge components (and, thus, the associated rails to which they are coupled) at desired angles relative to each other. One example of a suitable hinge mechanism is described in U.S. Pat. No. 4,407,045 to Boothe, the disclosure of which is incorporated by reference herein in its entirety. Other configurations of hinge mechanisms are also contemplated and can be used, as will be appreciated by those having ordinary skill in the art and the benefit of the present disclosure.

[0063] The articulating ladder 100 can be constructed so as to assume a variety of states or configurations. For example, using the locking mechanisms (112 or 124) to adjust a rail assembly (102 or 114) enables the ladder 100 to adjust in height. More specifically, considering the first rail assembly 102, as the rail assembly 102 is adjusted, with the outer assembly being displaced relative to the inner assembly, the associated locking mechanisms 112 engage the inner and outer assemblies when they are at desired relative positions with the rungs (106 and 110) of

the inner and outer assemblies at a desired vertical spacing relative to each other. At some of the adjustment heights of the rail assembly 102, at least some of their respective rungs (106 and 110) align with each other (such as shown in FIG. 1). The second rail assembly 114 may be adjusted in a similar manner.

[0064] Considering the embodiment shown in FIG. 1, adjustment of the rail assemblies 102 and 114 enables the ladder 100 to be configured as a step ladder with, for example, four effective rungs at a desired height (as shown in FIG. 1), or to be configured as a step ladder that is substantially taller having five, six, seven, or eight effective rungs, depending on the relative positioning of the inner and outer assemblies. However, it is noted that the inner and outer rail assemblies may be configured with more or fewer rungs than four. It is also noted that the first rail assembly 102 and the second rail assembly 114 do not have to be adjusted to similar heights (i.e., having the same number of effective rungs). Rather, if the ladder is used on an uneven surface (e.g., on stairs), the first rail assembly 102 may be adjusted to one height while the second rail assembly 114 may be adjusted to a different height in order to compensate for the slope of the supporting surface, for use on a set of stairs, or in a variety of other scenarios where the ground or support surface may exhibit a change in elevation between the first and second rails assemblies 102 and 114.

[0065] Additionally, the hinge mechanisms 126 provide for additional adjustability of the ladder 100. For example, the hinge mechanisms 126 enable the first and second rail assemblies 102 and 114 to be adjusted to a variety of angles relative to each other. As shown in FIG. 1, the first and second rail assemblies 102 and 114 may be configured at an acute angle relative to each other such that the ladder may be used as a self-supporting or "freestanding" ladder, similar to a step ladder. However, the first and second rail assemblies 102 and 114 may be rotated or pivoted

about the hinge mechanisms 126 so that they extend from one another in substantially the same plane (i.e., exhibiting an angle of substantially 180° with respect to each other) with the hinge mechanisms 126 locking them in such an orientation, as shown in FIGS. 4 and 4A. When configured in this manner, the ladder 100 may be used as an extension ladder or "straight ladder." Moreover, each of the first and second assemblies 102 and 114 are still adjustable with respect to their lengths (i.e., through the relative longitudinal displacement of their respective inner and outer assemblies). It is additionally noted that the rungs of the various assemblies (e.g., rungs 106, 110) are configured to have support surfaces on both the tops and the bottoms thereof so as to enable their use in either a step ladder configuration or an extension ladder configuration.

[0066] FIG. 2 shows an exploded perspective view of a hinge mechanism 126 including a pivot pin 128, a sleeve 130 or bushing, a set of slidable/rotatable rail plates 132, 134 (which are, respectively, parts of the first and second rail assemblies 102, 114), a biasing member 136 or spring, a button body 138, a button plate 140, button fasteners 142, and a support arm 144. The pivot pin 128 is attachable to the button body 138 while extending through the rail plates 132, 134, the sleeve 130, and the biasing member 136. The sleeve 130 can comprise a hardened barrel that holds together and aligns the rail plates 132, 134. In some embodiments, the sleeve 130 can act as a pivot for the hinge assemblies and can allow the hinge to be retained in an unlocked position (via a detent mechanism). For example, the pivot pin 128 can be inserted into an inward-opening aperture or recess in the button body 138 and can be secured in place by a fastener or clip to the button body 138. As also described in connection with U.S. Pat. No. 4,407,045, the pivot pin 128 can be integrally formed with (or coupled to, via a bracket 145) a pair of locking pins 146, 148 that are selectively insertable and (at least partially, if not entirely) withdrawable from a corresponding pair of locking apertures 150, 152 extending through each of the rail plates 132,

134. The locking apertures 150, 152 can align with each other to form a continuous passage through the rail plates 132, 134 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 positions).

[0067] Thus, as shown in the front plan view of FIG. 3A, the hinge mechanism 126 can have a locked position in which the locking pins (e.g., 146, 148) extend through the locking apertures (e.g., 150, 152) and thereby prevent the rail plates 134 associated with the first assembly 102 from rotating relative to the rail plates 132 associated with the second assembly 114. As shown in FIG. 3B, the hinge mechanism 126 can be laterally/axially transitioned to an unlocked position in which the locking pins 146, 148 are removed from the locking apertures 150, 152 (or at least from the locking apertures in the central rail plates 132 and the laterally outermost rail plate 134, e.g., similar to the pins in U.S. Pat. No. 4,407,045), thereby allowing rotation of the first rail plates 132 relative to the second rail plates 134 about an axis of rotation 135 (i.e., a pivot axis or hinge axis) extending centrally through the shaft of the pivot pin 128.

[0068] For example, when unlocked, the first assembly 102 can rotate relative to the second assembly 114 from the stepladder configuration of FIG. 1 into the extension configuration of FIG. 4 or into a storage configuration (i.e., a collapsed configuration) in which the rails of the first and second assemblies 102, 114 are parallel to each other and next to each other. A laterally inward-directed force can be applied to an axially-facing surface 156 (see FIG. 2) of the button body 138 to move the pivot pin 128 and locking pins 146, 148 laterally inward by overcoming a biasing force applied to the button body 138 by compressing the biasing member 136. When in the unlocked condition, the biasing member 136 can apply an laterally outward biasing force to the button body 138 that, via the pivot pin 128, biases the locking pins 146, 148 laterally outward and into the locking apertures 150, 152 when the apertures of both sets of plates 132, 134 align

(i.e., when the ladder 100 is in the standing configuration of FIG. 1 or in the extension configuration of FIG. 4). As used herein, a "lateral" direction refers to a direction parallel to axis 135, "laterally inward" refers to a lateral direction oriented toward the center of the ladder (i.e., the vertical centerline between the rails 104), and "laterally outward" refers to a lateral direction oriented away from the center of the ladder.

[0069] While the ladder 100 is in the freestanding configuration of FIG. 1, the button body 138 on each hinge mechanism 126 can be oriented relative to a ground plane (i.e., a horizontal support surface positioned under and supporting the first and second assemblies 102, 114) so that the support arm 144 on each side has a horizontally-extending width portion 154 when deployed (i.e., in the condition shown in FIG. 1). In other words, the tops of the buttons 138 can both face the same direction (e.g., vertically upward) when in the standing configuration, and the support arms 144 can both deploy downward (e.g., vertically downward) and laterally outward in a mirrored fashion with the width portions 154 of the arm(s) 144 parallel to the ground/ladder support surface under the feet of the ladder 100. As further explained below, the support arms 144 can therefore be configured to support tools or other objects for the user for easy access while the user has climbed the standing ladder. In some embodiments, the support arms 144 can be configured to remain in permanent positions relative to their respective button bodies 138, such as by being integral parts of the button body structures 138 or by being adhered, fastened, or otherwise permanently attached in the deployed position.

[0070] The support arms 144 can include a C- or U-shaped profile configured with ends 223 that fit into openings 214 in the button body 138. *See* FIGS. 2, 5-8, and 11-16. In some embodiments, a support arm 144 can have straight portions (e.g., width portion 154 and/or side bars 228) that extend between curved corner portions (e.g., as shown in the figures) or pointed

corner portions. The size of a support arm 144 can be sufficient that the three sides of the support arm 144 (e.g., 154 and 228) allow the support arm 144 to rotate to the storage or collapsed configuration (FIG. 5) with the horizontal width portion 154 positioned above the top surface of the button body 138. In other words, the entire thickness of the support arm 144 can lie between two parallel planes that are defined by the outward and inward axially-facing surfaces (i.e., 156 and 1600) of the body 138. The support arm 144 can have straight sides to maximize the size of the opening defined by the support arm 144 and body 138 (and/or plate 140) when the arm 144 is in the deployed configuration (FIG. 15). A large opening can enable a variety of tools or other objects to be supported by the button 200, including, for example, a chuck of a power drill or a large handle. Furthermore, straight sides of the arm 144 can allow a user to hang clips or hooks on the arm 144 that would not be able to hang on a curved rod, such as a tool's belt clip or clamps that are configured to be retained to a substantially flat (or flattenable) support member/belt. Additionally, by having three straight sides, the arm 144 can support such clips or hooks on three different sides of the arm 144 while it is deployed.

[0071] In some embodiments, the arm 144 can have a curved profile with zero, one, or two straight portions. A more curved profile can minimize the size of the button 200 while the arm 144 is in the collapsed configuration. For example, the arm 144 can have a shape that substantially conforms to the outer perimeter of the side surfaces (e.g., 220, 222, 240) of the body 138 or that is slightly larger than the body 138. Additionally, the arm 144 can have more than three straight portions, such as four or more, if the straight portions are shorter (e.g., width portion 154 is shorter in length) or if the arm 144 extends further from the body 138 when in the collapsed position.

[0072] Additionally, the arm 144 is shown with a substantially circular cross-sectional profile (*see, e.g.,* FIGS. 9-10), but its cross-sectional profile can also or alternatively be tubular, square, triangular, combinations thereof, or similar shapes. A curved profile (e.g., circular) can facilitate easier insertion and removal of objects from the arm 144, and a sharper or more angular profile can facilitate more secure retention of items.

[0073] The hinge mechanisms 126 can be configured with buttons 138 that rotate in synch with at least the laterally inner hinge plates 134 and their respective pivot pins 128. In one of the hinge mechanisms 126, the laterally inner hinge plate 134 is part of the first assembly 102, and in the other hinge mechanism 126 the laterally inner hinge plate 134 is part of the second assembly 114. This is shown in FIG. 4A, which is a frontal view of the ladder 100 at the hinge mechanisms 126 when in the extension configuration of FIG. 4. Therefore, when the ladder 100 transitions to the extension configuration, one of the buttons 138 can rotate about 180 degrees with the second assembly 114, as shown in FIG. 4A. For this reason, the buttons 138 can, in some configurations, have their orientations different from each other, such as by being flipped about 180 degrees relative to each other when the ladder 100 is in the extension configuration as compared to when the ladder is in the standing configuration. Furthermore, the support arms 144, when deployed, can be parallel to the ground support plane of the ladder 100 when in the freestanding configuration (FIG. 1), but may be at least partially angularly offset from the ground support plane of the ladder 100 when in the extension ladder configuration since the extension ladder can be tilted to various angles relative to the ground support plane. In at least one tilt angle of the extension ladder configuration, which angle corresponds to the angle of the rails relative to the ground support plane when the ladder 100 is in the freestanding configuration, at least one of the support arms 144 can be parallel to the ground support plane. Additionally, in the extension

ladder configuration, one of the support arms 144 can transition to being deployed by rotating downward (as indicated by arrow 158) and one of the support arms 144 can transition to being deployed by rotating upward (as indicated by arrow 160).

[0074] FIGS. 5 and 6 are perspective views of a button 200 that can be used as part of a locking mechanism (e.g., 126) of a ladder (e.g., 100). In some embodiments, the button 200 can be used as an outer part, handle, or grip of a rail assembly length-locking mechanism 112, 124. The button 200 can include a button body 138 and a support arm 144. The support arm 144 is pivotable relative to the body 138 about a pivot axis 202. In FIG. 5, the support arm 144 is in a collapsed, substantially in-plane flattened position relative to the body 138, and in FIG. 6, the support arm 144 is in a deployed, open, angled position relative to the body 138. While in the deployed position, a user object (e.g., a tool, supplies, hook, cup, *etc.*) can be supported by the support arm 144, such as by resting, clipping, or hanging a portion of the user object on the support arm 144. The body 138 can be coupled to a pin or shaft extending toward the rest of the locking mechanism 126 of the ladder (e.g., pivot pin 128), so the body 138 can support the support arm 144 while the support arm 144 supports the user object. In some embodiments, a bolt or other fastener can be inserted through the body 138 (e.g., through longitudinal opening 203; *see also* rear section view of FIG. 17 as taken through section plane 17 in FIG. 15) and through an opening in the pivot pin 128 to couple them to each other. That fastener can be removable, thereby enabling reversible removal of the button body 138 from the pivot pin 128. Thus, the button body 138 and pivot pin 128 can be separable, independent parts that can be reversibly removed from each other or can be coupled and attached to each other by a fastener and corresponding coupling components. FIGS. 7-8 show front side views, FIGS. 11-12 show right side views, and FIGS. 14-15 show top

side views the button 200 in the respective collapsed and deployed states. FIG. 16 shows a rear perspective view of the button 200 in a collapsed state.

[0075] The body 138 can include a first side surface (e.g., inner axially-facing surface 1600 in FIG. 16) and a second side surface (e.g., outer axially-facing surface 156 in FIG. 5). A user can press on the outer axially-facing surface 156 to compress the biasing member 136 to transition the button 200 from the laterally-outward locked position of FIG. 3A to the laterally-inward unlocked position of FIG. 3B. In some embodiments, the surface 156 can be sized and shaped to comfortably receive pressure from the palm or fingers of the user's hand. Thus, the button body 138 can be referred to as a button, switch, compression surface, or compression button of the locking mechanism 126.

