FIG. 4

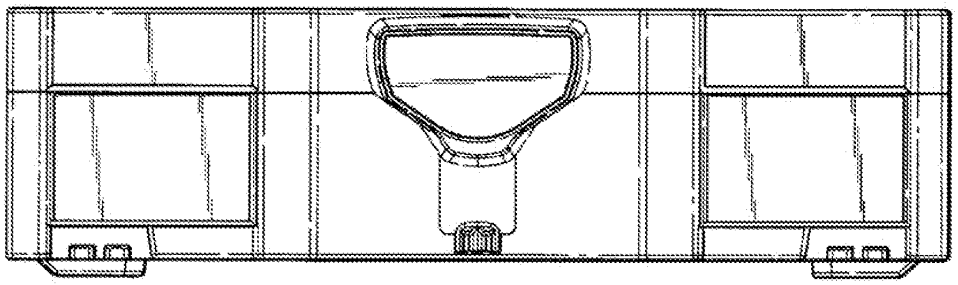
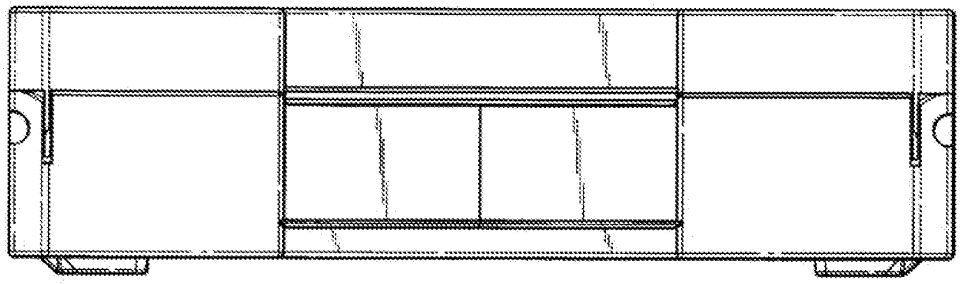


FIG. 5



Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 352
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

FIG. 6

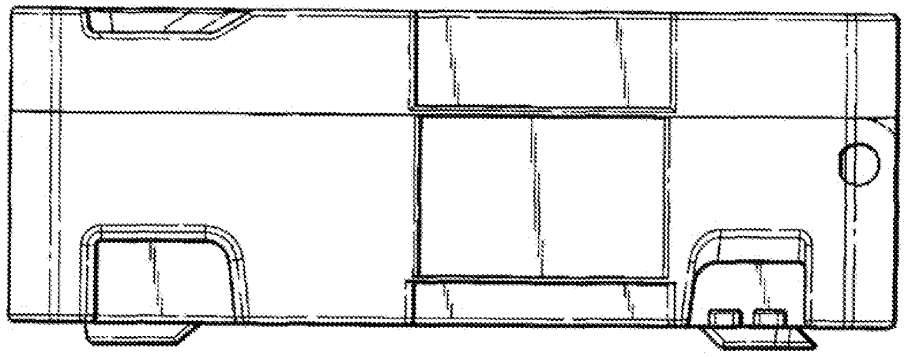
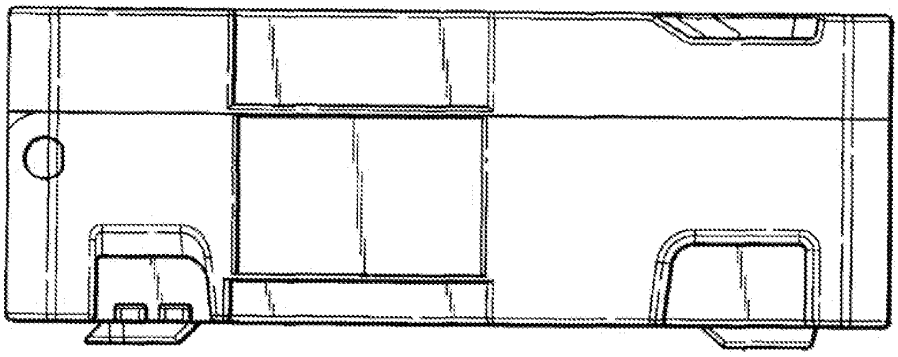


FIG. 7



Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 353
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Milwaukee Electric Tool Corporation
Title:	Utility Assembly and Coupling Mechanism
Appl. No.:	16/752,441
Filing Date:	January 24, 2020
Examiner:	WEINERTH, GIDEON R
Art Unit:	3736
Confirmation Number:	9540

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

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

Submitted herewith on Form PTO/SB/08 is a listing of the documents known to Applicants in order to comply with Applicants' duty of disclosure pursuant to 37 CFR § 1.56.

A copy of each non-U.S. patent document and each non-patent document is being submitted to comply with the provisions of 37 CFR § 1.97 and §1.98.

The submission of any document herewith, which is not a statutory bar, is not intended as an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicants do not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document which is determined to be a *prima facie* art reference against the claims of the present application.

Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 354
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(c), before the mailing date of any of a final action under 37 CFR § 1.113, a notice of allowance under 37 CFR §1.311, or an action that otherwise closes prosecution in the application.

FEES

The IDS Fee of $260.00 under 37 CFR 1.17(p) is being paid via Deposit Account No. 18-0882 via EFS-web.

RELEVANCE OF EACH DOCUMENT

All of the documents are in English.

Applicants respectfully request that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 18-0882. If any extensions of time are needed for timely acceptance of papers submitted herewith, applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 18-0882.

Respectfully submitted,

Date January 7, 2021

By /Derek H. Campbell/

Reinhart Boerner Van Deuren s.c.
Customer Number: 142078
Telephone: (414) 298-8374
Facsimile: (414) 298-8097

Derek H. Campbell
Attorney for Applicant
Registration No. 70,608

Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 355
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

PTO/SB/08 (09-06)
Approved for use through 03/31/2007. 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.

Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	16/752,441
Date Submitted: December 22, 2020				**Filing Date**	January 24, 2020
				First Named Inventor	Yaron Brunner
(use as many sheets as necessary)				Art Unit	3736
				Examiner Name	WEINERTH, GIDEON R
Sheet	1	of	2	Attorney Docket Number	066749-2584

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	3,514,170	05-26-1970	SHEWCHUK DONALD	
	A2	3,743,372	07-03-1973	Ruggerone; Guiseffe	
	A3	4,805,859	02-21-1989	Hudson; Don	
	A4	5,282,554	02-01-1994	Thomas; Jan B.	
	A5	5,653,366	08-05-1997	Liserre; Tony	
	A6	5,775,046	07-07-1998	Fanger; David J.	
	A7	5,890,613	04-06-1999	Williams; Warren Bret	
	A8	5,957,421	09-28-1999	Barbour; Lee	
	A9	8,448,829	05-28-2013	Watanabe; Takata	
	A10	10,758,065	09-01-2020	Penalver, Jr.; John	
	A11	2005/0242144	11-03-2005	Panosian, Michael	
	A12	2008/0296443	12-04-2008	Lunitz; Barbara	
	A13	2009/0127146	05-21-2009	Krebs; Kolja	
	A14	2012/0074158	03-29-2012	LAFLEUR; ANDRE	
	A15	2019/0168376	06-06-2019	BROCKET; Stephen	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

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 2 hours 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, 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 (1-800-786-9199) and select option 2.

PTO/SB/08 (09-06)
Approved for use through 03/31/2007. 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.

Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	16/752,441
				Filing Date	January 24, 2020
Date Submitted: December 22, 2020				**First Named Inventor**	Yaron Brunner
				Art Unit	3736
(use as many sheets as necessary)				Examiner Name	WEINERTH, GIDEON R
Sheet	2	of	2	Attorney Docket Number	066749-2584

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

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 2 hours 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, 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 (1-800-786-9199) and select option 2.

Electronic Patent Application Fee Transmittal	
Application Number:	16752441
Filing Date:	24-Jan-2020
Title of Invention:	Utility Assembly and Coupling Mechanism
First Named Inventor/Applicant Name:	Yaron Brunner
Filer:	Derek Howard Campbell/Andrea Dietzel
Attorney Docket Number:	066749-2584
Filed as Large Entity	
Filing Fees for Utility under 35 USC 111(a)	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	260	260
		Total in USD ($)		**260**

Electronic Acknowledgement Receipt	
EFS ID:	41467617
Application Number:	16752441
International Application Number:	
Confirmation Number:	9540
Title of Invention:	Utility Assembly and Coupling Mechanism
First Named Inventor/Applicant Name:	Yaron Brunner
Customer Number:	142078
Filer:	Derek Howard Campbell/Andrea Dietzel
Filer Authorized By:	Derek Howard Campbell
Attorney Docket Number:	066749-2584
Receipt Date:	22-DEC-2020
Filing Date:	24-JAN-2020
Time Stamp:	17:06:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$260
RAM confirmation Number	E2020BLH06223718
Deposit Account	180882
Authorized User	Andrea Dietzel
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.21 (Miscellaneous fees and charges) 37 CFR 1.20 (Post Issuance fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.16 (National application filing, search, and examination fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	066749-2584_IDS_Transmittal.pdf	82039 a71abe25cf718de84eb1e899755770bc765d4115	no	2
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	066749-2584_SB08.pdf	113442 fcfb8ad5ad13fda926e6d4a08b277ad042644e61	no	2
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Fee Worksheet (SB06)	fee-info.pdf	30732 186cca4de7f1e88eb808cc7cd13e61f2f0a60746	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	226213		

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 a 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.

Atty. Dkt. No. 066749-2584

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Milwaukee Electric Tool Corporation
Title:	Utility Assembly and Coupling Mechanism
Appl. No.:	16/752,441
Filing Date:	January 24, 2020
Examiner:	WEINERTH, GIDEON R
Art Unit:	3736
Confirmation Number:	9540

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

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

Submitted herewith on Form PTO/SB/08 is a listing of the documents known to Applicants in order to comply with Applicants' duty of disclosure pursuant to 37 CFR § 1.56.

The submission of any document herewith, which is not a statutory bar, is not intended as an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicants do not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document which is determined to be a *prima facie* art reference against the claims of the present application.

Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 362
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(c), before the mailing date of any of a final action under 37 CFR § 1.113, a notice of allowance under 37 CFR §1.311, or an action that otherwise closes prosecution in the application.

FEES

The IDS Fee of $260.00 under 37 CFR 1.17(p) is being paid via Deposit Account No. 18-0882 via EFS-web.

RELEVANCE OF EACH DOCUMENT

All of the documents are in English.

Applicants respectfully request that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 18-0882. If any extensions of time are needed for timely acceptance of papers submitted herewith, applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 18-0882.

Respectfully submitted,

Date December 22, 2020

By /Derek H. Campbell/

Reinhart Boerner Van Deuren s.c.
Customer Number: 142078
Telephone: (414) 298-8374
Facsimile: (414) 298-8097

Derek H. Campbell
Attorney for Applicant
Registration No. 70,608

Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 363
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

Doc Code: DIST.E.FILE **Document Description: Electronic Terminal Disclaimer - Filed**	PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT**
Application Number	16752441
Filing Date	24-Jan-2020
First Named Inventor	Yaron Brunner
Attorney Docket Number	066749-2584
Title of Invention	Utility Assembly and Coupling Mechanism

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
KETER PLASTIC LTD.	100%
Milwaukee Electric Tool Corporation	100%

The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)

10583962

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:
- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

◉ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

○ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.

Applicant claims the following fee status:

○ Small Entity

○ Micro Entity

◉ Regular Undiscounted

I hereby 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 application or any patent issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

◉ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application

Registration Number 70608

○ A sole inventor

○ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application

○ A joint inventor; all of whom are signing this request

Signature	/Derek H. Campbell/
Name	Derek H. Campbell

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	16752441
Filing Date:	24-Jan-2020
Title of Invention:	Utility Assembly and Coupling Mechanism
First Named Inventor/Applicant Name:	Yaron Brunner
Filer:	Derek Howard Campbell/Sarah Sesterhenn-Lee
Attorney Docket Number:	066749-2584

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	170	170
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**170**

Doc Code: DISQ.E.FILE
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 16752441

Filing Date: 24-Jan-2020

Applicant/Patent under Reexamination: Brunner

Electronic Terminal Disclaimer filed on December 18, 2020

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt	
EFS ID:	41428500
Application Number:	16752441
International Application Number:	
Confirmation Number:	9540
Title of Invention:	Utility Assembly and Coupling Mechanism
First Named Inventor/Applicant Name:	Yaron Brunner
Customer Number:	142078
Filer:	Derek Howard Campbell/Sarah Sesterhenn-Lee
Filer Authorized By:	Derek Howard Campbell
Attorney Docket Number:	066749-2584
Receipt Date:	18-DEC-2020
Filing Date:	24-JAN-2020
Time Stamp:	15:09:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$170
RAM confirmation Number	E2020BHF09239129
Deposit Account	180882
Authorized User	Sarah Sesterhenn-Lee
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 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)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	34600 023a499056e270a5671fc1735772ebb8f2d7cffe	no	3
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30535 5a4173d90a62e67d48dea7928acf09eaa9ba356c	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	65135		

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 a 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

Applicant:	Milwaukee Electric Tool Corporation et al.
Title:	Utility Assembly and Coupling Mechanism
Appl. No.:	16/752,441
Filing Date:	January 24, 2020
Examiner:	Weinerth, Gideon R.
Art Unit:	3736
Confirmation No:	9540

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

REPLY UNDER 37 C.F.R. § 1.111

This communication is responsive to the Non-Final Office Action dated September 25, 2020, concerning the above-referenced patent application.

A listing of claims is reproduced beginning on page 2 of this document for the Examiner's convenience and reference. No claim amendments are made herein.

Remarks begin on page 7 of this document.

Please amend the application as follows:

Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 372
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

This listing of claims is reproduced for the Examiner's convenience and reference. No claim amendments are made herein:

Listing of Claims:

1. (Original) A container assembly comprising:

a first container comprising:

a first coupler extending from a first face of the first container, the first coupler comprises two sidewalls and a rib, the two sidewalls project from a depressed surface of the first face, the rib extends from at least one of the two sidewalls; and

a latch recess; and

a second container comprising:

a second coupler extending from a second face of the second container, the second coupler comprises a tongue that is offset from the second face, the tongue of the second container is engageable with the rib of the first container, the second coupler defines a first planar surface generally parallel to the second face and that faces away from the second face, and wherein the second coupler defines a second planar surface generally parallel to the second face and that faces towards the second face; and

a latch coupled to the second container, the latch positionable in a locked position in which the latch prevents disengagement of the first container and the second container when the tongue and rib are engaged.

2. (Original) The container assembly of claim 1, wherein the first and second couplers on the first and second containers, respectively, engage when the first and second containers are slid along a sliding path defined by the rib and the tongue.

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3. (Original) The container assembly of claim 1, wherein the first face of the first container comprises a top face of the first container, and wherein the second face of the second container comprises a bottom face of the second container.

4. (Original) The container assembly of claim 1, wherein the rib extends in a first direction that is parallel to a bottom face of the first container.

5. (Original) The container assembly of claim 4, wherein the tongue extends in a second direction opposite the first direction.

6. (Original) The container assembly of claim 1, wherein the two sidewalls of the first coupler project from the depressed surface away from each other, and wherein the two sidewalls of the first coupler project from the depressed surface at an obtuse angle with respect to the depressed surface.

7. (Original) The container assembly of claim 1, wherein the rib is perpendicular to at least one of the two sidewalls, and , wherein the rib is parallel to the depressed surface of the first face.

8. (Original) The container assembly of claim 1, wherein a width of the second container is half-size a width of the first container.

9. (Original) The container assembly of claim 1, wherein at least one of the latch and the second coupler are actuated between a first position extending above the second face and a second position not extending above the second face.

10. (Original) The container assembly of claim 1, wherein when the tongue and rib are engaged:

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a first side wall of the two sidewalls of the first coupler and a second sidewall of the second coupler interface to restrict displacement between the first container and the second container in a third direction perpendicular to the first direction and parallel to the first face of the first container.

11. (Original) A first container configured to be removably coupled to a second container, the first container comprising:

a first face;

a second face; and

a first coupler that extends from the first face, wherein the first coupler comprises two sidewalls and a rib, the two sidewalls project from a depressed surface of the first face, the rib extends from at least one of the two sidewalls;

a second coupler that extends from the second face, wherein the second coupler comprises a tongue that is offset from the second face, wherein the second coupler defines a first planar surface generally parallel to the second face and that faces away from the second face, and wherein the second coupler defines a second planar surface generally parallel to the second face and that faces towards the second face;

a latch recess; and

a latch, the latch positionable in a locked position in which the latch interlocks with a second latch recess in the second container restricting displacement between the first container and the second container.

12. (Original) The first container of claim 11, wherein the first face comprises a top face of the first container, and wherein the second face comprises a bottom face of the first container.

13. (Original) The first container of claim 11, wherein the rib extends in a first direction that is parallel to a bottom face of the first container, and wherein the tongue extends in a second direction opposite the first direction.

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14. (Original) The first container of claim 11, wherein the two sidewalls of the first coupler project from the depressed surface away from each other, and wherein the two sidewalls of the first coupler project from the depressed surface at an obtuse angle with respect to the depressed surface.

15. (Original) The first container of claim 11, wherein the rib is perpendicular to at least one of the two sidewalls, and wherein the rib is parallel to the depressed surface of the first face.

16. (Original) A container assembly comprising:

a first container comprising:

a first coupler extending from a first face of the first container, the first coupler comprises two sidewalls and a rib, the two sidewalls project from a depressed surface of the first face, the rib extends from at least one of the two sidewalls, and the rib extends in a first direction that is parallel to the first face of the first container; and

a latch recess; and

a second container comprising:

a second coupler extending from a second face of the second container, the second coupler comprises a tongue that is offset from the second face, the tongue extends in a second direction opposite the first direction, the tongue of the second container is engageable with the rib of the first container, the second coupler defines a first planar surface generally parallel to the second face and that faces away from the second face, and wherein the second coupler defines a second planar surface generally parallel to the second face and that faces towards the second face; and

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a latch coupled to the second container, the latch positionable in a locked position in which the latch prevents disengagement of the first container and the second container when the tongue and rib are engaged.

17. (Original) The container assembly of claim 16, wherein when the tongue and rib are engaged:

a portion of the first coupler and a portion of the second coupler interface to restrict displacement between the first container and the second container in a third direction perpendicular to the first direction and parallel to the first face of the first container.

18. (Original) The container assembly of claim 16, wherein at least one of the latch and the second coupler actuate between a first position and a second position, wherein the at least one of the latch and the second coupler extends above the second face when in the first position.

19. (Original) The container assembly of claim 16, wherein the first face of the first container comprises a top face of the first container, and wherein the second face of the second container comprises a bottom face of the second container.

20. (Original) The container assembly of claim 1, wherein the two sidewalls of the first coupler project from the depressed surface at an obtuse angle with respect to the depressed surface.

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REMARKS

This reply is intended to be completely responsive to the Non-Final Office Action dated September 25, 2020.

Status

Claims 1-20 are pending in this application. Claims 1-20 were rejected.

No claims are amended, added or cancelled with this response.

A terminal disclaimer is submitted herewith to overcome the double patenting rejection, which was the only rejection or objection in the Office Action.

Applicant believes that each of the rejections raised by the Examiner has been addressed and the application is in condition for allowance. Reconsideration and allowance of the application is respectfully requested.

Double Patenting

On pages 2-5 of the Office Action, the Examiner has rejected claims 1-20 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-12 of U.S. Patent No. 10,583,962. Applicant submits herewith a terminal disclaimer, signed by the Attorney of Record, to overcome the referenced obviousness-type double patenting rejection. Withdrawal of the double patent rejection is respectfully requested.

Conclusion

Applicant believes that the present application is in condition for allowance. Favorable reconsideration of the application is respectfully requested.

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The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

It should be noted that, for the sake of clarity and simplicity, Applicant's remarks have focused on the rejections of the independent claims set forth in the Office Action with the understanding that the dependent claims are patentable for at least the same reasons as the independent claims. Further, in addressing the Examiner's rejections, Applicant's remarks have set forth only some of the available arguments for patentability of the rejected claims. Applicant expressly reserves the right to argue the patentability of all claims separately and to provide new, different, and/or additional arguments for patentability not set forth herein, including, but not limited to, the failure of cited references to disclose, teach, or suggest other elements of the claims, the lack of motivation to combine cited references, teachings away from the combination of cited references, the failure of references to qualify as prior art or improper combination of the cited references, in this or any future proceedings.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 18-0882. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 18-0882.

Respectfully submitted,

Date December 18, 2020

By /Derek H. Campbell/

Reinhart Boerner Van Deuren s.c.
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Registration No. 70,608

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Electronic Acknowledgement Receipt	
EFS ID:	41427723
Application Number:	16752441
International Application Number:	
Confirmation Number:	9540
Title of Invention:	Utility Assembly and Coupling Mechanism
First Named Inventor/Applicant Name:	Yaron Brunner
Customer Number:	142078
Filer:	Derek Howard Campbell/Sarah Sesterhenn-Lee
Filer Authorized By:	Derek Howard Campbell
Attorney Docket Number:	066749-2584
Receipt Date:	18-DEC-2020
Filing Date:	24-JAN-2020
Time Stamp:	15:06:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		066749-2584_NFOA_Response.pdf	107319 5e8b041a72eef2d00d13bdb8bb92571f192aa62a	yes	8

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	6
	Applicant Arguments/Remarks Made in an Amendment	7	8
Warnings:			
Information:			
	Total Files Size (in bytes):	107319	

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If a new application is being filed and the application includes the necessary components for a 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.

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/752,441	Filing Date 01/24/2020	☐ 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 $460 =	
☐ 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	12/18/2020	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".	/DAWN BREWER/
*** 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.**

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

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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
16/752,441	01/24/2020	3736	1720	066749-2584	20	3

CONFIRMATION NO. 9540

CORRECTED FILING RECEIPT

142078
Reinhart (Milwaukee Tool)
ATTN: TRAVIS MCDONNELL, PARALEGAL
1000 NORTH WATER STREET
SUITE 2100
MILWAUKEE, WI 53202

OC000000122048656

Date Mailed: 12/17/2020

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)

Yaron Brunner, Kibbutz Gvat, ISRAEL;
Grant T. Squiers, Cudahy, WI;
Christopher S. Hoppe, Milwaukee, WI;
Steven W. Hyma, Milwaukee, WI;

Applicant(s)

Milwaukee Electric Tool Corporation, Brookfield, WI;
Keter Plastic LTD., Herzelyia, ISRAEL;

Power of Attorney: The patent practitioners associated with Customer Number 142078

Domestic Priority data as claimed by applicant

This application is a CON of 16/216,724 12/11/2018 PAT 10583962
which is a CON of 15/826,232 11/29/2017 PAT 10703534
which is a CON of PCT/IL2017/050481 04/30/2017
which claims benefit of 62/459,076 02/15/2017
and claims benefit of 62/330,334 05/02/2016

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: No

Permission to Access Search Results: No

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: 02/12/2020

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/752,441**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

Title

Utility Assembly and Coupling Mechanism

Preliminary Class

220

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.

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/752,441	01/24/2020	Yaron Brunner	066749-2584

CONFIRMATION NO. 9540

142078
Reinhart (Milwaukee Tool)
ATTN: TRAVIS MCDONNELL, PARALEGAL
1000 NORTH WATER STREET
SUITE 2100
MILWAUKEE, WI 53202

POA ACCEPTANCE LETTER

OC000000122048650

Date Mailed: 12/17/2020

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/14/2020.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

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**.

/nbekele/

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
Approved for use through 03/31/2021. OMB 0651-0035
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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date
16/752,441	January 24, 2020

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 142078

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

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OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
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I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Keter Plastic Ltd.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	03/02/2020
Name	Nir Feinstein	Wval Rafi	
Title	General Counsel	Group Treasurer	

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 3 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.

Atty. Dkt. No. 066749-2584

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Milwaukee Electric Tool Corporation

Title: Utility Assembly and Coupling Mechanism

Appl. No.: 16/752,441

Filing Date: January 24, 2020

Examiner: WEINERTH, GIDEON R

Art Unit: 3736

Conf. No.: 9540

TRANSMITTAL OF UPDATED APPLICATION DATA SHEET

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

Kindly add the Applicant Information for Applicant 2, as shown below and in the attached annotated Application Data Sheet in compliance with 37 C.F.R. §1.76(c):

Applicant Information

Applicant 2 is the Assignee and the Assignee is an Organization.

Organization Name:	Keter Plastic LTD.
Mailing Address Information:	2 Sapir Street Herzelyia, Israel 4685206

As required by 37 C.F.R. 1.46(c), also attached is Statement Under 37 C.F.R. 3.73(c) establishing that Keter Plastic LTD. and Milwaukee Electric Tool Corporation collectively are the owner and the assignee of the entire right, title and interest in the above-referenced application.

Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 389
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 18-0882.

Please direct all correspondence to the undersigned attorney or agent at the address indicated below.

Respectfully submitted,

Date December 14, 2020

By /Derek H. Campbell/

Reinhart Boerner Van Deuren s.c.
Customer Number: 142078
Telephone: (414) 298-8374
Facsimile: (414) 298-8097

Derek H. Campbell
Attorney for Applicant
Registration No. 70,608

Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 390
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

Electronic Acknowledgement Receipt	
EFS ID:	41379317
Application Number:	16752441
International Application Number:	
Confirmation Number:	9540
Title of Invention:	Utility Assembly and Coupling Mechanism
First Named Inventor/Applicant Name:	Yaron Brunner
Customer Number:	142078
Filer:	Derek Howard Campbell/Andrea Dietzel
Filer Authorized By:	Derek Howard Campbell
Attorney Docket Number:	066749-2584
Receipt Date:	14-DEC-2020
Filing Date:	24-JAN-2020
Time Stamp:	17:19:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	066749-2584_Updated_ADS.pdf	86108 a7be0230f3f801f55d3441e46dade5361176e43f	no	6

Warnings:

Information:					
This is not an USPTO supplied ADS fillable form					
2	Assignee showing of ownership per 37 CFR 3.73	066749-2584_373c_Statement.pdf	84074 1a0aca8e6cc410b6fb62b608f1c8021bde288766	no	3
Warnings:					
Information:					
3	Power of Attorney	066749-2584_Keter_PoA.pdf	286182 3aab95a4232c0fea29ee1e4f28afd735066fea17	no	1
Warnings:					
Information:					
4	Transmittal Letter	066749-2584_Transmittal.pdf	74993 6c17ec273ac4d8ae9f7d9c6007456f6efcd5f44c	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	531357		

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.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a 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.
<u>National Stage of an International Application under 35 U.S.C. 371</u>
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.
<u>New International Application Filed with the USPTO as a Receiving Office</u>
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.

Updated Application Data Sheet

Application Information

Application Number:	~~To Be Determined~~ 16/752,441
Filing Date:	January 24, 2020
Application Type:	Nonprovisional
Subject Matter:	Utility
CD-ROM or CD-R:	None
Computer Readable Form (CRF):	No
Title:	Utility Assembly and Coupling Mechanism
Attorney Docket Number:	066749-2584
Request for Early Publication:	No
Request for Non-Publication:	No
Suggested Drawing Figure:	1A
Total Drawing Sheets:	48
Small Entity:	No
Petition included:	No
Secrecy Order in Parent Appl.:	No

Inventor Information

Status:	Full Capacity
Given Name:	Yaron
Family Name:	Brunner
City of Residence:	Kibbutz Gvat
State or Province of Residence:	
Country of Residence:	IL
Street of mailing address:	Kibbutz Gvat, P.O.B. 248
City of mailing address:	Kibbutz Gvat

Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 393
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

State or Province of mailing address:	
Country of mailing address:	IL
Postal or Zip Code of mailing address:	3657900

Status:	Full Capacity
Given Name:	Grant T.
Family Name:	Squiers
City of Residence:	Cudahy
State or Province of Residence:	Wisconsin
Country of Residence:	US
Street of mailing address:	3745 East Cudahy Avenue
City of mailing address:	Cudahy
State or Province of mailing address:	Wisconsin
Country of mailing address:	US
Postal or Zip Code of mailing address:	53110

Status:	Full Capacity
Given Name:	Christopher S.
Family Name:	Hoppe
City of Residence:	Milwaukee
State or Province of Residence:	Wisconsin
Country of Residence:	US
Street of mailing address:	3126 South Burrell Street
City of mailing address:	Milwaukee
State or Province of mailing address:	Wisconsin

Country of mailing address:	US
Postal or Zip Code of mailing address:	53207

Status:	Full Capacity
Given Name:	Steven W.
Family Name:	Hyma
City of Residence:	Milwaukee
State or Province of Residence:	Wisconsin
Country of Residence:	US
Street of mailing address:	1312 East Warnimont Avenue
City of mailing address:	Milwaukee
State or Province of mailing address:	Wisconsin
Country of mailing address:	US
Postal or Zip Code of mailing address:	53207

Correspondence Information

Correspondence Customer Number:	142078
E-Mail address:	ipadmin@reinhartlaw.com

Representative Information

Representative Customer Number:	142078	

Domestic Priority Information

Application:	Continuity Type:	Prior Application No.:	Parent Filing Date:	Prior Application Status:	Patent No.:
This Application	Is a continuation of	16/216,724	December 11, 2018	Pending	N/A
16/216,724	Is a continuation of	15/826,232	November 29, 2017	Pending	N/A
15/826,232	Is a continuation of	PCT/IL2017/050481	April 30, 2017	Expired	N/A
PCT/IL2017/050481	Claims the benefit under 35 U.S.C. 119(e)	62/459,076	February 15, 2017	Expired	N/A
PCT/IL2017/050481	Claims the benefit under 35 U.S.C. 119(e)	62/330,334	May 2, 2016	Expired	N/A

Foreign Priority Information

Country:	Application number:	Filing Date:	Priority Claimed:

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

Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 396
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

☐ 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.

Applicant Information

Applicant 1:

[X] Assignee	[ ] Legal Representative under 35 U.S.C. 117	[ ] 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 Assignee is an Organization check here [X]			

Organization Name:	Milwaukee Electric Tool Corporation
13135 West Lisbon Road Brookfield, Wisconsin 53005	

Applicant 2:

[X] Assignee	[ ] Legal Representative under 35 U.S.C. 117	[ ] 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 Assignee is an Organization check here [X]			

Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 397
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

Organization Name:	**Keter Plastic LTD.**
2 Sapir Street Herzelyia, Israel 4685206	

Signature:	**/Derek H. Campbell/**		**Date:**	**December 14, 2020**
First Name:	**Derek H.**	**Last Name:**	**Campbell**	
Registration No.:	**70,608**			

PTO/AIA/96 (08-12)
Approved for use through 11/30/2020. OMB 0651-0031
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: Keter Plastic LTD.

Application No./Patent No.: 16/752,441 Filed/Issue Date: January 24, 2020

Titled: Utility Assembly and Coupling Mechanism

Keter Plastic LTD., 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:

   Milwaukee Electric Tool Corporation

   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 052469, Frame 0612, 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.

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)

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.

/Derek H. Campbell/	December 14, 2020
Signature	Date
Derek H. Campbell	70,608
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.

PTO/SB/08 (09-06)
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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Date Submitted: November 12, 2020

(use as many sheets as necessary)

Sheet 1 of 3

Complete if Known	
Application Number	16/752,441
Filing Date	January 24, 2020
First Named Inventor	Yaron Brunner
Art Unit	3736
Examiner Name	Weinerth, Gideon R.
Attorney Docket Number	066749-2584

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	3,225,865	12-28-1965	J. W. Downey	
	A2	4,971,201	11-20-1990	Sathre	
	A3	5,098,235	03-24-1992	Svetlik et al.	
	A4	6,305,498	10-23-2001	Itzkovitch	
	A5	9,506,489	11-29-2016	Ko	
	A6	9,725,209	08-08-2017	Ben-Gigi	
	A7	10,106,180	10-23-2018	Bar-Erez et al.	
	A8	10,583,962	03-10-2020	Brunner et al.	
	A9	2002/0125072	09-12-2002	Levy	
	A10	2003/0094393	05-22-2003	Sahm, III	
	A11	2012/0292213	11-22-2012	Brunner	
	A12	2015/0034515	02-05-2015	Monyak et al.	
	A13	2016/0221177	08-04-2016	Reinhart	
	A14	2018/0099405	04-12-2018	Reinhart	
	A15	2018/0186513	07-05-2018	Brunner	
	A16	2020/0243925	07-30-2020	Polakowski et al.	
	A17	2020/0299027	09-24-2020	Brunner et al.	
	A18	D232,798	09-17-1974	Roche et al.	
	A19	D319,016	08-13-1991	Kahl	
	A20	D325,324	04-14-1992	Kahl	
	A21	D326,815	06-09-1992	Meisner et al.	
	A22	D340,167	10-12-1993	Kahl	
	A23	D352,208	11-08-1994	Brookshire	
	A24	D361,511	08-22-1995	Dickinson et al.	
	A25	D415,393	10-19-1999	Kei	
	A26	D420,860	02-22-2000	Golichowski et al.	
	A27	D527,225	08-29-2006	Krieger et al.	
	A28	D536,580	02-13-2007	Krieger et al.	
	A29	D649,350	11-29-2011	Shitrit	

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

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 2 hours 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, 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 (1-800-786-9199) and select option 2.

PTO/SB/08 (09-06)
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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Date Submitted: November 12, 2020

(use as many sheets as necessary)

Sheet 2 of 3

Complete if Known	
Application Number	16/752,441
Filing Date	January 24, 2020
First Named Inventor	Yaron Brunner
Art Unit	3736
Examiner Name	Weinerth, Gideon R.
Attorney Docket Number	066749-2584

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A30	D738,105	09-08-2015	Shitrit	
	A31	D753,396	04-12-2016	Brunner	
	A32	D777,426	01-31-2017	Dahl	
	A33	D784,089	04-18-2017	Furneaux et al.	
	A34	D803,631	11-28-20017	Min et al.	
	A35	D806,483	01-02-2018	Stanford et al.	
	A36	D831,352	10-23-2018	Brunner	
	A37	D836,995	01-01-2019	Carey et al.	
	A38	D839,681	02-05-2019	Evron et al.	
	A39	D845,080	04-09-2019	Jacobsen	
	A40	D845,081	04-08-2019	Jacobsen	
	A41	D857,387	08-27-2019	Shpitzer	
	A42	D873,085	01-21-2020	DeFrancia	
	A43	D880,252	04-07-2020	Jacobsen	
	A44	D880,951	04-14-2020	Jacobsen	
	A45	D883,752	05-12-2020	Carey et al.	
	A46	D887,788	06-23-2020	Meda et al.	
	A47	D888,422	06-30-2020	Yang	
	A48	D888,503	06-30-2020	Meda et al.	
	A49	D891,193	06-28-2020	Stanford et al.	
	A50	D891,195	07-28-2020	Zhou	
	A51	D891,875	08-04-2020	Olson	
	A52	D892,565	08-11-2020	Astle et al.	
	A53	D895,375	09-08-2020	Hurley, Jr.	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

Examiner Signature		Date Considered	

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Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	16/752,441
				Filing Date	January 24, 2020
Date Submitted: November 12, 2020				**First Named Inventor**	Yaron Brunner
				Art Unit	3736
(use as many sheets as necessary)				Examiner Name	Weinerth, Gideon R.
Sheet	3	of	3	Attorney Docket Number	066749-2584

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	A54	CN102608238	07-25-2012	Zhengzhou Tobacco Res Cntc		
	A55	JPD1503434	07-28-2014	Name not in English		
	A56	JPD1665028	08-03-2020	Keter Plastic LTD et al.		