[0076] The body 138 can include a pair of support surfaces 204 (or one support surface 204 on each opposing side of the body 138 between the first and second side surfaces 1600, 156) on which the support arm 144 can rest and engage when in the deployed position of FIG. 6, as shown in FIG. 8. The support surfaces 204 can therefore be oriented facing upward or substantially upward. The support surface 204 can provide resistance to downward angular rotation of the support arm 144 past a predetermined deployed angle 206, as shown in FIG. 12. The deployed angle 206 can be defined relative to a vertical direction or an axis lying in the plane defined by the outer axially-facing surface 156. In some embodiments, the deployed angle 206 can be about or exactly 90 degrees, such as being in a range of about 88 degrees to 91 degrees, wherein the side bars 228 of the support arm 144 are about or exactly horizontal and parallel to the horizontal ground support surface of the ladder 100 when deployed.

[0077] In some embodiments, the deployed angle 206 can be less than 90 degrees, such as being between about 75-85 degrees relative to the vertical direction. This configuration can

beneficially allow the support arm 144 to slightly bend downward (e.g., when loaded with an object) without bending past 90 degrees, thereby eliminating or at least limiting the possibility that the support arm 144 will rotate downward and allow the object to fall out of the support arm 144. Additionally, if the ladder 100 laterally tips over and falls to the ground with the button 200 having a deployed support arm 144, with a deployed angle 206 under 90 degrees, the arm 144 will, under the weight of the rest of the ladder 100, rotate back toward the collapsed or storage position (FIG. 11). With the arm 144 at 90 degrees, the arm 144 itself and the openings 214 supporting the arm 144 would bear more of the impact forces and more likely cause damage to the arm 144 or body 138.

[0078] In some embodiments, the support surfaces 204 can define inward-sloping ramped angles, as shown by angle 208 shown in FIG. 9 (which is a detail view of the button 200 as taken at box 9 in FIG. 8 and in which the support arm 144 is shown in section view where it contacts surface 204) and visible in FIGS. 7 and 8. When the support arm 144 is deployed, it can rest on the support surfaces 204, and the weight of objects supported by the arm 144 can pull downward on the arm 144 to rotate it toward the deployed position. The downward force (e.g., 210 in FIG. 9) can, when applied to the support surface 204, drive the arm 144 along an inward direction (i.e., along direction 212; down the slope and toward the centerline of the body 138 between the support surfaces 204), as shown in FIG. 10, which shows the arm 144 displaced inward relative to the unloaded condition shown in FIG. 9. This movement can reduce or eliminate the possibility that the arm 144 will flex laterally outward at the support surfaces 204 when weighted down and then potentially rotate past the deployed angle 206 or become detached from the body 138 (e.g., by being pulled from at least one side opening 214 shown in FIG. 11). Thus, any flexure of the support arm 144 can be biased inward by the ramped angle of the support

surfaces 204, thereby tightening the grip and attachment between the support arm 144 and the body 138 rather than potentially loosening that grip.

[0079] In some embodiments, the button plate 140 can be included on the laterally outward side 156 of the button body 138. A portion of the button plate 140 (e.g., a middle or central portion) can be spaced away from the axially-facing surface 156, as clearly shown in FIGS. 14-15. A gap 216 between the button plate 140 and the button body 138 can receive and retain a thin item such as a spatula, paper, or an end hook portion of a tape measure.

[0080] The ends of the button plate 140 can be attached to the body 138 and can have a top surface or top edge 218 (*see* FIG. 13) configured to engage the support arm 144 when the arm is in the deployed position. In some embodiments, the button plate 140 can comprise a more rigid material than the button body 138, so the top edge 218 can help limit the amount of downward flexure possible for the support surface 204 and arm 144 when the arm 144 is loaded by a user item. In some embodiments, the button plate 140 can be at least partially comolded or formed as an integral part of the body 138. Thus, the button plate 140 and body 138 can be formed of different materials having different weights, strengths, and flexibilities, such as with the button plate 140 comprising metal (e.g., steel, aluminum, magnesium, similar metals, alloys, or combinations thereof) and the body comprising plastic (e.g., polyurethane, acrylonitrile butadiene styrene (ABS), polyvinyl chloride (PVC), similar plastics, or combinations thereof).

[0081] Side surfaces 220, 222 of the body 138 can have the side openings 214 formed therein to receive ends of the support arm 144. One or both of the side surfaces 220, 222 can also include a set of protrusions 224, 226 configured to face away from the center of the body 138 and to engage the support arm 144. A vertical protrusion 226 on each side can limit angular rotation of the support arm 144 about the arm pivot axis 202 in a laterally inward direction past a

predefined, in-plane storage position (e.g., as shown in FIG. 11). Thus, the normal operating range of motion of the support arm 144 can be defined by contact with the support surface 204 on one end (e.g., FIG. 12) and by contact with the vertical protrusion 226 on the opposite end (e.g., FIG. 11). In some embodiments, the support arm 144 can comprise a flexible material, shape, and size that permits it to expand, at least temporarily, and to flex to have its ends 223 (*see* FIG. 16) withdrawn from the side openings 214 and to have its side bars (e.g., 228 in FIG. 11) clear the vertical protrusion 226 for removal of the support arm 144 from the body 138. This direction of flexure is indicated, for example, by arrows 221 in FIG. 16. Similarly, the support arm 144 can be constructed in a manner capable of flexing to pass the vertical protrusion 226 when being installed to the body 138. The side openings 214 can be formed in recesses (e.g., 230 in FIG. 13) relative to the side surfaces 220 so that the ends 223 of the support arm 144 do not have to expand outward so far as to potentially cause plastic deformation or breakage of the support arm 144 while being installed to (or removed from) the body 138.

[0082] Central protrusions 224 of the side surfaces 220, 222 can provide ramped surfaces that bias the side bars 228 of the support arm 144 into the storage position (FIG. 11) on one end and into the deployed position (FIG. 12) on the opposite end if the central protrusion 224. Thus, the central protrusions 224, vertical protrusions 226, and support surfaces 204 can form a pair of grooves in a side surface (e.g., 220), with one groove corresponding to the storage position and one groove corresponding to the deployed position. FIG. 13 shows the protrusions 224, 226 and support surface 204 with example collapsed-arm groove 232 and deployed-arm groove 234 indicated. The support arm 144 can comprise an elastically deformable material (e.g., spring steel) configured to flex outward and away from the side surfaces 220, 222 to move from a low-potential-energy position in a groove (e.g., 232) to a higher-potential energy position (e.g., engaging the

protruding part of protrusion 224 between the grooves 232, 234) and then to be elastically biased back into a lower-potential energy position when reaching another groove (e.g., 234) as the arm 144 rotates about axis 202. Thus, the support arm 144 can be biased into the grooves 232, 234, and can resist rotation away from a groove 232/234 due to friction with the central protrusion 224, but can be rotated away from a groove 232/234 upon application of sufficient torque to overcome that friction and to expand the side bars 228 away from the side surfaces 220, 222.

[0083] In some embodiments, the vertical protrusion 226 can protrude further from the side surface 220 than the central protrusion 224. *See* FIGS. 8-10 and 14-15. Thus, the expansion of the support arm 144 needed to rotate over the central protrusion 224 is less than the expansion of the support arm 144 needed to rotate past the vertical protrusion 226. This can help limit over-rotation of the support arm 144 whereby the arm 144 would move out of the range of motion discussed above.

[0084] The top views of FIGS. 14 and 15, among others, show that the button body 138 can include a top surface 240. The top surface 240 can be configured to face, on average, vertically upward when the ladder 100 is in the freestanding configuration and on a level ground support surface. The button body 138 can include a set of item retention apertures 242, 244 (or recesses) extending through (or receding into) the top surface 240. Retention apertures 242, 244 can be generally circular in cross-section and can provide openings into which an elongated item can be inserted through the top surface 240, such as a screwdriver, awl, fastener (e.g., nail or screw), fork, brush, or similar structure. Furthermore, in some embodiments, an accessory can be attached to the body 138 using the retention apertures 242, 244 such as, for example, a shelf or cup holder having hooks or other elongated rods insertable into the retention apertures 242, 244 so that the accessory is at least temporarily supportable by the button body 138. Additionally, an

accessory (e.g., shelf, cup holder, tool organizer, etc.) can be attachable to the outer axially-facing surface 156 through at least one axially-oriented opening 250 (e.g., using fasteners into the opening(s) 150). *See* FIGS. 5-8 and 16.

[0085] In some embodiments, at least one retention aperture (e.g., 242 or 244) can vertically align with an internal aperture (e.g., 246 or 248) extending through a web or other structural feature within the button body 138, as shown in FIG. 16. Thus, an elongated item can extend through and be positioned within both the retention aperture and the internal aperture for increased support and stability of the item while it is being held in place.

[0086] FIGS. 18-22 show an embodiment of a button 300 having features in common with button 200 described above and which are referenced using similar identifying numerals. Button 300 includes a support arm 344 with partially curved and angled portions connected to each other by a straight width portion 354. Thus, the support arms 344 can include a C- or U-shaped profile configured with ends that fit into side openings in the button body 338 in the manner described above in connection with openings 214. In some embodiments, the support arm 344 has straight side bar portions 328 that are configured to slide against and engage the side protrusions 324 of the button body 338 and that fit within the storage groove and deployed groove on the ends of the side protrusions 324.

[0087] A set of scooped or curved portions 380 can be positioned in the support arm 344 between the side bar portions 328 and the width portion 354. As indicated in FIG. 22, the curved portions 380 can respectively lie in planes 376, 378 that are parallel to the side surfaces 320, 322 of the button body 338. Additionally, as shown in FIGS. 19 and 21, the curved portions 380 can each form a recessed profile of the arm 344 that, when the arm 344 is deployed, is vertically offset (e.g., offset downward by distance 382) relative to the horizontal (or substantially

horizontal) top surface plane 384 of the straight side bar portions 328. In some embodiments, the side bar portions 328 may not be straight, and the recessed profile at the curved portions 380 can be vertically offset downward from a horizontal plane tangent to the highest point proximal to the opening (e.g., 214) in which the arm 344 is coupled to the button body 338. The recessed profile can beneficially be used to support and retain objects that are long, narrow, cylindrical, tubular, etc., such as a pipe or tube that lies in a horizontal plane extending across the recessed profiles above the curved portions 380 and between the width portion 354 and body 338. An example object C is shown in broken lines in FIGS. 21-22. As shown in the figures, object C can rest upon the arm 344 without rolling off of the arm 344, despite its round profile, due to the recessed profile receiving a bottom portion of the object C. Thus, the recessed profile of the arm 344 can help retain objects that might be susceptible to rolling off of arm 144.

[0088] The curved portions 380 and width portion 354 can also form a raised distal portion of the arm 344, as shown in FIG. 21. A horizontal plane 386 tangent to (or about parallel to a horizontal plane tangent to) the top surface of the width portion 354 can be vertically offset (e.g., by distance 388) from the horizontal (or substantially horizontal) top surface plane 384. Accordingly, the curved portions 380 can position the width portion 354 to act as a rail or raised distal support that can help prevent an object (e.g., object C) from moving distally off of the arm 344 due to the distal end (at portion 354), when deployed, being vertically higher than the proximal end (e.g., at side bar portions 328) and thereby mechanically interfering with and forming a barrier against sliding or rolling of the object in a distal direction. Additionally, in conjunction with the body 338 and the recessed profile described above, the arm 344 can form a side cupping profile (as defined between plane 386 and the top surfaces of the arm 344 and outer axially-facing surface of body 338) that can receive and support objects of various sizes across both side portions of the

arm 344 (i.e., across portions 328 and 380). The loop shape of the arm 344 and body 338 can also define an aperture through the arm 344, as seen in FIG. 22. In some embodiments, the arm 344, body 338, or plate 340 can define a bottom surface or a support portion that extends under the aperture through the arm 344 and that limits downward movement of objects through the aperture. For example, the plate 340 can provide a bottom support for a cup or other object placed in the aperture of the loop of the arm 344.

[0089] The size of a support arm 344 can be sufficient that the three main portions of the support arm 344 (e.g., 354 and each pair of 328/380) allow the support arm 344 to rotate to the storage or collapsed configuration (FIGS. 18-19) with the width portion 354 positioned above the top surface of the button body 338. In other words, the entire thickness of the support arm 344 can lie between two parallel planes that are defined by the outward and inward axially-facing surfaces (i.e., corresponding to 156 and 1600) of the body 338.

[0090] Additionally, the arm 344 is shown with a substantially circular cross-sectional profile, but its cross-sectional profile can also or alternatively be tubular, square, triangular, combinations thereof, or similar shapes. A curved profile (e.g., circular) can facilitate easier insertion and removal of objects from the arm 344, and a sharper or more angular profile can facilitate more secure retention of items.

[0091] Various inventions have been described herein with reference to certain specific embodiments and examples. However, they will be recognized by those skilled in the art that many variations are possible without departing from the scope and spirit of the inventions disclosed herein, in that those inventions set forth in the claims below are intended to cover all variations and modifications of the inventions disclosed without departing from the spirit of the

inventions. The terms "including:" and "having" come as used in the specification and claims shall have the same meaning as the term "comprising."

CLAIMS

What is claimed is:

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.

2. 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;

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

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;

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;

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

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.

3. The ladder of claim 1, wherein

the second button body comprises a substantially flat outward-facing surface parallel to the first button body; and

the at least one gap is sized and shaped to hang the object from the second button body.

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

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

6. The ladder of claim 1, wherein the at least one gap includes two open ends.

7. 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.

8. 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.

9. The ladder of claim 1, wherein the second button body defines a surface facing axially inward toward the pair of hinges and substantially parallel to the first button body.

10. The ladder of claim 1, wherein the object is supportable by the second button body by hanging on the second button body while at least partially positioned in the at least one gap.

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

12. A button for a locking mechanism, the button comprising:

a button body including a first button body portion and a second button body portion;

a pivot pin coupled with the first button body portion and extending away from the button body; and

a biasing member operable to apply a biasing force to the button body, wherein the biasing force is configured to oppose a force applied to the button body opposite the pivot pin;

wherein the second button body portion includes a width portion and at least two side portions, the at least two side portions connecting the width portion to the first button body portion, wherein the second button body portion and the first button body portion define an opening.

13. The button of claim 12, wherein the second button body portion and the first button body portion are integrally formed as a single piece.

14. The button of claim 12, wherein the opening opens radially outward in a first direction.

15. The button of claim 14, wherein the opening opens radially outward in a second direction opposite the first direction.

16. The button of claim 12, wherein the at least two side portions are coupled to the first button body portion at opposite lateral ends of the width portion.

17. The button of claim 12, further comprising:

a bracket coupled with the pivot pin; and

a pair of locking pins coupled with the bracket and oriented substantially parallel to the pivot pin.

18. The button of claim 12, wherein the second button body portion comprises a plate shape connected to an opposite side of the first button body portion relative to the pivot pin.

19. 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 movable between a set of first axial positions along the pivot axis and a set of second axial positions 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;

a plate structure integrally formed with the body on at least two ends of the plate structure, 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 body surface and configured to receive and support a tool;

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 set of 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 set of second axial positions and the at least one locking pin is positioned in the first opening and in the second opening.

20. The ladder of claim 19, 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.

ABSTRACT

Ladders have first and second assemblies with pairs of rails that form a pair of hinges rotatable about a pivot axis. The hinges include at least one retainer movable between axial positions along the pivot axis. The at least one retainer includes a body and a support arm coupled with the body. The arm can be pivotable relative to the body between a deployed position and a collapsed position. The support arm can support objects while a user is in an elevated position on the ladder.

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Application Number	Not yet assigned
Filing Date	Herewith
First Named Inventor	B. Scott Maxfield
Title	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT
Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	P298048US03 (506318-576)

SIGNATURE of Applicant or Patent Practitioner

Signature	/Richard C. Galati/	Date (Optional)	
Name	Richard C. Galati	Registration Number	66759
Title (if Applicant is a juristic entity)	Attorney for Applicant		
Applicant Name (if Applicant is a juristic entity)	LITTLE GIANT LADDER SYSTEMS, LLC		

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**10/19/2023 09:31:14 PM ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Eve Stark
PATENT CENTER #	63039238	AUTHORIZED BY	Richard Galati
CUSTOMER #	153511	FILING DATE	-
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	B. Scott Maxfield

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
DA / 506181	**E20230IL34067418**	**Eve Stark**

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
506181	**37 CFR 1.16 (National application filing, search, and examination fees); 37 CFR 1.17 (Patent application and reexamination processing fees); 37 CFR 1.19 (Document supply fees); 37 CFR 1.20 (Post Issuance fees); 37 CFR 1.21 (Miscellaneous fees and charges)**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1830	PROCESSING FEE, EXCEPT IN PROVISIONAL APPLICATIONS	140.00	1	140.00
1817	REQUEST FOR PRIORITIZED EXAMINATION	4200.00	1	4200.00
1111	UTILITY PATENT APPL. SEARCH FEE	700.00	1	700.00
1011	BASIC FILING FEE - UTILITY (PAPER FILING ALSO REQUIRES NON-	320.00	1	320.00

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	ELECTRONIC FILING FEE UNDER 1.16(T))			
1311	PATENT APPL. EXAMINATION FEE	800.00	1	800.00
			TOTAL AMOUNT:	**$6,160.00**

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/490,715	**10/19/2023 09:31:14 PM ET**	**P298048US03 (506318-576)**

Title of Invention

MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5970	FILED BY	Eve Stark
PATENT CENTER #	63039238	FILING DATE	-
CUSTOMER #	153511	FIRST NAMED INVENTOR	B. Scott Maxfield
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Richard Galati

Documents

TOTAL DOCUMENTS: 7

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
P298048US03_506318-576_CONApp ADS.pdf	9	Application Data Sheet	2174 KB
P298048US03_506318-576_CONApp-Track1.pdf	2	Track One Request	112 KB
P298048US03_506318-576_CONApp POA.pdf	2	Power of Attorney	280 KB
P298048US03_506318-576_CONApp Declarations.pdf	3	Oath or Declaration filed	674 KB
P298048US03_506318-576	34	Application body structured text	45 KB

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CONApp Specification-APP.TEXT.docx		document	

Warning: Hidden items were found and have been removed. Bookmarks were found and have been removed.

P298048US03_506318-576_CONApp Drawings.pdf	16	Drawings-only black and white line drawings	2868 KB
P298048US03_506318-576 CONApp_Specification.pdf	33	Auxiliary PDF of Application	528 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
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P298048US03_506318-576 CONApp Specification-APP.TEXT.docx	2A24309210AD2F14461F81DA4AA715796FA40F4430BD32E85E851EF8954549C034DB5119F5AF750081773F0C576CCC3F2C190690D64A6002E32EDA95712B8E6F
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P298048US03_506318-576	8F6055C4C5E71BE91598318AD082A834690D67393885986A49
CONApp_Specification.pdf	C2224CC8CDECDABC2CA665E7FBFC0736240EA48192086AB
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT

As the below named inventor, I hereby declare that:

This declaration is directed to:

- [x] The attached application, or
- [ ] United States application or PCT international application number _____ filed on _____

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: B. Scott Maxfield Date (Optional): _____

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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LEGAL NAME OF INVENTOR

Inventor: N. Ryan Moss Date (Optional): May 25 2022

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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LEGAL NAME OF INVENTOR

Inventor: Steven S. Miner Date (Optional): 5-23-2022

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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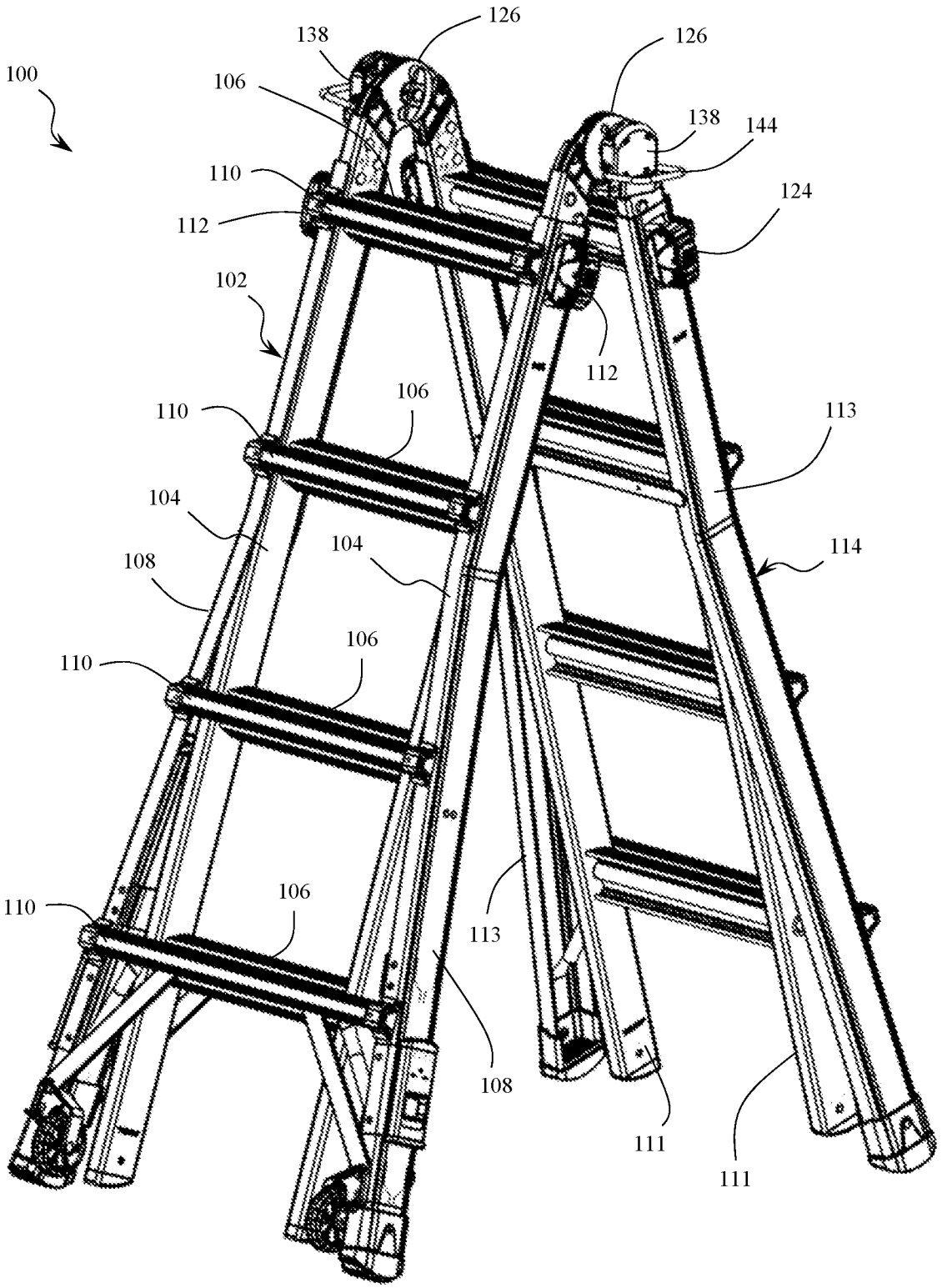
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FIG. 1