NON PATENT LITERATURE DOCUMENTS

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Electronic Patent Application Fee Transmittal	
Application Number:	16752441
Filing Date:	24-Jan-2020
Title of Invention:	Utility Assembly and Coupling Mechanism
First Named Inventor/Applicant Name:	Yaron Brunner
Filer:	Derek Howard Campbell/Sarah Sesterhenn-Lee
Attorney Docket Number:	066749-2584
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Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
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Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
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Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
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EFS ID:	41108496
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1	Foreign Reference	CN102608238A.pdf	351046 3d013b643a3f2fcfd7ccba060d2ad640f91a7204	no	7
Warnings:					
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2	Foreign Reference	JPD1503434.pdf	181544 78a5b5a9a4a36fb69d998726398dcc7ece65629e	no	2
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New International Application Filed with the USPTO as a Receiving Office

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Espacenet

Bibliographic data: CN102608238 (A) — 2012-07-25

Method for measuring interception amount in filter tip to benzo(a)pyrene in main stream smoke of cigarette

Inventor(s): BIN PENG; KEJIAN LIU; JIZHAO GUO; QUANPING YAN; YAQIONG QIN; XIANG LI; CONG NIE ± (PENG BIN, ; LIU KEJIAN, ; GUO JIZHAO, ; YAN QUANPING, ; QIN YAQIONG, ; LI XIANG, ; NIE CONG)

Applicant(s): ZHENGZHOU TOBACCO RES CNTC ± (ZHENGZHOU TOBACCO RESEARCH INSTITUTE OF CNTC)

Classification: **- international:** ***G01N30/06; G01N30/72***
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Application number: CN20121070389 20120317 Global Dossier

Priority number(s): CN20121070389 20120317

Abstract of CN102608238 (A)

The invention provides a method for measuring the interception in a filter tip to benzo(a)pyrene in a main stream smoke of a cigarette, which is characterized by comprising the following steps of: 1) selecting an extracting agent; (2) heating and gasifying the extracting agent, so as to enable condensed liquid of the gasified extracting agent to flow through the filter tip to extract the benzo(a)pyrene in the filter tip; 3) purifying extracted liquid by using a purifying material, and then heating and gasifying again; (4) circularly heating, gasifying, extracting and purifying; and 5) carrying out GC-MS (Gas Chromatograph-Mass Spectrometer) quantitative analysis the final extracted liquid. According to the principles disclosed by the invention, a boiling point of the benzo(a)pyrene is higher than that of the extracting agent, and therefore, the extracting agent in the extracted liquid is heated and gasified again, and the benzo(a)pyrene is remained. After the operations are carried out in a circulating way for a while, the benzo(a)pyrene in the filter tip is entirely extracted and a residual extracting agent is finally gasified out. Finally, the GC-MS quantitative analysis is carried out on concentrated liquid. The method disclosed by the invention integrates extraction, purification and concentration, has few operation steps and is simple and liable to operate.

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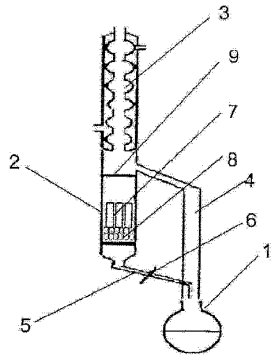
权利要求书 1 页 说明书 3 页 附图 1 页

(54)发明名称

测定滤嘴对卷烟主流烟气中苯并[a]芘截留量的方法

(57)摘要

一种测定滤嘴对卷烟主流烟气中苯并[a]芘截留量的方法，其特征在于：包括以下步骤：1)选择提取剂；2)加热气化提取剂，使气化后的提取剂冷凝液流过滤嘴，对其中的苯并[a]芘进行提取；3)利用净化材料对提取液进行净化后，再次被加热气化；4)循环加热气化、提取净化过程；5)对最终提取液进行GC-MS定量分析。本发明原理在于：由于苯并[a]芘的沸点高于提取剂的沸点，因此提取液中仅提取剂被再次被加热气化，苯并[a]芘则被保留下来，如此循环一段时间，待滤嘴中的苯并[a]芘完全被提取，最后将多余的提取剂气化出去，最后对浓缩液进行GC-MS定量分析。本发明集提取、净化和浓缩一体，操作步骤少，简单易行。



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1. 一种测定滤嘴对卷烟主流烟气中苯并 [a] 芘截留量的方法，其特征在于：包括以下步骤：

1）选择沸点低于苯并 [a] 芘的提取剂；

加热气化提取剂，使气化后的提取剂冷凝液流过滤嘴，对滤嘴中的苯并 [a] 芘进行提取，得到提取液；

利用净化材料对提取液进行净化后，除去苯并 [a] 芘以外的中等极性和极性较强的物质，如色素类化合物，再次被加热气化；

循环加热气化、提取净化过程，直至滤嘴中的苯并 [a] 芘完全被提取；

对步骤 4）中的最终提取液进行 GC-MS 定量分析。

2. 根据权利要求 1 所述的测定滤嘴对卷烟主流烟气中苯并 [a] 芘截留量的方法，其特征在于：提取剂为正己烷或环己烷。

3. 根据权利要求 1 所述的测定滤嘴对卷烟主流烟气中苯并 [a] 芘截留量的方法，其特征在于：所用净化材料为已干燥的、粒径为 30-500μm 的球形硅胶；最佳为 50μm 球形硅胶。

4. 根据权利要求 1 所述的测定滤嘴对卷烟主流烟气中苯并 [a] 芘截留量的方法，其特征在于：所述的加热气化温度为 75 ～ 95℃，通过水浴加热方式进行。

5. 根据权利要求 1 所述的测定滤嘴对卷烟主流烟气中苯并 [a] 芘截留量的方法，其特征在于：所述的冷凝温度为 5 ～ 15℃。

6. 根据权利要求 1 所述的测定滤嘴对卷烟主流烟气中苯并 [a] 芘截留量的方法，其特征在于：所述的循环提取时间为 1 ～ 4h，最佳为 2 小时。

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测定滤嘴对卷烟主流烟气中苯并 [a] 芘截留量的方法

[0001]

技术领域

[0002] 本发明涉及一种苯并 [a] 芘的测定方法，更具体说是涉及一种测定滤嘴对卷烟主流烟气中苯并 [a] 芘截留量的方法。

[0003]

背景技术

[0004] 滤嘴作为抽烟者与主流烟气之间的桥梁，可以有效地滤除烟气中的部分有害成分，因而得到了广泛的重视与应用。测定滤嘴对卷烟主流烟气中有害成分的截留量，可以为科学设计卷烟滤嘴提供技术支撑。

[0005] 目前，对于卷烟主流烟气中苯并 [a] 芘释放量的测定方法比较成熟，我国已经有了相关的标准方法（《GB/T 21130-2007 卷烟 烟气总粒相物中苯并 [a] 芘的测定》）。然而，对于滤嘴中截留的苯并 [a] 芘没有相关的标准方法。已有的研究报道例如《卷烟烟气中稠环芳烃的分析研究》中介绍的测定滤嘴从卷烟主流烟气中截留的苯并 [a] 芘的方法都是先用溶剂将滤嘴中的苯并 [a] 芘萃取出来后，再经过净化处理，最后利用浓缩装置对样品进行浓缩、富集，然后采用气质或者液质进行定量分析。

[0006]

发明内容

[0007] 本发明的目的正是针对上述已有测定方法存在的提取、净化和浓缩分别进行操作的问题，而提供的一种可同时实现提取、净化和浓缩的方法，对滤嘴中截留的苯并 [a] 芘进行测定。

[0008] 本发明的目的是通过以下技术方案来实现的：

本发明的测定滤嘴对卷烟主流烟气中苯并 [a] 芘截留量的方法，包括以下步骤：

1）选择沸点低于苯并 [a] 芘的提取剂；

2）加热气化提取剂，使气化后的提取剂冷凝液流过滤嘴，对滤嘴中的苯并 [a] 芘进行提取，得到提取液；

3）利用净化材料对提取液进行净化后，除去苯并 [a] 芘以外的中等极性和极性较强的物质，如色素类化合物，再次被加热气化；

4）循环加热气化、提取净化过程，直至滤嘴中的苯并 [a] 芘完全被提取；

5）对步骤 4）中的最终提取液进行 GC-MS 定量分析。

[0009] 所述提取剂为正己烷或环己烷。

[0010] 所用净化材料为已干燥的、粒径为 30-500μm 的球形硅胶；最佳为 50μm 球形硅胶。

[0011] 所述的加热气化温度为 75 ～ 95℃，通过水浴加热方式进行；所述的冷凝温度为

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5 ～ 15℃。

[0012] 所述的循环提取时间为 1 ～ 4h，最佳为 2 小时。

[0013] 滤嘴的数量可为 10-20 个。

[0014] 本发明所述的 GC-MS 定量分析方法与《GB/T 21130-2007 卷烟 烟气总粒相物中苯并 [a] 芘的测定》所述仪器与条件相同。

[0015] 本发明所用的提取装置包括水浴加热收集瓶、提取净化腔体和设置在提取净化腔体上方的冷凝管构成，提取净化腔体中设置有待测滤嘴，净化材料铺设在滤嘴下面，提取净化腔体底部设有与收集瓶连通的提取液回流管并由阀门控制，收集瓶上端口设有通入提取净化腔体的气化管，该气化管出口位置位于冷凝管与待测滤嘴之间。工作时，关闭阀门，水浴加热收集瓶中的提取剂，待冷凝下来的提取剂浸没滤嘴后，调节阀门，使冷凝下来的提取剂和回流管流出的提取液速度基本一致，循环气化提取一段时间(约 2 小时)后，滤嘴中的苯并 [a] 芘完全被提取，关闭阀门，继续水浴加热，待收集瓶中的提取液浓缩至 1-2 毫升，即可进行 GC-MS 定量分析。

[0016] 本发明所依据的科学原理在于：由于苯并 [a] 芘的沸点高于提取剂的沸点，因此提取液中仅提取剂被再次被加热气化，苯并 [a] 芘则被保留下来，如此循环一段时间，待滤嘴中的苯并 [a] 芘完全被提取，最后将多余的提取剂气化出去，最后对浓缩液进行 GC-MS 定量分析。

[0017] 本发明与现有的一些分析方法相比较，集提取、净化和浓缩一体，操作步骤少，简单易行。

[0018]

附图说明

[0019] 图 1 为本发明所用提取装置的结构示意图。

[0020] 图中：1. 收集瓶，2. 提取净化腔体，3. 冷凝管，4. 气化管，5. 回流管，6. 阀门，7. 滤嘴，8. 净化材料，9. 定位刻线。

[0021]

具体实施方式

[0022] 本发明以下结合实施例做进一步说明：

实施例 1

按附图接好实验装置，放入 5g 已干燥的、粒径约为 50μm 的球形硅胶和 10 个 28mm 长抽吸后的滤嘴，以 50ml 正己烷作为提取剂，关闭阀门，85℃水浴加热，待冷凝下来的提取剂浸没滤嘴后，调节阀门，使冷凝回流的速度与提取液流出的速度一致，提取 2h 后，关闭阀门，继续水浴加热，待冷凝液面至提取净化腔体上的定位刻线位置(本实验中，刻线至阀门的空腔体积为 60ml)，取下收集瓶，此时收集瓶内提取液的体积约为 1 ～ 2ml，按《GB/T 21130-2007 卷烟 烟气总粒相物中苯并 [a] 芘的测定》所述仪器与条件定量分析苯并 [a] 芘。

[0023] 表 1 滤嘴苯并 [a] 芘含量测定结果

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每个滤嘴的含量	平行测定			
	1	2	3	4
苯并[a]芘 (ng)	3.08	3.39	3.51	3.67

实施例 2

加标回收率实验。

[0024] 按附图接好实验装置，放入 7g 已干燥的、粒径约为 50μm 的球形硅胶和 10 个 28mm 长添加了已知量的苯并 [a] 芘的滤嘴，以 50ml 环己烷作为提取剂，关闭阀门，95℃水浴加热，待冷凝下来的提取剂浸没滤嘴后，调节阀门，使冷凝回流的速度与提取液流出的速度一致，提取 2.5h 后，关闭阀门，继续水浴加热，待冷凝液面至提取净化腔体的定位刻线位置（本实验中，刻线至阀门的空腔体积为 60ml），取下收集瓶，此时收集瓶内提取液的体积约为 1 ～ 2ml，按《GB/T 21130-2007 卷烟 烟气总粒相物中苯并 [a] 芘的测定》所述仪器与条件定量分析苯并 [a] 芘。根据实际加入量和测定结果，计算加标回收率。

[0025] 表 2 苯并 [a] 芘回收率

标准物质加入量 (ng)	40.21				
实测值 (ng)	37.59	38.87	38.91	37.19	37.02
回收率 (%)	93.5	96.7	96.8	92.5	92.1

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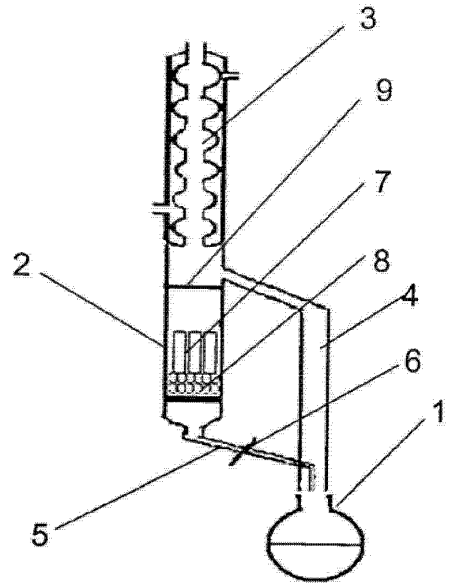


图 1

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Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

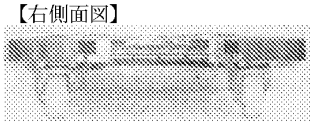
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（４５）【発行日】平成２６年7月２８日（２０１４．７．２８）
（１２）【公報種別】意匠公報（Ｓ）
（１１）【登録番号】意匠登録第１５０３４３４号（Ｄ１５０３４３４）
（２４）【登録日】平成２６年6月２７日（２０１４．６．２７）
（５４）【意匠に係る物品】台車
（５２）【意匠分類】Ｇ２－５００
（５１）【国際意匠分類（参考）】１２－０１、１２－０２、１２－０８、１２－１１、２１－０３
【Ｄターム】Ｇ２－５００ＡＢ
（２１）【出願番号】意願２０１３－２２９７２（Ｄ２０１３－２２９７２）
（２２）【出願日】平成２５年１０月１日（２０１３．１０．１）
（７２）【創作者】
【氏名】水口　稔
【住所又は居所】石川県白山市吉野オ５２－４
（７３）【意匠権者】
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【氏名又は名称】水口　稔
【住所又は居所】石川県白山市吉野オ５２－４
【審査官】生亀　照恵
【図面】
【正面図】



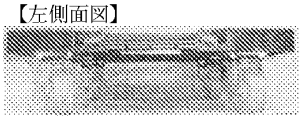
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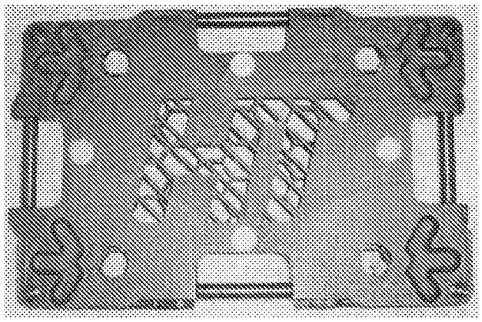
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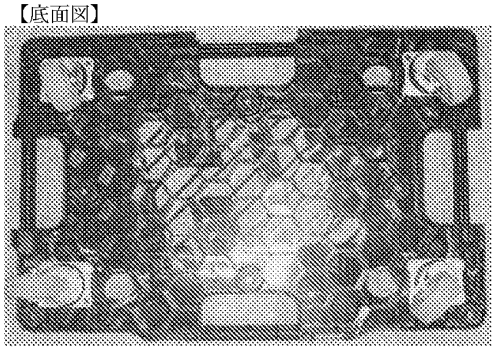
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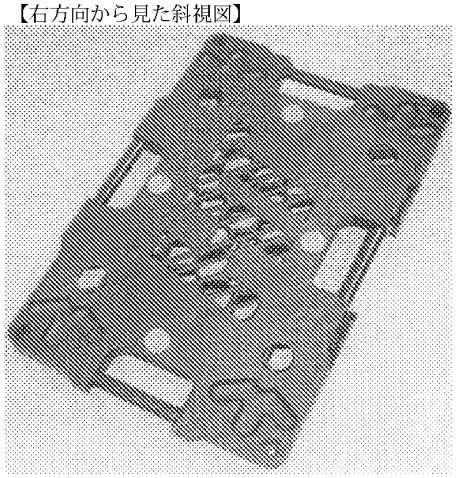
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【底面図】

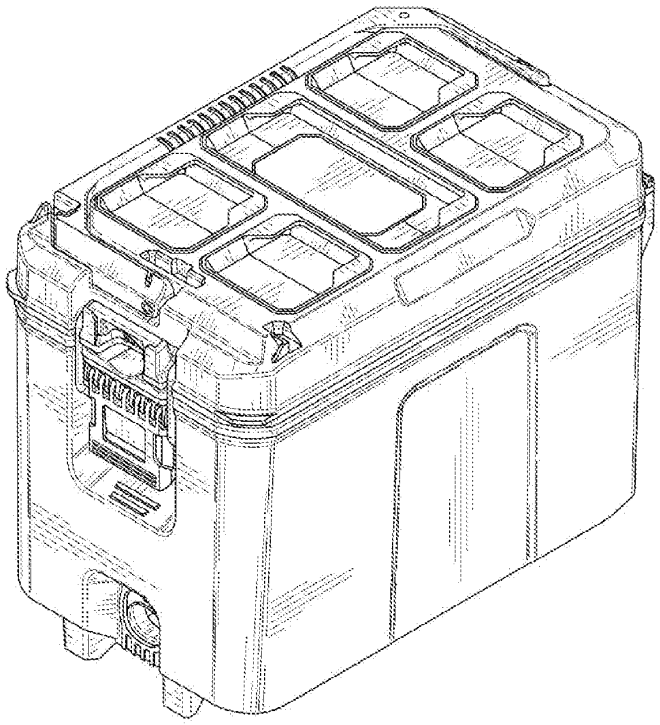


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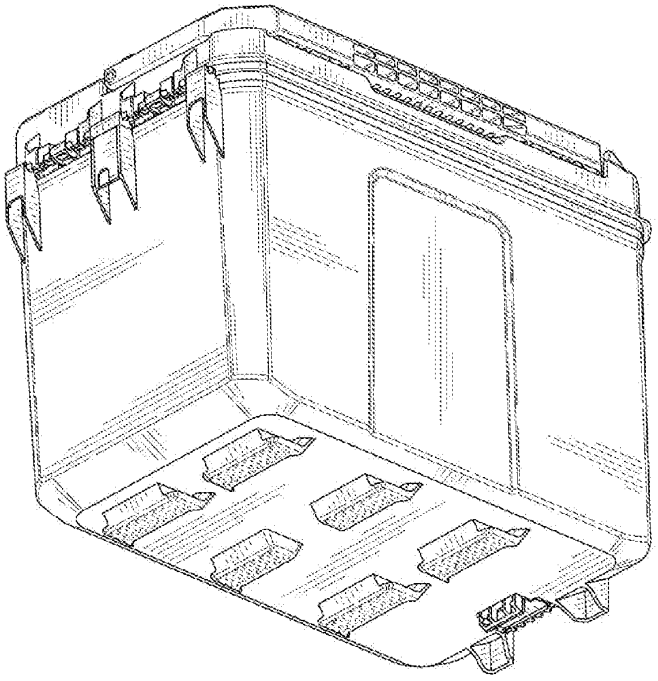


（１９）【発行国・地域】日本国特許庁（ＪＰ）
（４５）【発行日】令和２年８月３日（２０２０．８．３）
（１２）【公報種別】意匠公報（Ｓ）
（１１）【登録番号】意匠登録第１６６５０２８号（Ｄ１６６５０２８）
（２４）【登録日】令和２年７月１４日（２０２０．７．１４）
（５４）【意匠に係る物品】クーラーボックス
（５２）【意匠分類】Ｃ５－３２５１
（５１）【国際意匠分類】Ｌｏｃ（１２）Ｃｌ．７－１０
【Ｄターム】Ｃ５－３２５１ＶＺＡ
（２１）【出願番号】意願２０１９－２６１２８（Ｄ２０１９－２６１２８）
（２２）【出願日】令和１年１１月２６日（２０１９．１１．２６）
（３１）【優先権主張番号】２９／６９３，１４１
（３２）【優先日】令和１年５月３１日（２０１９．５．３１）
（３３）【優先権主張国・地域又は機関】米国（ＵＳ）
（７２）【創作者】
【氏名】ヤーロン　ブルナー
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（７２）【創作者】
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【識別番号】５１０２８７７８４
【氏名又は名称】ケター　プラスチック　リミテッド
【氏名又は名称原語表記】Ｋｅｔｅｒ　Ｐｌａｓｔｉｃ　Ｌｔｄ．
【住所又は居所】イスラエル国　４６８５２０５　ヘルツリーヤ　インダストリアル・ゾーン　サピア・ストリート　１　１４階
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（７３）【意匠権者】
【識別番号】５９１１１８３５１
【氏名又は名称】ミルウォーキー　エレクトリック　ツール　コーポレーション
【氏名又は名称原語表記】ＭＩＬＷＡＵＫＥＥ　ＥＬＥＣＴＲＩＣ　ＴＯＯＬ　ＣＯＲＰＯＲＡＴＩＯＮ
【住所又は居所】アメリカ合衆国，５３００５ウイスコンシン，ブルックフィールド，リスボンロードウエスト１３１３５番地
（７４）【代理人】
【識別番号】１００１３３４００
【弁理士】
【氏名又は名称】阿部　達彦
（７４）【代理人】
【識別番号】１００１３７７４１
【弁理士】
【氏名又は名称】小暮　理恵子
（７４）【代理人】
【識別番号】１００１９５５０１

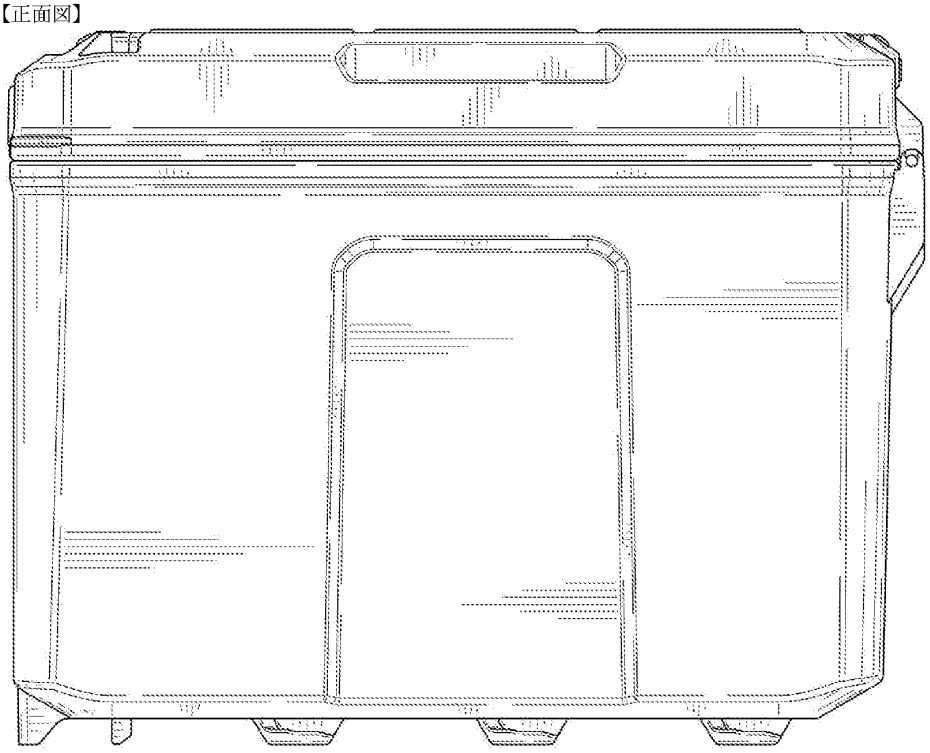
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【氏名又は名称】行田　朋弘
（７４）【代理人】
【識別番号】１００１７１２９５
【弁理士】
【氏名又は名称】岡村　太一
【審査官】木村　智加
（５５）【意匠の説明】実線で表した部分が、意匠登録を受けようとする部分である。各図の表面部に表された細線は、いずれも立体表面の形状を表す線である。
【図面】
【第一の斜視図】



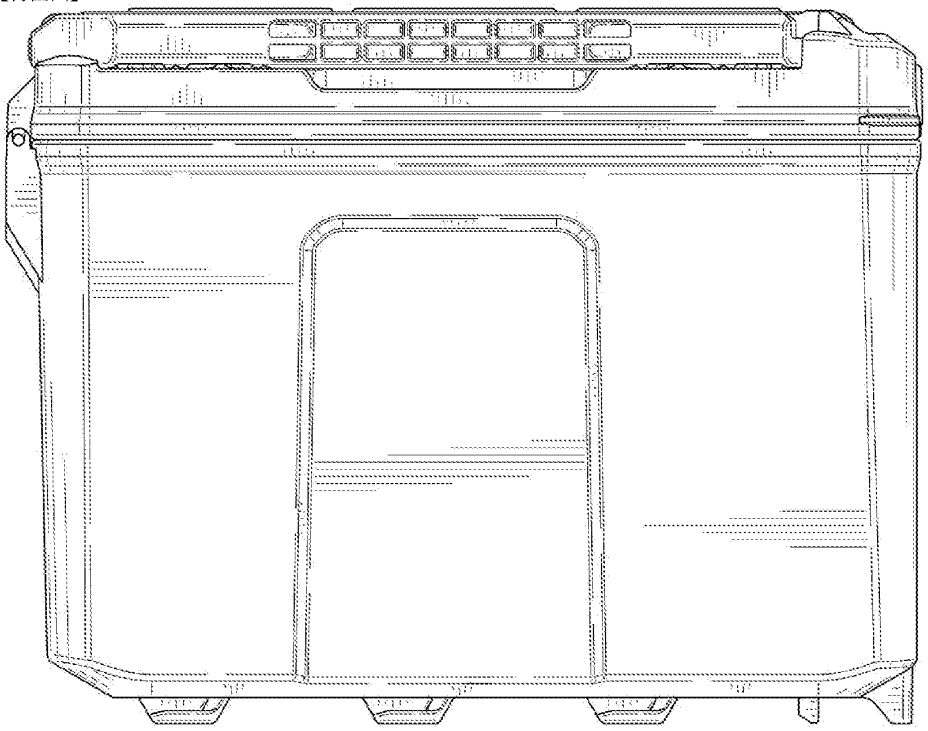
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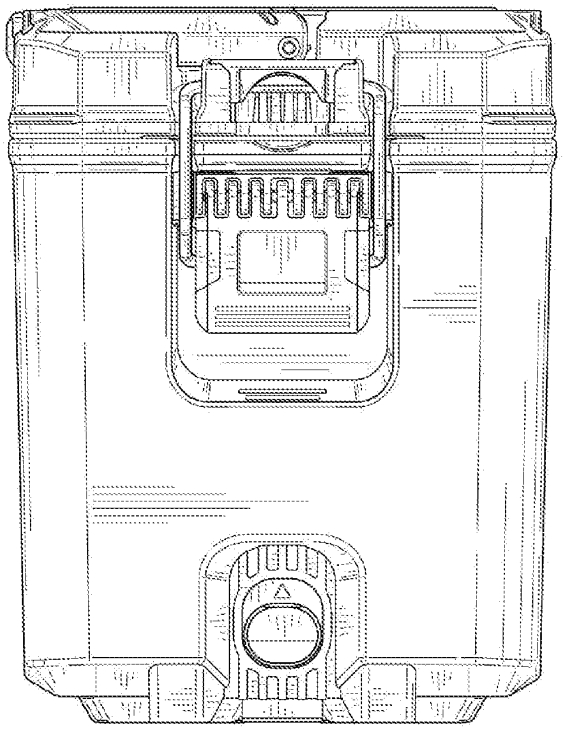
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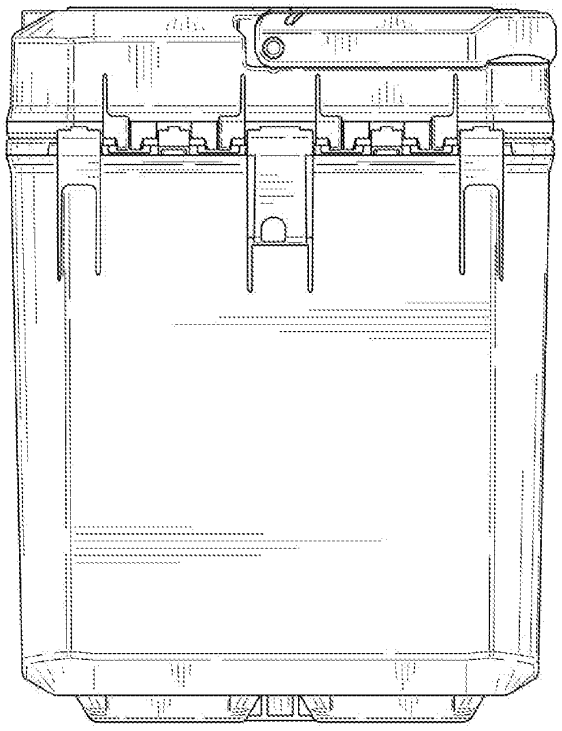
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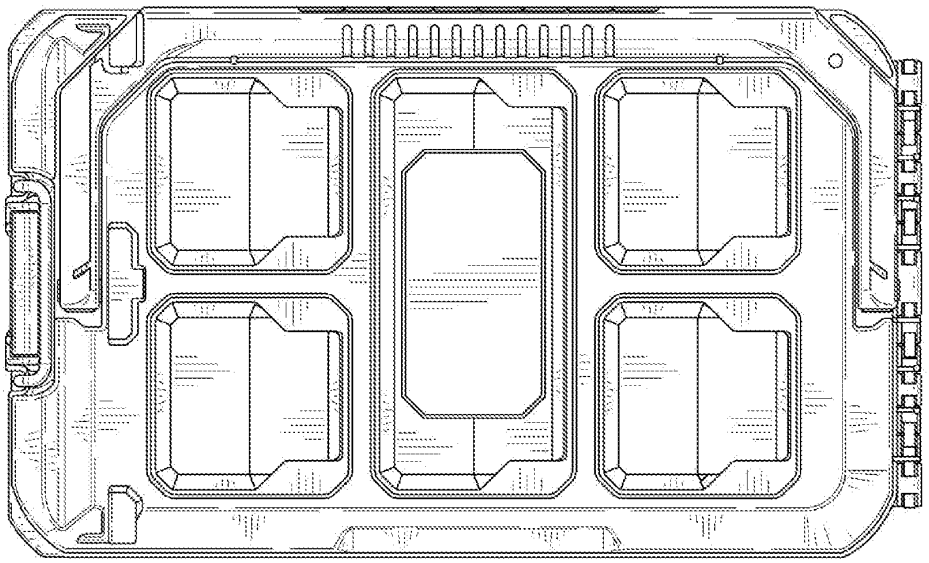
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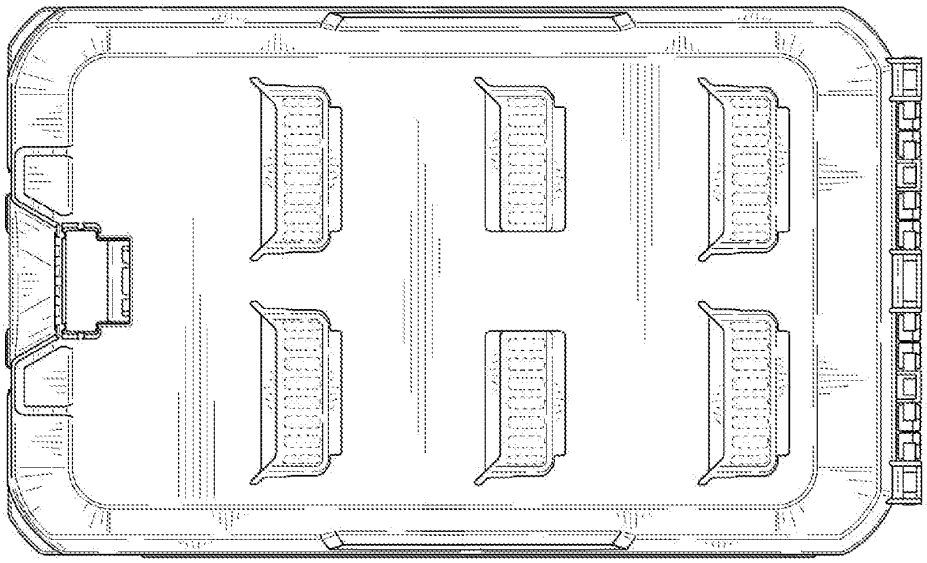
【右側面図】



【平面図】



【底面図】



（５６）【参考文献】意登１６１３０５８　意登１６１３０６１

Atty. Dkt. No. 066749-2584

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Milwaukee Electric Tool Corporation
Title:	Utility Assembly and Coupling Mechanism
Appl. No.:	16/752,441
Filing Date:	January 24, 2020
Examiner:	WEINERTH, GIDEON R.
Art Unit:	3736
Confirmation Number:	9540

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

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

Submitted herewith on Form PTO/SB/08 is a listing of the documents known to Applicants in order to comply with Applicants' duty of disclosure pursuant to 37 CFR § 1.56.

A copy of each non-U.S. patent document and each non-patent document is being submitted to comply with the provisions of 37 CFR § 1.97 and §1.98.

The submission of any document herewith, which is not a statutory bar, is not intended as an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicants do not waive any rights to take any action which would be appropriate to

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Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
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antedate or otherwise remove as a competent reference any document which is determined to be a *prima facie* art reference against the claims of the present application.

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(c), before the mailing date of any of a final action under 37 CFR § 1.113, a notice of allowance under 37 CFR §1.311, or an action that otherwise closes prosecution in the application.

FEES

The IDS Fee of $260.00 under 37 CFR 1.17(p) is being paid via Deposit Account No. 18-0882 via EFS-web.

RELEVANCE OF EACH DOCUMENT

The relevance of the foreign-language document(s) is shown in the figures of foreign-language documents, in the accompanying English language search report/office action from a related foreign application, and/or are described in the English-language abstract and/or machine translation submitted herewith, where available. An English non-machine translation of the foreign-language document is not readily available. However, the absence of such translation does not relieve the PTO from its duty to consider the submitted foreign language document (37 CFR §1.98 and MPEP §609).

Applicants respectfully request that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 18-0882. If any extensions of time are needed for timely acceptance of papers submitted herewith, applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 18-0882.

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Respectfully submitted,

Date November 12, 2020

By /Derek H. Campbell/

Reinhart Boerner Van Deuren s.c.
Customer Number: 142078
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Attorney for Applicant
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UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/752,441	01/24/2020	Yaron Brunner	066749-2584	9540

142078 7590 09/25/2020

Reinhart (Milwaukee Tool)
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1000 NORTH WATER STREET
SUITE 2100
MILWAUKEE, WI 53202

EXAMINER	
WEINERTH, GIDEON R	

ART UNIT	PAPER NUMBER
3736	

NOTIFICATION DATE	DELIVERY MODE
09/25/2020	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):

IPAdmin@reinhartlaw.com

Office Action Summary	**Application No.** 16/752,441	**Applicant(s)** Brunner et al.	
	Examiner GIDEON R WEINERTH	**Art Unit** 3736	**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 _____.

☐ 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) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-20 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 24 January 2020 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 9/16,/20, 5/28/20, 5/7/20, 3/31/20, 1/24/20.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☑ Other: Double Patenting Claim Comparison charts.

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DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Double Patenting

2. 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 USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The 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/process/file/efs/guidance/eTD-info-I.jsp.

3. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-12 of U.S. Patent No. 10583962. Although the claims at issue are not identical, they are not patentably distinct from each other because the claims recite an identical structure with no functional difference. Also, the structure is substantially duplicated in US 10703534 and Application 15826201/US Publication 2018/0161975.

4. The claims, if allowed, would improperly extend the “right to exclude” already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: The single rib and latching lock structure is

structurally identical and is drawn to the same embodiment as US 10583962 and what is claimed in US 2018/0161975.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GIDEON R. WEINERTH whose telephone number is (571)270-5121. The examiner can normally be reached on Monday-Friday 10AM-6PM EST.

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, Greg Pickett can be reached on (571) 272-4560. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see https://ppair-my.uspto.gov/pair/PrivatePair. Should you have questions on access to the Private

PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GIDEON R WEINERTH/
Examiner, Art Unit 3736

Notice of References Cited	Application/Control No. 16/752,441	Applicant(s)/Patent Under Reexamination Brunner et al.	
	Examiner GIDEON R WEINERTH	Art Unit 3736	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20200165036-A1	05-2020	Squiers; Grant T.	A45C13/02	1/1
*	B	US-20200147781-A1	05-2020	Squiers; Grant T.	A45C7/0045	1/1
*	C	US-D896518-S	09-2020	Brunner; Yaron		D3/294
*	D	US-D896517-S	09-2020	Brunner; Yaron		D3/294
*	E	US-D895967-S	09-2020	Brunner; Yaron		D3/294
*	F	US-D895966-S	09-2020	Brunner; Yaron		D3/294
	G					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	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 MM-YYYY format are publication dates. Classifications may be US or foreign.

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IPR2024-01400

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/752,441	Brunner et al.
	Examiner	Art Unit
	GIDEON R WEINERTH	3736

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

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

CLAIM		DATE								
Final	Original	09/22/2020								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
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	17	✓								
	18	✓								
	19	✓								
	20	✓								

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IPR2024-01400

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/752,441	Brunner et al.
	Examiner	Art Unit
	GIDEON R WEINERTH	3736

CPC - Searched*		
Symbol	Date	Examiner

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
Update searches from 15826201, 15826232, 16216724, See search history	09/16/2020	GW

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/GIDEON R WEINERTH/ Examiner, Art Unit 3736	

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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S40	60	(french adj cleat)	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:16
S41	25	("3361293").URPN.	USPAT	OR	OFF	2018/04/05 21:21

S42	32	("2483269" | "3219400" | "3361293" | "3512696" | "3565624" | "3763980" | "4190172" | "4322118" | "4389078" | "4624383" | "4660725" | "5016946" | "5038937" | "5105962" | "5310071" | "6047827" | "6056377" | "6276550" | "D330128" | "D332745").PN. OR ("7152752").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:22
S43	11	("20070145864" | "20100254757" | "20110085853" | "3944282" | "4900090" | "4995176" | "6612078" | "6830236" | "6877824" | "7152752" | "8464408").PN. OR ("9506489").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:23
S44	16	("3469331" | "4716666").PN. OR ("4995176").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:24
S45	22	("3131829" | "3194426" | "3338452" | "4258847" | "4328902" | "4428479" | "5016946" | "5050755" | "5310071" | "5316159" | "5503288" | "5845790").PN. OR ("6276550").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:25
S46	7	("1849659").URPN.	USPAT	OR	OFF	2018/04/05 21:29
S47	46	("1849659" | "2774511" | "2916293" | "2994457" | "3053397" | "3100582" | "3113680" | "3219232" | "3282458" | "3647112" | "4000817" | "4176747" | "Re26758" | "Re27649").PN. OR ("4550837").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:30
S48	1,066	B65D21/0217,0219,0222,0228,023.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:33
S49	92	B65D21/0217,0219,0222,0228,023.cpc. and spring	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:33
S50	0	("2017/0121056").URPN.	USPAT	OR	OFF	2018/04/05 21:37
S51	4	("20110139777" | "5301829" | "5427265" | "8602217").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:37
S52	16	("20080000899" | "20120312812" | "20130127129" | "3379482" | "3811559" | "4118048" | "4619363" | "5125697" | "5904269" | "6082539" | "6371320" | "6874634" | "6889838" | "7387350" | "7516842").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:39
S53	2	("2012/0024739").URPN.	USPAT	OR	OFF	2018/04/05 21:43

S54	4	("2011/0168599").URPN.	USPAT	OR	OFF	2018/04/05 21:44
S55	22	("5699925" | "6959507" | "20090139892" | "3182856" | "20030155267" | "20080308641" | "3182856" | "5353948" | "3581928" | "4351448" | "20090178989" | "2634020" | "3387732" | "5755180" | "6761266" | "20050224494" | "7246718" | "5606820" | "20090236255" | "5469961").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:45
S56	237	206/501.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:46
S57	2	("2010/0219193").URPN.	USPAT	OR	OFF	2018/04/05 21:50
S58	72	("0879455" | "20040134390" | "20040178208" | "20060254946" | "20060254947" | "20080017650" | "20100219193" | "2695115" | "2849151" | "3103278" | "3117692" | "3383009" | "3391824" | "3407758" | "3419184" | "3481502" | "3616943" | "3754645" | "3756396" | "3759416" | "3811747" | "3916803" | "3926321" | "3968879" | "4287997" | "4618059" | "4655360" | "4765252" | "4832200" | "4848605" | "4889235" | "5054617" | "5203494" | "5392945" | "5404829" | "5454477" | "5641090" | "5718350" | "5769230" | "5779051" | "5974981" | "6021916" | "6085467" | "6186345" | "6237758" | "6308858" | "6371364" | "6446563" | "6457599" | "6585090" | "6622642" | "6662950" | "6698362" | "7163122" | "D236326" | "D333094" | "D361715" | "D446017" | "D500924").PN. OR ("8851287").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:50
S59	36	("20020096844" | "4066155" | "4813542" | "5099968" | "5564805" | "5906291" | "D439739").PN. OR ("6585090").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:52
S60	73	("20030029750" | "20030123965" | "20050072642" | "20050077136" | "20060119060" | "20070012694" | "20070068757" | "2497173" | "3061057" | "3452846" | "3532355" | "3572253" | "3650216" | "3861703" | "3891230" | "4081061" | "4118048" | "4122925" | "4350194" | "4621716" | "4657135" | "4693345" | "4738340" | "4792025" | "4813521" | "4951818" | "5038842" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:53

		"5048649" | "5109961" | "5142445" | "5178244" | "5186290" | "5197579" | "5339934" | "5373104" | "5379870" | "5407039" | "5447216" | "5484045" | "5484046" | "5632496" | "5713439" | "5890571" | "5927361" | "6073737" | "6116390" | "6164425" | "6213266" | "6401890" | "6520327" | "6585090" | "6634496" | "6758334" | "6976566" | "7077252" | "7232018" | "7380685" | "7398868" | "7726483" | "7780002" | "7942282" | "D294775" | "D453623").PN. OR ("8561769").URPN.				
S61	44	("20040007574" | "20050036847" | "20050199459" | "20070130731" | "20090178946" | "20120292867" | "3419184" | "3987829" | "4287997" | "4452555" | "5058746" | "5085448" | "5186330" | "5564805" | "5709008" | "5785328" | "6116390" | "6983946" | "7011214" | "7044528" | "7163122" | "7350789" | "7482928" | "7530580" | "7537119" | "7714708" | "7780026" | "7854321" | "7883096" | "7938412" | "8132819" | "8146771" | "8256242" | "8561769" | "8567796" | "D358765" | "D401412" | "D467424" | "D467425" | "D467426" | "RE44656").PN. OR ("9550605").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 21:59
S62	10	("20050199623" | "5765707" | "5829595" | "6024223" | "7337908").PN. OR ("8146771").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:03
S63	42	("0621601" | "2761582" | "3113690" | "3616943" | "3643993" | "3823973" | "3828964" | "3977558" | "4000704" | "4042111" | "4416374" | "4678084" | "4887731" | "5011036" | "5022546" | "5105967").PN. OR ("5186330").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:05
S64	74	("0879455" | "2849151" | "3005282" | "3371816" | "3393858" | "3481502").PN. OR ("3616943").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:08
S65	36	("1234730" | "20020145022" | "20030010799" | "20040207225" | "20090212584" | "2578238" | "2883764" | "3002650" | "3131829" | "3351228" | "3374914" | "3616943" | "4754883" | "4838745" | "4941784" | "5025964" | "5392945" | "5469999" | "5538153" | "5671511" | "5676251" | "5687895" | "5855310" | "6471278" | "7159730" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:09

		"7329451" | "7537119" | "D264014" | "D333094").PN. OR ("9738198").URPN.				
S66	75	("0879455" | "20040178208" | "20060254947" | "2695115" | "2849151" | "2939603" | "3103278" | "3117692" | "3383009" | "3391824" | "3419184" | "3481502" | "3616943" | "3754645" | "3756396" | "3759416" | "3811747" | "3968879" | "4287997" | "4655360" | "4671411" | "4765252" | "4832200" | "4848605" | "5042674" | "5203494" | "5392945" | "5454477" | "5566824" | "5641090" | "5718350" | "5769230" | "5779051" | "6021916" | "6085467" | "6186345" | "6237758" | "6308858" | "6367630" | "6371364" | "6457599" | "6585090" | "6662950" | "7163122" | "D333094" | "D361715" | "D446017" | "D500924").PN. OR ("7537119").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:10
S67	45	("0491865" | "1142932" | "1665238" | "20060016812" | "20070108080" | "20080264820" | "20100084119" | "3144016" | "3259263" | "3369691" | "3384259" | "3828964" | "4109789" | "4655360" | "4760921" | "4901380" | "5086926" | "5203494" | "5461755" | "5564583" | "5671856" | "5699925" | "5769230" | "6024223" | "6085467" | "6186345" | "6237758" | "6273258" | "6457599" | "6715627" | "6840378" | "6851566" | "7510096" | "7537119" | "8056722" | "RE37518").PN. OR ("8813960").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:11
S68	32	("4506798" | "4626155" | "4741449" | "5109985" | "5123541" | "5190179" | "5722328" | "5862917").PN. OR ("6024223").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:12
S69	4	("1665238").URPN.	USPAT	OR	OFF	2018/04/05 22:15
S70	39	("2885135" | "3376046" | "3539071" | "3568879" | "3987829" | "4174950" | "4765252" | "4844263" | "D248015").PN. OR ("D333094").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:17
S71	53	("2761582" | "3117692" | "3360162" | "3379341" | "3392875" | "3419184" | "3675815" | "3759416" | "3979016" | "4093071" | "4106624" | "4189052" | "4379508").PN. OR ("4832200").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:19
S72	79	("3117692").URPN.	USPAT	OR	OFF	2018/04/05 22:22

S73	45	("1762635" | "2531671" | "2614399" | "3117692" | "3498494" | "3501044" | "3502241" | "3667647" | "3751852").PN. OR ("4279354").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:24
S74	13	("20060186186" | "20070209962" | "20080202976" | "2328689" | "2828059" | "3811566" | "4279354" | "4293071" | "6315126").PN. OR ("8684222").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:25
S75	45	("1762635" | "2531671" | "2614399" | "3117692" | "3498494" | "3501044" | "3502241" | "3667647" | "3751852").PN. OR ("4279354").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:26
S76	110	("2457842" | "2483464" | "2664219" | "2702142" | "3073466" | "3130855" | "3140007" | "3586204" | "3828964").PN. OR ("4287997").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:30
S77	63	("2461526" | "3078484" | "3114486" | "3233803" | "3749294" | "3902640" | "3915189" | "4082208" | "4287997" | "4307826" | "4366922" | "4424841" | "4491258" | "4545414" | "4673070" | "4790432" | "4813542" | "4884731" | "5131576" | "5184763" | "5321904" | "5419473").PN. OR ("5628443").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:33
S78	151	("1409838" | "20010040080" | "20020074332" | "20020130005" | "20020185350" | "20030034215" | "20030034636" | "20040000457" | "20040004332" | "20040026199" | "20040074725" | "20040163910" | "20040211634" | "20040238303" | "20050077133" | "20050077706" | "20050098402" | "20050103590" | "20050150733" | "20050258621" | "20050285359" | "20060010644" | "20060086583" | "20060102677" | "20060163305" | "20060175170" | "20060196743" | "20060207848" | "20080060953" | "20080136133" | "20080223679" | "20080236972" | "20080308369" | "20080308370" | "20090057082" | "20090139813" | "20090160147" | "20090218187" | "20100000805" | "20100025174" | "20100095480" | "20100108452" | "20100147642" | "20100263977" | "20100307879" | "20100308563" | "20110247910" | "20120160617" | "20120261223" | "20150091264" | "20160045000" | "2454438" | "2602675" | "3131829" | "3178197" | "3317081" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:34

		"3659867" | "3842953" | "3891230" | "3974898" | "4087102" | "4314624" | "4335895" | "4575109" | "4588055" | "4673070" | "4917392" | "4953257" | "4969660" | "5072958" | "5105962" | "5127662" | "5263727" | "5310071" | "5348325" | "5533231" | "5628443" | "5630601" | "5749503" | "5803471" | "5815843" | "5873145" | "5984154" | "5984327" | "6016893" | "6042127" | "6047442" | "6141841" | "6179176" | "6182981" | "6186295" | "6196366" | "6196560" | "6213266" | "6213267" | "6237734" | "6260871" | "6279705" | "6289554" | "6305587" | "6360400" | "6367602" | "6401888" | "6401890" | "6409412" | "6454065" | "6471019" | "6474524").PN. OR ("6484362" | "6530507" | "6533086" | "6575493" | "6591950" | "6604617" | "6609271" | "6736073" | "6769701" | "6832670" | "6880685" | "6923352" | "6961976" | "6964420" | "7066311" | "7070190" | "7073694" | "7093700" | "7097181" | "7097183" | "7143912" | "7226073" | "7232018" | "7237660" | "7281616" | "7284304" | "7318507" | "7328779" | "7350648" | "7374183" | "7426985" | "7441785" | "7478803" | "7594569" | "7597341" | "7780026" | "8607947").PN. OR ("9888752").URPN.				
S79	6	("2008/0308369").URPN.	USPAT	OR	OFF	2018/04/05 22:35
S80	45	("0672173" | "1084360" | "20020144376" | "20040084269" | "20040173427" | "20040238241" | "20050077136" | "20050092568" | "20080308369" | "20090095588" | "20090101461" | "20100059322" | "20100170761" | "20100236886" | "20100270116" | "20110168507" | "20130037364" | "20130175129" | "20130213753" | "20130220754" | "2581417" | "4836343" | "5099968" | "5355980" | "5560458" | "5671832" | "5829559" | "5927450" | "5988334" | "6347693" | "6533086" | "6536568" | "7322477" | "7322585" | "7503569" | "7909149" | "8087513" | "D516869" | "D671316").PN. OR ("9027722").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:36

S81	35	("0922567" | "1084360" | "1567461" | "2372845" | "2428906" | "2801666" | "2858957" | "3837447" | "4098312" | "4122925" | "4142563" | "4257463" | "4286639" | "4673070" | "4744446").PN. OR ("4836343").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:39
S82	51	("0778785" | "1567461" | "2372845" | "2428906" | "2989998" | "3631572" | "3696850" | "4122925" | "4128194" | "4256245" | "4424841").PN. OR ("4673070").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:40
S83	33	("0842498" | "1689399" | "3114486" | "3698045" | "4231135" | "4673070" | "4799298" | "4934573" | "5205448" | "5259093" | "5465425" | "5604958" | "5632071" | "5724707" | "5815843" | "6108816" | "7080430" | "7251867").PN. OR ("7526842").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:41
S84	23	("2428906" | "2707035" | "3225951" | "3319744" | "3696850" | "3958731").PN. OR ("4122925").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:43
S85	33	("1973819" | "2007696" | "3373911").PN. OR ("4142563").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:46
S86	12	("2858957").URPN.	USPAT	OR	OFF	2018/04/05 22:48
S87	12	("20060071581" | "20080060964" | "2858957" | "3346137" | "3568879" | "4258847" | "4592601" | "4685565" | "4863222" | "7311202").PN. OR ("9724820").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:49
S88	43	("2128854" | "3743372").PN. OR ("4863222").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:49
S89	73	("2842420" | "2998128" | "3032381" | "3294463" | "3501044" | "3552817").PN. OR ("3743372").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:51
S90	36	("2011962" | "3514170" | "3552817" | "3743372" | "3851936" | "3999818" | "4198777" | "4238032" | "4353470" | "4589546" | "4744612" | "4782619" | "4874210" | "4907703" | "5046789" | "5137340" | "5176435" | "5191983" | "5344024" | "5399004" | "5454634").PN. OR ("6050657").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:53
S91	17	("3131829" | "3429632" | "3552579" | "3707023" | "4062302" | "4239306" | "5246284").PN. OR ("5454634").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:55

S92	55	("0511617" | "1890000" | "2492697" | "2557630" | "2807387" | "3203744" | "3283915" | "3514170" | "3743372" | "3758181" | "3918781" | "3999818" | "4026615" | "4056295" | "4120549").PN. OR ("4243279").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 22:59
S93	45	("2593998" | "2653072" | "2730423" | "3131829" | "3219400" | "3514170" | "3552817" | "3563624" | "3743372" | "3814489").PN. OR ("3999818").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 23:03
S94	14	("2593998").URPN.	USPAT	OR	OFF	2018/04/05 23:06
S95	52	("4081061" | "4621716" | "5316159" | "6213266" | "6213267" | "7976024" | "1084360" | "3749273" | "4570799" | "4995436" | "5779051" | "D447944" | "3103278" | "3374917" | "5000713" | "6585090" | "5098328" | "D359315" | "20030132184" | "20050199459" | "4813542" | "0480709" | "5062539" | "5186290" | "6276550" | "D346627" | "5310071" | "20040222059" | "3583590" | "3836043" | "4287997" | "4656840" | "5167336" | "5392945" | "6257381" | "20040000458" | "4573595" | "7644828" | "D483200" | "7648407" | "3811747" | "20010027902" | "5099968" | "5485920" | "5709304" | "5735422" | "3346137").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 23:14
S96	22	("3131829" | "3194426" | "3338452" | "4258847" | "4328902" | "4428479" | "5016946" | "5050755" | "5310071" | "5316159" | "5503288" | "5845790").PN. OR ("6276550").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 23:16
S97	41	("2454438" | "2495132" | "3131829" | "3194426" | "3297196" | "3317081" | "3343705" | "3404805" | "3851936" | "4192422").PN. OR ("4328902").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 23:18
S98	43	("1092651" | "2565969" | "2891639" | "3028207" | "3032381" | "3506321").PN. OR ("3974898").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 23:29
S99	11	("0907507" | "1626482" | "2343525" | "3974898" | "4065014").PN. OR ("4423687").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/05 23:30
S100	32	("3481502").URPN.	USPAT	OR	OFF	2018/04/05 23:38
S101	8	(("1112943") or ("2255513") or ("2849151") or ("3371816")).PN.	USPAT; USOCR	OR	OFF	2018/04/05 23:41

S102	16	("2849151").URPN.	USPAT	OR	OFF	2018/04/05 23:41
S103	8	(("0993866") or ("1342909") or ("1514512") or ("1640368")).PN.	USPAT; USOCR	OR	OFF	2018/04/05 23:42
S104	21	("1112943").URPN.	USPAT	OR	OFF	2018/04/05 23:43
S105	16	("2849151").URPN.	USPAT	OR	OFF	2018/04/06 12:32
S106	8	(("0993866") or ("1342909") or ("1514512") or ("1640368")).PN.	USPAT; USOCR	OR	OFF	2018/04/06 12:33
S107	22	("879455").URPN.	USPAT	OR	OFF	2018/04/06 12:34
S108	16	("2849151").URPN.	USPAT	OR	OFF	2018/04/06 13:10
S109	8	(("0993866") or ("1342909") or ("1514512") or ("1640368")).PN.	USPAT; USOCR	OR	OFF	2018/04/06 13:11
S110	37	("3899229" | "4431237" | "4519655" | "4828341" | "4889254" | "5191983").PN. OR ("5469961").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 13:11
S111	25	("20030155267" | "20050224494" | "20080308641" | "20090139892" | "20090178989" | "20090236255" | "2634020" | "3182856" | "3387732" | "3581928" | "4351448" | "5353948" | "5469961" | "5606820" | "5699925" | "5755180" | "6761266" | "6959507" | "7246718").PN. OR ("8677661").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 13:12
S112	24	("1226708" | "2833137" | "2834121" | "2843943" | "3139744" | "3220229" | "3545235" | "3824813" | "4507942" | "4551996" | "4663948" | "4680948" | "4821535" | "4972687" | "4989426" | "5469961" | "5653416").PN. OR ("5951130").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 13:13
S113	118	(US-20130127129-$ or US-20110155613-$ or US-20110139665-$ or US-20040195793-$ or US-20020000440-$ or US-20120292213-$ or US-20070012694-$ or US-20150336710-$ or US-20020134700-$ or US-20100270764-$ or US-20100000893-$ or US-20050062244-$ or US-20040183266-$ or US-20020014488-$ or US-20020113386-$ or US-20030196860-$ or US-20170259956-$ or US-20160144500-$ or US-20160130034-$ or US-20150274362-$ or US-20110168599-$ or US-20090178989-$ or US-20100219193-$ or US-20060254946-$ or US-20070068757-	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:03

		$ or US-20090178946-$).did. or (US-20050199459-$ or US-20080308369-$ or US-20050077136-$).did. or (US-7503569-$ or US-9022234-$ or US-8875888-$ or US-8657307-$ or US-8590704-$ or US-3182856-$ or US-8459495-$ or US-7097036-$ or US-6193062-$ or US-9393684-$ or US-6637592-$ or US-D730088-$ or US-5833065-$ or US-5482162-$ or US-5244265-$ or US-4244509-$ or US-9643629-$ or US-7780026-$ or US-9132543-$ or US-8567796-$ or US-8226092-$ or US-8201837-$ or US-8132819-$ or US-7997594-$ or US-3010775-$ or US-9669930-$).did. or (US-4813542-$ or US-6585090-$ or US-6085925-$ or US-D776106-$ or US-6839238-$ or US-9609964-$ or US-7152752-$ or US-9506489-$ or US-3944282-$ or US-5241765-$ or US-4389078-$ or US-1849659-$ or US-4405057-$ or US-9802741-$ or US-8851287-$ or US-8763836-$ or US-8561769-$ or US-D808164-$ or US-9550605-$ or US-4887731-$ or US-9738198-$ or US-7537119-$ or US-8813960-$ or US-9669968-$ or US-6024223-$ or US-1665238-$ or US-D333094-$).did. or (US-3376046-$ or US-4832200-$ or US-D364558-$ or US-3419184-$ or US-3117692-$ or US-8684222-$ or US-2328689-$ or US-4287997-$ or US-5628443-$ or US-9888752-$ or US-9027722-$ or US-4673070-$ or US-7526842-$ or US-5465839-$ or US-9724820-$ or US-4863222-$ or US-3743372-$ or US-6050657-$ or US-5454634-$ or US-3851936-$ or US-5602721-$ or US-3999818-$ or US-5271515-$ or US-4243279-$ or US-6276550-$ or US-4328902-$ or US-7350648-$).did. or (US-5407074-$ or US-3481502-$ or US-2849151-$ or US-3616943-$ or US-5469961-$ or US-8677661-$ or US-5951130-$).did. or (US-3117692-$ or US-2593998-$).did.				
S115	286	B65D21/0223.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:05

S116	226	B65D21/0224.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:05
S117	2,198	B25H3/021,022,023,04,06.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:07
S118	436	A47B47/00.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:10
S119	1,076	A47B87/02,007,0276.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:10
S120	550	A47B67/04.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:11
S121	770	Y10T403/7045.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:12
S122	9	("7451578" | "6209278" | "4599841" | "6363677" | "6955020" | "7040068" | "6588166" | "6804926" | "6658808").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:14
S123	102	("0890436" | "2740167" | "3310919" | "3988187" | "5295341" | "5630304" | "6023907" | "1854396" | "2381469" | "20030029116" | "3040388" | "3192574" | "3347048" | "3526420" | "4599841" | "6098365" | "5899038" | "20020112433" | "20030029115" | "2381469" | "3673751" | "4599841" | "4819932" | "5086599" | "5363616" | "6029416" | "6216409" | "6324809" | "6546691" | "6606834" | "6647690" | "20030029115" | "3902291" | "5295341" | "5630304" | "6421970" | "6763643" | "0753791" | "20030029116" | "2430200" | "3579941" | "5283102" | "6209278" | "6647690" | "6854235" | "20030024201" | "3579941" | "3673751" | "4426820" | "4741136" | "5860267" | "6023907" | "6122879" | "6769835" | "0338653" | "1776188" | "1854396" | "20030024201" | "3172508" | "3175476" | "3902291" | "4094090" | "5706621" | "6122879" | "6397548" | "2740167" | "20020112433" | "3175476" | "4416097" | "5797237" | "6029416" | "6182410" | "6397548" | "0890436" | "0623562" | "3040388" | "3192574" | "3347048" | "4426820" | "5860267" | "6098365" | "6490836" | "20050210810" | "3310919" | "4819932" | "5086599" | "5283102" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:15

		"6006486" | "6101778" | "6209278" | "6324809" | "3720027" | "20020170258" | "4416097" | "4807416" | "5165816" | "5618602" | "6094882" | "6101778" | "6182410" | "6513862" | "20020170258" | "20030024200" | "3657852" | "3988187" | "5165816" | "6094882" | "6591568" | "5274979" | "6772568" | "3200553" | "3657852" | "4741136" | "4819532" | "5797237" | "6006486" | "6505452" | "6591568" | "6854235" | "4094090" | "5363616" | "5618602" | "6513862" | "6606834" | "5548937" | "6880307" | "7065935" | "20030024200" | "2138085" | "2142305" | "3526420" | "5348778" | "20050210810" | "1776188" | "2138085" | "2142305" | "2430200" | "3172508" | "0338653" | "5706621" | "6490836" | "6504552" | "6546691" | "5274979" | "1723306").PN.				
S124	373	("2740167").URPN.	USPAT	OR	OFF	2018/04/06 18:16
S125	477	("0087853" | "0108068" | "0124228" | "0213740" | "0274354" | "0316176" | "0634581" | "0861911" | "1194636" | "1723306" | "1743492" | "1809393" | "1902716" | "20010024707" | "20020031646" | "20020069611" | "20020092263" | "20020170258" | "20020170259" | "20020178674" | "20020178680" | "20020189190" | "20020194807" | "20030009971" | "20030024199" | "20030037504" | "20030084636" | "20030094230" | "20030101681" | "20030145549" | "20030180091" | "20030188504" | "20030196405" | "20040016196" | "20040031227" | "20040049999" | "20040060255" | "20040068954" | "20040123548" | "20040128934" | "20040139676" | "20040139678" | "20040159066" | "20040168392" | "20040177584" | "20040182033" | "20040182036" | "20040200175" | "20040211143" | "20040244325" | "20040250492" | "20040261348" | "20050003132" | "20050028474" | "20050050827" | "20050160694" | "20050166514" | "20050205161" | "20050210810" | "20050235593" | "20050252130" | "20050268570" | "20060053724" | "20060070333" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:17

		"20060101769" | "20060156670" | "20060174577" | "20060179754" | "20060236642" | "20060260254" | "20060272262" | "20070006543" | "20070011981" | "20070028547" | "20070065293" | "20070175156" | "20070193178" | "20080000182" | "20080000186" | "20080000187" | "20080005998" | "20080010931" | "20080010937" | "20080028707" | "20080034708" | "20080041008" | "20080066415" | "20080104921" | "20080110125" | "20080134607" | "20080134613" | "20080134614" | "20080155930" | "20080216434" | "20080216920" | "20080295432" | "20090133353").PN. OR ("20090193748" | "20100293879" | "20100300031" | "20100319290" | "20100319291" | "20110030303" | "20110041996" | "20110088344" | "20110088345" | "20110088346" | "20110154763" | "20110167750" | "20110225922" | "20110252733" | "20110283650" | "20120017533" | "20120031029" | "20120036804" | "20120151865" | "20120174515" | "20120174520" | "20120279161" | "20130008117" | "20130014463" | "20130019555" | "20130042562" | "20130042563" | "20130042564" | "20130042565" | "20130047536" | "20130081349" | "20130111845" | "20130145708" | "20130160391" | "20130232905" | "20130239508" | "20130263454" | "20130263547" | "20130318906" | "20140007539" | "20140020324" | "20140033634" | "20140053497" | "20140059966" | "20140069043" | "20140090335" | "20140109501" | "20140109506" | "20140123586" | "20140150369" | "20140190112" | "20140208677" | "20140223852" | "20140237931" | "20140250813" | "20140260060" | "20140305065" | "20140366476" | "20140373478" | "20140373480" | "20150000221" | "20150013260" | "20150059281" | "20150089896" | "20150121796" | "20150152644" | "20150167318" | "20150211239" | "20150233125" | "20150267419" | "20150300029" | "20150330088" | "20150337537" |				

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S126	100	("2732706").URPN.	USPAT	OR	OFF	2018/04/06 18:21
S127	16	(("1351133") or ("1459189") or ("1465421") or ("1652421") or ("1652305") or ("1667160") or ("2201110") or ("2460330")).PN.	USPAT; USOCR	OR	OFF	2018/04/06 18:22
S128	6	(("0935402") or ("1925070") or ("2453918")).PN.	USPAT; USOCR	OR	OFF	2018/04/06 18:23
S129	3	("3351366").URPN.	USPAT	OR	OFF	2018/04/06 18:39

S130	51	("1575270" | "20020170933" | "20030141329" | "20050247653" | "20060237509" | "20080142462" | "20080179370" | "20080185353" | "20090145789" | "20090145866" | "20140075650" | "20170266804" | "2290468" | "2546720" | "2763377" | "2964196" | "3145031" | "3536286" | "4264013" | "4923202" | "4932576" | "5395023" | "5511705" | "5722576" | "5881891" | "5971242" | "6213365" | "6666465" | "6698632" | "6874624" | "7090075" | "7322482" | "7686196" | "7699197" | "7726495" | "7762440" | "8267260" | "8510868" | "9038869" | "D163637" | "D165553" | "D328681").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:42
S131	18	("2715966" | "20050247653" | "4771897" | "5429252" | "5740927" | "5845792" | "5915573" | "6152312" | "6267338" | "6435357" | "6564949" | "6581788" | "6698603" | "6871749" | "7014052" | "7028854" | "7117998").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:43
S132	7	("20100314271" | "8991599" | "5799787" | "7686180" | "8695795" | "8991599" | "20100314271" | "5797508" | "3862689").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:46
S133	2	("20080236562" | "7723655").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:47
S134	6	(matthew near3 vargo).inv.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:49
S135	75	(Hoppe near2 Christopher).inv.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:49
S136	14	B65D25/2823.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:54
S137	351	B65D25/06.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 18:54
S138	73	(Milwaukee adj Electric).as. and (stack box)	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 19:01
S139	8	(Milwaukee adj Electric).as. and ("220" "206" "215").clas.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 19:02

S140	8	(Milwaukee and tool).as. and ("220" "206" "215").clas.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 19:02
S141	84	(Milwaukee and tool).as. and latch	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 19:03
S142	37	(Milwaukee and tool).as. and (stack stacked stacking)	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 19:04
S143	629	("1275862" | "20010022257" | "20020008125" | "20020014507" | "20020017752" | "20020043534" | "20020074332" | "20020084159" | "20020125160" | "20020162716" | "20020163284" | "20030034636" | "20030042091" | "20030042093" | "20030075468" | "20030132080" | "20030151218" | "20040004332" | "20040026199" | "20040026294" | "20040036240" | "20040108179" | "20040112777" | "20040144606" | "20040154889" | "20040163910" | "20040188201" | "20040188205" | "20040195791" | "20040206431" | "20040245735" | "20050023096" | "20050056511" | "20050109650" | "20050121275" | "20050121868" | "20050194756" | "20050224305" | "20050279123" | "20060017293" | "20060124505" | "20060144732" | "20060151967" | "20060196744" | "20060201834" | "20060213735" | "20070045370" | "20070045974" | "20070051765" | "20070074941" | "20070137960" | "20070164064" | "20070170671" | "20070194543" | "20070200309" | "20070215425" | "20070241113" | "20070267371" | "20070290466" | "20080017463" | "20080017537" | "20080035508" | "20080035510" | "20080067206" | "20080135364" | "20080135366" | "20080136130" | "20080152944" | "20080164842" | "20080169739" | "20080217130" | "20080230416" | "20090014974" | "20090080809" | "20090139813" | "20090166141" | "20090211932" | "20090212536" | "20090236810" | "20090250365" | "20090301833" | "20100000805" | "20100012538" | "20100012655" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 19:04

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OR ("6367603" | "6371320" | "6371346" |
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"6755448" | "6758534" | "6761366" |