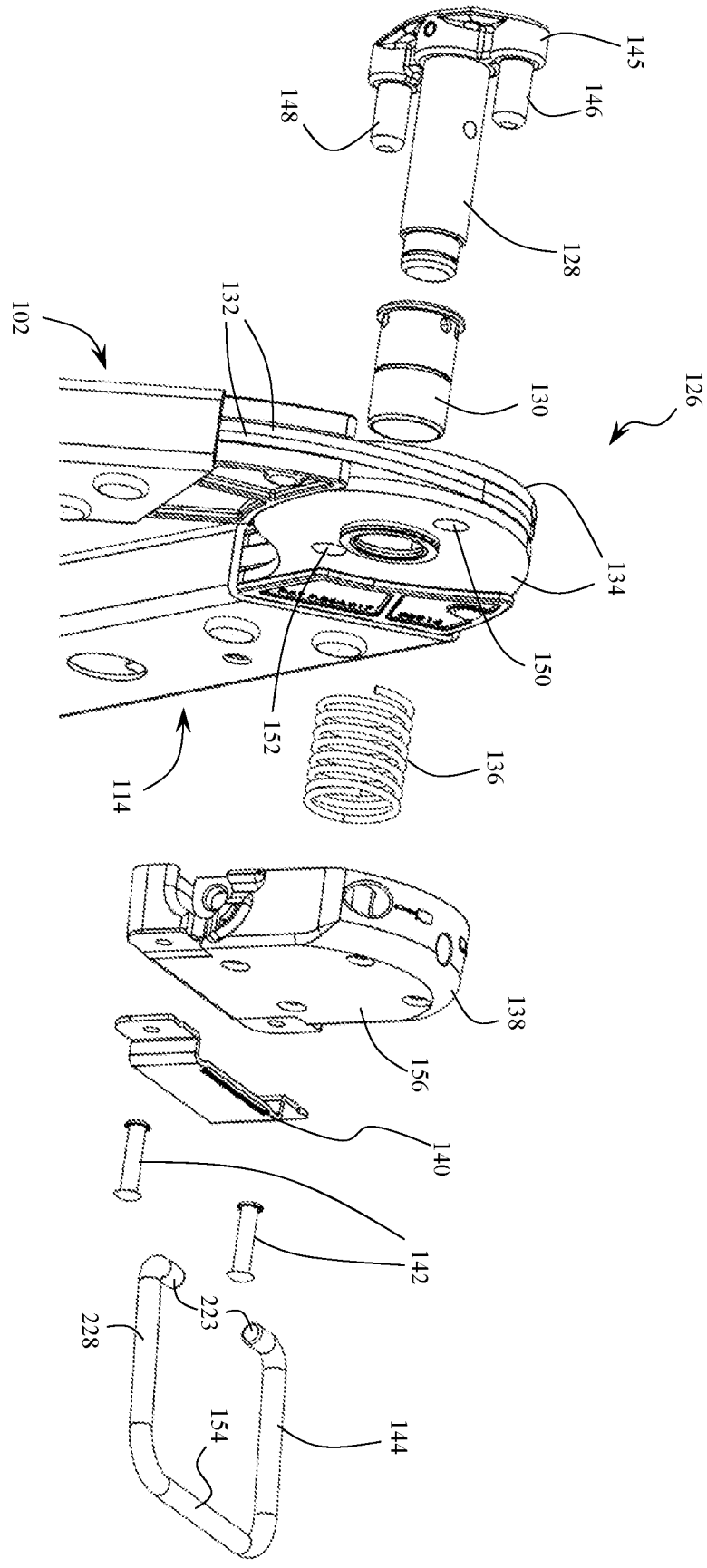

FIG. 2

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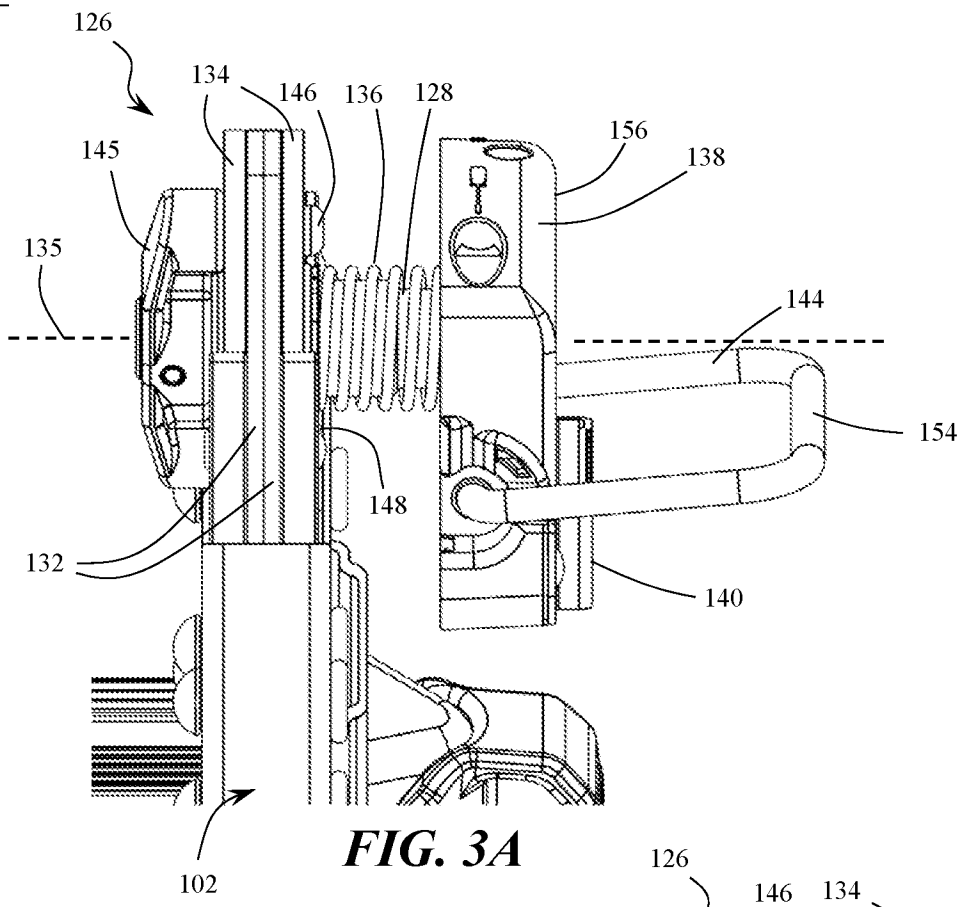
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FIG. 3A

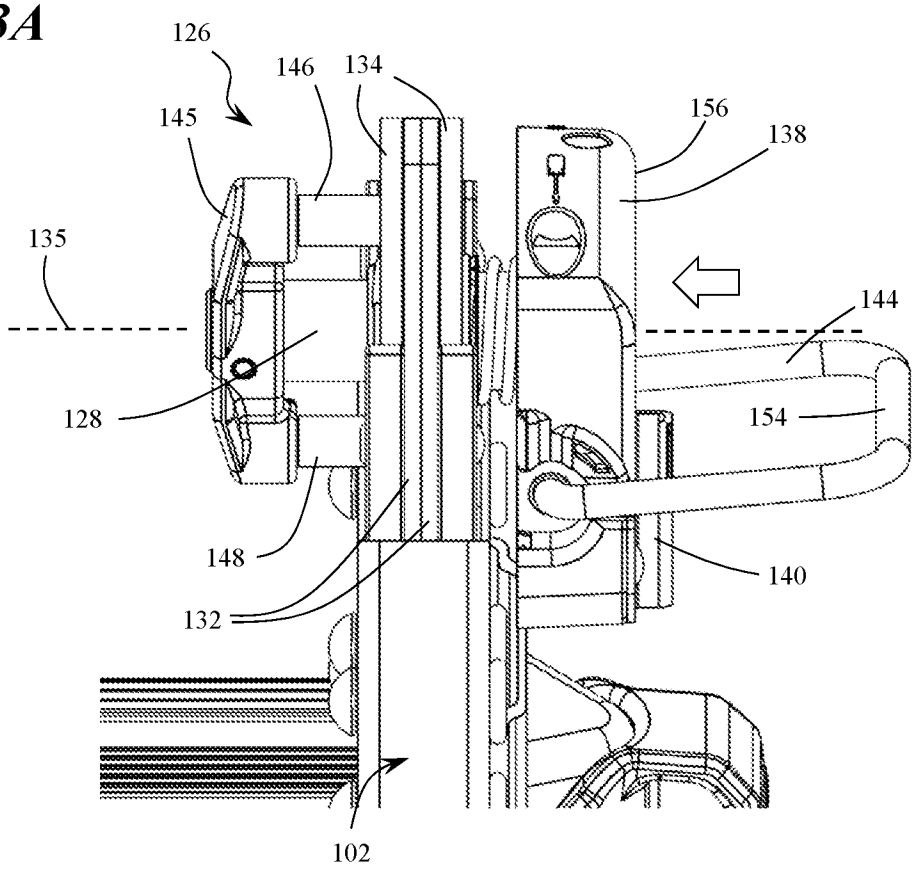
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FIG. 3B

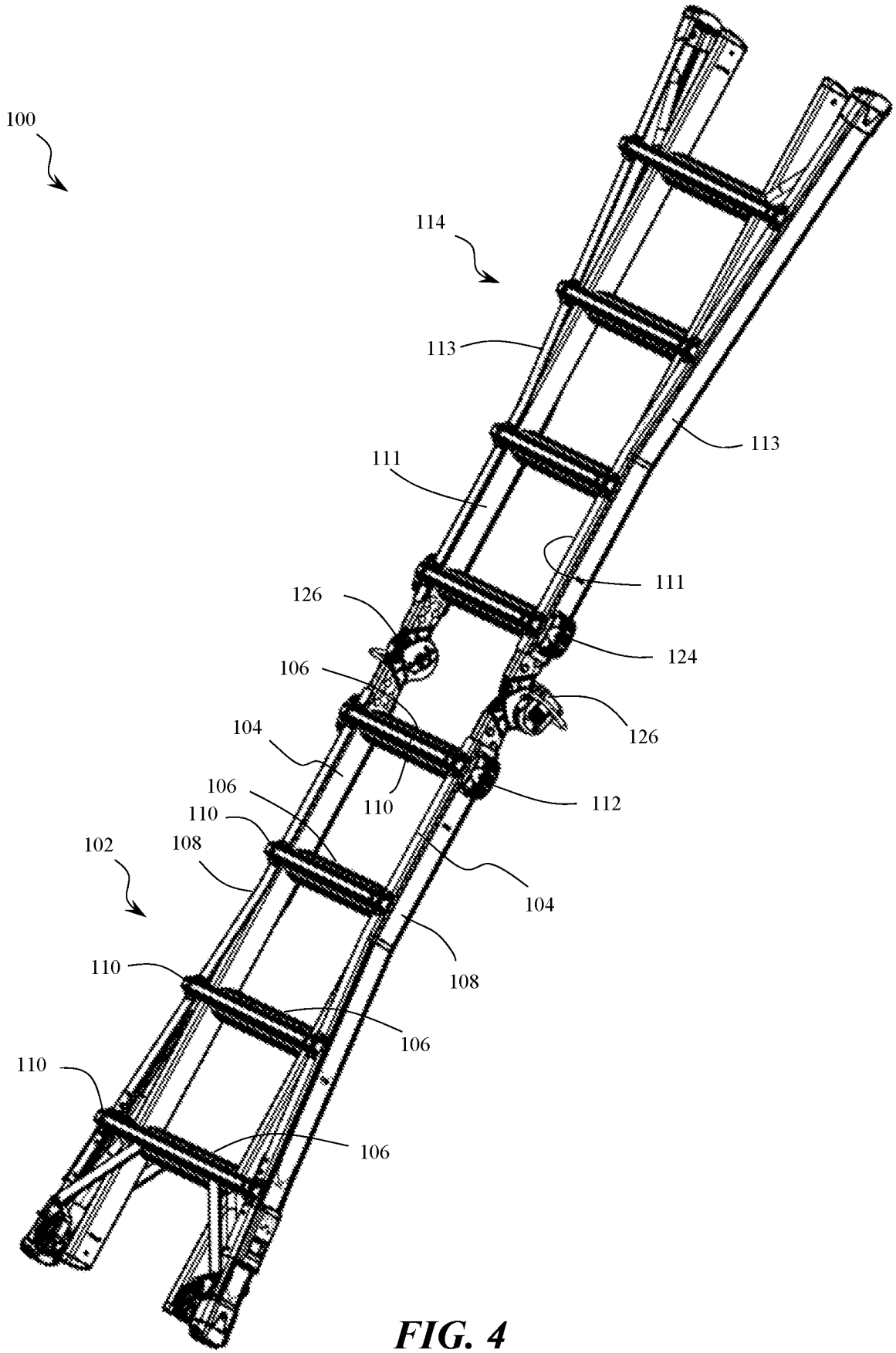

FIG. 4

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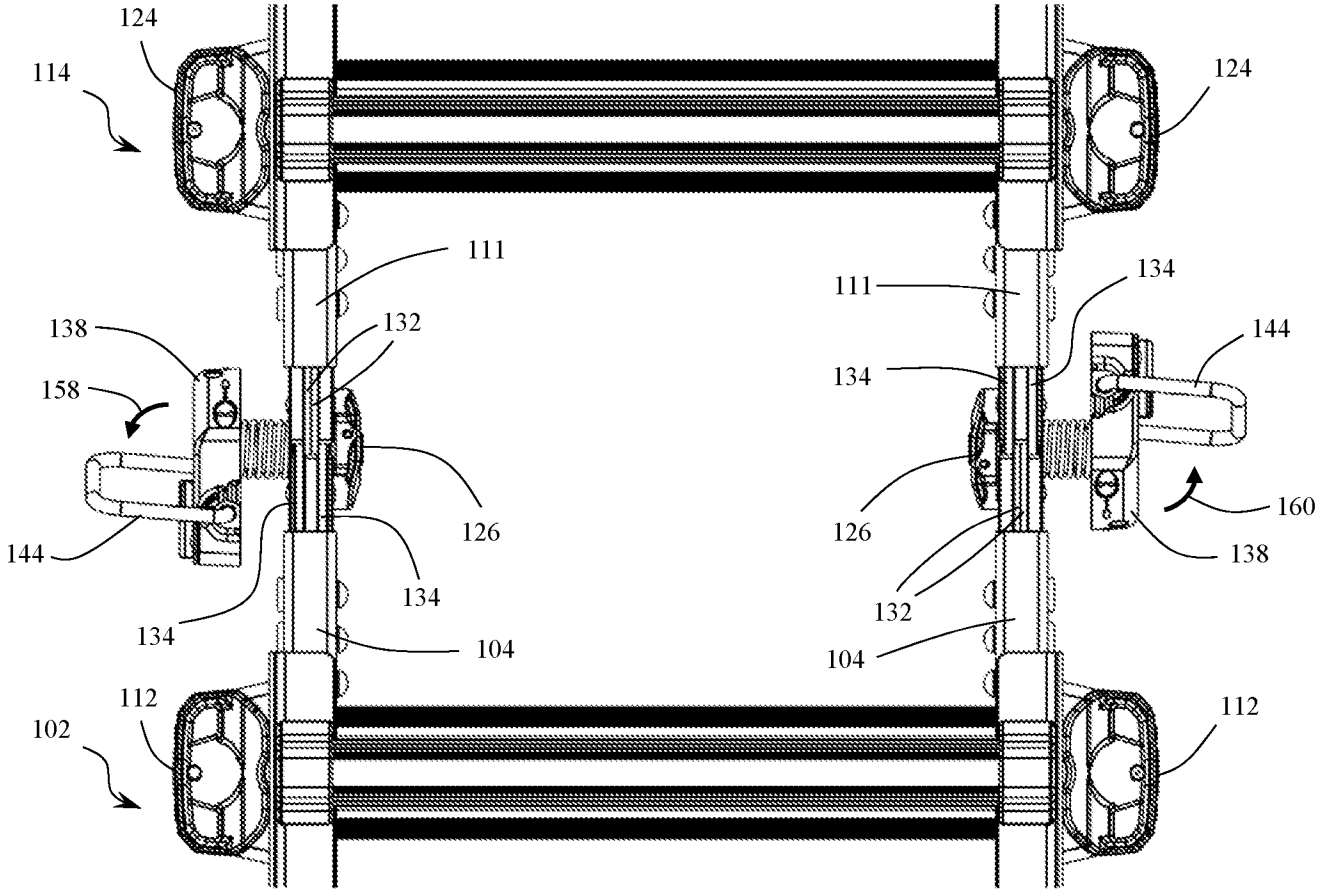