		"6789670" | "6820878" | "6840359" | "6860059" | "6910560" | "6915902" | "6923352" | "6926129" | "6938740" | "6938741" | "6948724" | "6955381" | "6976566" | "6978890" | "7004481" | "7008031" | "7021637" | "7036641" | "7048133" | "7066311" | "7073694" | "7104555" | "7108131" | "7111853" | "7117991" | "7121407" | "7144020" | "7147089" | "7158376" | "7168713" | "7201243" | "7225923" | "7228983" | "7237673" | "7237688" | "7240909" | "7246704" | "7270223" | "7296808" | "7316309" | "7318542" | "7322470" | "7322583" | "7326428" | "7331454" | "7334680" | "7357250" | "7357268" | "7367451" | "7370891" | "7374183" | "7387304" | "7387305" | "7387350" | "7389997" | "7401698" | "7401700" | "7416066" | "7418846" | "7438084" | "7438308" | "7458601" | "7461730" | "7467695" | "7478711" | "7500547" | "7503439" | "7503440" | "7503569" | "7516502" | "7540364" | "7552560" | "7552950" | "7571915" | "7581736" | "7591627" | "7594569" | "7597341" | "7600618" | "7600640").PN. OR ("7631380" | "7661530" | "7661683" | "7780051" | "7823991" | "7837053" | "7837206" | "7845653" | "7850020" | "7854321" | "7874328" | "7883096" | "7938412" | "7946609" | "7984820" | "7997591" | "8037983" | "8056919" | "8056943" | "8061536" | "8087513" | "8123007" | "8123068" | "8132289" | "8132819" | "8152037" | "8191910" | "8210387" | "8256591" | "8262106" | "8267230" | "8267245" | "8267247" | "8272628" | "8282113" | "8327576" | "8328247" | "8328530" | "8342543" | "8365886" | "8376177" | "8434617" | "8439174" | "8469195" | "8505729" | "8517155" | "8517400" | "8534434" | "8567796" | "8657307" | "8662268" | "8695770" | "8708351" | "8752683" | "8844689" | "8851282" | "8869960" | "8888111" | "8919896" | "8936140" | "8936258" | "8960959" | "8979073" | "8979100" | "9060577" | "9066565" | "9067614" | "9095193" | "9260129" | "9295313" | "D258705" | "D259154" | "D272203" | "D309981" | "D316485" | "D326815" | "D333215" | "D333487" | "D347731" |			

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S144	325	B65D21/0212.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 19:09
S145	27	("4212415" | "4664283" | "4823955" | "4896926" | "5246105").PN. OR ("5544751").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 19:11
S146	44	("1699130" | "2072672" | "2551814" | "2633285" | "2736487" | "3010638" | "3361322" | "3623650" | "3632037" | "3713579" | "3905478" | "3905541" | "3921896" | "4002261" | "4023617" | "4187977" | "4230233" | "4245773" | "4251006" | "4277015" | "4291830" | "4389013" | "4482074" | "4643314" | "4685610" | "4762270" | "4763833" | "4828894" | "4884739" | "4911356" | "4948039" | "4993623" | "5038998" | "5116290" | "5190213").PN. OR ("5429260").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 19:12
S147	0	("1140005").URPN.	USPAT	OR	OFF	2018/04/06 19:30

S148	119	("1267650" | "1999162" | "3163268" | "3379482" | "3419184" | "3425471" | "3498689" | "3642168" | "3700137" | "3979016" | "3987829" | "4161261" | "4293073" | "4303158" | "4523692" | "4664347" | "4799503" | "4804092" | "4819795" | "4915913" | "4982863" | "4984687" | "5011013" | "5024471" | "5040834" | "5042674" | "5065885" | "5065887" | "5080250" | "5103994" | "5117979" | "5123564" | "5176281" | "5186330" | "5190152" | "5193706" | "5244265" | "5319937" | "D237135" | "D237611" | "D238148" | "D239695" | "D246872" | "D248280" | "D257934" | "D258721" | "D277797" | "D286937" | "D292711" | "D302774" | "D312573" | "D316516" | "D319016" | "D321090" | "D321091" | "D322164" | "D325323" | "D325324" | "D326775" | "D326815" | "D327646" | "D328425" | "D328818" | "D328819" | "D329331" | "D329747" | "D330161" | "D330162" | "D330329" | "D331317" | "D335960" | "D336366" | "D339471" | "D342364").PN. OR ("5564805").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 20:05
S149	62	("0198092" | "0564782" | "1063046" | "1268124" | "1740470" | "1987822" | "2011197" | "2094805" | "2122969" | "2504722" | "2759507" | "2786500" | "2791251" | "2799306" | "3018355" | "3615087" | "3746210" | "3851756" | "4061323" | "4239195" | "4256294" | "4278243" | "4303158" | "4378828" | "4460085" | "4909491" | "4911296" | "5011013" | "5117979" | "5193706" | "D253212" | "D263533" | "D288867").PN. OR ("5595228").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 22:03
S150	15	("2587829" | "2610761" | "2740517" | "4252239" | "4733703" | "5329929" | "5595228").PN. OR ("6206063").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/06 22:04
S151	6	("4466659" | "4967944" | "5207470" | "6193118" | "6554169" | "7000810").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/07 00:38
S152	96	("1032326" | "1503894" | "1926162" | "2612200" | "2629644" | "2724595" | "2735597" | "2754079" | "2979190" | "3229946" | "3640423" | "3642168" | "3664704" | "3727971" | "3759416" | "3791547" | "3854621" | "3940009" | "3987829" | "4190281" | "4213539" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/07 00:38

		"4215896" | "4288011" | "4403786" | "4458570" | "4488669" | "4499998" | "4522326" | "4531774" | "4580827" | "4593816" | "4623071" | "4674665" | "D259413" | "D285673").PN. OR ("4967944").URPN.				
S153	25	("2967080" | "2987358" | "4844305" | "4967944" | "5419476" | "5667115").PN. OR ("5988473").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/07 00:40
S154	10	("2987358").URPN.	USPAT	OR	OFF	2018/04/07 00:41
S155	4	("2009/0315285").URPN.	USPAT	OR	OFF	2018/04/07 00:46
S156	223	("5072918" | "5390943" | "5871219" | "6739605" | "0875476" | "6086073" | "4743040" | "6109628" | "1427388" | "20040129658" | "20050023786" | "20050057011" | "20060232033" | "20060237091" | "3472392" | "3999775" | "4699270" | "4786122" | "5072955" | "5743607" | "5876047" | "6123346" | "6545863" | "7232136" | "D396023" | "6497423" | "D153654" | "2155769" | "3313498" | "3870177" | "4391422" | "4763799" | "4923202" | "4998023" | "5509671" | "5915646" | "6073919" | "6095156" | "6170839" | "6264216" | "D188099" | "D460235" | "D461941" | "D469235" | "5921566" | "D415867" | "20030047895" | "20030218308" | "5183372" | "5275349" | "5465988" | "5913528" | "6276471" | "6752281" | "7114733" | "7134673" | "7144020" | "4743040" | "3379431" | "4457527" | "5316232" | "5566961" | "6572123" | "D153654" | "D415867" | "6497423" | "D485037" | "20060066064" | "3698735" | "3908749" | "4895068" | "6138558" | "6251113" | "6267080" | "6471010" | "6497424" | "7207449" | "4901937" | "5308012" | "6270094" | "D463646" | "D474570" | "D485410" | "5921566" | "D273242" | "D474570" | "1149639" | "2413164" | "2575661" | "2819908" | "20050001395" | "20060006621" | "20060157944" | "4099735" | "4688860" | "5048857" | "5224531" | "5452908" | "7017603" | "7156475" | "7204374" | "7296808" | "5887878" | "1126544" | "2705114" | "20050280228" | "20050284697" | "5285981" | "6116533" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/07 00:50

		"D302064" | "D361187" | "D381168" | "D424321" | "D487604" | "D504000" | "D469235" | "1200008" | "1471446" | "1562089" | "2623642" | "2845780" | "20010045718" | "20020084607" | "20020096844" | "20060076306" | "3965969" | "4138504" | "4165088" | "4373761" | "4880248" | "6539831" | "7044569" | "5154544" | "20040065989" | "20040227315" | "3212645" | "4179080" | "4759560" | "5188308" | "5362078" | "5495951" | "5687928" | "5839739" | "5971512" | "6497423" | "6669214" | "D336183" | "D471687" | "6086073" | "D302064" | "D336183" | "20020060438" | "20040056439" | "20060208440" | "4518208" | "4832355" | "5221132" | "5375860" | "5873585" | "6022088" | "6101831" | "6206385" | "D140635" | "4380293" | "6109437" | "3610431" | "4743040" | "5269545" | "5848798" | "6241181" | "6315376" | "D391032" | "D395108" | "D403826" | "D468881" | "D471688" | "D485037" | "20030122331" | "4923202" | "1487856" | "20030107195" | "3606445" | "3873114" | "5011240" | "5634649" | "5716116" | "5941229" | "6578938" | "6783563" | "6910710" | "D469235" | "4815394" | "1660521" | "3759538" | "4564152" | "4585130" | "5016948" | "5123666" | "5595395" | "6102497" | "6109628" | "6322061" | "6615973" | "D361188" | "D153654" | "1649065" | "20020064478" | "20030121874" | "20050127627" | "3722700" | "4019793" | "5282678" | "6857644" | "D147135").PN.				
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S158	31	("0783059" | "2878928" | "3245528" | "3319685" | "3386607" | "3605374" | "3835992" | "3992810" | "4320846" | "4627595" | "4799590" | "4890741" | "5135823" | "5370255").PN. OR ("5676274").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/07 16:50
S159	26	("1101357" | "1149266" | "1862868" | "2702116" | "3145871" | "4154362" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/07 16:53

		"4503955" | "4705316" | "4896926" | "4998616").PN. OR ("5415255").URPN.				
S160	37	("3182856" | "3565146" | "4951812" | "4998616" | "5036980" | "5040681" | "5060851" | "5117979").PN. OR ("5325966").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/07 16:55
S161	6	("3412888" | "4204609" | "5409126" | "5499715" | "5769229").PN. OR ("6467681").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/07 17:17
S162	173	(US-20130127129-$ or US-20110155613-$ or US-20110139665-$ or US-20040195793-$ or US-20020000440-$ or US-20120292213-$ or US-20070012694-$ or US-20150336710-$ or US-20020134700-$ or US-20100270764-$ or US-20100000893-$ or US-20050062244-$ or US-20040183266-$ or US-20020014488-$ or US-20020113386-$ or US-20030196860-$ or US-20170259956-$ or US-20160144500-$ or US-20160130034-$ or US-20150274362-$ or US-20110168599-$ or US-20090178989-$ or US-20100219193-$ or US-20060254946-$ or US-20070068757-$ or US-20090178946-$).did. or (US-20050199459-$ or US-20080308369-$ or US-20050077136-$ or US-20080104921-$ or US-20160153200-$ or US-20080134613-$ or US-20080134607-$ or US-20070193178-$ or US-20170266804-$ or US-20140075650-$ or US-20090145866-$ or US-20170217464-$ or US-20170174392-$ or US-20170166352-$ or US-20160023349-$ or US-20140166516-$ or US-20120326406-$ or US-20110121695-$ or US-20070194543-$ or US-20070170671-$ or US-20110049824-$ or US-20130056378-$ or US-20120312812-$ or US-20120187013-$ or US-20120080432-$ or US-20120061930-$ or US-20050280228-$).did. or (US-20060027475-$ or US-20050155889-$ or US-20160168880-$).did. or (US-7503569-$ or US-9022234-$ or US-8875888-$ or US-8657307-$ or US-8590704-$ or US-3182856-$ or US-8459495-$ or US-7097036-$ or US-6193062-$ or US-9393684-$ or US-6637592-$ or US-D730088-$ or US-5833065-$ or US-5482162-$ or US-5244265-$ or US-4244509-$ or US-9643629-$ or US-7780026-$ or US-9132543-$ or US-8567796-$ or US-	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/09 01:25

		8226092-$ or US-8201837-$ or US-8132819-$ or US-7997594-$ or US-3010775-$ or US-9669930-$).did. or (US-4813542-$ or US-6585090-$ or US-6085925-$ or US-D776106-$ or US-6839238-$ or US-9609964-$ or US-7152752-$ or US-9506489-$ or US-3944282-$ or US-5241765-$ or US-4389078-$ or US-1849659-$ or US-4405057-$ or US-9802741-$ or US-8851287-$ or US-8763836-$ or US-8561769-$ or US-D808164-$ or US-9550605-$ or US-4887731-$ or US-9738198-$ or US-7537119-$ or US-8813960-$ or US-9669968-$ or US-6024223-$ or US-1665238-$ or US-D333094-$).did. or (US-3376046-$ or US-4832200-$ or US-D364558-$ or US-3419184-$ or US-3117692-$ or US-8684222-$ or US-2328689-$ or US-4287997-$ or US-5628443-$ or US-9888752-$ or US-9027722-$ or US-4673070-$ or US-7526842-$ or US-5465839-$ or US-9724820-$ or US-4863222-$ or US-3743372-$ or US-6050657-$ or US-5454634-$ or US-3851936-$ or US-5602721-$ or US-3999818-$ or US-5271515-$ or US-4243279-$ or US-6276550-$ or US-4328902-$ or US-7350648-$).did. or (US-5407074-$ or US-3481502-$ or US-2849151-$ or US-3616943-$ or US-5469961-$ or US-8677661-$ or US-5951130-$ or US-7451578-$ or US-6122879-$ or US-3526420-$ or US-2740167-$ or US-9803375-$ or US-9663940-$ or US-7841144-$ or US-9616562-$ or US-5544751-$ or US-5429260-$ or US-7946609-$ or US-6578708-$ or US-6176559-$ or US-5927837-$ or US-5564805-$ or US-5595228-$ or US-6206063-$ or US-7000810-$ or US-4967944-$ or US-5988473-$).did. or (US-6641013-$ or US-2987358-$ or US-4576423-$ or US-4756394-$ or US-4896926-$ or US-5325966-$ or US-5697500-$ or US-6467681-$).did. or (US-3117692-$ or US-2593998-$).did.				
S163	3	(("20170166352") or ("20110139665") or ("5628443")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/09 01:26

S164	28	(US-20170166352-$ or US-20110139665-$ or US-20170266804-$ or US-20170217464-$ or US-20170174392-$ or US-20160168880-$ or US-20160144500-$ or US-20160130034-$ or US-20140166516-$ or US-20120326406-$ or US-20100219193-$ or US-20090145866-$ or US-20070194543-$ or US-20070068757-$ or US-20060254946-$ or US-20060027475-$).did. or (US-5628443-$ or US-9132543-$ or US-9506489-$ or US-8813960-$ or US-8677661-$ or US-8459495-$ or US-8132819-$ or US-6641013-$ or US-6085925-$ or US-5988473-$ or US-5595228-$ or US-3117692-$).did.	US-PGPUB; USPAT	OR	OFF	2018/04/09 01:36
S165	7	(("5240264") or ("7503569") or ("20020000440") or ("20040195793") or ("20110139665") or ("20110155613") or ("20130127129")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/09 01:37
S166	27	S164 not S165	US-PGPUB; USPAT; USOCR	OR	OFF	2018/04/09 01:37
S167	1	("2011/0139665").URPN.	USPAT	OR	OFF	2018/11/21 18:13
S168	56	("1932429" | "20060016811" | "20060070906" | "20060237341" | "20070080089" | "20080110190" | "20080112782" | "20080121253" | "20080128414" | "20090178989" | "20090184021" | "20110139665" | "2178091" | "2259041" | "5271515" | "5429260" | "5531517" | "5544751" | "5549241" | "5860527" | "6062388" | "6581772" | "6880705" | "6991106" | "7044483" | "7063210" | "7516854" | "7661549" | "8342329" | "8640871" | "8973811" | "8997993" | "9056694" | "9101212" | "D277532" | "D277723" | "D277819" | "D347130" | "D385306" | "D406478" | "D470641" | "D529755" | "D538571" | "D543030" | "D589723" | "D590021" | "D645902" | "D654726" | "D664034" | "D689718" | "D709716" | "D773217" | "D781625").PN. OR ("D815471").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:13
S169	5	(("20160144500") or ("0784114") or ("20110073516") or ("20150274362")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:16

S170	4	(("20160144500") or ("7841144") or ("20110073516") or ("20150274362")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:17
S171	554	("0124228" | "0213740" | "0714987" | "0753791" | "1124228" | "1194636" | "1371856" | "1407679" | "1454250" | "1468288" | "1477813" | "1510924" | "1540128" | "1575821" | "1602256" | "1602267" | "1615096" | "1622103" | "1622104" | "1637634" | "1644710" | "1660480" | "1714738" | "1718702" | "1723306" | "1734826" | "1743492" | "1764331" | "1778069" | "1787027" | "1790178" | "1809393" | "1823039" | "1859667" | "1898364" | "1902716" | "1906411" | "1925070" | "1929871" | "1940377" | "1953306" | "1986739" | "1988201" | "1995264" | "20010029720" | "20020007608" | "20020007609" | "20020014047" | "20020020127" | "20020031646" | "20020046528" | "20020056245" | "20020069611" | "20020083673" | "20020092263" | "20020100231" | "20020160610" | "20020178673" | "20020178674" | "20020178682" | "20030009971" | "20030009972" | "20030024199" | "20030033777" | "20030033784" | "20030037504" | "20030041545" | "20030084636" | "20030101674" | "20030101681" | "20030115812" | "20030115821" | "20030180091" | "20030188504" | "20030196405" | "20030221387" | "20030233809" | "20040016196" | "20040031227" | "20040035078" | "20040035079" | "20040060255" | "20040068954" | "20040115921" | "20040139678" | "20040168392" | "20040177584" | "20040182036" | "20040200175" | "20040206036" | "20040211143" | "20040241374" | "20040255541" | "20050034404" | "20050034405" | "20050097860" | "20050102937" | "20050108970" | "20050138881" | "20050160694" | "20050161468" | "20050166516" | "20050193677" | "20050208255").PN. OR ("20050210810" | "20050235593" | "20050252130" | "20050268570" | "20060032168" | "20060048474" | "20060070333" | "20060073320" | "20060075713" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:17

		"20060101769" | "20060117696" | "20060179773" | "20060196139" | "20060236642" | "20060260254" | "20060283127" | "20070006543" | "20070028547" | "20070119110" | "20070151189" | "20070193178" | "20080000186" | "20080010931" | "20080010937" | "20080028707" | "20080034708" | "20080066415" | "20080104921" | "20080110125" | "20080134607" | "20080134613" | "20080134614" | "20080295432" | "20090193748" | "2015813" | "2026511" | "2044216" | "2088238" | "2089075" | "2204675" | "2266464" | "2276071" | "2303745" | "2324628" | "2398632" | "2430200" | "2495862" | "2596280" | "2732706" | "2740167" | "2780253" | "2851740" | "2865058" | "2894292" | "2947040" | "3023681" | "3045294" | "3100556" | "3120083" | "3125138" | "3182769" | "3200553" | "3203149" | "3247638" | "3267630" | "3282010" | "3301147" | "3310919" | "3347048" | "3377931" | "3378958" | "3387422" | "3436888" | "3460304" | "3481810" | "3508523" | "3512324" | "3517927" | "3526071" | "3526420" | "3535844" | "3538665" | "3548559" | "3553919" | "3554850" | "3555762" | "3572224" | "3579941" | "3694983" | "3714747" | "3731445" | "3742669" | "3759007" | "3768846" | "3786608" | "3842562" | "3849235" | "3857749" | "3859000" | "3902293" | "3908053" | "3919820" | "3936551" | "3988187" | "4037377" | "4082129" | "4084996" | "4090338" | "4099358" | "4100710" | "4107892" | "4113399" | "4169688").PN. OR ("4196554" | "4227430" | "4242390" | "4299070" | "4304083" | "4426820" | "4471012" | "4489115" | "4501102" | "4561233" | "4567706" | "4599841" | "4612074" | "4612745" | "4641469" | "4643237" | "4646494" | "4648165" | "4653242" | "4703597" | "4715162" | "4716700" | "4738071" | "4769963" | "4819932" | "4822440" | "4831806" | "4845907" | "4905442" | "5029425" | "5113632" | "5117603" | "5148850" | "5165816" | "5179812" | "5182892" | "5216861" | "5247773" | "5253464" | "5271564" | "5286545" | "5295341" | "5344700" |			

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S172	969	Y10S292/38,53.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:25
S173	35	E04F2201/013.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:25
S174	1,351	E04F2201/0146,023,05.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:26
S175	514	B25H3/02.cpc.	USPAT	OR	OFF	2018/11/21 18:45
S176	1,041	B25H3/02.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:45

S177	165	B25H3/021.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:45
S178	0	("2018/0213934").URPN.	USPAT	OR	OFF	2018/11/21 18:46
S179	369	A47B88/90.cpc.	USPAT	OR	OFF	2018/11/21 18:46
S180	81	A47B2210/19.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:47
S181	29	("2614016" | "2676080" | "3001564" | "3079037" | "3974898" | "4040538" | "4119204" | "4239309" | "4287997" | "4293072" | "4865404" | "5190156").PN. OR ("5407074").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:50
S182	27	("0224486" | "1472676" | "2975930" | "3159436" | "3424334" | "3506321" | "3584738" | "3737031" | "4155452").PN. OR ("4293072").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:51
S183	48	("3506321").URPN.	USPAT	OR	OFF	2018/11/21 18:54
S184	46	("1092651" | "2565969" | "2891639" | "3028207" | "3032381" | "3506321").PN. OR ("3974898").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 18:56
S185	520	B65D21/0204.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 19:01
S186	868	A47B87/02.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 19:02
S187	2,232	312/107,111.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 19:02
S188	703	A47B88/90.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 19:15
S189	50	(("BRUNNER") near3 ("Yaron")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 19:23
S190	34	("0455883" | "0484121" | "0918297" | "20060175945" | "20100052276" | "20110279956" | "20120086319" | "20130134850" | "2341434" | "2431830" | "2441728" | "3058320" | "3135570" | "3326203" | "3712697" | "4590709" | "5011240" | "5026130" | "5048902" | "5145245" | "5673984" | "6068356" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 19:24

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S191	45	("1223455" | "2123803" | "2704699" | "3272581" | "3316045" | "3796474" | "4155611" | "4505526" | "4577773" | "4848588" | "5205595" | "5246105" | "5299688" | "5344226" | "5358321" | "5426885").PN. OR ("5603559").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 19:27
S192	36	("1253546" | "1619761" | "1857640" | "2004900" | "3133771" | "3409162" | "3529878" | "3606506" | "3729242" | "3758181").PN. OR ("5246105").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 19:28
S193	16	("20080000899" | "20120312812" | "20130127129" | "3379482" | "3811559" | "4118048" | "4619363" | "5125697" | "5904269" | "6082539" | "6371320" | "6874634" | "6889838" | "7387350" | "7516842").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 20:02
S194	75	("0440957" | "1933637" | "2511949" | "2789828" | "2981549" | "3055723" | "3349924" | "3379482" | "3891230" | "3905662").PN. OR ("4118048").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 20:03
S195	45	("0273398" | "0325555" | "0825642" | "0953715" | "0953815" | "1143711" | "1365098" | "1495046" | "1611034" | "2055657" | "2565969" | "2714433" | "3828899" | "3891230" | "3974898" | "3987875" | "4066155" | "4118048" | "4139084" | "4202586" | "4389078" | "4693345").PN. OR ("4813521").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 20:04
S196	29	("2472491" | "2925283" | "3057636").PN. OR ("3891230").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 20:05
S197	143	("0344661" | "0687619" | "1424819" | "20010052681" | "20020014488" | "20020067027" | "20020074905" | "20020113386" | "20020185831" | "20030001348" | "20030146589" | "20040265104" | "20050062244" | "20050104308" | "20050258610" | "20050275178" | "20060006619" | "20060012139" | "20060038367" | "20070080512" | "20070194543" | "20070273114" | "20080084036" | "20080121547" | "20080128305" | "20080143069" | "20090020528" | "20090026901" | "20090096181" | "20090309323" | "20100052276" | "20100290877" | "20100327562" | "20110049824" | "20110181008" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 20:05

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S198	18	("2042387" | "2528872" | "3401420" | "3891230" | "4989291" | "5915438" | "6230361" | "7000287").PN. OR ("7263742").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 20:07
S199	37	("5013055" | "5207723" | "5378005").PN. OR ("5799958").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 20:08
S201	2,395	280/47.26,47.28,652.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 20:09
S202	1,975	280/47.26,47.28.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 20:10
S203	518	280/652.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/21 20:10

S204	1	"15826201"	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/22 00:33
S205	12	(US-0271616-$ | US-0320243-$ | US-1276744-$ | US-1477050-$ | US-15826201-$ | US-20080308369-$ | US-3616562-$ | US-3875888-$).DID.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/22 03:39
S206	2	(("8875888") or ("9616562") or ("20080308369")).PN.	USPAT; USOCR	OR	OFF	2018/11/22 03:40
S207	3	(("8875888") or ("9616562") or ("20080308369")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/22 03:40
S208	64	("20020113387" | "20070194543" | "20080079227" | "20080084036" | "20110049824" | "3522955" | "4118048" | "4119044" | "4281843" | "5176281" | "5193706" | "5244265" | "5378005" | "5634649" | "5641170" | "5680932" | "5799958" | "5906381" | "5938396" | "5950828" | "6131926" | "6170839" | "6176559" | "6264220" | "6347847" | "6371320" | "6601930" | "6761366" | "6817623" | "7367571" | "7467801" | "7503569" | "7628406" | "7845653" | "7883096" | "7938412" | "D404916" | "D437484" | "D462168" | "D462170").PN. OR ("8132819").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/22 19:37
S209	269	("20020014507" | "20020043534" | "20020074332" | "20020125160" | "20030075468" | "20040112777" | "20050109650" | "20060017293" | "20060124505" | "20060144732" | "20060201834" | "20070137960" | "20070194543" | "20070241113" | "20080017537" | "20080035508" | "20080035510" | "20080067206" | "20080152944" | "20080164842" | "20080169739" | "20080230416" | "20090080809" | "20090211932" | "20090236810" | "20090250365" | "20100012538" | "20100012655" | "20100033325" | "20100224527" | "20100258465" | "20110084075" | "20110094910" | "20110132046" | "20110174648" | "20110268374" | "20120018330" | "20120152944" | "20120206907" | "20120257379" | "20120267374" | "20120292213" | "20120312708" | "20120317933" | "20120318792" | "20120326406" | "20120326669" | "20130007979" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/22 19:39

		"20130186795" | "20140102928" | "2125856" | "2145143" | "2799306" | "2883184" | "3177023" | "3259411" | "3394955" | "3817419" | "3851756" | "3924844" | "4105112" | "4278187" | "4353182" | "4890414" | "5042193" | "5165148" | "5295742" | "5379887" | "5386907" | "5429287" | "5470000" | "5501379" | "5518139" | "5562208" | "5580137" | "5595228" | "5620212" | "5660276" | "5672145" | "5732987" | "5755311" | "5762411" | "5915553" | "5915554" | "5924533" | "6006906" | "6015064" | "6038747" | "6073766" | "6081695" | "6082538" | "6167680" | "6176559" | "6203075" | "6206063" | "6213296" | "6230887" | "6244485" | "6244486" | "6343708" | "6343815" | "6347847" | "6371320" | "6405864" | "6415924" | "6478463" | "6502882" | "6527309").PN. OR ("6533138" | "6561402" | "6614337" | "6622856" | "6675965" | "6675967" | "6695142" | "6698609" | "6722524" | "6755302" | "6755448" | "6761366" | "6789670" | "6860059" | "6915902" | "6955381" | "6978890" | "7008031" | "7021637" | "7048133" | "7108131" | "7121407" | "7158376" | "7225923" | "7228983" | "7237673" | "7237688" | "7246704" | "7316309" | "7322470" | "7326428" | "7334680" | "7357250" | "7357268" | "7367451" | "7370891" | "7401698" | "7401700" | "7418846" | "7540364" | "7552560" | "7552950" | "7600640" | "7661530" | "7837053" | "7845653" | "7854321" | "7874328" | "7883096" | "7938412" | "7984820" | "8056943" | "8061536" | "8132819" | "8152037" | "8191910" | "8210387" | "8267245" | "8267247" | "8272628" | "8327576" | "8328247" | "8376177" | "8434617" | "8469195" | "8505729" | "8657307" | "D259154" | "D272203" | "D309981" | "D326815" | "D333215" | "D333487" | "D347731" | "D355849" | "D368159" | "D370619" | "D374772" | "D375834" | "D377118" | "D378247" | "D385110" | "D386903" | "D390358" | "D402106" | "D405956" | "D414038" | "D418977" | "D437684" | "D447340" | "D447630" | "D448162" | "D449442" | "D449738" | "D451275" | "D452071" | "D453624" | "D455263" |			

		"D459073" | "D462168" | "D465923" | "D467070" | "D470659" | "D471360" | "D472774" | "D480867" | "D505548" | "D509656" | "D516310" | "D516808" | "D516812" | "D520746" | "D563669" | "D572479" | "D572480" | "D588811" | "D589703" | "D599112" | "D600015" | "D600912" | "D601797" | "D605403" | "D608094" | "D609911" | "D609913").PN. OR ("D616200" | "D618911" | "D624317" | "D627968" | "D629607" | "D630435" | "D630851" | "D635769" | "D636996" | "D637812" | "D639554" | "D641552" | "D647301" | "D648532" | "D648533" | "D649350" | "D649783" | "D661858" | "D661903" | "D664354" | "D668867" | "D668868" | "D668869" | "D670500" | "D672555" | "D673774" | "D701696" | "D744750" | "D750890").PN. OR ("9539722").URPN.				
S210	15	("2007/0194543").URPN.	USPAT	OR	OFF	2018/11/22 19:40
S211	56	("1478913" | "20010035704" | "20050159784" | "20050269792" | "20060006621" | "20060144732" | "20070194543" | "20070235959" | "20080128305" | "20090301913" | "20100289236" | "20100295430" | "20110127736" | "20120292870" | "20130118818" | "3861703" | "3874531" | "4435115" | "4726602" | "4822116" | "4846485" | "4858940" | "4976450" | "4993551" | "5174447" | "5378005" | "5452908" | "5573089" | "5743607" | "5799958" | "5893572" | "6027128" | "6170839" | "6439585" | "6446987" | "6702168" | "6935641" | "6945546" | "7044569" | "7083174" | "7314134" | "7328905" | "7431313" | "7434819" | "7503569" | "7661685" | "7905502" | "8226092" | "8376376" | "8668209" | "D182716").PN. OR ("8915504").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/22 19:40
S212	2	("2012/0292870").URPN.	USPAT	OR	OFF	2018/11/22 19:41
S213	52	("6264083" | "6666362" | "7204374" | "20120247044" | "4249684" | "6264220" | "6935641" | "7048320" | "7165702" | "20040194333" | "20040251227" | "20070210021" | "20100300996" | "20120199708" | "4944416" | "7487981" | "6615973" | "6786374" | "20070137532" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/22 19:46

		"5628534" | "7017254" | "6932406" | "20040051016" | "20050006539" | "20080296245" | "7740329" | "20060021985" | "5913380" | "6736265" | "20020100396" | "20120131872" | "3610429" | "6629654" | "4535897" | "6581920" | "20110107704" | "0332360" | "5406894" | "6474245" | "20050269792" | "5582269" | "20070012636" | "5687856" | "5899544" | "6247720" | "6814362" | "20040222176" | "20110168651" | "4630739" | "4961295" | "5730414").PN.				
S214	39	("2320387" | "3052484" | "3179270" | "3734526" | "4281843" | "4363496" | "4790549" | "5464104" | "5465987" | "5474312" | "5595395" | "5671933").PN. OR ("6131926").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/22 23:52
S215	1	"12736715"	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/23 01:36
S216	1	("2011/0139665").URPN.	USPAT	OR	OFF	2018/11/23 01:36
S217	20	("2807387" | "20060220503" | "3219400" | "3424334" | "4293072" | "4643494" | "4782619" | "4996628" | "5184726" | "5246105" | "5427394" | "5544751" | "5699925" | "5901998" | "5924778" | "6367631" | "6983946").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/23 01:37
S218	36	("1253546" | "1619761" | "1857640" | "2004900" | "3133771" | "3409162" | "3529878" | "3606506" | "3729242" | "3758181").PN. OR ("5246105").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/23 01:38
S219	13	("3379482").URPN.	USPAT	OR	OFF	2018/11/23 02:28
S220	0	("2012/0152800").URPN.	USPAT	OR	OFF	2018/11/23 02:30
S221	12	("20080060964" | "3568879" | "4592601" | "4685565" | "20060071581" | "4258847" | "4863222" | "2858957" | "7311202" | "3346137").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/23 02:30
S222	1,041	B25H3/02.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/23 02:39
S223	140	S222 and (snap)	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/23 02:39

S224	67	(US-20170166352-$ or US-20110139665-$ or US-20170266804-$ or US-20170217464-$ or US-20170174392-$ or US-20160168880-$ or US-20160144500-$ or US-20160130034-$ or US-20140166516-$ or US-20120326406-$ or US-20100219193-$ or US-20090145866-$ or US-20070194543-$ or US-20070068757-$ or US-20060254946-$ or US-20060027475-$ or US-20150274362-$ or US-20110073516-$ or US-20090193748-$ or US-20080134607-$ or US-20080104921-$ or US-20180313094-$ or US-20180213934-$ or US-20150102717-$ or US-20180161975-$ or US-20140305829-$).did. or (US-20120312812-$ or US-20180290288-$ or US-20180162592-$ or US-20170239808-$ or US-20170121056-$ or US-20130127129-$ or US-20060038367-$ or US-20160114822-$ or US-20080308369-$ or US-20080169739-$ or US-20120292870-$).did. or (US-5628443-$ or US-9132543-$ or US-9506489-$ or US-8813960-$ or US-8677661-$ or US-8459495-$ or US-8132819-$ or US-6641013-$ or US-6085925-$ or US-5988473-$ or US-5595228-$ or US-3117692-$ or US-5429260-$ or US-7841144-$ or US-5407074-$ or US-4293072-$ or US-3506321-$ or US-3974898-$ or US-6109707-$ or US-4423687-$ or US-9872562-$ or US-6547347-$ or US-4619363-$ or US-4118048-$ or US-3891230-$ or US-9566990-$).did. or (US-5799958-$ or US-9616562-$ or US-5184726-$).did. or (US-2430200-$).did.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/23 14:36
S225	3	("20080308369" | "8875888" | "9616562").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/23 14:37
S226	28	(US-20170266804-$ or US-20170217464-$ or US-20170174392-$ or US-20170166352-$ or US-20160168880-$ or US-20160144500-$ or US-20160130034-$ or US-20140166516-$ or US-20120326406-$ or US-20100219193-$ or US-20090145866-$ or US-20070194543-$ or US-20070068757-$ or US-20060254946-$ or US-20060027475-$ or US-20110139665-$).did. or (US-9506489-$ or US-9132543-$ or US-8813960-$ or US-8677661-$ or US-8459495-$ or US-8132819-$ or US-6641013-$ or US-6085925-$ or US-	US-PGPUB; USPAT	OR	OFF	2018/11/23 14:37

		5988473-$ or US-5628443-$ or US-5595228-$ or US-3117692-$).did.				
S227	37	S224 not (S225 S226)	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/23 14:37
S228	1	"20170174392".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/23 14:54
S229	14	(US-20180290288-$ or US-20180161975-$ or US-20170239808-$ or US-20170121056-$ or US-20080169739-$ or US-20080134607-$ or US-20080104921-$ or US-20060038367-$).did. or (US-9872562-$ or US-9566990-$ or US-7841144-$ or US-6547347-$ or US-5429260-$).did. or (US-2430200-$).did.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/23 21:07
S230	716	((("MILWAUKEE") near3 ("ELECTRIC") near3 ("TOOL") near3 ("CORPORATION"))).AS,AANM.	USPAT	OR	OFF	2019/01/16 16:21
S231	51	((("Brunner") near3 ("Yaron"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:21
S232	33	((("Squiers") near3 ("Grant") near3 ("T"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:21
S233	56	((("Hoppe") near3 ("Christopher") near3 ("S"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:21
S234	114	((("Hyma") near3 ("Steven") near3 ("W"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:21
S235	0	("2017/0166352").URPN.	USPAT	OR	OFF	2019/01/16 16:23
S236	1	(("2012312812") or ("4974740")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:25
S237	0	"2012312812".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:26
S238	1	"20120312812".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:26
S239	4	("2012/0312812").URPN.	USPAT	OR	OFF	2019/01/16 16:26
S240	0	("2018/0161975").URPN.	USPAT	OR	OFF	2019/01/16 16:29

S241	0	("2018/0044059").URPN.	USPAT	OR	OFF	2019/01/16 16:29
S242	68	("6082539" | "6874634" | "8875888" | "7503569" | "D462519" | "D467424" | "D753394" | "D753395" | "D753396" | "20010030403" | "20120152944" | "6761366" | "D437484" | "D439407" | "D449738" | "D564216" | "D629607" | "D636994" | "D668048" | "D700777" | "D709697" | "D753397" | "6371320" | "20140102928" | "D415894" | "D520237" | "D613560" | "D643217" | "D701697" | "7905353" | "20110181008" | "D348152" | "D647300" | "D663952" | "D674605" | "D710098" | "D713639" | "20110049824" | "20110139666" | "5022546" | "D467426" | "D527181" | "D572479" | "D630851" | "D701696" | "D711105" | "5437369" | "D693121" | "20070273114" | "20090145790" | "8602217" | "8789699" | "8851282" | "D630435" | "D702044" | "D703437" | "D709287" | "9393684" | "8505729" | "20040134818" | "D493284" | "D600912" | "D649350" | "D653832" | "D694522" | "D703436" | "D710100" | "D719352").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:30
S243	46	("20030062232" | "20040211634" | "20060012139" | "20060027475" | "5011013" | "5209384" | "5240264" | "5664652" | "5833065" | "6126003" | "6176559" | "6347847" | "6371320" | "6601930" | "6761366" | "7004481" | "7210689").PN. OR ("7503569").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:34
S244	23	("1192847" | "1891811" | "2053969" | "2828023").PN. OR ("5022546").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:37
S245	14	("2053969").URPN.	USPAT	OR	OFF	2019/01/16 16:38
S246	19	("2053969" | "3014604" | "3061134" | "3162320" | "3734308" | "4109789" | "4616752" | "6024223").PN. OR ("6840378").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:39
S247	22	("20040000550" | "2705575" | "3346137" | "4293072" | "5628443" | "5704625" | "6840378").PN. OR ("7780026").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:39
S248	21	("3081120" | "3162320" | "3653521").PN. OR ("3734308").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:41

S249	34	("3015407" | "3493258" | "3501193" | "3552557" | "3633777" | "3677599" | "3691595" | "3712661" | "3734308" | "3888536" | "3980185" | "4093090" | "4149747" | "4341495" | "4356145" | "4630856" | "4648645" | "5163726" | "5931617" | "6135524" | "7014234").PN. OR ("8177463").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:41
S250	65	("2053969" | "3014604" | "3691595" | "3712661").PN. OR ("3980185").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:42
S251	23	("0610816" | "20080099622" | "2357182" | "2431194" | "3380602" | "3765711" | "3980185" | "4128267" | "4341495" | "4881601" | "5161705" | "5328133" | "5344203" | "5593113" | "5836548" | "7014234" | "7549687" | "7887011" | "8177463").PN. OR ("9440741").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:42
S252	28	("2876726" | "3004772" | "3057315" | "3107024" | "3162320" | "3711902" | "3734308" | "3799100" | "3805721" | "3818854" | "3822667" | "3872555" | "3938461" | "3980185" | "4290382" | "4294185").PN. OR ("4695184").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:44
S253	899	B60P7/13,06.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:46
S254	110	410/84.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:47
S255	7	("6077006" | "7056081" | "6490766" | "8342786" | "8523501" | "7056061" | "8523401").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:47
S256	2	("1751571").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:49
S257	38	("3034256" | "3159368" | "3334953" | "3618795" | "4249684" | "4303367" | "4325531" | "4737055" | "4805859" | "4901961" | "5161700" | "5205602" | "5240214" | "5511842" | "5588631" | "5609451" | "5653366" | "5730414" | "5855310" | "5899544").PN. OR ("6666362").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:50
S258	25	("3334953" | "4249684" | "4938398" | "4993771" | "5255832" | "5395019").PN. OR ("5653366").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:51

S259	17	("2696962" | "4929973" | "5035389" | "5040712" | "5129613" | "5282554" | "5332183" | "5356105" | "5653366" | "5730348" | "5730406" | "6036071" | "6315182" | "7225958" | "8020821").PN. OR ("8448829").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:51
S260	37	("1252207" | "20060186290" | "20070097617" | "20070170336" | "20070230102" | "20080105803" | "2174140" | "5730406" | "5833189" | "5850996" | "6173931" | "6315255" | "6371424" | "6431510" | "6702604" | "6758454" | "6877641" | "7261264" | "7334762" | "7455271" | "7499272" | "7673838").PN. OR ("8020821").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:52
S261	10	("20050139745" | "4660793" | "5035389" | "5433416" | "5452874" | "5608603" | "5924790" | "6237886" | "6520463" | "6637707").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:52
S262	10	("5356104" | "5639522" | "5662375" | "5694123" | "5943208" | "5947440" | "6349911" | "6402106" | "6446915" | "6710828").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:53
S263	12	("5284311" | "5428502").PN. OR ("5608603").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:54
S264	788	248/224.7,225.21.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:56
S265	21	("1862466" | "2979300" | "3110467" | "3669035" | "4056250" | "4076204" | "4085867").PN. OR ("4660793").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 16:57
S266	25	("3334953" | "4249684" | "4938398" | "4993771" | "5255832" | "5395019").PN. OR ("5653366").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 17:01
S267	38	("3454250" | "3456929" | "4065092" | "4230248" | "4249684" | "4444427" | "4848629" | "4974766" | "4984837" | "5007568" | "5046652" | "5181639" | "5275320" | "5285942").PN. OR ("5395019").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 17:02
S268	42	("2680000" | "2897928" | "3631572" | "3881677" | "4346868" | "4618081" | "4948085" | "5181774").PN. OR ("5332183").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 17:05
S269	71	("2708088" | "3878589" | "3915189" | "3931893" | "4450989" | "4461445" | "4858869" | "5026016" | "5035389" |	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 17:45

		"5078279" | "5344032" | "5356038" | "5433416" | "5435511" | "5452874" | "5765699" | "5915572" | "D329192" | "D386298" | "D386304").PN. OR ("6637707").URPN.				
S270	32	("2103106" | "2703912" | "2879561" | "3237779" | "3399374" | "3403641" | "4029038" | "4068332" | "4266882" | "4340199" | "4376593" | "4389133" | "4430947").PN. OR ("4565465").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 17:55
S271	570	220/4.27.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:12
S272	319	B65D21/0223.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:12
S273	1,937	A45C5/14.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:12
S274	69	A45C7/005.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:12
S275	2,987	A45C13/02.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:13
S277	357	A45F3/10.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:13
S278	850	B25H1/04.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:14
S279	1,194	B25H3/02,021.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:14
S280	1,052	B62B1/14.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:14
S281	437	B65D21/0209.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:14
S282	164	B65D21/0228.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:15
S283	320	A45C7/0045.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:15

S284	436	B25H3/023.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:15
S285	752	B62B5/067.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:16
S286	23	B65D2255/00.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:16
S287	177	B65H2701/533.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:16
S288	121	(US-0000440-$ | US-0027475-$ | US-0038367-$ | US-0068757-$ | US-0104921-$ | US-0121056-$ | US-0127129-$ | US-0130034-$ | US-0134607-$ | US-0139665-$ | US-0144500-$ | US-0145866-$ | US-0155613-$ | US-0161975-$ | US-0166352-$ | US-0166516-$ | US-0168880-$ | US-0169739-$ | US-0174392-$ | US-0194543-$ | US-0195793-$ | US-0217464-$ | US-0219193-$ | US-0239808-$ | US-0254946-$ | US-0266804-$ | US-0271616-$ | US-0290288-$ | US-0308369-$ | US-0320243-$ | US-0326406-$ | US-1276744-$ | US-1477050-$ | US-2430200-$ | US-20020000440-$ | US-20040195793-$ | US-20060027475-$ | US-20060038367-$ | US-20060254946-$ | US-20070068757-$ | US-20070194543-$ | US-20080104921-$ | US-20080134607-$ | US-20080169739-$ | US-20080308369-$ | US-20090145866-$ | US-20100219193-$ | US-20110139665-$ | US-20110155613-$ | US-20120326406-$ | US-20130127129-$ | US-20140166516-$ | US-20160130034-$ | US-20160144500-$ | US-20160168880-$ | US-20170121056-$ | US-20170166352-$ | US-20170174392-$ | US-20170217464-$ | US-20170239808-$ | US-20170266804-$ | US-20180161975-$ | US-20180290288-$ | US-2608238-$ | US-3117692-$ | US-5240264-$ | US-5429260-$ | US-5595228-$ | US-5628443-$ | US-5988473-$ | US-6085925-$ | US-6547347-$ | US-6641013-$ | US-7503569-$ | US-7841144-$ | US-8132819-$ | US-8459495-$ | US-8677661-$ | US-8813960-$ | US-8875888-$ | US-9132543-$ | US-9506489-$ | US-9566990-$ | US-9616562-$ | US-9872562-$).DID.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:23

S289	4	(CN-2608238-$ | JP-1276744-$ | JP-1477050-$ | KR-300271616-$ | KR-300320243-$ | TW-135074-$ | TW-168686-$ | TW-174412-$ | VA-223131450-$ | WO-2016142935-$ | WO-2017028845-$).DID.	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/01/16 21:24
S290	0	(15/826201).APP.	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/01/16 21:25
S291	0	("150826201").APP.	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/01/16 21:25
S292	0	"150826201"	FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/01/16 21:25
S293	45	("1699130" | "2072672" | "2551814" | "2633285" | "2736487" | "3010638" | "3361322" | "3623650" | "3632037" | "3713579" | "3905478" | "3905541" | "3921896" | "4002261" | "4023617" | "4187977" | "4230233" | "4245773" | "4251006" | "4277015" | "4291830" | "4389013" | "4482074" | "4643314" | "4685610" | "4762270" | "4763833" | "4828894" | "4884739" | "4911356" | "4948039" | "4993623" | "5038998" | "5116290" | "5190213").PN. OR ("5429260").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:39
S294	2	"2430200".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:43
S295	70	("3861703" | "4738340" | "4951818" | "5038842" | "5048649" | "5178244" | "D294775" | "5373104" | "6213266" | "20030123965" | "3061057" | "3532355" | "4350194" | "5407039" | "6634496" | "6758334" | "7077252" | "20020104725" | "20050077136" | "4081061" | "4118048" | "4813521" | "5484045" | "20070068757" | "5927361" | "7232018" | "4693345" | "4122925" | "5484046" | "20060119060" | "20050072642" | "4792025" | "D453623" | "5186290" | "5890571" | "6073737" | "7380685" | "5109961" | "20070012694" | "3452846" | "4657135" | "5339934" | "5379870" | "5447216" | "6116390" | "6401890" | "5142445" | "7398868" | "7726483" | "6164425" | "6520327" |	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:50

		"6976566" | "3650216" | "2497173" | "20010027902" | "20030029750" | "4621716" | "5197579" | "5632496" | "5713439" | "7780002" | "7942282" | "3572253" | "6585090" | "3891230").PN.				
S296	70	("3861703" | "4738340" | "4951818" | "5038842" | "5048649" | "5178244" | "D294775" | "5373104" | "6213266" | "20030123965" | "3061057" | "3532355" | "4350194" | "5407039" | "6634496" | "6758334" | "7077252" | "20020104725" | "20050077136" | "4081061" | "4118048" | "4813521" | "5484045" | "20070068757" | "5927361" | "7232018" | "4693345" | "4122925" | "5484046" | "20060119060" | "20050072642" | "4792025" | "D453623" | "5186290" | "5890571" | "6073737" | "7380685" | "5109961" | "20070012694" | "3452846" | "4657135" | "5339934" | "5379870" | "5447216" | "6116390" | "6401890" | "5142445" | "7398868" | "7726483" | "6164425" | "6520327" | "6976566" | "3650216" | "2497173" | "20010027902" | "20030029750" | "4621716" | "5197579" | "5632496" | "5713439" | "7780002" | "7942282" | "3572253" | "6585090" | "3891230").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:51
S297	40	("20020096844" | "4066155" | "4813542" | "5099968" | "5564805" | "5906291" | "D439739").PN. OR ("6585090").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:53
S298	29	("2472491" | "2925283" | "3057636").PN. OR ("3891230").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:55
S299	59	("3194426" | "3338452" | "3441033" | "3862683" | "4426056" | "4523680" | "4589430" | "4804773").PN. OR ("4889254").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/16 21:59
S300	0	("2018/0127007").URPN.	USPAT	OR	OFF	2019/01/17 20:57
S301	3	("20110220531" | "5890613" | "6925834").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/17 20:58
S302	4	("20110139777" | "5301829" | "5427265" | "8602217").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/17 21:07
S303	1	("2014/0326693").URPN.	USPAT	OR	OFF	2019/01/17 21:08

S304	4	("20110139777" | "5301829" | "5427265" | "8602217").PN. OR ("9701443").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/17 21:09
S305	22	("3521764").URPN.	USPAT	OR	OFF	2019/01/17 21:15
S306	0	("2016/0082585").URPN.	USPAT	OR	OFF	2019/01/17 21:21
S307	11	("4887751" | "20080169739" | "20050045640" | "20090250470" | "20050211586" | "20140353191" | "4688674" | "20040016666" | "20080197756" | "4403638" | "5653337").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/17 21:22
S308	13	("2414708" | "4720021" | "4365725" | "5011013" | "4997090" | "5353948" | "5967322" | "7780036" | "0520505" | "4161261" | "4714158").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/17 21:24
S309	8	("6761366" | "0968633" | "6761366" | "0968633" | "5575401" | "20020030425" | "5575401" | "20050224384" | "20070012694" | "6371320").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/17 21:26
S310	12	("2006/0027475").URPN.	USPAT	OR	OFF	2019/01/17 21:29
S311	18	("1193809" | "1268124" | "1521310" | "3696850" | "4724976" | "4756394" | "4787488" | "5209279" | "5219423" | "5314046" | "5971119" | "0622263" | "0695149").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/17 21:29
S312	1	"20110073516".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/19 21:16
S313	71	(US-20180290288-$ or US-20180161975-$ or US-20170239808-$ or US-20170121056-$ or US-20080169739-$ or US-20080134607-$ or US-20080104921-$ or US-20060038367-$ or US-20190002004-$ or US-20120312812-$ or US-20180044059-$ or US-20110181008-$ or US-20090145790-$ or US-20130121783-$ or US-20030034654-$ or US-20080105803-$ or US-20050139745-$ or US-20170174392-$ or US-20060254946-$ or US-20170318927-$ or US-20170259956-$ or US-20100147642-$ or US-20150274362-$ or US-20140262885-$ or US-20130127129-$ or US-20120152800-$).did. or (US-20060027475-$ or US-20030094392-$ or US-20080277221-$ or US-20110073516-$).did. or (US-9872562-$ or US-9566990-$	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/19 21:16

		or US-7841144-$ or US-6547347-$ or US-5429260-$ or US-9725209-$ or US-8789699-$ or US-7503569-$ or US-5022546-$ or US-6840378-$ or US-3980185-$ or US-7780026-$ or US-8657307-$ or US-8177463-$ or US-9440741-$ or US-4341495-$ or US-5183375-$ or US-4695184-$ or US-3734308-$ or US-8342786-$ or US-6666362-$ or US-5653366-$ or US-8448829-$ or US-8020821-$ or US-5608603-$ or US-4660793-$).did. or (US-5395019-$ or US-9056586-$ or US-8387940-$ or US-5332183-$ or US-8398315-$ or US-5129613-$ or US-6637707-$ or US-4565465-$ or US-2053969-$ or US-6585090-$ or US-8561769-$ or US-3891230-$ or US-4889254-$ or US-9701443-$).did. or (US-2430200-$).did.				
S314	121	(US-20180290288-$ or US-20180161975-$ or US-20170266804-$ or US-20170239808-$ or US-20170217464-$ or US-20170174392-$ or US-20170166352-$ or US-20170121056-$ or US-20160168880-$ or US-20160144500-$ or US-20160130034-$ or US-20140166516-$ or US-20130127129-$ or US-20120326406-$ or US-20110155613-$ or US-20110139665-$ or US-20100219193-$ or US-20090145866-$ or US-20080308369-$ or US-20080169739-$ or US-20080134607-$ or US-20080104921-$ or US-20070194543-$ or US-20070068757-$ or US-20060254946-$ or US-20060038367-$).did. or (US-20060027475-$ or US-20040195793-$ or US-20020000440-$).did. or (US-9872562-$ or US-9616562-$ or US-9566990-$ or US-9506489-$ or US-9132543-$ or US-8875888-$ or US-8813960-$ or US-8677661-$ or US-8459495-$ or US-8132819-$ or US-7841144-$ or US-7503569-$ or US-6641013-$ or US-6547347-$ or US-6085925-$ or US-5988473-$ or US-5628443-$ or US-5595228-$ or US-5429260-$ or US-5240264-$ or US-3117692-$ or US-2608238-$ or US-2430200-$ or US-1477050-$ or US-1276744-$ or US-0326406-$).did. or (US-0320243-$ or US-0308369-$ or US-0290288-$ or US-0271616-$ or US-0266804-$ or US-	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/19 21:16

		0254946-$ or US-0239808-$ or US-0219193-$ or US-0217464-$ or US-0195793-$ or US-0194543-$ or US-0174392-$ or US-0169739-$ or US-0168880-$ or US-0166516-$ or US-0166352-$ or US-0161975-$ or US-0155613-$ or US-0145866-$ or US-0144500-$ or US-0139665-$ or US-0134607-$ or US-0130034-$ or US-0127129-$ or US-0121056-$ or US-0104921-$ or US-0068757-$).did. or (US-0038367-$ or US-0027475-$ or US-0000440-$).did. or (US-3117692-$ or US-2608238-$ or US-2430200-$ or US-1477050-$ or US-1276744-$ or US-0326406-$ or US-0320243-$ or US-0308369-$ or US-0290288-$ or US-0271616-$ or US-0266804-$ or US-0254946-$ or US-0239808-$ or US-0219193-$ or US-0217464-$ or US-0195793-$ or US-0194543-$ or US-0174392-$ or US-0169739-$ or US-0168880-$ or US-0166516-$ or US-0166352-$ or US-0161975-$ or US-0155613-$ or US-0145866-$ or US-0144500-$).did. or (US-0139665-$ or US-0134607-$ or US-0130034-$ or US-0127129-$ or US-0121056-$ or US-0104921-$ or US-0068757-$ or US-0038367-$ or US-0027475-$ or US-0000440-$).did.				
S315	52	S313 not S314	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/19 21:17
S316	1	"20120207571".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/06/06 19:39
S317	1	"20080115312".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/06/06 19:47
S318	13	(US-0023349-$ | US-0115312-$ | US-0186624-$ | US-0207571-$ | US-20060186624-$ | US-20080115312-$ | US-20120207571-$ | US-20160023349-$ | US-6848980-$).DID.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/06/06 20:25
S319	2,000	A45C5/14.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/06/09 16:14

S320	380	A45C7/0045,005.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/06/09 16:15
S321	700	F16B12/24,44.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/06/09 16:34
S322	13	("7534065" | "9506489" | "20100254757" | "3944282" | "4995176" | "6612078" | "20110085853" | "4900090" | "6830236" | "6877824" | "8464408" | "20070145864" | "7152752").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/06/09 16:36
S355	14	(US-20110073516-$ or US-20190002004-$ or US-20180044059-$ or US-20170318927-$ or US-20130121783-$ or US-20110181008-$ or US-20100147642-$ or US-20090145790-$ or US-20080277221-$ or US-20050139745-$ or US-20080115312-$ or US-20170138382-$ or US-20070145864-$).did. or (US-9506489-$).did.	US-PGPUB; USPAT	OR	OFF	2019/06/09 21:00
S356	14	("20050139745" | "20080277221" | "20090145790" | "20100147642" | "20110073516" | "20110181008" | "20130121783" | "20170318927" | "20180044059" | "20190002004" | "5608603" | "6637707" | "8177463" | "9701443").PN.	US-PGPUB; USPAT	OR	OFF	2019/06/09 21:00
S357	4	S355 not S356	US-PGPUB; USPAT	OR	OFF	2019/06/09 21:01
S359	11	("20070145864" | "20100254757" | "20110085853" | "3944282" | "4900090" | "4995176" | "6612078" | "6830236" | "6877824" | "7152752" | "8464408").PN. OR ("9506489").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/09/03 21:43
S380	1	(US-20170138382-$).did.	US-PGPUB	OR	OFF	2019/09/04 13:40
S381	1	(US-20170138382-$).did.	US-PGPUB	OR	OFF	2019/09/04 13:42
S382	1	(US-20170138382-$).did.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/09/04 13:42
S386	1	"16752441"	US-PGPUB; USPAT; USOCR	OR	OFF	2020/09/17 21:31
S387	30	(US-0031222-$ | US-0055534-$ | US-0068903-$ | US-0076759-$ | US-0153312-$ | US-0154218-$ | US-0236482-$ | US-0274362-$ | US-0349013-$ | US-	US-PGPUB; USPAT; USOCR	OR	OFF	2020/09/17 21:38

		20090236482-$ | US-20130068903-$ | US-20130154218-$ | US-20140076759-$ | US-20150274362-$ | US-20170349013-$ | US-20180153312-$ | US-20190031222-$ | US-20200055534-$ | US-5538213-$ | US-7779764-$ | US-D871013-$).DID.				
S388	7	(("7779764") or ("20090236482") or ("2011174939") or ("20130154218") or ("D437669") or ("D456972") or ("D828671") or ("D871013")).PN. or ((2013/0068903) or (2013/146551) or (2014/0076759) or (2015/0274362) or (2017/0349013) or (2018/0153312) or (2019/0031222) or (2020/0055534)).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/09/17 21:41
S389	14	(("7779764") or ("20090236482") or ("2011174939") or ("20130154218") or ("20130068903") or ("2013146551") or ("20140076759") or ("20150274362") or ("20170349013") or ("20180153312") or ("20190031222") or ("20200055534") or ("D437669") or ("D456972") or ("D828671") or ("D871013")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/09/17 21:41
S390	2	(("D668869") or ("D815831")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/09/17 21:43
S391	980	((("MILWAUKEE") near3 ("ELECTRIC") near3 ("TOOL") near3 ("CORPORATION"))).AS,AANM.	USPAT	OR	OFF	2020/09/17 21:48
S392	67	((("Brunner") near3 ("Yaron"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/09/17 21:48
S393	55	((("Squiers") near3 ("Grant") near3 ("T"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/09/17 21:48
S394	89	((("Hoppe") near3 ("Christopher") near3 ("S"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/09/17 21:48
S395	162	((("Hyma") near3 ("Steven") near3 ("W"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/09/17 21:48
S396	12	(("8505729") or ("8567796") or ("8979100") or ("9511491") or ("20090026901") or ("20150376917") or ("D395533") or ("D653832") or ("D661858") or ("D738106") or ("D816334") or ("D826510")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/09/17 21:51

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S405	1,163	B25H3/02.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/09/17 22:02
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S423	6	("2016/0144500").URPN.	USPAT	OR	OFF	2020/09/18 00:00
S424	13	("20030094392" | "20070034539" | "20120024739" | "20120312812" | "20160008972" | "20160144500" | "5325966" | "6082539" | "7523827").PN. OR ("9725209").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/09/18 00:01

9/22/2020 10:07:07 AM
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PTO/SB/08 (09-06)
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Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	16/752,441
Date Submitted: May 7, 2020				**Filing Date**	January 24, 2020
				First Named Inventor	Yaron Brunner
(use as many sheets as necessary)				Art Unit	3736
				Examiner Name	PICKETT, JOHN G
Sheet	1	of	1	Attorney Docket Number	066749-2584

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

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Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
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	A2	CN103659777	03-26-2014	Bosch GMBH Robert		
	A3	CN204161752	02-18-2015	Meridian International Co Ltd		
	A4	KR3009995990000	03-27-2019	Korea Container Pool Co, Ltd		
	A5	KR3008812960000	11-15-2016	NPC Co., Ltd.		
	A6	KR3008599650000	06-22-2016	NPC Co., Ltd.		
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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]

Examiner Signature	/GIDEON R WEINERTH/	Date Considered	09/17/2020

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Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	16/752,441
Date Submitted: September 16, 2020				**Filing Date**	January 24, 2020
				First Named Inventor	Yaron Brunner
(use as many sheets as necessary)				Art Unit	3736
				Examiner Name	WEINERTH, GIDEON R
Sheet	1	of	2	Attorney Docket Number	066749-2584

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Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	5,538,213	07-23-1996	Brown Office Systems Inc.	
	A2	7,779,764	08-24-2010	NAIDU et al.	
	A3	2009/0236482	09-24-2009	SS3 Storage Systems LLC	
	A4	2011/174939	07-21-2013	Parts Express International Inc.	
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UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

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Examiner Signature		Date Considered	

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				First Named Inventor	Yaron Brunner
(use as many sheets as necessary)				Art Unit	3736
				Examiner Name	WEINERTH, GIDEON R
Sheet	2	of	2	Attorney Docket Number	066749-2584

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	A28	WO2017/212840	12-14-2017	GENESIS CO., LTD.		

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
/G.R.W/	A29	International Search Report and Written Opinion for International Application No. PCT/IL2020/050433, dated June 21, 2020, 14 pages	

Examiner Signature	/GIDEON R WEINERTH/	Date Considered	09/17/2020

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Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	To be determined
Date Submitted: January 24, 2020				**Filing Date**	January 24, 2020
				First Named Inventor	Yaron Brunner
(use as many sheets as necessary)				Art Unit	To be determined
				Examiner Name	To be determined
Sheet	1	of	10	Attorney Docket Number	066749-2584

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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	A2	2,430,200	11-04-1947	Wilson Winfred E.	
	A3	2,970,358	02-07-1961	E. C. Elsner	
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	A59	9,616,562	04-11-2017	Hoppe; Christopher S.	
	A60	9,643,629	05-09-2017	The Stanley Works Israel Ltd.	
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				Filing Date	January 24, 2020
Date Submitted: January 24, 2020				**First Named Inventor**	Yaron Brunner
				Art Unit	To be determined
(use as many sheets as necessary)				Examiner Name	To be determined
Sheet	4	of	10	Attorney Docket Number	066749-2584

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Examiner Signature	/GIDEON R WEINERTH/	Date Considered	09/17/2020

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Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	To be determined
				Filing Date	January 24, 2020
Date Submitted: January 24, 2020				**First Named Inventor**	Yaron Brunner
				Art Unit	To be determined
(use as many sheets as necessary)				Examiner Name	To be determined
Sheet	7	of	10	Attorney Docket Number	066749-2584

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				Filing Date	January 24, 2020
Date Submitted: January 24, 2020				**First Named Inventor**	Yaron Brunner
				Art Unit	To be determined
(use as many sheets as necessary)				Examiner Name	To be determined
Sheet	8	of	10	Attorney Docket Number	066749-2584

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				Filing Date	January 24, 2020
Date Submitted: January 24, 2020				**First Named Inventor**	Yaron Brunner
				Art Unit	To be determined
(use as many sheets as necessary)				Examiner Name	To be determined
Sheet	9	of	10	Attorney Docket Number	066749-2584

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				Filing Date	January 24, 2020
Date Submitted: January 24, 2020				**First Named Inventor**	Yaron Brunner
				Art Unit	To be determined
(use as many sheets as necessary)				Examiner Name	To be determined
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Date Submitted: March 31, 2020				**Filing Date**	January 24, 2020
				First Named Inventor	Yaron Brunner
(use as many sheets as necessary)				Art Unit	3633
				Examiner Name	To be determined
Sheet	1	of	2	Attorney Docket Number	066749-2584

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	A13	CN302371147	03-27-2013	吉田攻一郎		
	A14	JPD1395115	08-16-2010	Toyoharu Senda		
	A15	TWI324578	05-11-2010	NAIDU VISHNU et al.		

Examiner Signature	/GIDEON R WEINERTH/	Date Considered	09/17/2020

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Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	16/752,441
				Filing Date	January 24, 2020
Date Submitted: March 31, 2020				**First Named Inventor**	Yaron Brunner
				Art Unit	3633
(use as many sheets as necessary)				Examiner Name	To be determined
Sheet	2	of	2	Attorney Docket Number	066749-2584

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]

Examiner Signature	/GIDEON R WEINERTH/	Date Considered	09/17/2020

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If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Bibliographic Data

Application No: 16/752,441

Foreign Priority claimed: ○ Yes ◉ No

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

Verified and Acknowledged: /GIDEON R WEINERTH/ (Examiner's Signature) | (Initials)

Title: Utility Assembly and Coupling Mechanism

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/24/2020	220	3736	066749-2584
RULE			

APPLICANTS

Milwaukee Electric Tool Corporation, Brookfield, WI, UNITED STATES

INVENTORS

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Grant T. Squiers, Cudahy, WI, UNITED STATES

Christopher S. Hoppe, Milwaukee, WI, UNITED STATES

Steven W. Hyma, Milwaukee, WI, UNITED STATES

CONTINUING DATA

This application is a CON of 16216724 12/11/2018 PAT 10583962

16216724 is a CON of 15826232 11/29/2017 PAT 10703534

15826232 is a CON of PCT/IL2017/050481 04/30/2017

PCT/IL2017/050481 has PRO of 62459076 02/15/2017

PCT/IL2017/050481 has PRO of 62330334 05/02/2016

FOREIGN APPLICATIONS

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02/12/2020

STATE OR COUNTRY

ISRAEL

ADDRESS

Reinhart (Milwaukee Tool)
ATTN: TRAVIS MCDONNELL, PARALEGAL
1000 NORTH WATER STREET
SUITE 2100
MILWAUKEE, WI 53202

UNITED STATES

FILING FEE RECEIVED

$1,720

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.R.W/

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Date Submitted: September 16, 2020

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Sheet 1 of 2

Complete if Known	
Application Number	16/752,441
Filing Date	January 24, 2020
First Named Inventor	Yaron Brunner
Art Unit	3736
Examiner Name	WEINERTH, GIDEON R
Attorney Docket Number	066749-2584

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number: Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	5,538,213	07-23-1996	Brown Office Systems Inc.	
	A2	7,779,764	08-24-2010	NAIDU et al.	
	A3	2009/0236482	09-24-2009	SS3 Storage Systems LLC	
	A4	2011/174939	07-21-2013	Parts Express International Inc.	
	A5	2013/0154218	06-20-2013	TIILIKAINEN	
	A6	2013/0068903	03-21-2013	Peerless Ind Inc.	
	A7	2013/146551	06-13-2013	Electrolux Home Prod Inc.	
	A8	2014/0076759	03-20-2014	ROEHM et al.	
	A9	2015/0274362	10-01-2015	CHRISTOPHER et al.	
	A10	2017/0349013	12-07-2017	GRONHOLM	
	A11	2018/0153312	06-07-2018	Buck James et al.	
	A12	2019/0031222	01-31-2019	TAKYAR et al.	
	A13	2020/0055534	02-20-2020	HASSELL	
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	A15	D456,972	05-07-2002	BLASON et al.	
	A16	D828,671	09-11-2018	COPE et al.	
	A17	D871,013	12-24-2019	LIU	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

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Examiner Signature	/GIDEON R WEINERTH/	Date Considered	09/17/2020

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	16/752,441
Date Submitted: September 16, 2020				**Filing Date**	January 24, 2020
				First Named Inventor	Yaron Brunner
(use as many sheets as necessary)				Art Unit	3736
				Examiner Name	WEINERTH, GIDEON R
Sheet	2	of	2	Attorney Docket Number	066749-2584

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	A18	DE402018201520	05-11-2018	Dirk SCHLENZKA		
	A19	GB2110076	06-15-1983	Ostling Bernt et al.		
	A20	GB2449934	12-10-2008	Protrend Co Ltd.		
	A21	JP2013022972	02-04-2013	IZUMI DOI, HIDEKI NOMA, MASAYUKI NAKANISHI		
	A22	JP2013022976	02-04-2013	DAIFUKU KK		
	A23	WO2007/121746	11-01-2007	J.O. MADSEN APS; MADSEN JENS OLE		
	A24	WO2009/140965	11-26-2009	J.O. MADSEN APS; MADSEN JENS OLE		
	A25	WO2011/009480	01-27-2011	HENSEL MAIC; HESS STEFAN; KAERCHER GMBH & CO KG.		
	A26	WO2013/026084	02-28-2013	CONNOR PAUL FRANCIS; DEMAIN TECHNOLOGY PTY LTD.		
	A27	WO2014/125488	08-21-2014	KETER PLASTIC LTD		
	A28	WO2017/212840	12-14-2017	GENESIS CO., LTD.		

NON PATENT LITERATURE DOCUMENTS

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/G.R.W/	A29	International Search Report and Written Opinion for International Application No. PCT/IL2020/050433, dated June 21, 2020, 14 pages	

Examiner Signature	/GIDEON R WEINERTH/	Date Considered	09/17/2020

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Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	16/752,441
Date Submitted: May 28, 2020				**Filing Date**	January 24, 2020
				First Named Inventor	Yaron Brunner
(use as many sheets as necessary)				Art Unit	3736
				Examiner Name	John G. Pickett
Sheet	1	of	1	Attorney Docket Number	066749-2584

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	D668,869	10-16-2012	Yamamoto et al.	
	A2	D815,831	04-24-2018	Tonelli	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	A3	KR 3008066040000	07-22-2015	Woojubon Co. LTD		
	A4	KR 3008496000000	04-15-2016	Hwang, Hyung Keun		
	A5	JP D1180963	08-04-2003	Name not in English		
	A6	JP D1395116	08-16-2010	Toyoharu Senda		
	A7	JP D1455321	11-12-2012	Name not in English		
	A8	JP D1625407	02-25-2019	Name not in English		
	A9	TW 206875	05-21-1993	Name not in English		
	A10	TW D192092	08-11-2018	Name not in English		

NON PATENT LITERATURE DOCUMENTS

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Date Submitted: September 16, 2020

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Sheet | 1 | of | 2

Complete if Known	
Application Number	16/752,441
Filing Date	January 24, 2020
First Named Inventor	Yaron Brunner
Art Unit	3736
Examiner Name	WEINERTH, GIDEON R
Attorney Docket Number	066749-2584

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	A6	2013/0068903	03-21-2013	Peerless Ind Inc.	
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	A11	2018/0153312	06-07-2018	Buck James et al.	
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	A13	2020/0055534	02-20-2020	HASSELL	
	A14	D437,669	02-13-2001	BLASON et al.	
	A15	D456,972	05-07-2002	BLASON et al.	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Date Submitted: September 16, 2020

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Sheet 2 of 2

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First Named Inventor	Yaron Brunner
Art Unit	3736
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Attorney Docket Number	066749-2584

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	A24	WO2009/140965	11-26-2009	J.O. MADSEN APS; MADSEN JENS OLE		
	A25	WO2011/009480	01-27-2011	HENSEL MAIC; HESS STEFAN; KAERCHER GMBH & CO KG.		
	A26	WO2013/026084	02-28-2013	CONNOR PAUL FRANCIS; DEMAIN TECHNOLOGY PTY LTD.		
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	A29	International Search Report and Written Opinion for International Application No. PCT/IL2020/050433, dated June 21, 2020, 14 pages	

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Deutsches Patent- und Markenamt

Information relating to design 402018201520-0001

Status on Sep 14, 2020

Please note: this English version is a non-binding translation of the German register excerpt. Only the German version of the register excerpt is legally binding.