FIG. 4A

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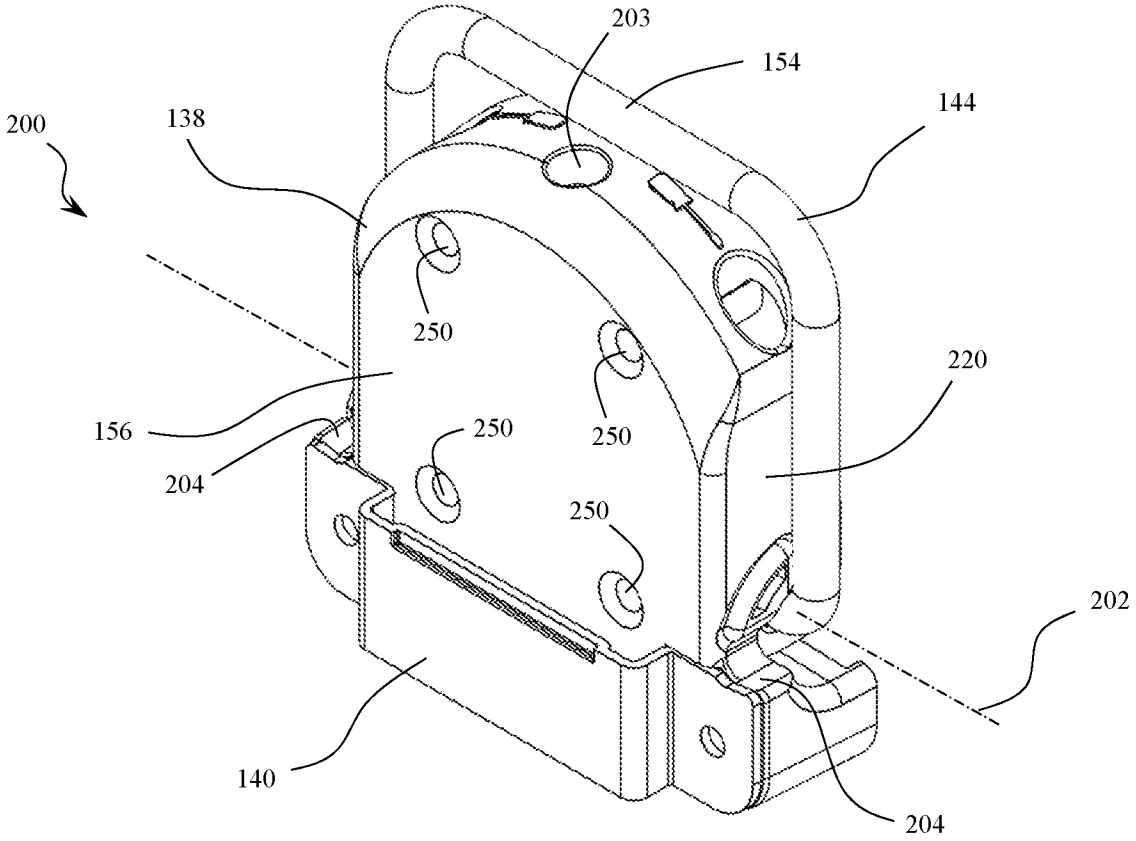

FIG. 5

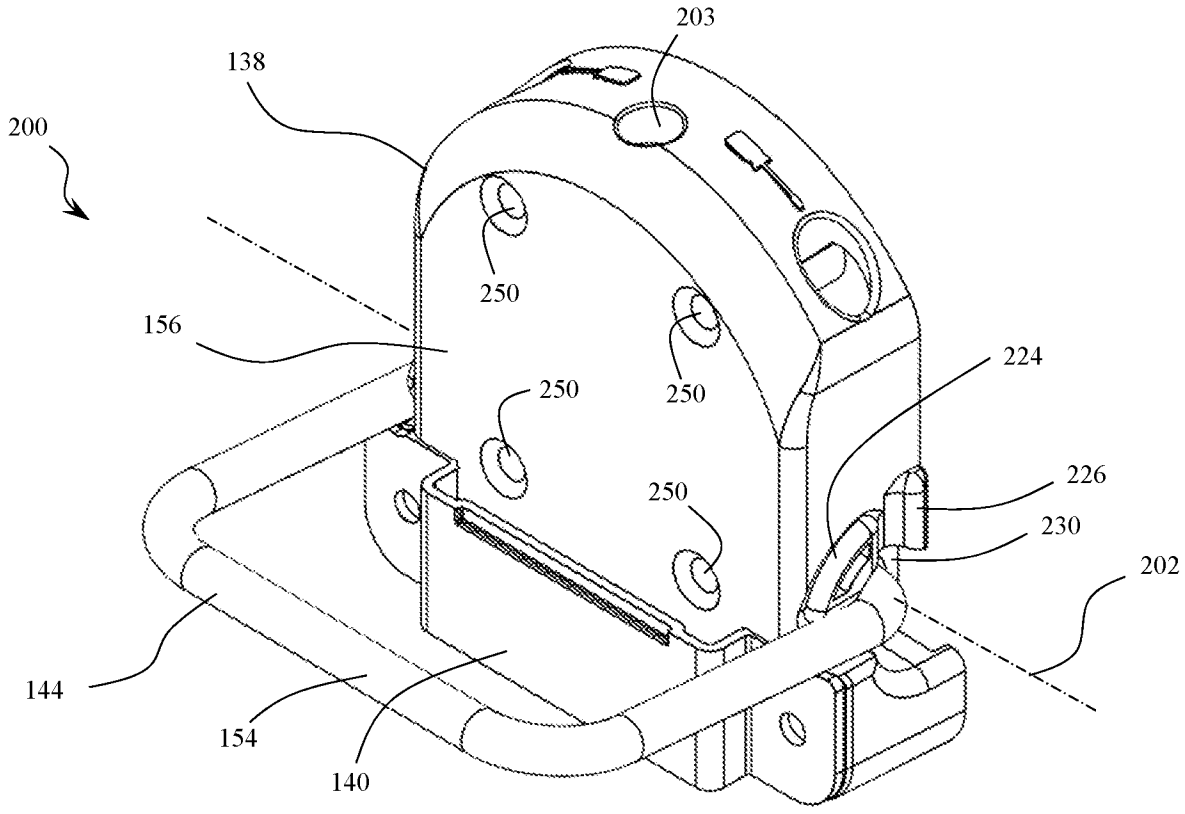

FIG. 6

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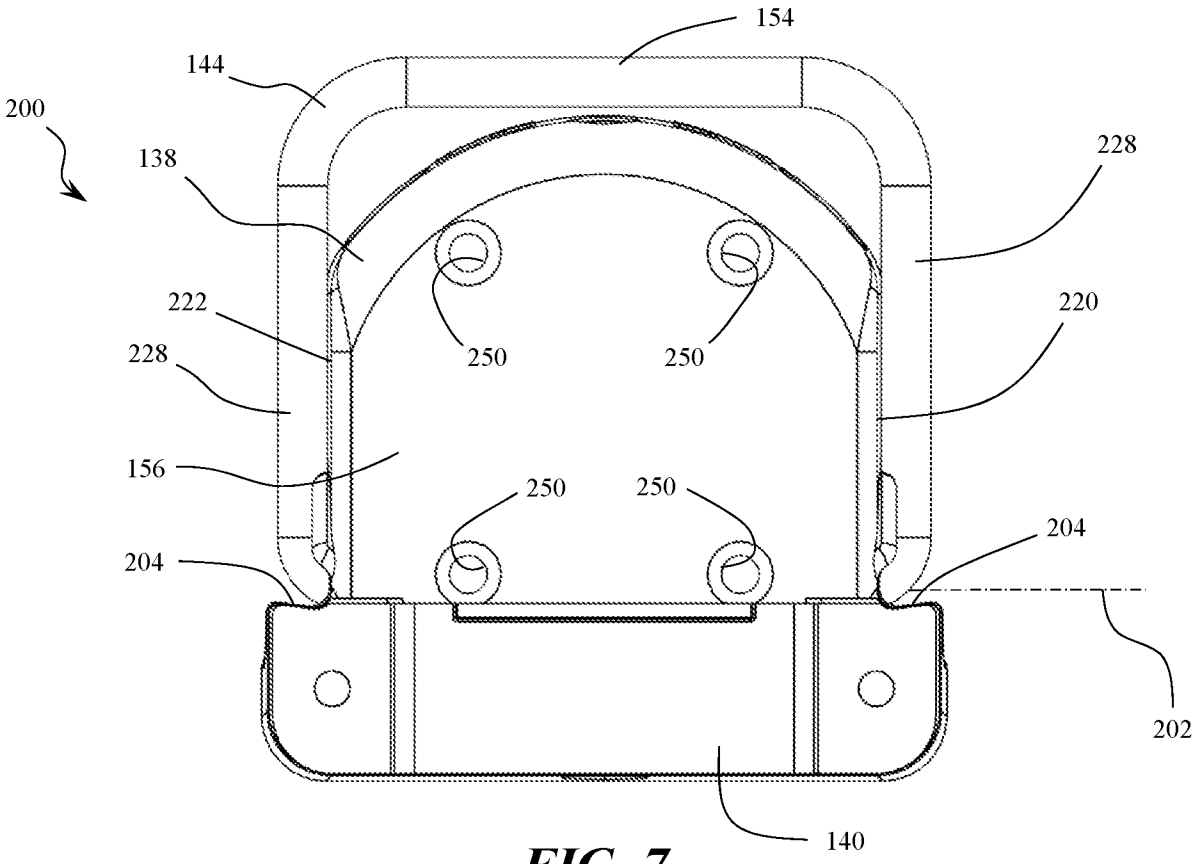
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FIG. 7

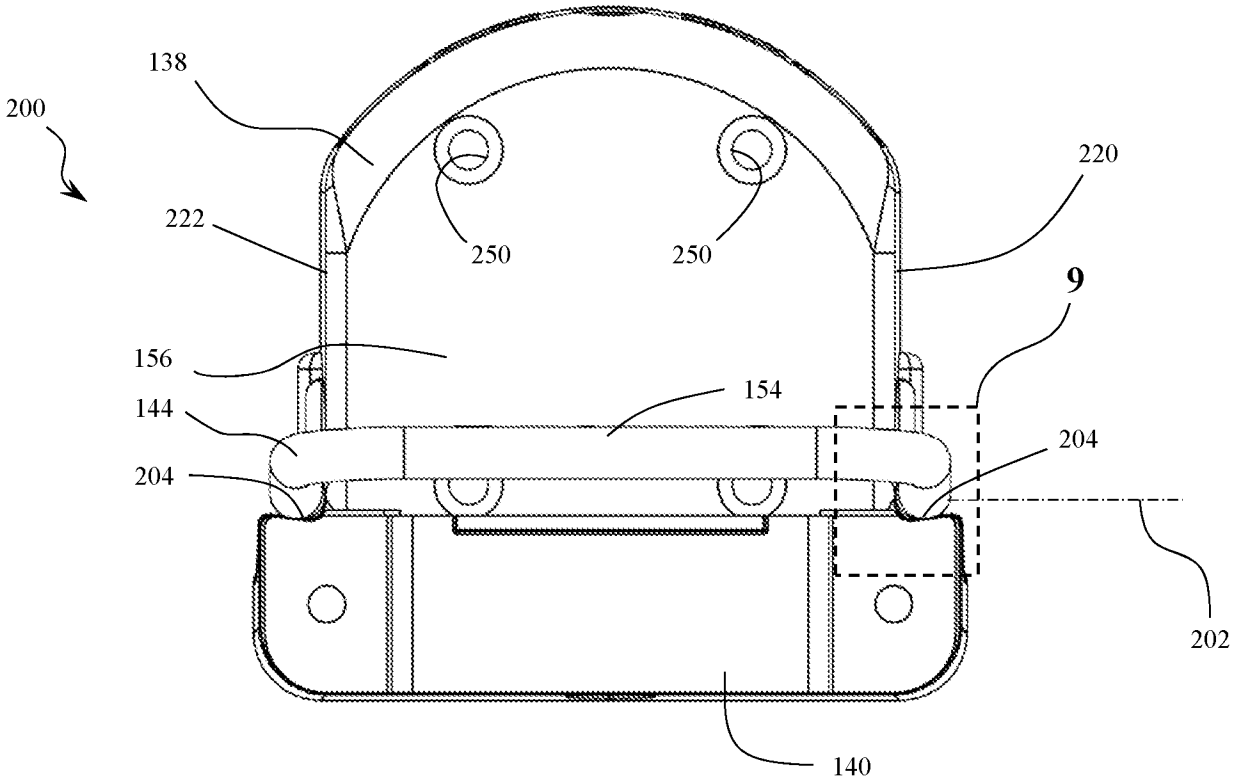
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FIG. 8