The following registrations exist:

Master data

[19] **Data file:** DE
[-----] **Data pool:** Active
[-----] **Design number:** 402018201520-0001
[21] **File number:** 402018201520.6
[11] **Register number:** 402018201520
[-----] **Design status:** Design registered
[-----] **Deferment status:** No deferment
[22] **Application date:** Apr 29, 2018
[15] **Date of registration:** Nov 5, 2018
[-----] **Publication date:** Nov 30, 2018
[-----] **Product(s):** Transportsicherungen, Transportgestelle, Transportpaletten
[51] **Class(es) of goods:** 08-08; 09-03; 09-08
[-----] **Version of class of goods:** 11
[-----] **Number of reproductions:** 3
[73] **Owner:** Dirk Schlenzka, 24329 Grebin, DE
[-----] **Address for service:** Herrn, Dirk Schlenzka, Saseler Redder 7, 24329 Grebin
[-----] **Term of protection obtained:** 5 years
[-----] **Payment due on:** Apr 30, 2023
[-----] **Payment deadline:** Oct 31, 2023
[-----] **Date of capture in the IT system:** Nov 30, 2018
[-----] **Date of the first transfer into DPMAregister:** Nov 6, 2018
[-----] **Date of the (most recent) update in DPMAregister:** Nov 6, 2018; Nov 30, 2018

Milwaukee Electric Tool, Keter Home and Garden Products – Ex. 2003 - Page 524
Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

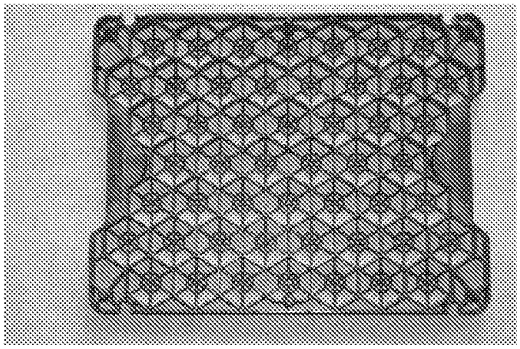
Procedural data

Registration

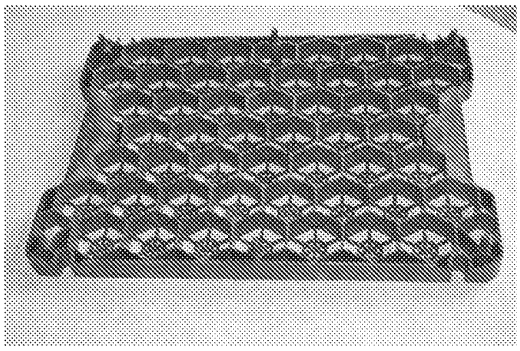
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[-----] **Legal status:** The design has been registered
[-----] **Date of capture in the IT system:** Nov 5, 2018
[-----] **Issue:** 48
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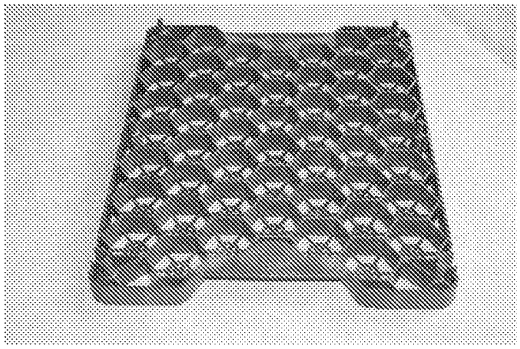


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402018201520-0001.3

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Deutsches Patent- und Markenamt

Information relating to design 402018201520-0002

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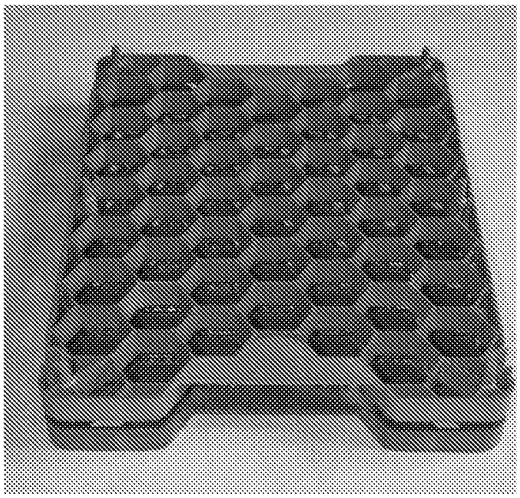
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(54) **A mounting device**

(57) A toolholder for a numerically controlled machine is engaged by bars 7 in notches 9 and recess 10 of a bracket 5. The bracket bears a four-hooked mounting saddle and a pivotable abutment 16, and can be engaged with a slotted mounting plate 1 by:–

(a) first engaging the upper hooks, then swinging the bracket downwardly until the lower hooks engage, and the abutment contacts the plate at 15

(b) first folding the abutment upwardly, thereby allowing the lower hook to engage first, then swinging the bracket upwardly to engage the upper hooks, and finally swinging the abutment down to contact the plate at 15.

Method (a) is used when the vertical spacing of slots 2 is large, and method (b) is used when the slots are closely spaced. The inclination of the toolholder can be selected according to which notch 9 is used.

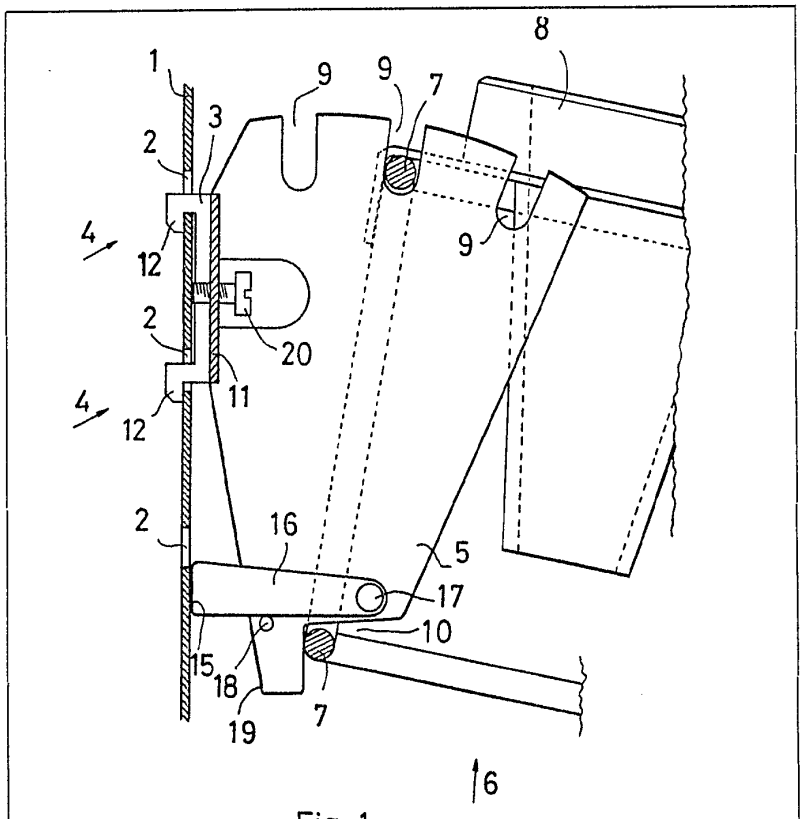


Fig 1

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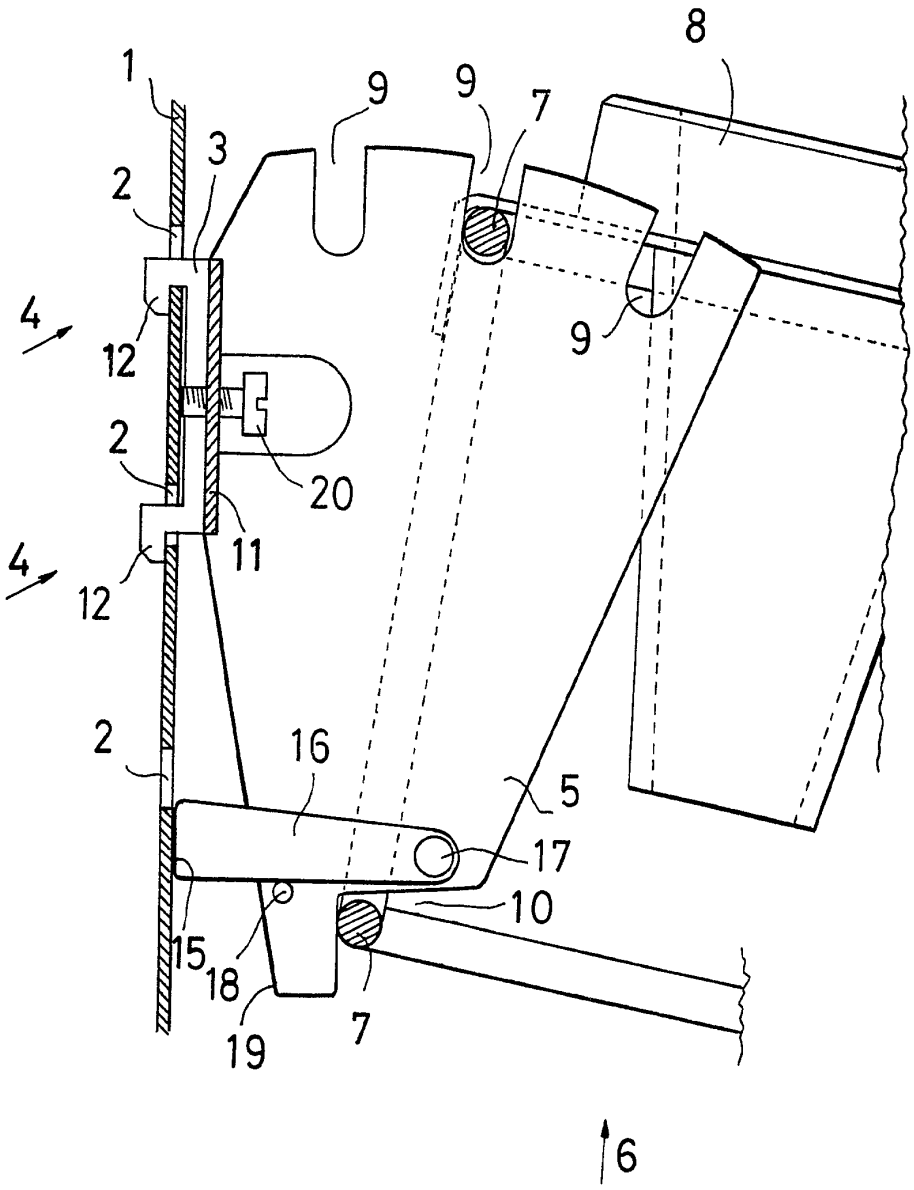


Fig 1

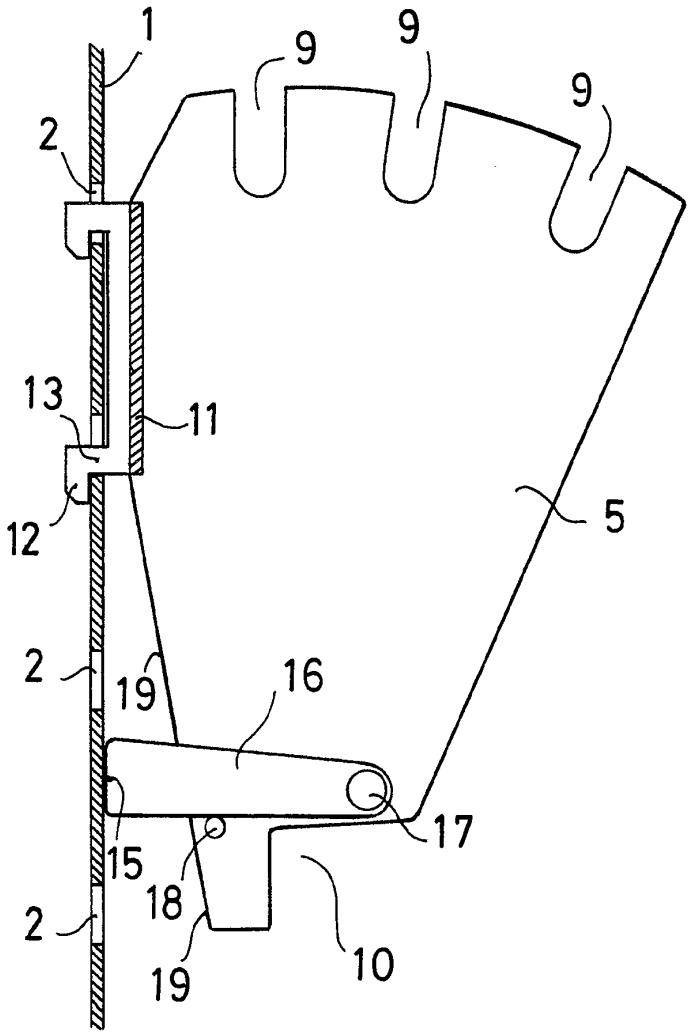


Fig 2

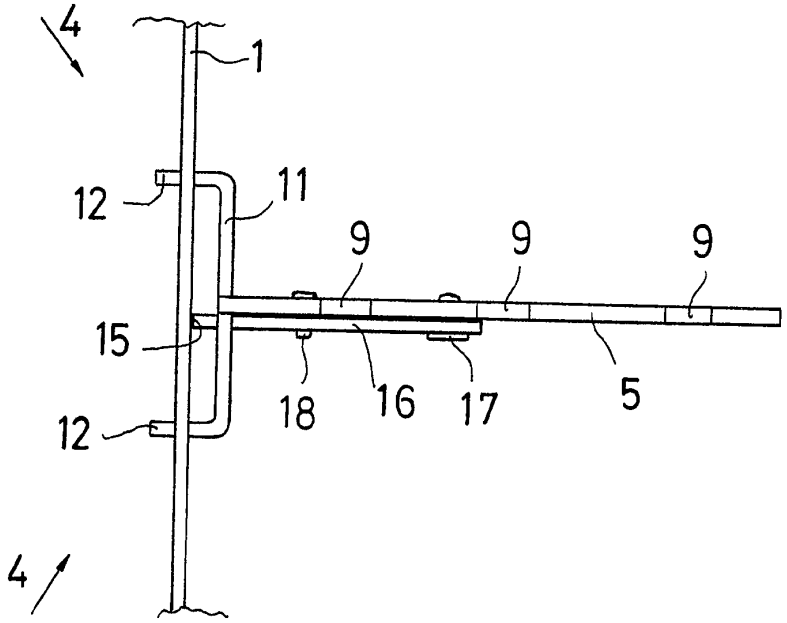


Fig 3

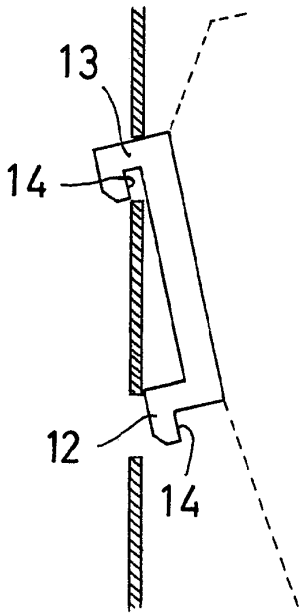


Fig 4

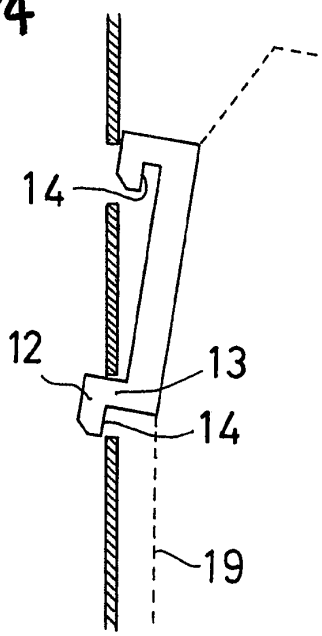


Fig 6

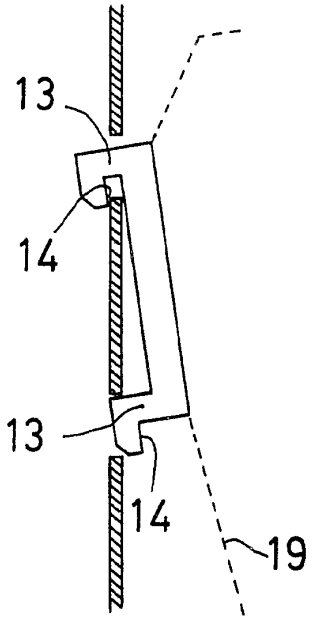


Fig 5

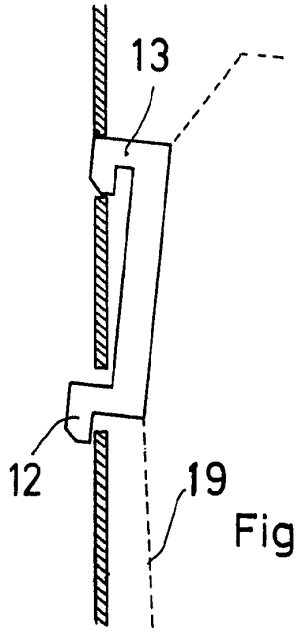


Fig 7

SPECIFICATION

A mounting device

The present invention relates to a device for mounting a tool rack which, for example, may be used for tools to an NC-controlled machine and which may releasably be suspended upon a carrier designed as a sheet metal plate perforated with square holes, the square holes being optionally one of two given, standardised spacings.

In the precision engineering industry, more and more use is being made of tool racks in which, for example, drills, milling heads or preset special tools for NC-controlled machines are stored during downtime and when the tools have been selected for use in the processing machine in question. The current types of tools are often heavy, this being particularly applicable to large milling heads and tools for NC-controlling machines, for which reason the tool rack may be of considerable weight. Furthermore, the tools may, on many occasions, be of such a bulky nature that they extend laterally outside the tool rack employed.

In the precision engineering industry, use is often made, for suspending different types of tools, machine parts, implements and the like, of sheet metal panels perforated with square holes. In these perforated sheet metal panels, the square holes have the same dimensions but there are two different spacings between the holes, both vertically and horizontally. For this reason, there are available on the market both special tool holders in a great number of variaties which are intended for either of the hole spacings, but certain types of universal tool holders have also been launched on the market which may be used for both hole spacings.

Despite the fact that the above-mentioned square hole-perforated panels have come into considerable use, it has not hitherto been possible to use them for mounting the tool racks mentioned by way of introduction. Instead, special panels, bracket rails and the like in highly specialised designs have been used, the tool racks being in many cases designed in such a way as to be suspendible directly in these bracket rails. The use of these tool racks entails, thus, a risk for two different, mutually incompatible systems for tool storage, a situation which is wholly unacceptable.

One conceivable reason that the above-mentioned square hole perforated sheet metal panels have not been used for tool racks of the type described by way of introduction is that the mounting means used in the sheet metal panels have displayed, because of the dimensions of the sheet metal panels, wholly unsatisfactory strength properties.

Thus, the object of the present invention is the like, the device being designed in such a manner as to be able to cooperate with the square hole-perforated sheet metal panels mentioned by way of introduction, irrespective of the spacing of the holes thereof. A further object of the present invention is to realise a mounting device which offers fully satisfactory stability and strength properties, despite the often considerable weight of the tool racks. Finally, a further object of the present invention is to realise a mounting device which permits mounting of a tool rack in such a manner that the tool rack inclines in relation to a vertical plane.

The objects of the present invention are attained by means of a device of the type disclosed by way of introduction which has catches disposed on an anchorage portion for engagement in the above-mentioned holes, the anchorage portion transmitting the load of the tool rack to a support member designed as a perforated sheet metal panel, and the invention being characterised in that the anchorage portion has a projecting retainer member on which the tool rack may be suspended, that the retainer member has a portion extending beneath the catches with a support surface in contact with the support member, and that the catches have mutually superposed abutment surfaces which, irrespective of the spacing of the holes, are in contact with that side of the support member turned to face away from the support surface.

In order to ensure simultaneous abutment between all of the abutment surfaces and the support member so as thereby to obtain a greater load-bearing capacity, the subject matter of the present invention is further suitably characterised in that the support surface and the abutment surfaces are in such mutual spaced apart relationship that a plane through the abutment surfaces at the support surface is at a distance therefrom which substantially coincides with the material thickness of the support member.

One advantageous method of designing the anchorage portion so that it may, irrespective of the hole spacing in the support member, cooperate therewith, will be realised if the vertical maximum dimensions for the heads of the catches are insignificantly less than the vertical extent of the holes, and if the catches are dispoed with a spacing which lies between the prevalent hole spacing. In this embodiment, only one catch determined by the hole spacing in question can simultaneously be inserted through the holes, whereby the anchorage portion must be inclined. According to the present invention, this embodiment is suitably characterized in that the portions of the retainer member located above and beneath the catches are disposed in spaced apart relationship from the support member in order to permit inclination of the anchorage

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vided on a movably disposed portion, whereby the support surface is movable to a greater distance from a plane through the abutment surfaces.

In order readily to permit placing of the tool rack on the retainer member and also removal of the rack therefrom, the subject matter of the present invention is suitably characterised in that the retainer member has a lower recess closed towards the support member for cooperation with a part included in the tool rack, and at least one upwardly open recess for cooperation with a further part included in the tool rack.

An example of the invention will be described in greater detail below with reference to the accompanying drawings, in which:–

Figure 1 shows a rack mounting device in vertical section with a tool rack mounted in cooperation with a perforated sheet metal panel with the larger of the two given hole spacings;

Figure 2 is a view corresponding to Fig. 1, a locking screw having, however, been dispensed with and the subject matter of the present invention being mounted in a sheet metal panel of the lesser hole spacing;

Figure 3 is a top plan view of the device according to Fig. 2;

Figures 4 and 5 illustrate two mutually subsequent steps in the attachment of the anchorage portion to a sheet metal panel with the larger of the two hole spacings; and

Figures 6 and 7 show corresponding steps in the attachment of the anchorage portion to a sheet metal panel with the lesser hole spacing.

Fig. 1 illustrates a sheet metal panel or support, designated 1, and perforated with square holes 2. The holes in this sheet metal panel are all of equal size and have, in those types most frequently offered on the market, a 9 mm hole side. The spacing, both horizontal and vertical, may vary between two dimensions namely 34 and 38 mm, respectively.

The sheet metal panel 1 may, in practice, be disposed with approximately vertical directioning, and, for example, be permanently fixed to a wall in a store premises on a specially provided frame, a trolley or the like. Sheet metal panels of this type are conventionally used for suspending all kinds of tools, equipment, machine parts and the like and may, in general terms, be considered as standard.

An anchorage device 3 is disposed in the square holes of the sheet metal panel and is provided with four catches 4 (see Fig. 3), the anchorage device 3 being further provided with a projecting retainer member 5 which serves to cooperate with the tool rack 6 proper.

The tool rack per se is of no vital importance to the present invention, but merely has which cooperate with the retainer member 5. Otherwise, it should be designed in such a manner as to possess the requisite stability and such that it may simply be lifted from the retainer member 5 and carried to a site of use. Furthermore, the tool rack 6 has, on its upper face, a number of brackets 8, preferably manufactured of plastics material, in which the cutting tools proper are placed.

Since the tools themselves may often be of relatively large diameter, it is necessary that the tool rack can be suspended in such a manner that it is not located immediately adjacent the sheet metal panel 1, since, in such an event, the tools would perhaps not have room. Furthermore, considerable space saving in the vertical direction may be achieved at the same time as the tools will be more easily accessible if the tool racks were to be suspended above one another and inclined outwardly from the sheet metal panel 1 to an angle of up to 30°. The above-described placement of the tool racks and tools therein entails that the centre of gravity would be located at a considerable horizontal distance out from the sheet metal panel 1.

In order to permit the above-described suspension of the tool rack in several differnt manners in the retainer member 5, the retainer member has, in its upper edge, a series of recesses 9 which are open upwardly. Furthermore, in its lower portion, the retainer member has a recess 10 which is closed in a direction in towads the sheet metal panel 1, but is open at least in the opposite direction. As a result, the tool rack may readily be removed from the retainer member 5 in that the lower horizontal rod 7 is pivoted outwardly from the sheet metal panel 1, whereafter the entire tool rack is lifted so that the upper horizontal rod 7 is freed from the recess 9.

In order that suspension of the tool rack be effected in a closed but nevertheless reliable manner, the upper recesses 9 are, according to the invention, placed approximately along the arc of a circle whose centre point is located in the lower recess 10.

As will be apparent from Fig. 3, the retainer member 5 according to the invention may suitably be of one-piece sheet metal construction of appropriate thickness.

As is aparent from Fig. 3, the anchorage portion 3 is of U-shape seen from above and has a rectangular plate 11 from whose corners four catches 4 extend. The catches have, in their outer ends, heads 12 whose vertical extent is slightly less than the vertical extent of the holes 2 in the sheet metal panel 1. Furthermore, the catches are provided with collar portions 13 inside the heads 12, the collar portions connecting the heads to the anchorage portion 3 proper.

Suitably, the spacing between the catches 4

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of the two alternative hole spacings in the sheet metal panel 1. In a practical example, this would entail that the vertical spacing of the cataches 4 amounts to 36mm if both of the alternative hole spacings are 34 and 38mm, repsectively. Furthermore, the vertical extent of the collar portion 13 may suitably amount to approximately half of the vertical extent of the heads 12 of the catches.

As a result of the above-described relationship between the placing and dimensioning of the catches, and the holes and their mutual spacing in the sheet metal panel, it is possible to insert the anchorage portion 3 to those positions illustrated in Figs. 1 and 2 where, thus, the heads 12 of the catches are located on the rear face of the sheet metal panel 1. In the alternative with the larger hole spacing in the sheet metal panel 1, it is necessary first to insert the head of the upper catch completely through a hole, whereafter the entire catch is shifted vertically downwardly until the head of the lower catch may also be passed through a corresponding lower hole. This process is illustrated in Figs. 4 and 5, and it should be particularly emphasized that the entire anchorage portion 3 and, naturally, the retainer member 5, will, therefore, also be relatively greatly inclined during the mounting operation in relation to the sheet metal panel 1.

If the sheet metal panel 1 has the lesser of the two hole spacings, it is impossible to insert the anchorage portion 3 in the above-described manner. Instead, the head of the lower catch must first be fully inserted through a suitable hole in the sheet metal panel. Thereafter, the anchorage portion 3 must be shifted downwardly until the head 12 of the upper catch is located in register with a corresponding upper hole, whereafter the head may be inserted therethrough and the entire anchorage portion shifted into place. This operation is illustrated in Figs. 6 and 7. If is apparent from these Figs. that the entire anchorage portion 3 and, naturally, also the retainer member 5, will be greatly inclined during the initial phase of the mounting operation.

It will be apparent from Fig. 1 that in the alternative with the larger hole spacing in the sheet metal panel 1, the upper pair of catches 4 will support all of the vertical loading from the tool rack 6. On the other hand, all four catches in the anchorage portion 3 will contribute to load uptake in a direction which is at right angles out from the sheet metal panel 1.

It will be further apparent from Fig. 2 that the same loading conditions apply in the horizontal direction if the sheet metal panel 1 has the lesser hole spacing, whereas, on the other hand, the loading in the vertical direction will be taken up completely by the lower catch pair.

In order that the described loading in-abutment surfaces of the catches facing the sheet metal panel 1 participate in the load uptake, the retainer member 5 must abut with a support surface 15 against the sheet metal panel 1. However, this support surface 15 cannot be disposed directly on the retainer member 5, since, in such an event, the requisite inclination of the retainer member on mounting on the sheet metal panel 1 would be prevented (See Figs. 6 and 7). Consequently, the support surface 15 is disposed on a support arm 16 which, by means of a joint 17, is pivotally connected to the retainer member 5 so that, in the operative position, it abuts against a stop member 18, and extends with a portion beyond the edge 19 of the retainer member 5 facing the sheet metal panel. This projection portion of the support arm 16 mounts the support surface 15 in its extremity. In order thus to permit mounting of the retainer member and the anchorage portion, the support arm 16 is, as intimated in Figs. 6 and 7, quite simply swung away so that it is located inside the edge 19. When the retainer member is subsequently brought to the position shown in Figs. 1 and 2, the suppot arm 16 is pivoted back so that thereby the support surface 15 comes into abutment against the sheet metal panel.

A condition that co-operation between the four catches and the sheet metal panel 1 be effected in the contemplated manner is that a plane through all four abutment surfaces 14 be in spaced apart relationship to the support surface 15 in its operative position a distance which substantially coincides with the material thickness of the sheet metal panel 1. As one alternative, the support surface 15 can, naturally, also constitute a cam surface which may with a certain portion be moved closer to or further away from the above-mentioned plane simple by a more or less extensive pivoting of the support arm 16.

As is apparent from Fig. 1, the plate 11 is further provided, in the anchorage portion 3, with a locking screw 20 whose primary object is to prevent play and rattle between the catches and the sheet metal panel 1. However, the screw 20 may also be seen as a guarantee against unintentional release of the anchorage portion 3 at least in that case when the anchorage portion is placed in the sheet metal panel having the larger hole spacing.

As a result of the above-described design of the anchorage portion, its catches and the sheet metal panel, a particularly favourable load uptake will be realised. Thus, loadings will be taken up in a favourable shearing direction in a vertical direction towards the collar portions by two catches simultaneously. As far as loading at right angles to the sheet metal panel 1 is concerned, all four catches co-operate, this being advantageous because of the long lever for the loading exercised by

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In order further to improve the load uptake direction in the horizontal line, it is possible according to the present invention to shift the anchorage portion 3 upwardly so that it is placed flush with the upper edge of the retainer member 5.

Furthermore, the support arm 16 need not be of the appearance shown on the drawings, only as long as the support surface 15 may be moved away from its position of engagement with the sheet metal panel 1. For example, the pivotal support arm 16 may be replaced by a screw which extends through a threaded lug up-standing from the retainer member 5 and being approximately parallel to the plate 11.

The invention may be modified further without departing from the scope of the appended claims.

CLAIMS

1. A device for mounting a tool rack (6) or the like on a carrier (1), the carrier being provided with a number of vertical hole rows whose holes (2) have one optionally of preferably two given spacings, and catches (4) on an anchorage portion (3) engaging in the holes of the carrier, the loading of the tool rack being transmitted to the carrier, characterised in that the anchorage portion (3) has a projecting retainer member (5) on which the tool rack (6) may be suspended, that the retainer member (5) has a support member (16) extending beneath the catches and having a support surface (15) in contact with the carrier (1), and that the catches have mutually superposed abutment surfaces (14) which, irrespective of the spacing of the holes (2), are in contact with the side of the carrier facing away from the support surface.

2. A device according to claim 1, characterised in that the support surfaces (15) and the abutment surfaces (14) are of such mutual placing that a plane through the abutment surfaces at the support surface is at a distance therefrom which substantially coincides with the material thickness of the carrier (1).

3. A device according to claim 1 or 2 and in which the vertical maximum dimension of the heads (12) of the catches (4) are insignificantly less than the vertical extent of the holes (2), and the catches are disposed at a spacing which lies between the given spacings for the holes, whereby, on mounting of the anchorage portion (3), but one catch determined by the current hole spacing can simultaneously be passed through the holes, characterised in that the portions of the retainer member (5) located above and below the catches (4) are disposed in spaced apart relationship to the carrier (1) in order to permit inclination of the anchorage portion (3), and that the support surface (15) is disposed on a movably disposed support member (16), whereby the tance from the plane through the abutment surfaces.

4. A device according to claim 1, 2 or 3, characterised in that the retainer member (5) has a lower recess (10) closed towards the carrier member for co-operation with a part (7) included in the tool rack (6), and at least one upwardly open recess (9) for co-operation with a further part included in the tool rack.

5. A device according to claim 3, charaterised in that the retainer member (5) has a plurality of upwardly open recesses (9) disposed at different distances from the carrier (1) and disposed approximately along the arc of a circle with the lower recess (10) as the centre point thereof.

6. A device according to any one of the preceding claims, characterised in that four catches (4) are disposed on each anchorage portion (3), the cataches being disposed pairwise on the same vertical level.

7. A device for mounting a tool rack substantially as hereinbefore described with reference to the accompanying drawings.

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US 6024333 A **US 5921412 A**
US 5538213 A **US 3701325 A**

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UK CL (Edition X) **A4B**
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Other: **WPI, EPODOC**

(54) Abstract Title: **A wall mounted rack assembly**

(57) A multipurpose wall-mount rack 1 includes at least two vertical posts 10, each of which is provided on a front side with two longitudinal rows of spaced holes 11; and a plurality of supporting brackets 20 of the same configuration adapted to connect to the vertical posts by inserting respective rear end into the holes on the front side of the vertical posts. The supporting brackets have a plurality of retaining slots 23,24,25 on their upper edges and are configured to support any one of a metal-wire shelf 30, a board-type shelf (60, fig 10), a slide-out basket (67, fig 13) or a suit hanger bar (73, fig 16) thereon. The vertical posts are also provided at two lateral sides with a longitudinal row of spaced holes 12. A box-type container 50 maybe mounted to and between the two vertical posts via two hooking members (51, fig 5) which are hooked at outer hook portions to the lateral holes and engaged at upper slots with two pins (52, fig 5) projecting rearwardly from near two rear upper ends of the box-type container.