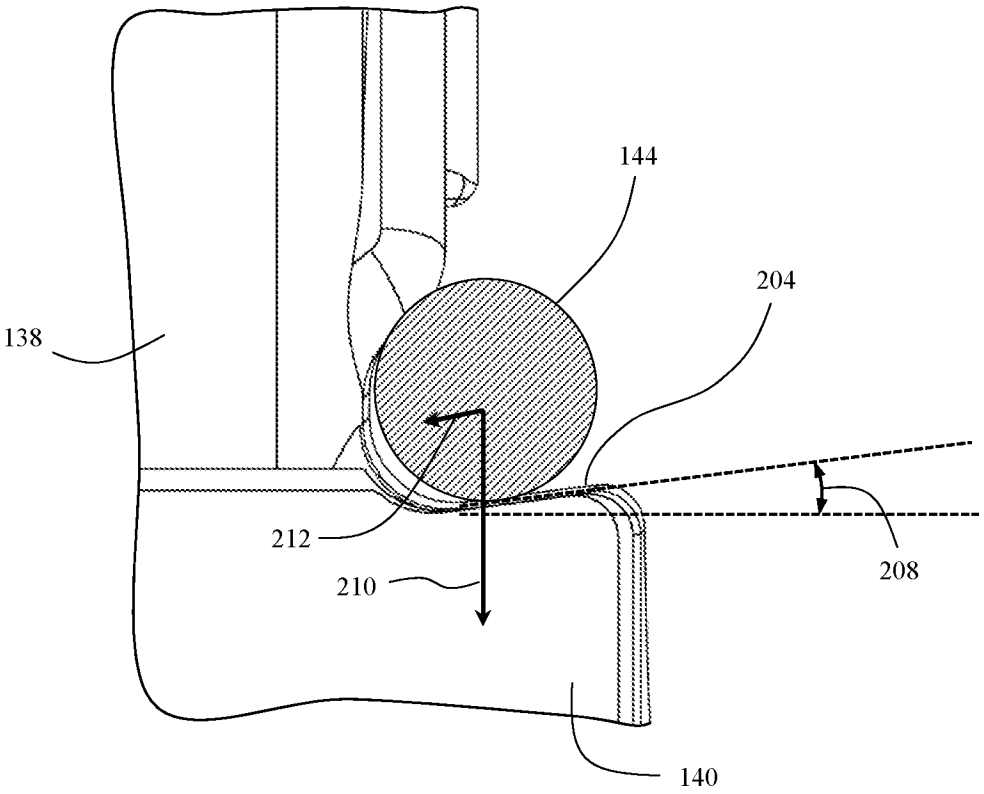

FIG. 9

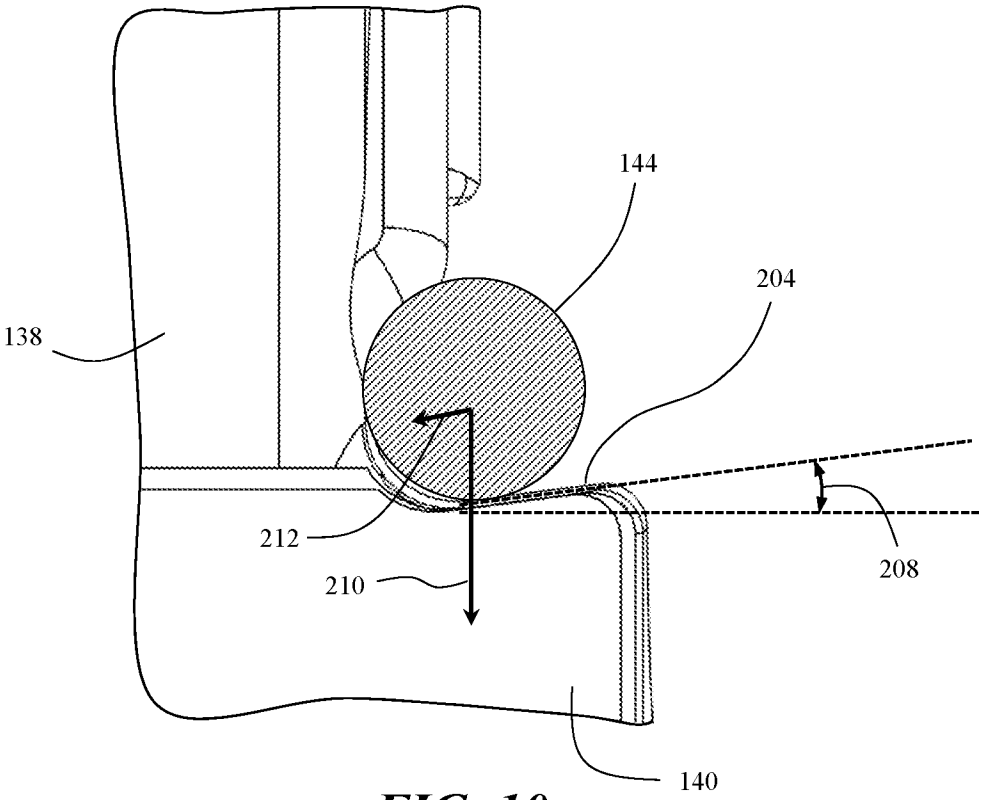

FIG. 10

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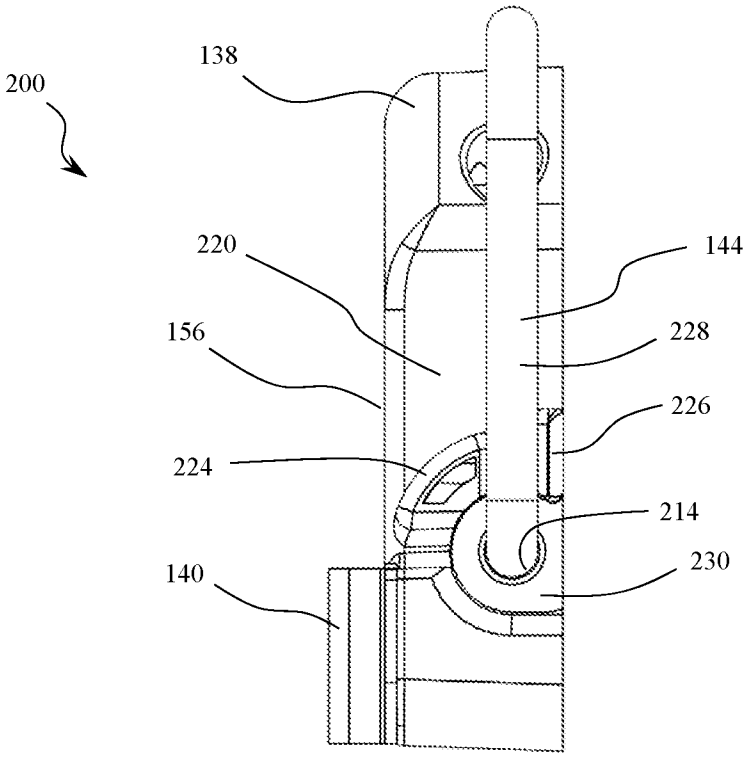

FIG. 11

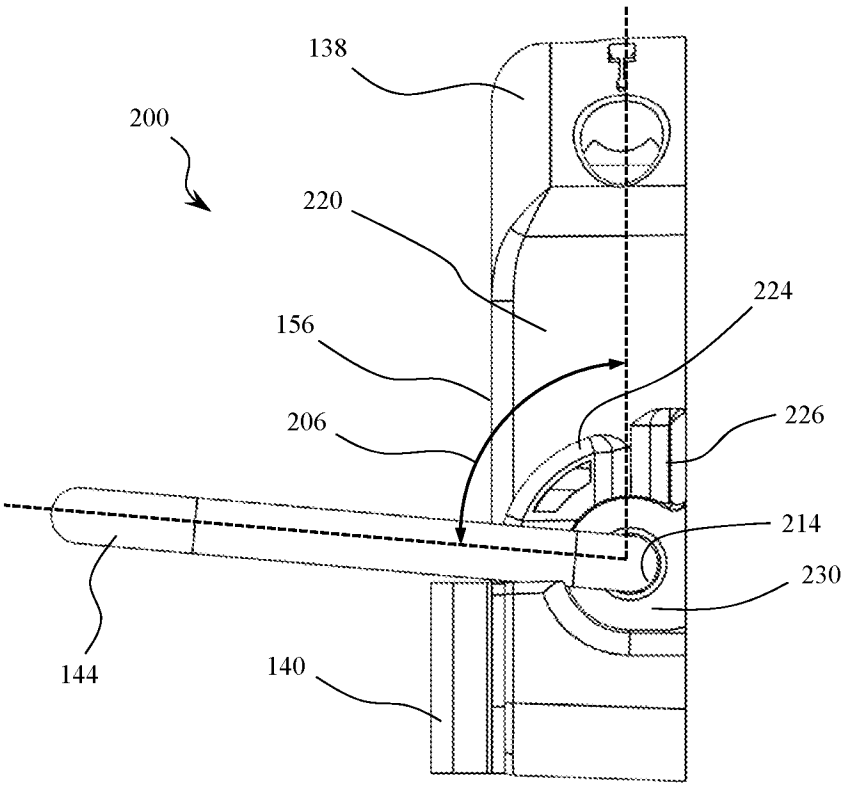

FIG. 12

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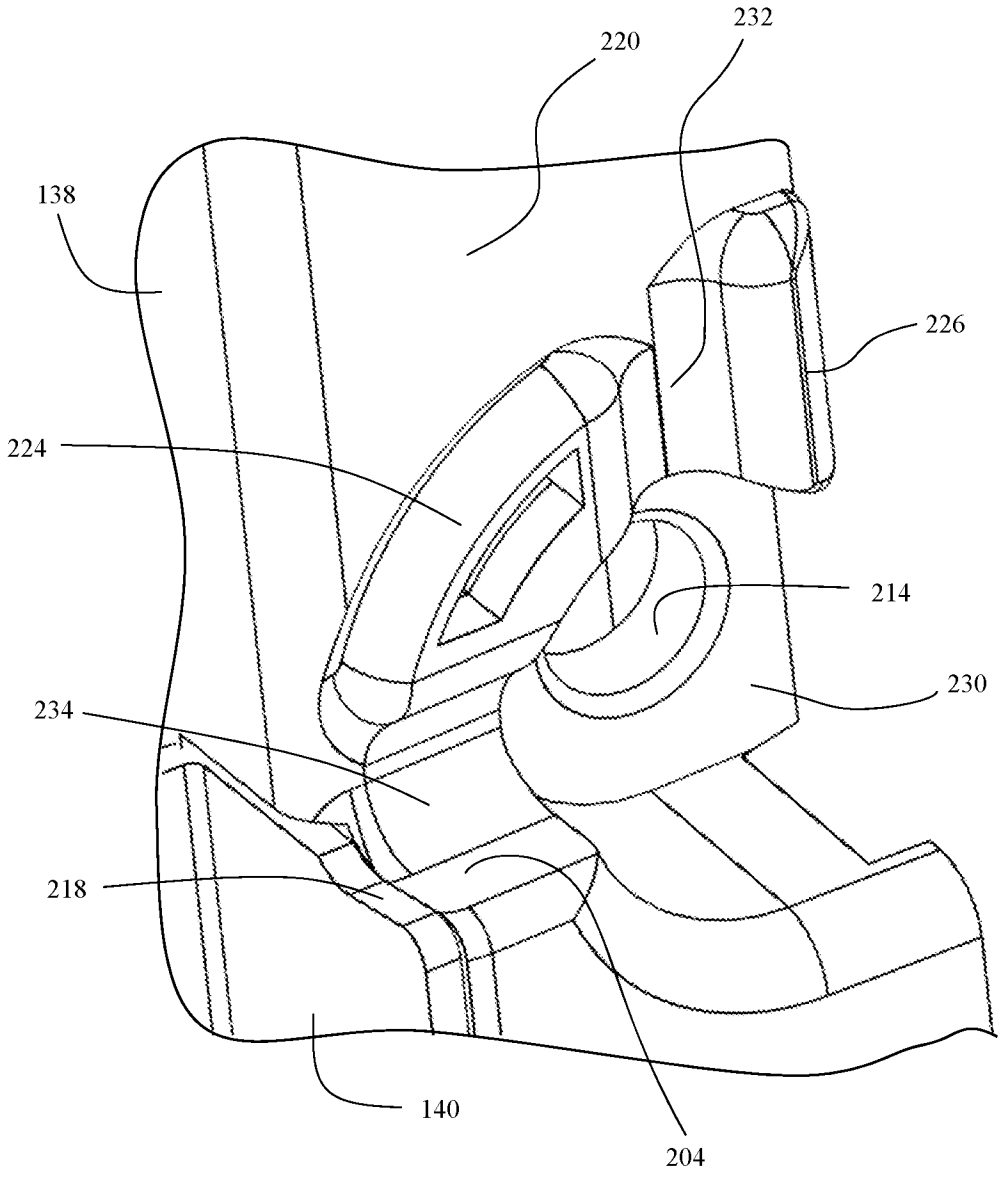

FIG. 13

PGR2026-00044
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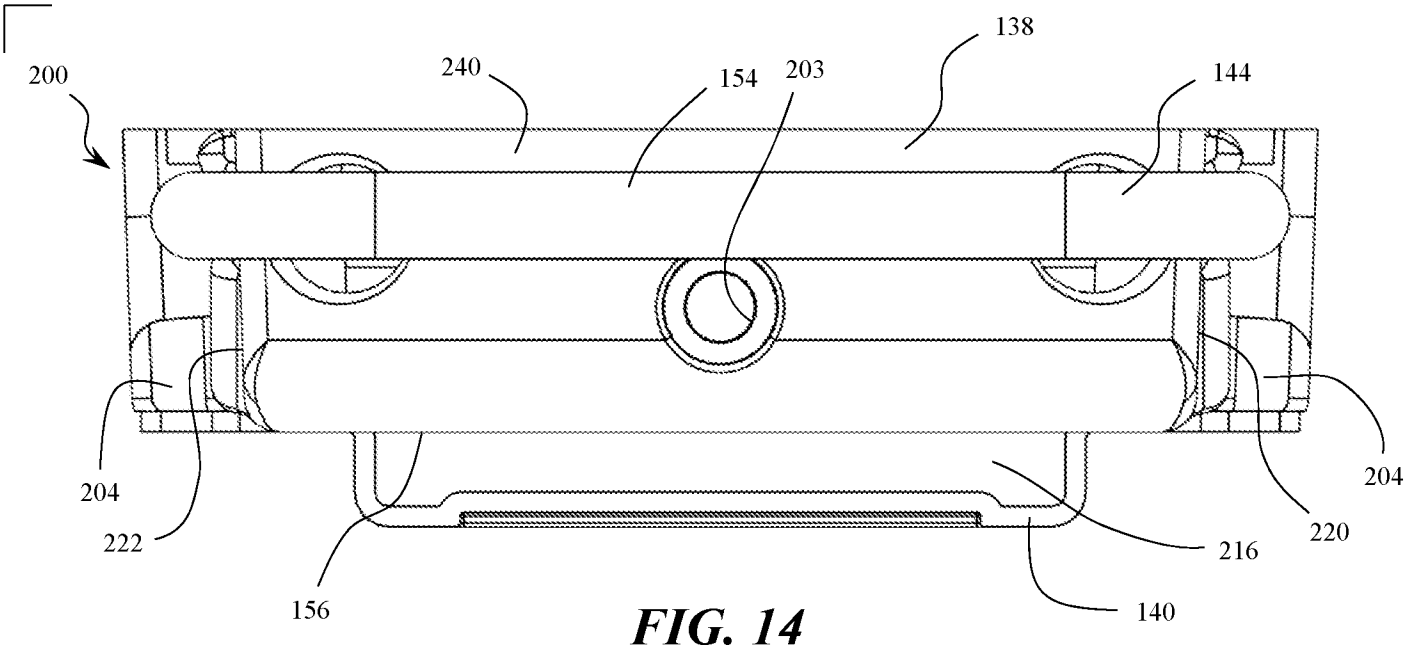