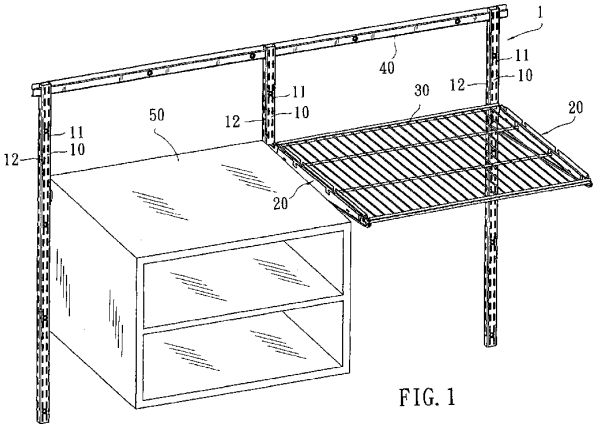


FIG. 1

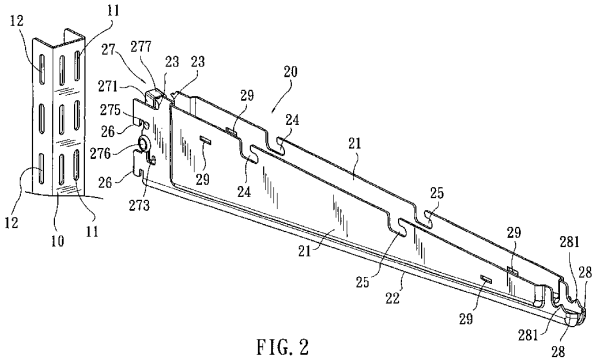


FIG. 2

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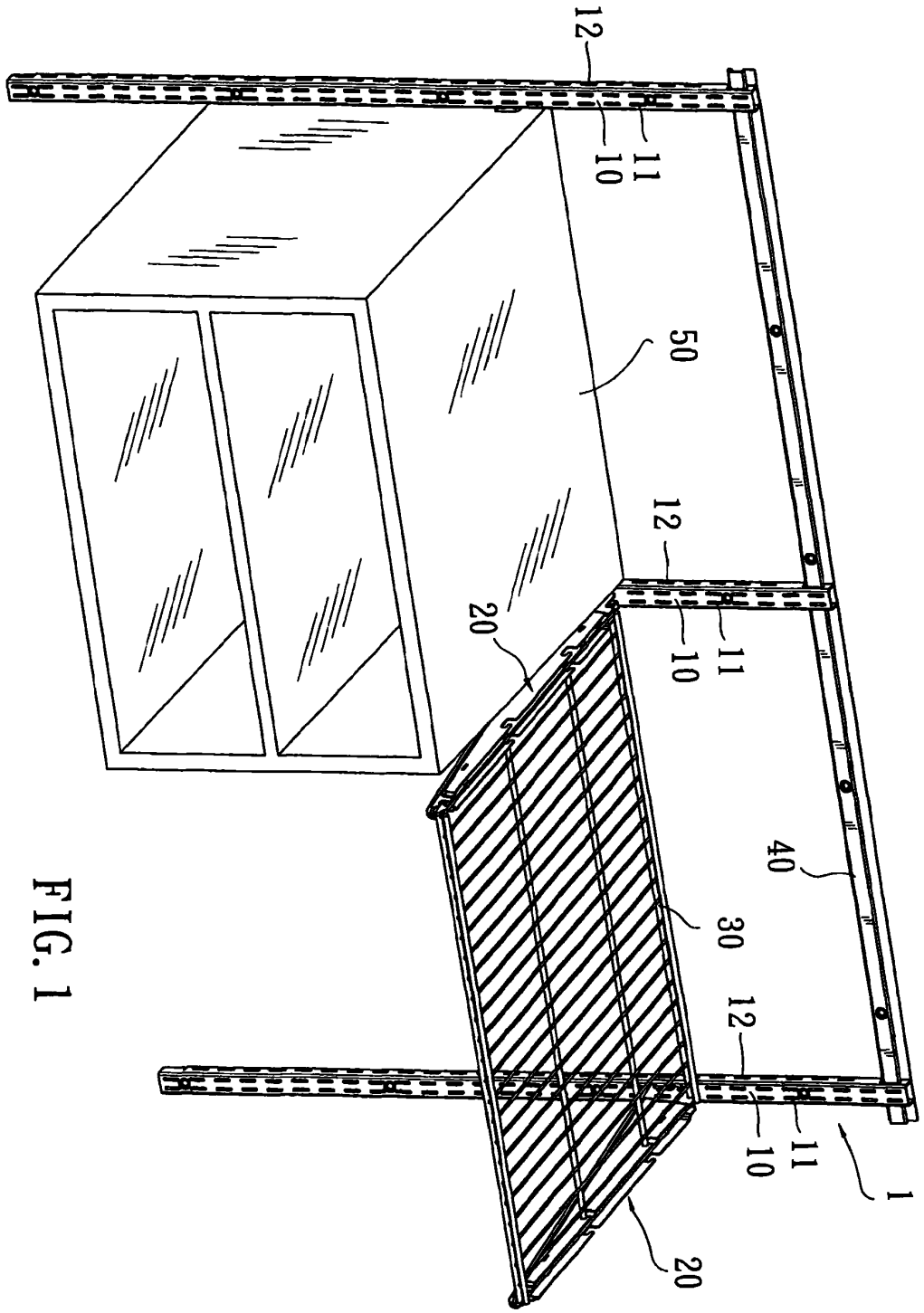


FIG. 1

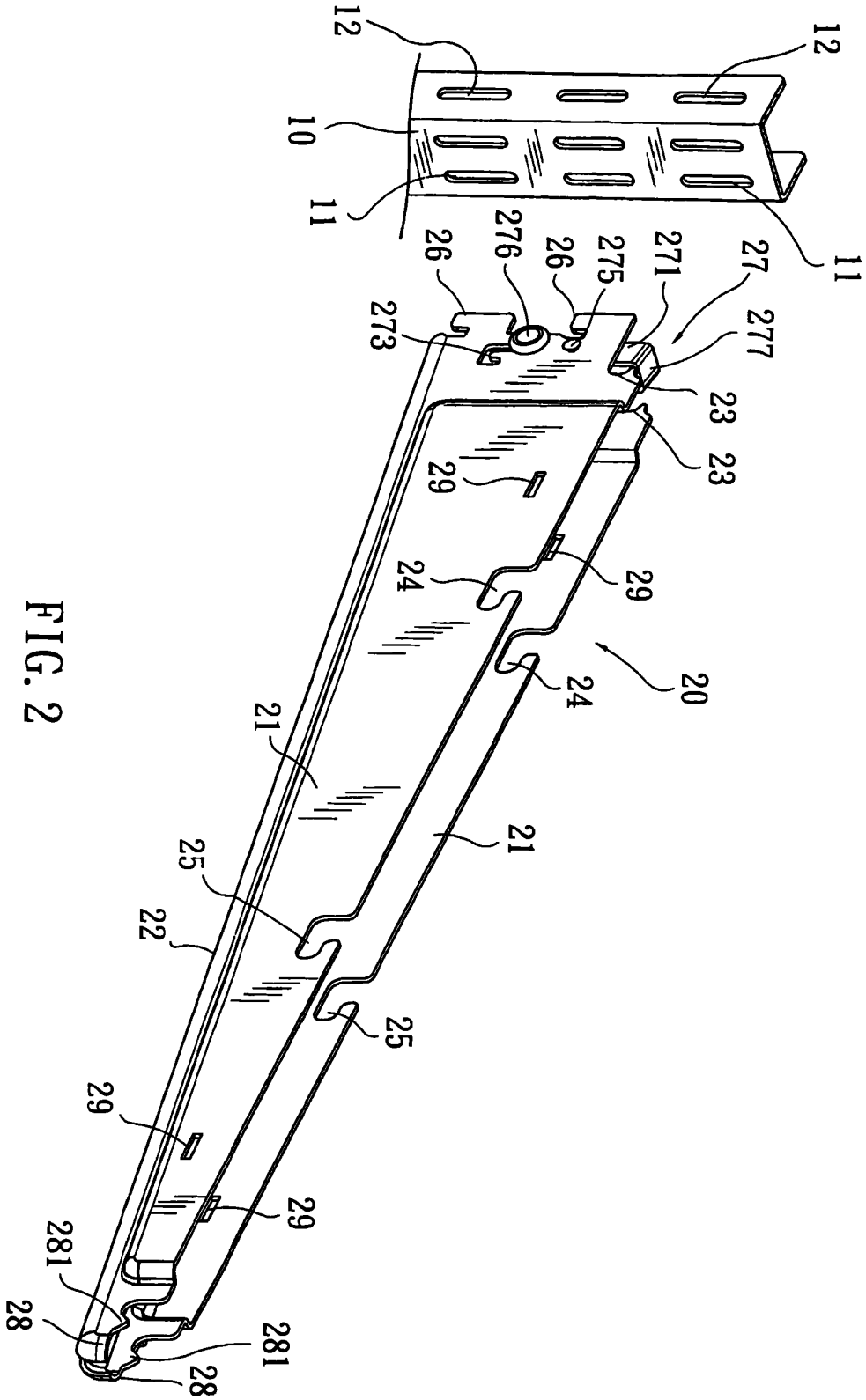

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FIG. 2

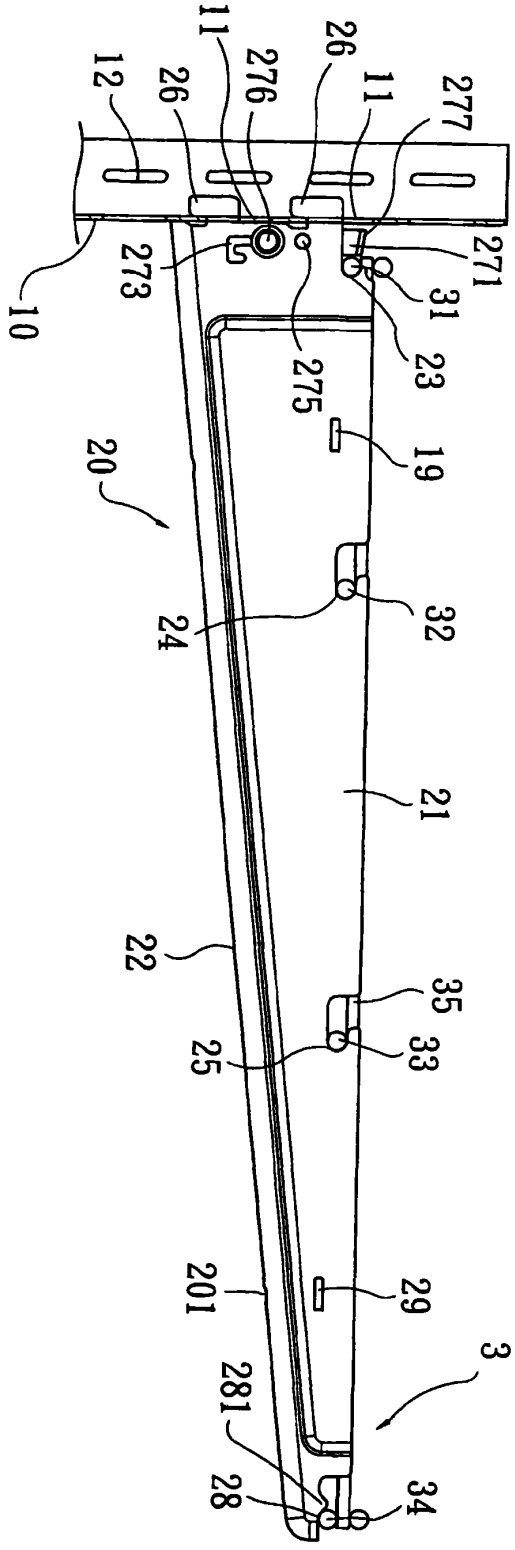

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FIG. 3

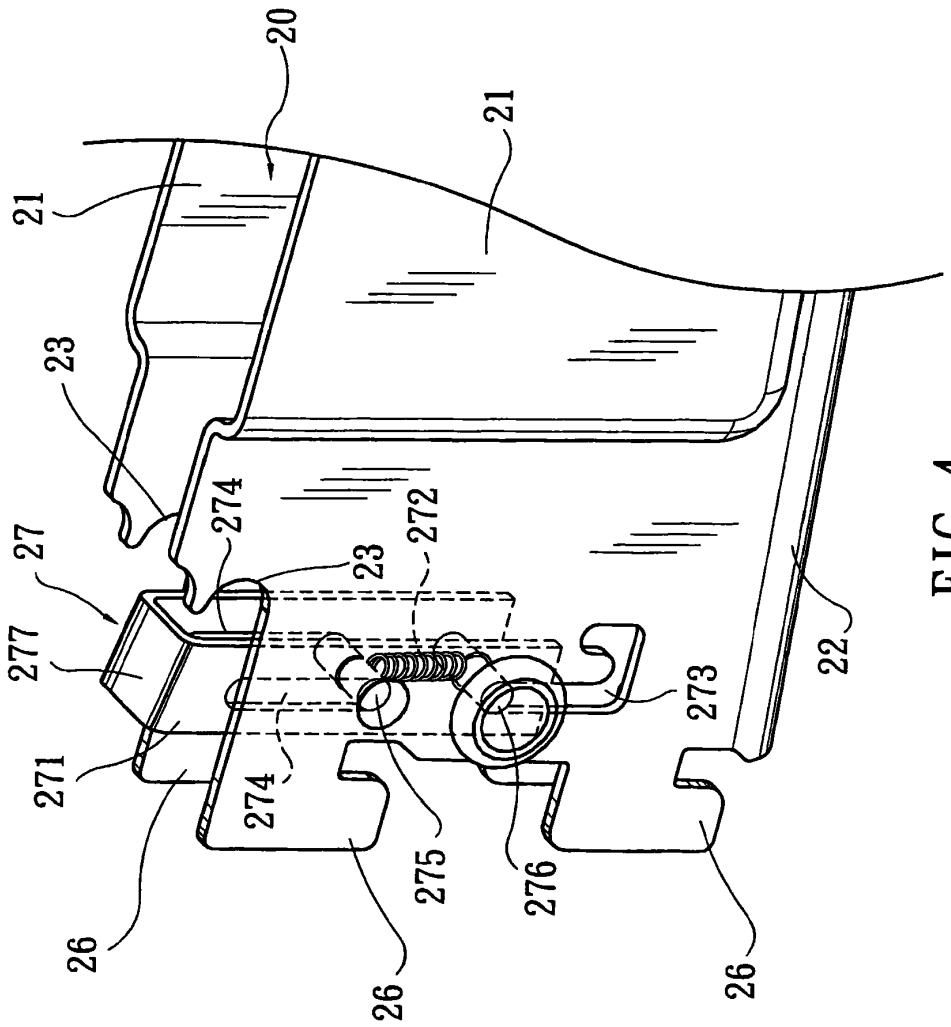


FIG. 4

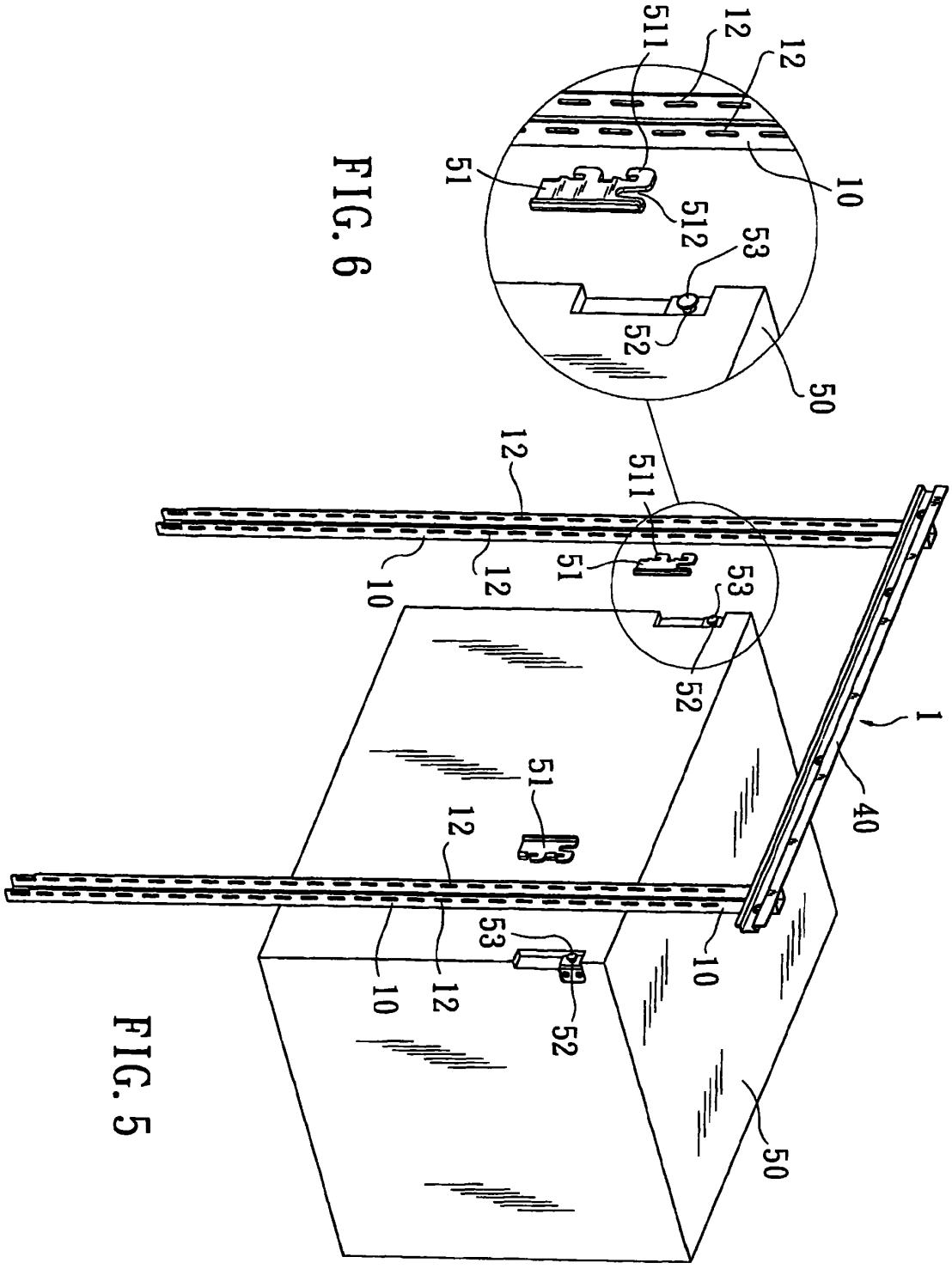

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FIG. 6

FIG. 5

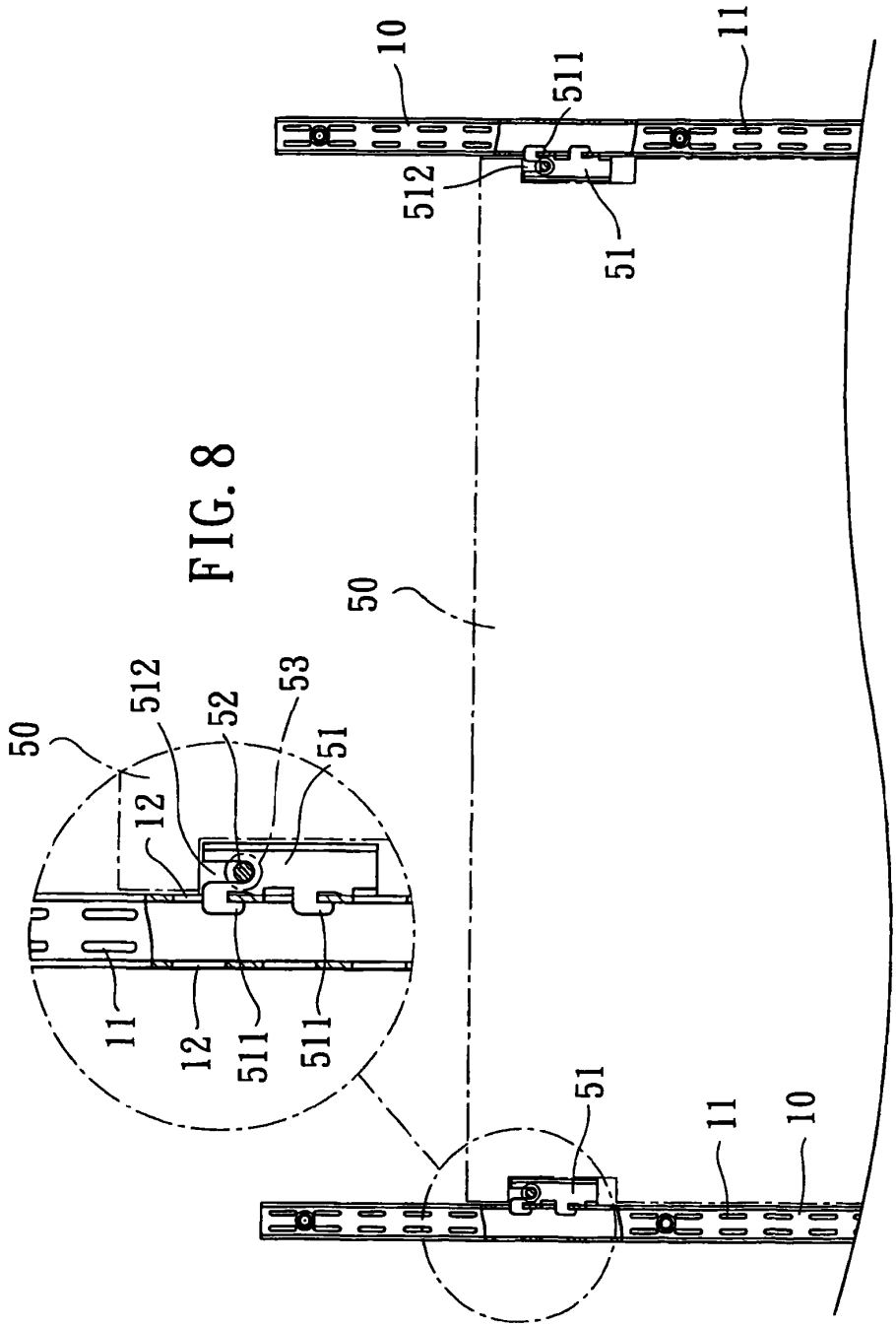


FIG. 8

FIG. 7

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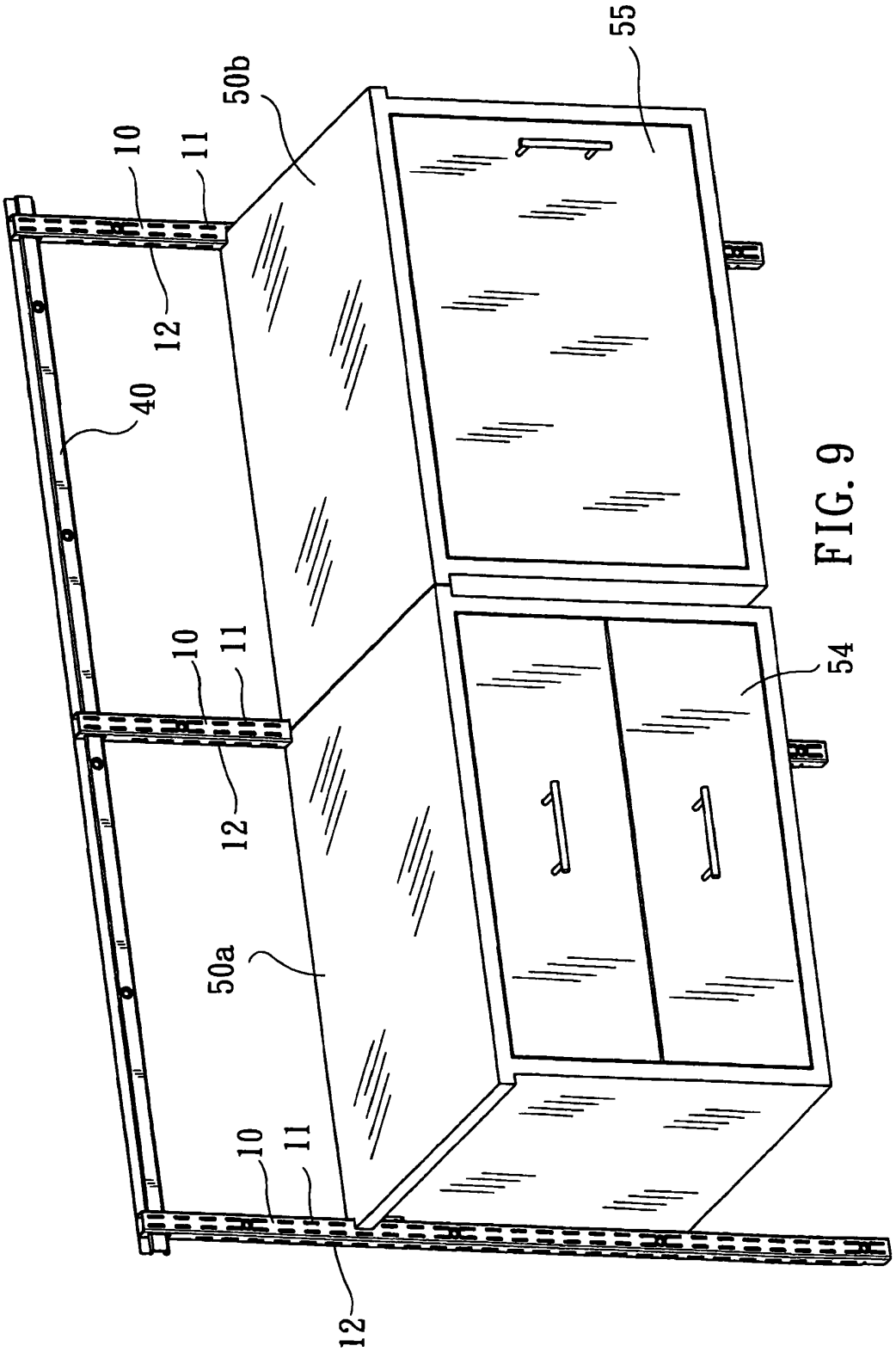


FIG. 9

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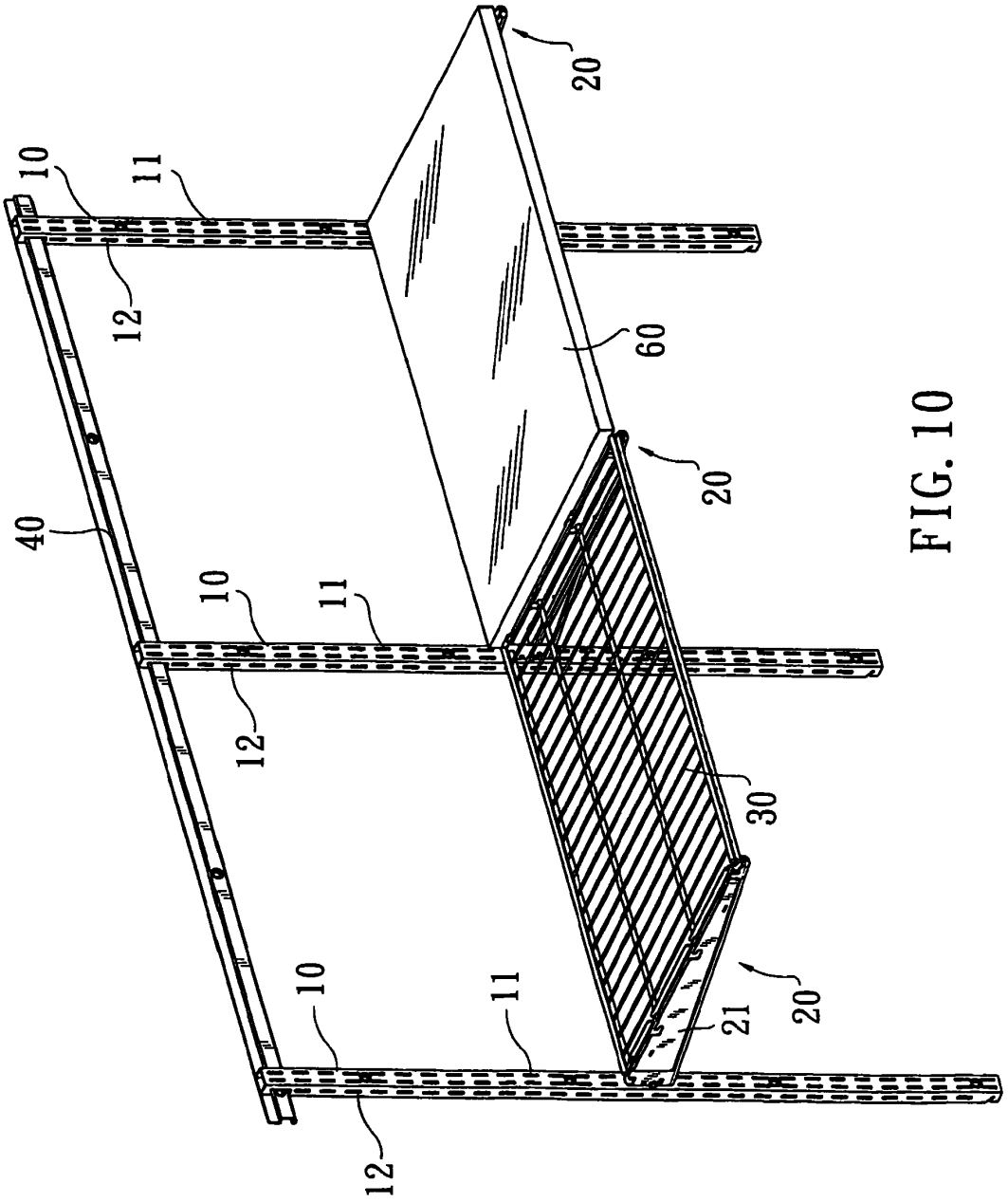


FIG. 10

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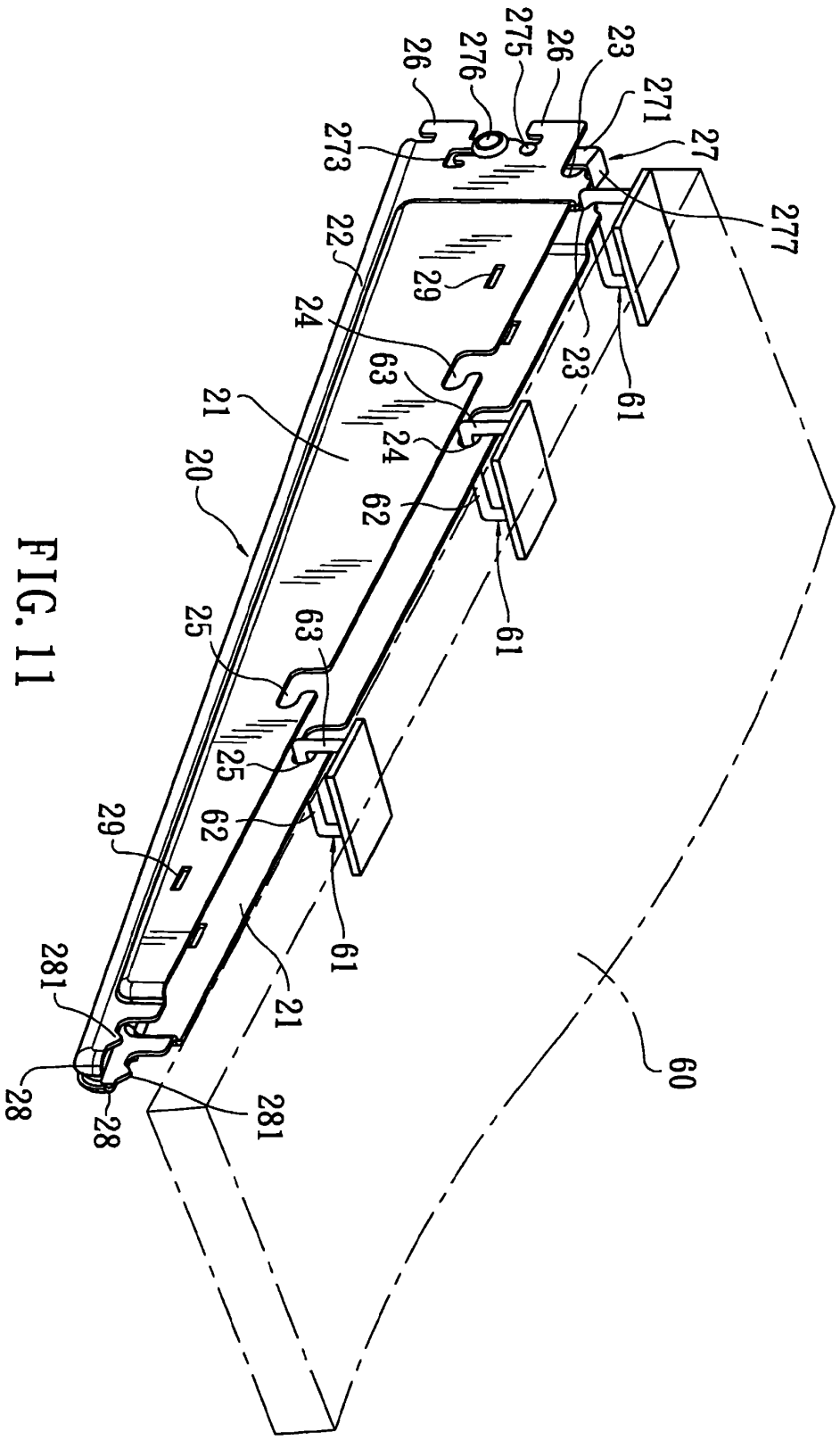