FIG. 14

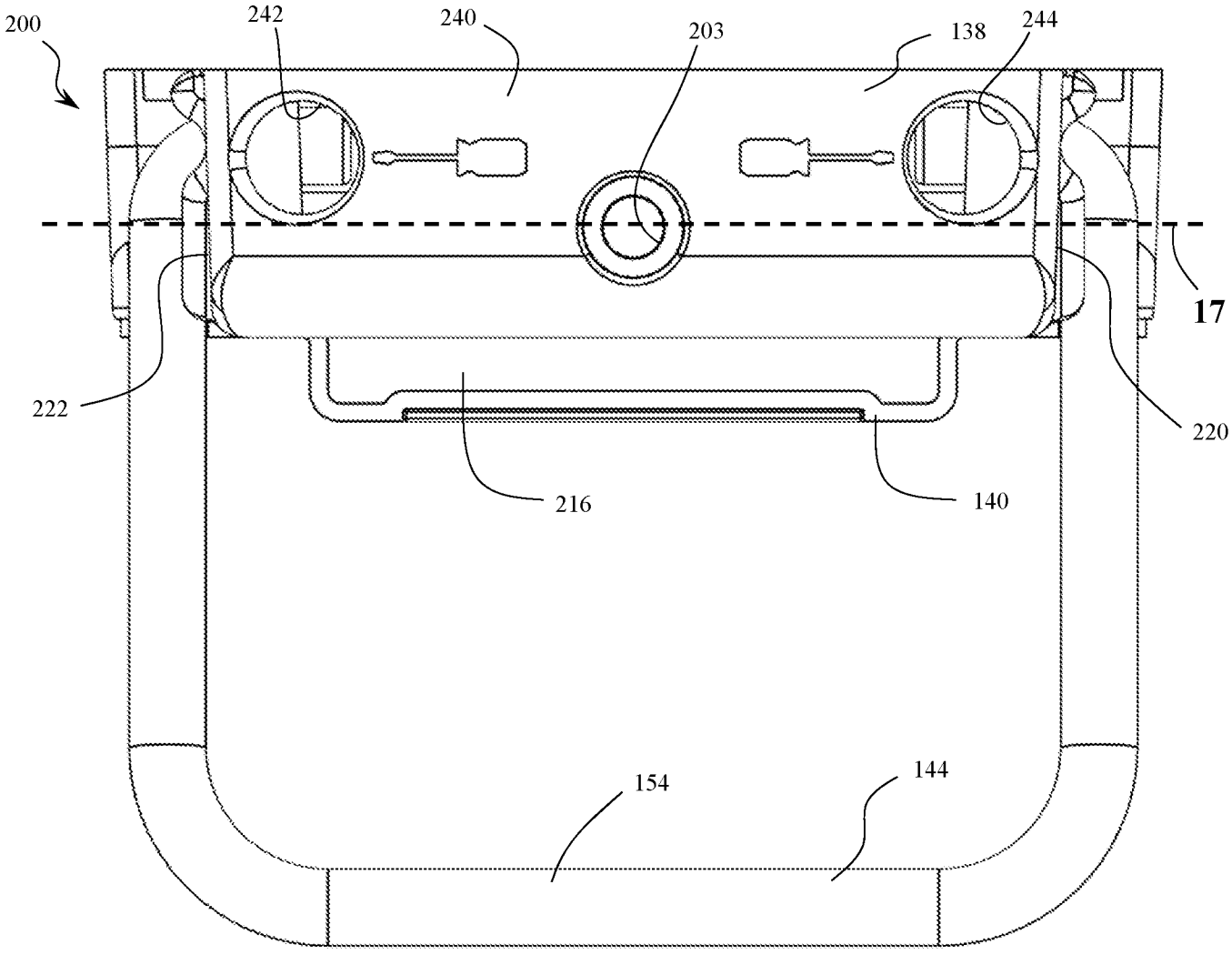

FIG. 15

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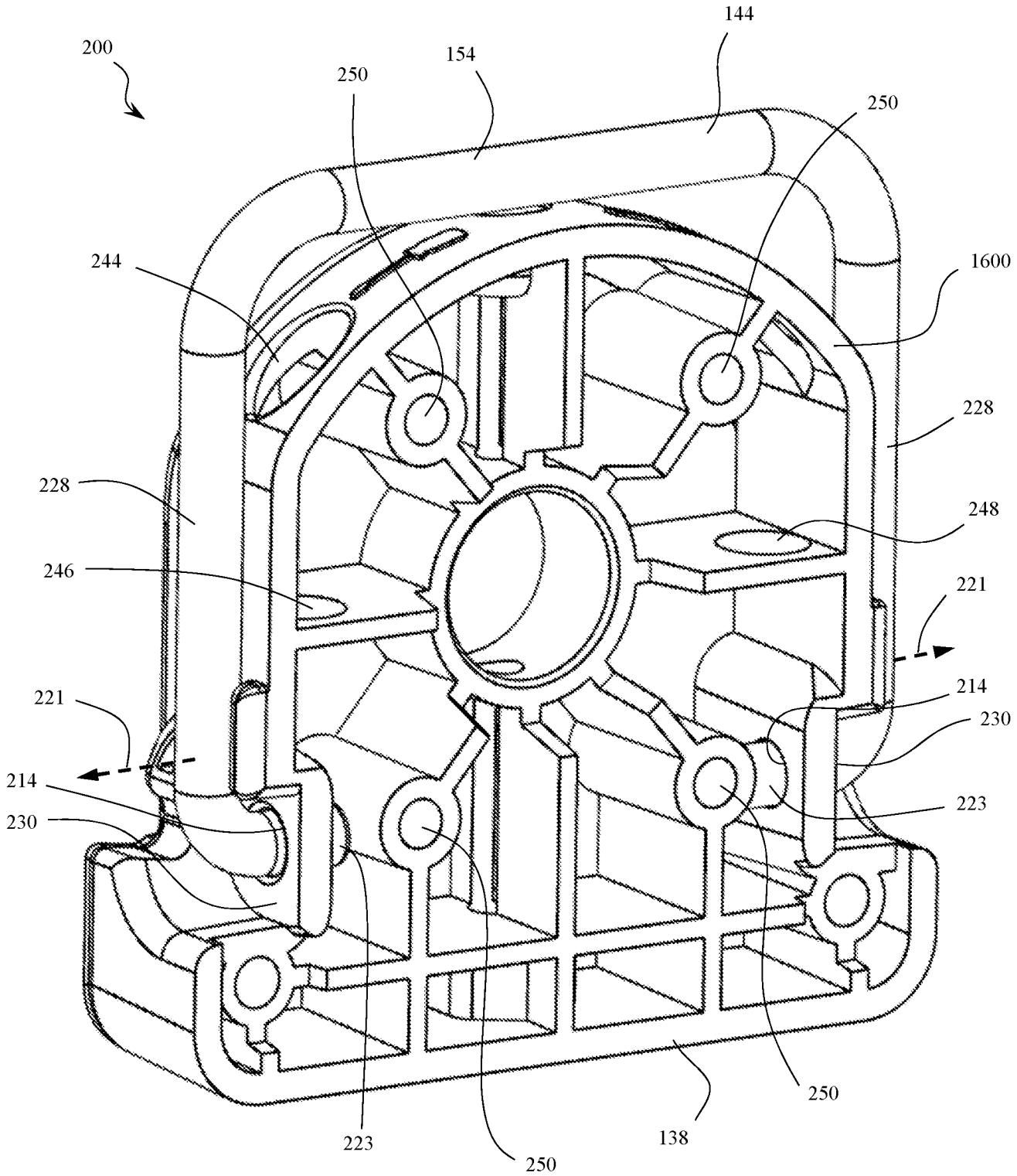

FIG. 16

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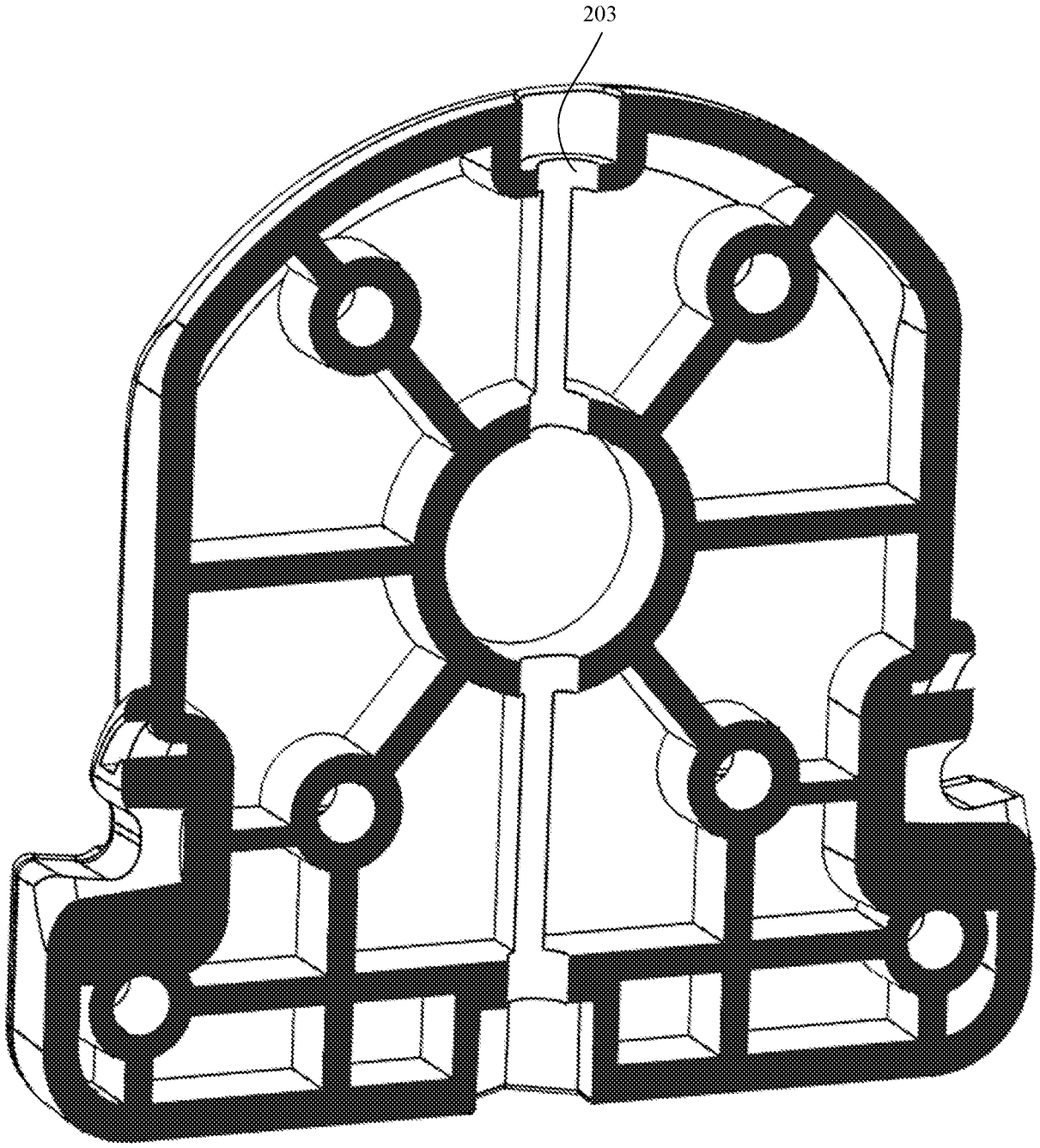

FIG. 17

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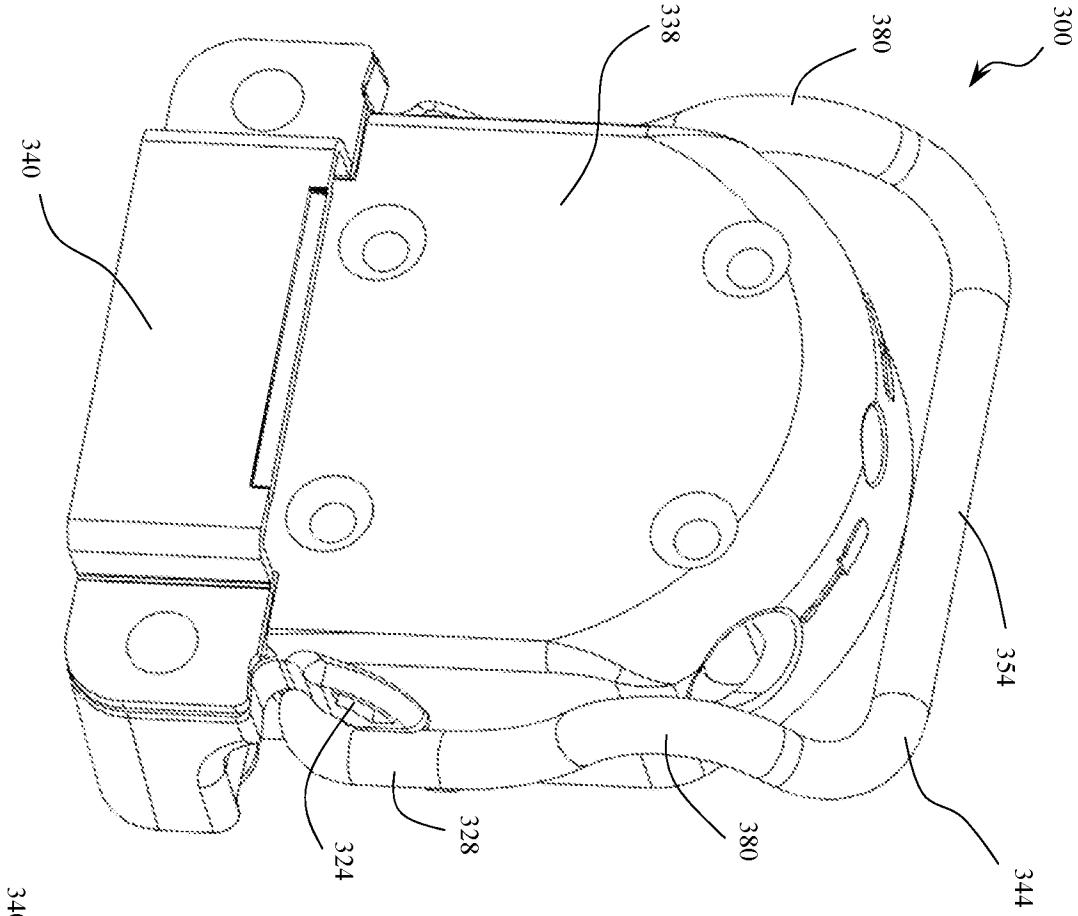

FIG. 18

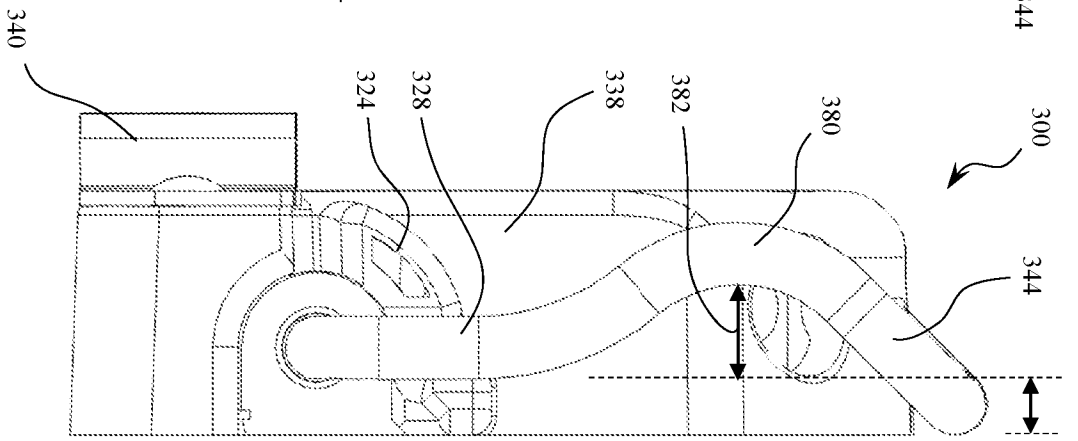

FIG. 19

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TRICAM EX1002

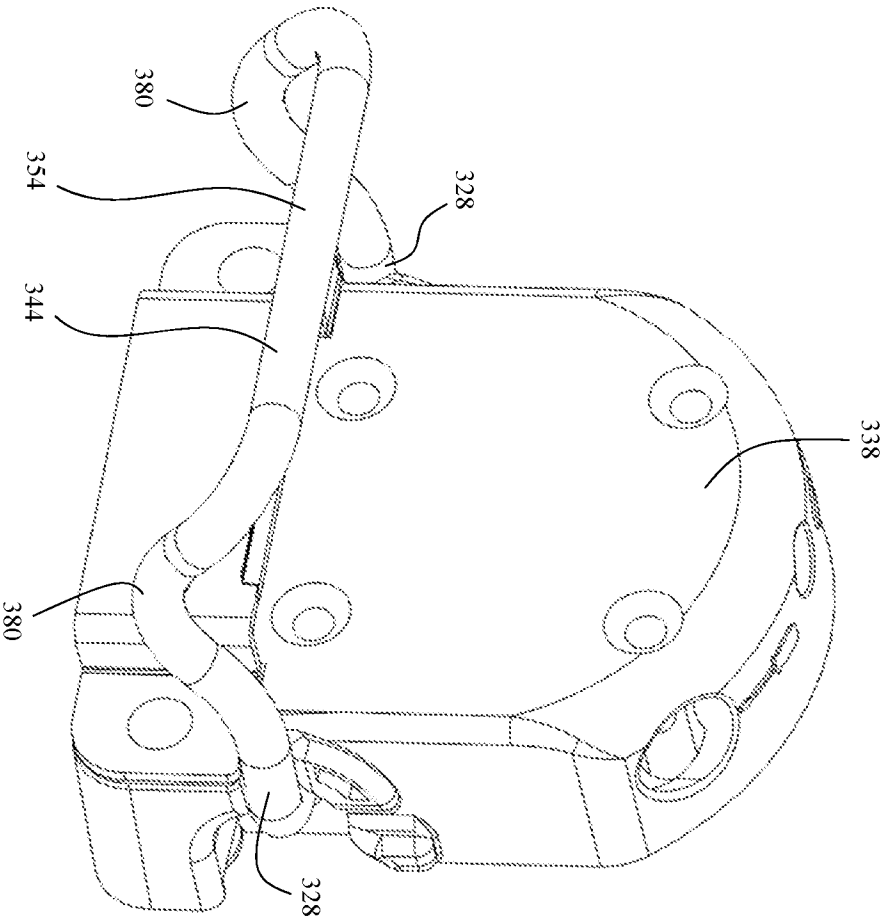

FIG. 20

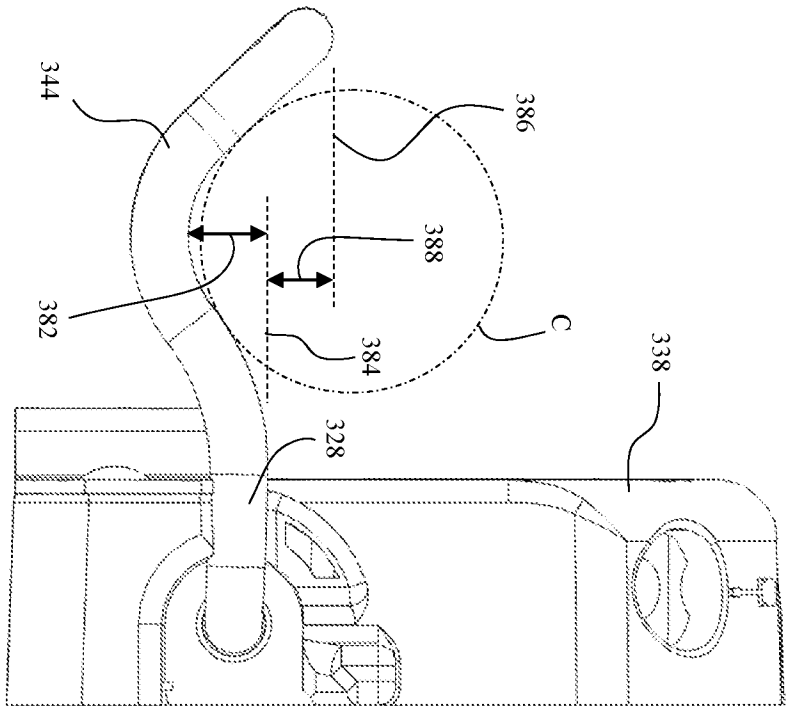

FIG. 21

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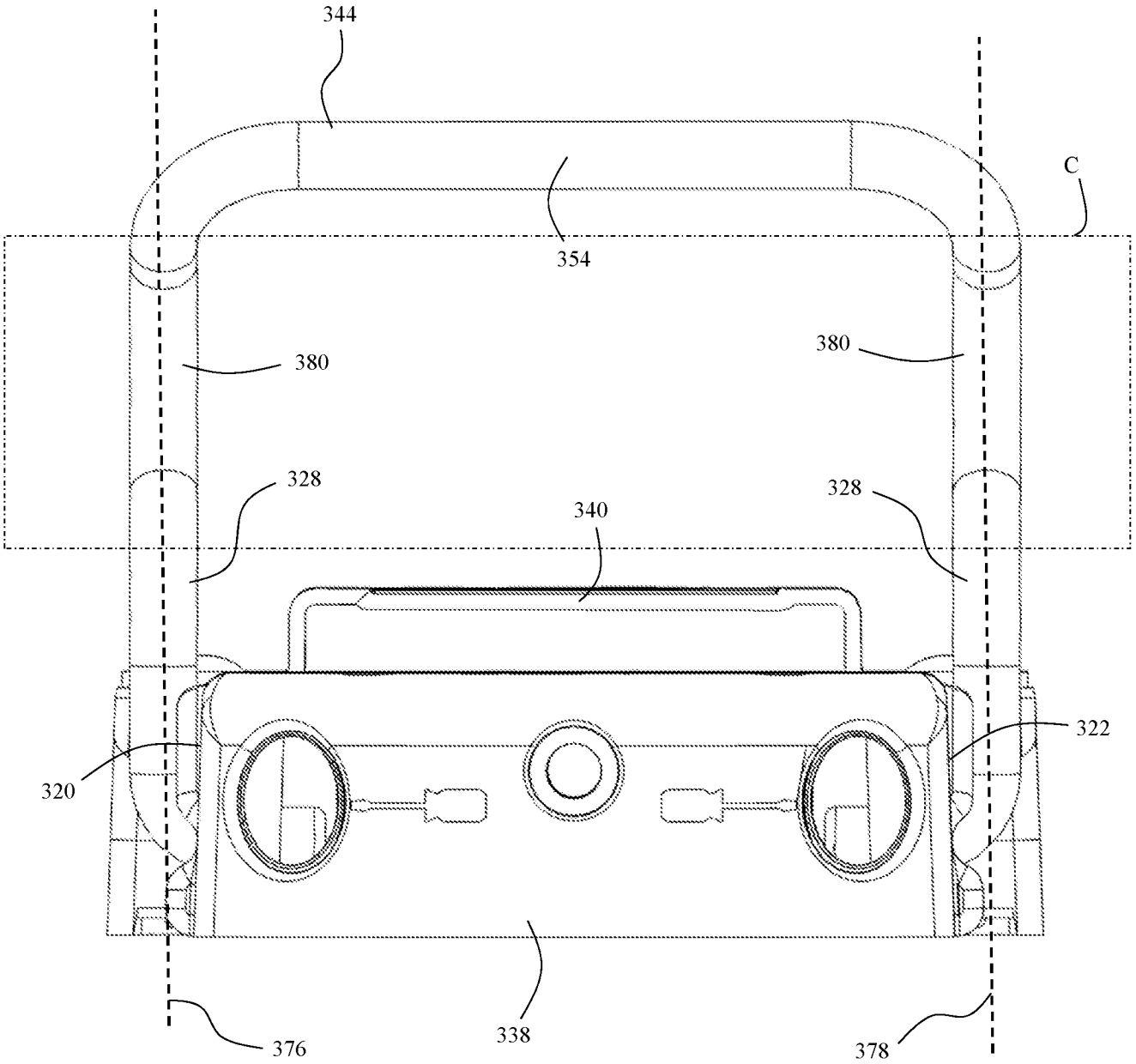

FIG. 22

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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	B.	Scott	Maxfield	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Mapleton	State/Province	UT	Country of Residence	US

Mailing Address of Inventor:

Address 1	1262 North 1150 East		
Address 2			
City	Mapleton	State/Province	UT
Postal Code	84664	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	N.	Ryan	Moss	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Mapleton	State/Province	UT	Country of Residence	US

Mailing Address of Inventor:

Address 1	522 North 1400 East		
Address 2			
City	Mapleton	State/Province	UT
Postal Code	84664	Country	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Steven	S.	Miner	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

City	Springville	State/Province	UT	Country of Residence	US

Mailing Address of Inventor:

Address 1	1642 S. Main Street, Apt. 2		
Address 2			
City	Springville	State/Province	UT
Postal Code	84663	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	153511		
Email Address	ip.docket.slc@dorsey.com	Add Email	Remove Email

Application Information:

Title of the Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT		
Attorney Docket Number	P298048US03 (506318-576)	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	16	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	153511		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	18324971	2023-05-27
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
18324971	Claims benefit of provisional	63346420	2022-05-27

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Remove

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	LITTLE GIANT LADDER SYSTEMS, LLC		
Mailing Address Information For Applicant:			
Address 1	1198 North Spring Creek Place		
Address 2			
City	Springville	**State/Province**	UT
Country	US	Postal Code	84663
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Richard C. Galati/			Date (YYYY-MM-DD)	2023-10-19
First Name	Richard C.	Last Name	Galati	Registration Number	66759

Additional Signature may be generated within this form by selecting the Add button. Add

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P298048US03 (506318-576)
	Application Number	
Title of Invention	MULTIFUNCTION BUTTON FOR LADDER ADJUSTMENT	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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SCORE Placeholder Sheet for IFW Content

Application Number: 18490715 Document Date: 10/19/2023

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

- Drawing

At the time of document entry (noted above):

- USPTO employees may access SCORE content via DAV or via the SCORE web page.
- External customers may access SCORE content via PAIR using the Supplemental Content tab.

Form Revision Date: March 1, 2019

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