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FIG. 11

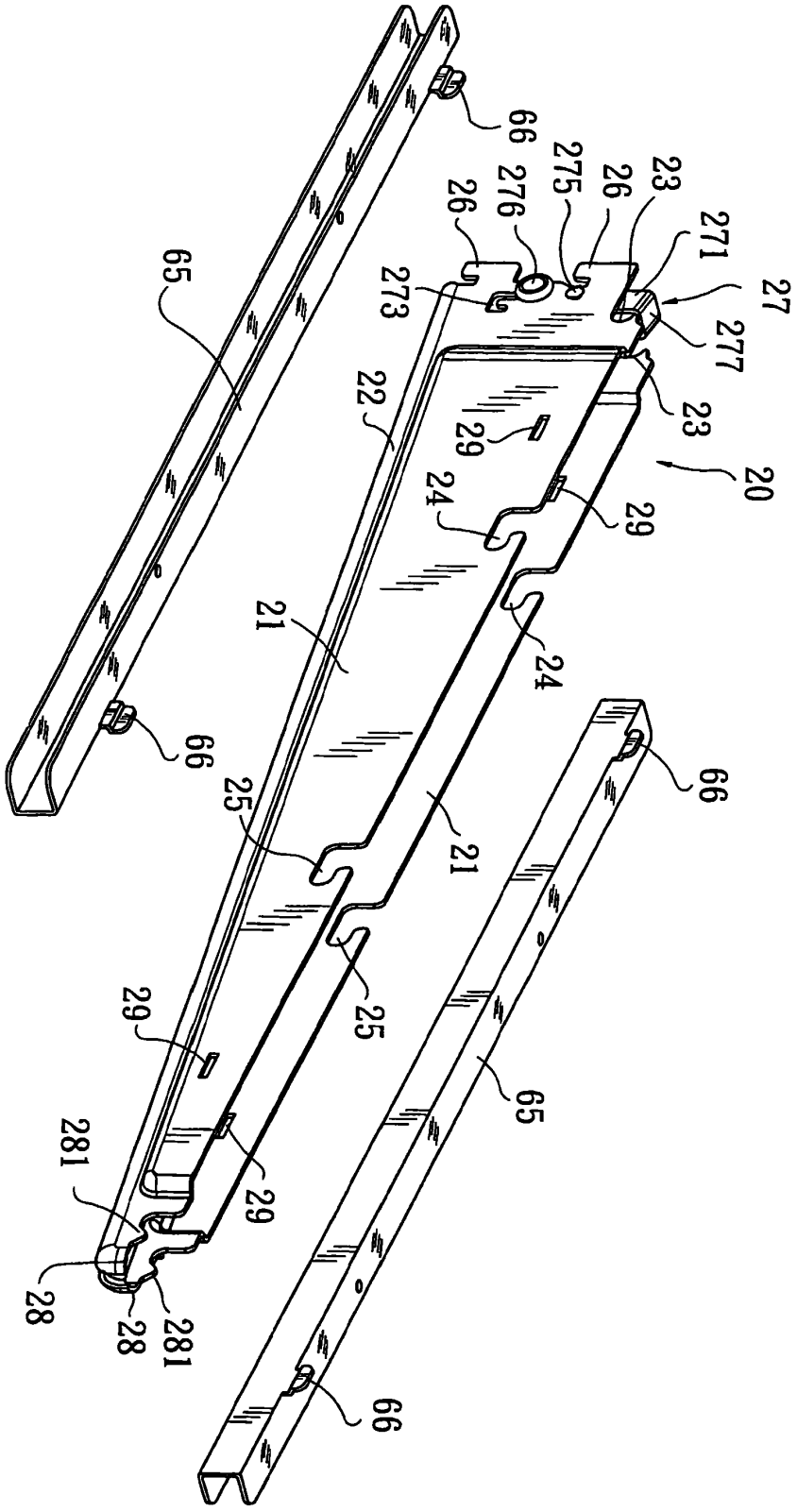


FIG. 12

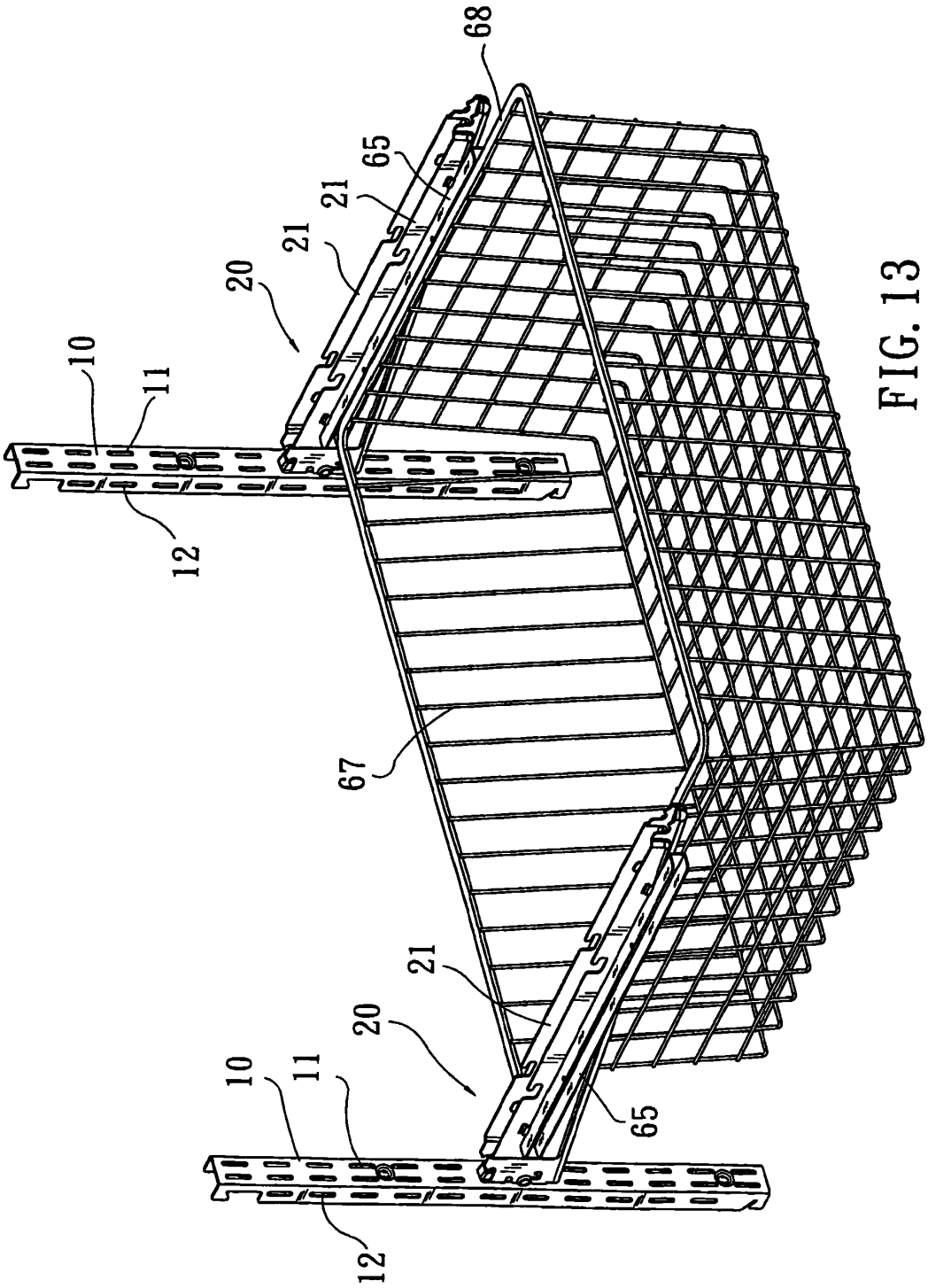


FIG. 13

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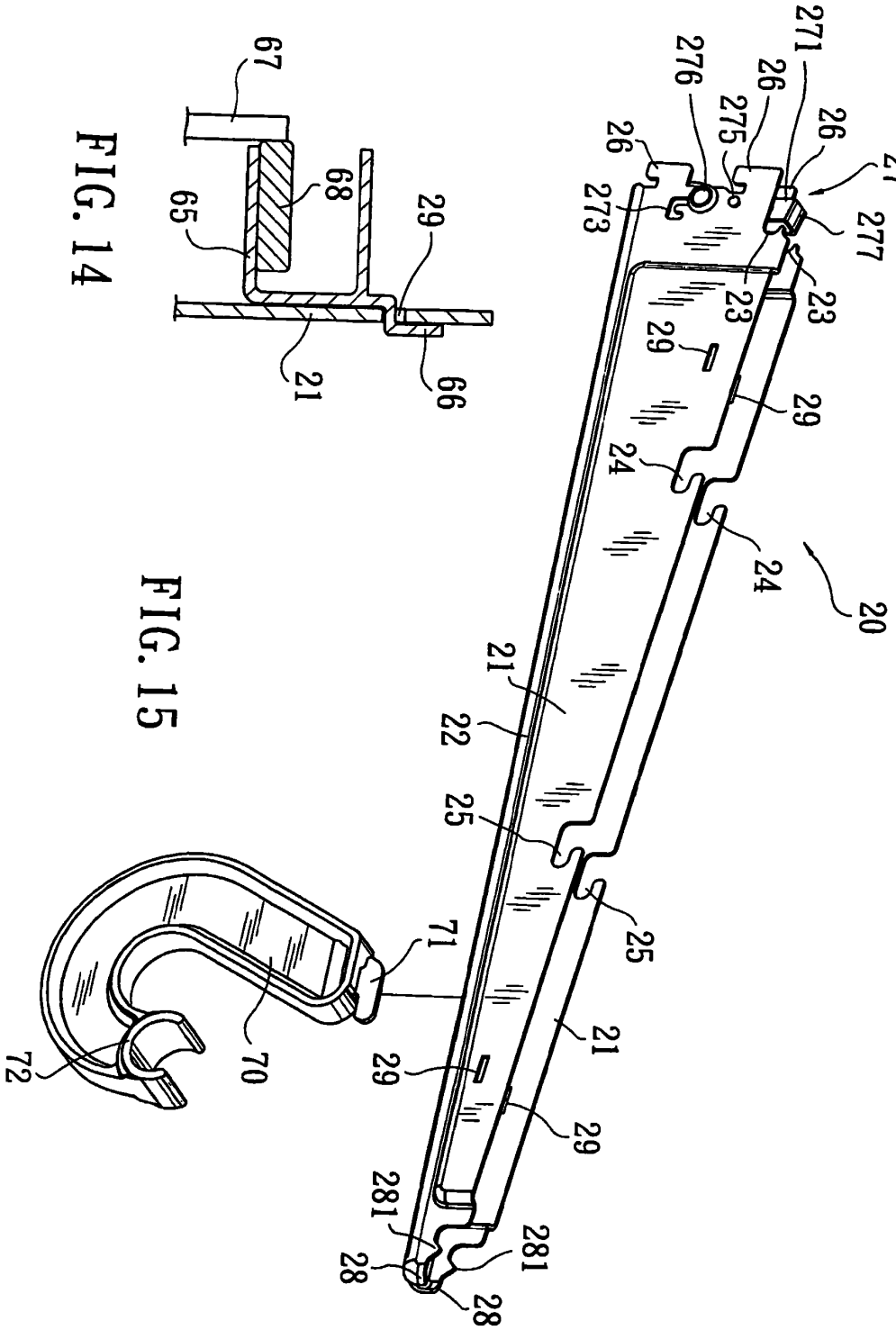

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FIG. 14

FIG. 15

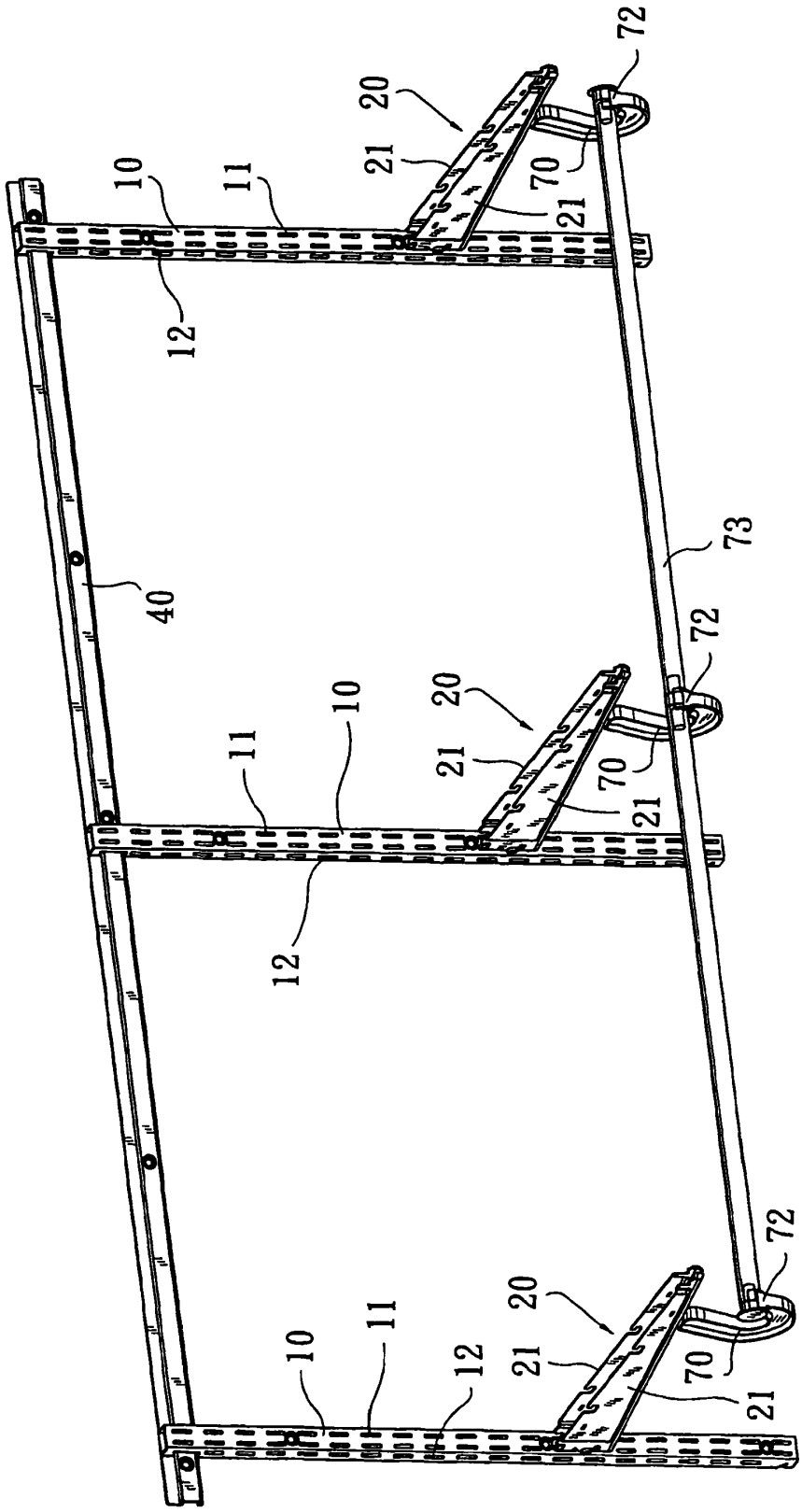


FIG. 16

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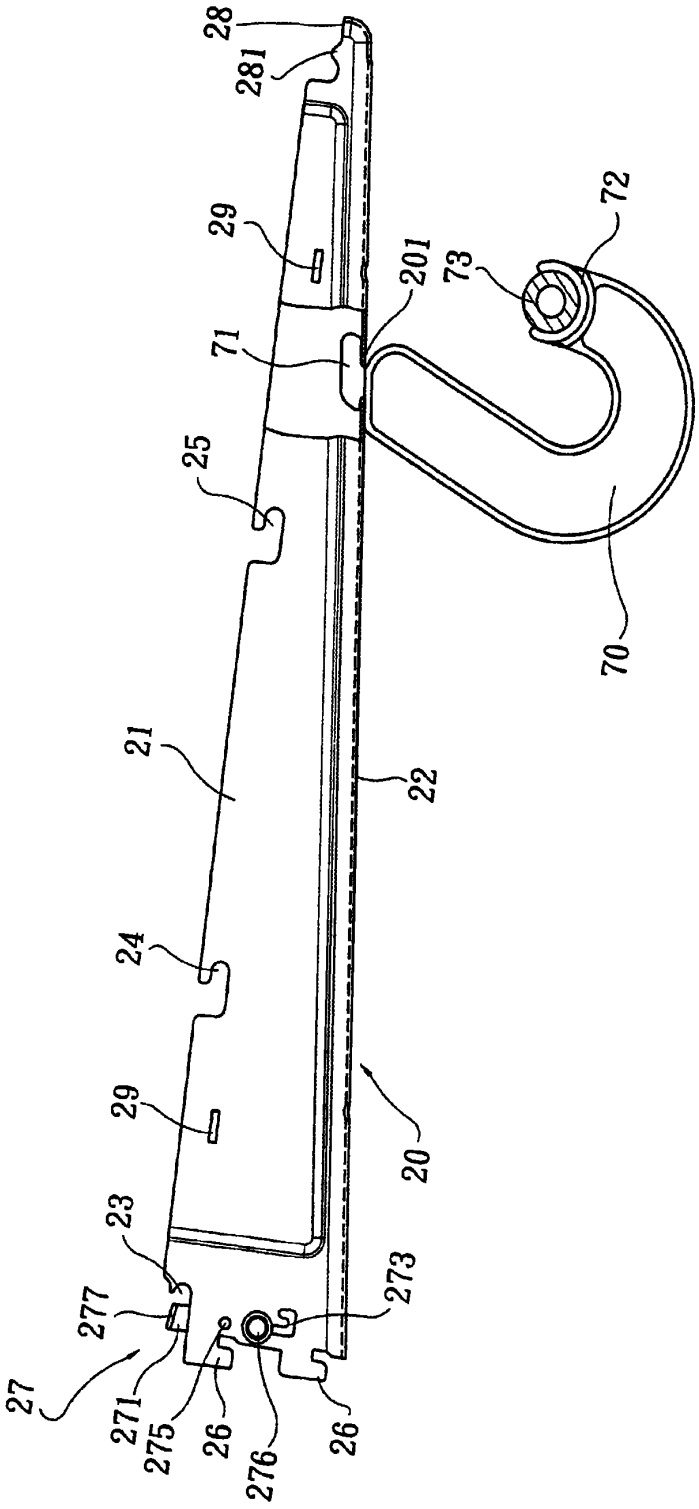

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FIG. 17

FIG. 18

FIG. 19

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MULTIPURPOSE WALL-MOUNT RACK

FIELD OF THE INVENTION

The present invention relates to a wall-mount rack, and more particularly to a multipurpose wall-mount rack that allows metal-wire shelves, board-type shelves, slide-out baskets, box-type containers, etc. to connect thereto to thereby provide complete functions for holding different things.

BACKGROUND OF THE INVENTION

A general wall-mount rack includes a horizontal crossbar and a plurality of vertical posts. The horizontal crossbar is horizontally fixed to a wall surface high from the ground or floor, and the vertical posts are hung on the crossbar to parallelly space from one another and perpendicular to the ground or floor. The vertical post is provided on a front side with a row of holes, into which one or more supporting brackets may be inserted, so that a metal-wire shelf may be supported on two horizontally corresponding supporting brackets on the rack for holding things thereon. US patent Nos. D490697, 3701325, 5110080, etc. disclose

wall-mount racks having the above-described structure.

The conventional supporting brackets for wall-mount rack are designed to support only one type of member for holding things. For example, the brackets disclosed in US Patent Nos. 3,701,325 and 6,024,333 are designed to support metal-wire shelves only. When it is desired to mount a slide-out basket, for example, on the wall-mount rack, another type of bracket is required. Moreover, the brackets disclosed in US Patent Nos. 3,701,325 and 6,024,333 are designed to support only one metal-wire shelf each. When it is desired to mount two metal-wire shelves side by side at the same height on the wall-mount rack, two brackets are required to locate between the two metal-wire shelves to separately support one of them.

When it is desired to mount a box-type container on the vertical posts, the container would occupy the holes provided on the front sides of the vertical posts. Therefore, there are not holes available on the vertical posts at the same height as the box-type container for mounting brackets to support other shelves on another side of the vertical posts.

SUMMARY OF THE INVENTION

A primary object of the present invention is to provide a multipurpose wall-mount rack, which includes a multipurpose supporting bracket adapted to support metal-wire shelves, board-type shelves, slide-out baskets, suit hanger bars, etc., so that parts for the wall-mount rack can be simplified.

Another object of the present invention is to provide a multipurpose wall-mount rack that allows a box-type container to be mounted between two adjacent vertical posts of the rack without hindering the mounting of other types of shelves or slide-out baskets to the vertical posts adjacent to the box-type container.

To achieve the above and other objects, the multipurpose wall-mount rack according to the present invention includes at least two vertical posts, at least two supporting brackets of the same configuration, and at least one shelf. Each of the vertical posts is provided on a front side with two longitudinal rows of spaced holes and on two lateral sides with one longitudinal row of spaced holes each. The two supporting brackets are separately hooked to two pairs of corresponding

holes at the same level on the front sides of the two vertical posts. The shelf is supported at two lateral sides on the two supporting brackets and thereby stably mounted on and between the two vertical posts.

The multipurpose wall-mount rack of the present invention may further include at least one box-type container and at least two hooking members. The hooking members may be hooked to two corresponding holes at the same level on two opposite inner lateral sides of the two vertical posts. The box-type container is symmetrically provided at two rear lateral ends near a top thereof with two rearward projected pins. The box-type container is hung on the two hooking members by engaging the two pins with the two hooking members and thereby stably mounted on and between the two vertical posts.

The supporting bracket included in the multipurpose wall-mount rack of the present invention may have at least one rail connected to one of two side walls thereof for supporting one lateral wall of a slide-out basket on the rail.

The supporting bracket included in the multipurpose

wall-mount rack of the present invention may have a supporting hook connected to a lower side thereof, so that a suit hanger bar may be transversely supported on two such supporting hooks hung from two adjacent supporting brackets for holding suit hangers thereon.

BRIEF DESCRIPTION OF THE DRAWINGS

The structure and the technical means adopted by the present invention to achieve the above and other objects can be best understood by referring to the following detailed description of the preferred embodiments and the accompanying drawings, wherein

Fig. 1 is an assembled front perspective view of a multipurpose wall-mount rack according to a first embodiment of the present invention;

Fig. 2 is an exploded perspective view showing a vertical post and a supporting bracket adopted in the multipurpose wall-mount rack of the present invention;

Fig. 3 is a left side view of the supporting bracket shown in Fig. 2;

Fig. 4 is a fragmentary and enlarged perspective view of the supporting bracket;

Fig. 5 is an exploded rear perspective view showing the mounting of a box-type container to two vertical posts of the multipurpose wall-mount rack shown in Fig. 1;

Fig. 6 is an enlarged view of the circled area in Fig. 5;

Fig. 7 is a partially sectioned view showing the mounting of the box-type container to the vertical posts;

Fig. 8 is an enlarged view of the circled area in Fig. 7;

Fig. 9 is an assembled front perspective view showing differently configured box-type containers are mounted to vertical posts of the multipurpose wall-mount rack of the present invention;

Fig. 10 is an assembled front perspective view of a multipurpose wall-mount rack according to a second embodiment of the present invention;

Fig. 11 shows the connection of a board-type shelf to the supporting bracket in the second embodiment of the present invention shown in Fig. 10;

Fig. 12 is an exploded perspective view showing one supporting bracket and two rails for connecting to two lateral sides of the supporting bracket;

Fig. 13 is an assembled front perspective view showing the use of multiple supporting brackets and rails of Fig. 12 to support a slide-out basket on the multipurpose wall-mount rack of the present invention;

Fig. 14 is a sectional view showing the mounting of the slide-out basket on the rail;

Fig. 15 is an exploded perspective view showing the supporting bracket and a supporting hook for connecting to a lower side of the supporting bracket;

Fig. 16 is an assembled front perspective view showing the use of multiple supporting brackets and supporting hooks of Fig. 15 to support a suit hanger bar thereon;

Fig. 17 is a sectional view showing the manner in which a suit hanger bar is supported on the supporting bracket and the supporting hook of the multipurpose wall-mount rack of the present invention;

Fig. 18 is an exploded front perspective view showing the connection of two vertical posts for the multipurpose wall-mount rack of the present invention; and

Fig. 19 is an assembled sectioned side view of Fig. 18.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Please refer to Fig. 1. A multipurpose wall-mount rack 1 according to a first embodiment of the present invention includes a horizontal bar 40, at least two vertical posts 10, at least two supporting brackets 20, and at least one metal-wire shelf 30. The supporting brackets 20 are mounted on the vertical posts 10 to support the metal-wire shelf 30 thereon, so that a basic form of the multipurpose wall-mount rack 1 is provided.

Each of the vertical posts 10 is a U-sectioned post defining a front side, two lateral sides, and a rear open side. Two longitudinal rows of spaced holes 11 are formed on the front side and one longitudinal row of space holes 12 are correspondingly formed on each lateral side of the vertical post 10. The vertical posts 10 are fixed to a wall surface with the rear open side facing toward the wall surface. Moreover, the vertical posts 10 are mounted to the wall surface with a predetermined fixed distance left between them.

The two vertical posts 10 are connected at an upper end to the horizontal crossbar 40, so that the vertical posts 10 are parallel to each other and perpendicular to the ground or floor, and two holes 11 or 12 correspondingly formed on the two vertical posts 10 are at the same level. Since this is a known skill, it is not described in details herein.

Please refer to Figs. 2 and 3. Each of the supporting brackets 20 includes two side walls 21 and an elongate bottom wall 22 extended between and connected to lower edges of the two side walls 21. The two side walls 21 are parallel to each other and have a horizontal or near horizontal top edge each. The two side walls 21

are correspondingly provided on the top edges with a plurality of retaining slots 23, 24, 25. The metal-wire shelf 30 includes a plurality of transverse metal bars 31, 32, 33. The metal-wire shelf 30 is stably supported on and between two adjacent supporting brackets 20 by disposing two lateral ends of the transverse metal bars 31, 32, 33 in the retaining slots 23, 24, 25 on two inner side walls 21 of the two adjacent supporting brackets 20. Since each of the two side walls 21 of one supporting bracket 20 may hold one metal-wire shelf 30 thereto, two metal wire shelves 30 may be supported on one supporting bracket 20 at two opposite lateral sides thereof.

The two side walls 21 of the supporting bracket 20 are provided at respective rear end with two vertically spaced hooks 26. The hooks 26 at the rear ends of the two side walls 21 may be extended into and hooked to the holes 11 on the front side of the vertical post 10, so as to hold the supporting bracket 20 to the multipurpose wall-mount rack 1. When the supporting bracket 20 has been fully assembled to the vertical post 10 of the wall-mount rack 1, the top edges of the two side walls 21 are in or close to a horizontal position. The retaining slots 23, 24, 25 on each of the two side

walls 21 of the supporting bracket 20 are adapted to receive one lateral end of the transverse metal bars 31, 32, 33, respectively, of the metal-wire shelf 30, so that the metal wire shelf 30 can be supported on two supporting brackets 20, and each supporting bracket 20 is able to support two metal-wire shelves 30 at two opposite lateral sides thereof.

An elastic stopper 27 is disposed on the supporting bracket 20 behind the two rearmost retaining slots 23 on the side walls 21, so as to normally block two rearward openings of the two rearmost retaining slots 23 and prevent the transverse metal bars 31 of the metal-wire shelves 30 from moving out of the retaining slots 23.

The rearmost retaining slots 23 on the side walls 21 of the supporting bracket 20 have a rearward opening each. The elastic stopper 27 is disposed at a position adapted to block the rearward openings of the retaining slots 23, so as to stop the metal bars 31 of the metal-wire shelves 30 received in the retaining slots 23 from moving out of the retaining slots 23 via the rearward openings thereof.

The metal-wire shelf 30 is formed by welding intersected

metal wires together, and includes a plurality of transverse metal bars 31, 32, 33, 34, which are parallel to one another, and are connected at respective two lateral ends to two longitudinal metal bars 35. The transverse metal bars 31 and 34 respectively form a rear and a front edge of the metal-wire shelf 30, and the longitudinal metal bars 35 form two lateral edges of the metal-wire shelf 30. When one lateral end of the transverse metal bars 31, 32, 33 of the metal-wire shelf 30 are sequentially received in the retaining slots 23, 24, 25 on one side wall 21 of the supporting bracket 20, the longitudinal metal bar 35 corresponding to that end of the metal bars 31, 32, 33 is pressed against an inner surface of that side wall 21, preventing the metal wire shelf 30 from sidewardly separating from the supporting bracket 20.

Please refer to Fig. 4. The elastic stopper 27 includes a reversed U-shaped member 271, and an elastic element 272. The elastic element 272 normally pushes the reversed U-shaped member 271 upward to an elevated position just behind the retaining slots 23 to block the latter. A first rivet 275 immovably fixed on the supporting bracket 20 is extended into a long slot 274 vertically formed on the reversed U-shaped member 271.

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A second rivet 276 immovably fixed to the reversed U-shaped member 271 is extended into an L-shaped guide slot 273 formed on the supporting bracket 20, so that the reversed U-shaped member 271 may be moved upward and downward in the L-shaped guide slot 273 via the second rivet 276. The elastic element 272 is connected at two ends to the first and the second rivet 275, 276, such that the reversed U-shaped member 271 may be automatically restored to the elevated position via the elastic element 272.

A top 277 of the reversed U-shaped member 271 is a slightly forward and downward inclined surface. When an end of the transverse metal bar 31 of the metal-wire shelf 30 is pressed against the top 277 of the reversed U-shaped member 271, the metal bar 31 is brought to move forward along the inclined top 277 while presses the whole reversed U-shaped member 17a downward due to the weight of the metal-wire shelf 30, and then automatically moves into the retaining slot 23. At this point, the reversed U-shaped member 271 is automatically elevated by the elastic element 272 to block the rearward opening of the retaining slot 23 again and locate behind the metal bar 31. Meanwhile, the ends of the transverse metal bars 32, 33 of the

metal-wire shelf 30 correspondingly sink into the retaining slots 24, 25 on the supporting bracket 20, making one lateral side of the metal-wire shelf 30 stably held to and supported on the supporting bracket 20. When the two lateral sides of one metal-wire shelf 30 are separately held to and supported on two adjacent supporting brackets 20, the metal-wire shelf 30 is assembled to the wall-mount rack 1 for use. When it is desired to dismount the metal-wire shelf 30 from the rack 1, simply move the reversed U-shaped member 271 downward with the second rivet 276 located in a lower end of the L-shaped guide slot 273. At this point, the reversed U-shaped member 271 is held to a lowered position, and the transverse metal bar 31 of the metal-wire shelf 30 can be removed from the retaining slot 23 to dismount the metal wire shelf 30 from the wall-mount rack 1.

The retaining slots 24, 25 on the side walls 21 of the supporting bracket 20 are L-shaped slots having an open-topped vertical section and a lower horizontal section. The transverse metal bars 32, 33 of the metal-wire shelf 30 enter the L-shaped retaining slots 24, 25 via the open-topped vertical section thereof. When the metal-wire shelf 30 is further pushed forward,

the metal bars 32, 33 are moved into the lower horizontal section of the retaining slots 24, 25 to restrict the metal-wire shelf 30 from moving upward.

A front end 28 of each of the side walls 21 of the supporting bracket 20 is adapted to support the front transverse metal bar 34 of the metal-wire shelf 30. A protrusion 281 is formed closely behind the front end 28 to stop the metal bar 34 from moving rearward, so that the metal-wire shelf 30 assembled to the wall-mount rack 1 is stably located in place.

Please refer to Figs. 5 and 6. The multipurpose wall-mount rack 1 of the present invention may further include at least one box-type container 50, and at least two hooking members 51. The hooking member 51 is a flat member and is formed at an outer side with at least one downward extended hook portion 511 and at a top with an open-topped slot 512. The two hooking members 51 are hung on the two vertical posts 10 by separately extending the hook portions 511 thereof into two sets of holes 12 at the same height on two opposite inner lateral sides of the two vertical posts 10, as shown in Figs. 7 and 8.

The box-type container 50 includes a square case defining an inner space for holding things therein. As can be seen from Fig. 5, the box-type container 50 is symmetrically provided at two rear lateral ends near a top thereof with two rearward projected pins 52. Each of the pins 52 has a free end formed into a diametrically expanded head 53, and the head 53 has an outer diameter larger than a width of the open-topped slot 512 on the hooking member 51. The box-type container 50 is mounted to the two vertical posts 10 by resting the two pins 52 in the slots 512 of the two hooking members 51 with the expanded heads 53 located behind the slots 512, as shown in Figs. 7 and 8.

The box-type container 50 has an overall width slightly smaller than and very close to the distance between the two vertical posts 10, so that the container 50 could be stably mounted on and between the two vertical posts 10 with the two opposite inner lateral sides of the two vertical posts 10 fitly bearing against two lateral sides of the box-type container 50.

In the first embodiment of the present invention as shown in Fig. 1, the inner space of the box-type container 50 is divided into two compartments. In a second

embodiment of the present invention as shown in Fig. 9, the multipurpose wall-mount rack 1 includes a box-type container 50a having a plurality of drawers 54, and another box-type container 50b provided with a front door 55. Since there is a wide choice of box-type containers 50, 50a, 50b providing different spatial designs, the wall-mount rack 1 of the present invention is more convenient and practical for use.

When the box-type container 50 is mounted on the rack 1, only the holes 12 at the inner lateral sides of the two vertical posts 10 are occupied. The holes 11 on the front sides of the vertical posts 10 at the same height of the container 50 are still available for the supporting brackets 20 to connect thereto for supporting other metal-wire shelves 30, as shown in Fig. 1.

Fig. 10 shows the use of the supporting brackets 20 of the present invention to support a board-type shelf 60 thereon. Please also refer to Fig. 11. The board-type shelf 60 is provided along each lateral side of a lower bottom surface with three U-shaped metal bars 61 corresponding to the retaining slots 23, 24, 25 on the side walls 21 of the supporting bracket 20.

The U-shaped metal bar 61 includes a horizontal bottom section 62 that is extended in a direction perpendicular to that of the retaining slots 23, 24, 25, and two vertical side sections 63. When the board-type shelf 60 has been mounted to the supporting bracket 20 with the U-shaped metal bars 61 received in the retaining slots 23, 24, 25, outer ones of the vertical side sections 63 of the U-shaped metal bars 61 are pressed against the inner surface of the side wall 21 to stably hold the board-type shelf 60 to the supporting bracket 20 for use.

Please refer to Figs. 12, 13, and 14. The supporting bracket 20 may have a rail 65 externally connected to either side wall 21 for supporting a slide-out basket 67 thereon. The two side walls 21 of the supporting bracket 20 are correspondingly provided with a rear and a front insertion hole 29 each. The rail 65 is provided at predetermined positions with two L-shaped hook tabs 66 corresponding to the rear and front insertion holes 29 on the side walls 21. The rail 65 may be connected to the supporting bracket 20 simply by inserting the two L-shaped tabs 66 into the two insertion holes 29. The slide-out basket 67 may be supported on and between two rails 65 connected to two

adjacent supporting brackets 20. The slide-out basket 67 is provided at the tops of two lateral side walls with two outward extended portions 68, which are slidably rested on the two rails 65 to thereby hold the slide-out basket 67 to the rails 65.

Please refer to Figs. 15, 16, and 17. The supporting bracket 20 may further have a supporting hook 70 connected to a lower side thereof. For this purpose, the elongated bottom wall 22 of the supporting bracket 20 is provided at a predetermined position with a longitudinally extended narrow slot 201. The supporting hook 70 is provided at a top with an upward projected tab 71, which is extended in the same direction as that of the elongated bottom wall 22, and is connected only at a near middle portion to the top of the supporting hook 70, so that a front and a rear portion of the tab 71 are longitudinally projected from the near middle portion; and at a lower free end formed with a supporting recess 72. The tab 71 has an overall length longer than that of the narrow slot 201. The supporting hook 70 is connected to the lower side of the supporting bracket 20 by extending the front or the rear portion of the tab 71 through the narrow slot 201 first, and then shifting the tab 71 to one end of the narrow slot 201

to allow extending of the other end portion of the tab 71 into the narrow slot 201, and then, the supporting hook 70 is moved for the two end portions of the tab 71 to rest on an inner side of the narrow slot 201. A suit hanger bar 73 may be horizontally rested on the supporting recesses 72 of at least two supporting hooks 70 for holding a plurality of suit hangers (not shown) thereon. Even with the supporting hook 70 provided on the supporting bracket 20, the supporting bracket 20 may still be used to support a metal-wire shelf 30 or a flat board-type shelf 60 thereon.

Please refer to Figs. 18 and 19. Each of the vertical posts 10 is provided at a lower end with two horizontal narrow slits 13 correspondingly formed on the two lateral sides of the vertical post 10, and a receded section 14 immediately below each of the horizontal slits 13. Two aligned vertical posts 10 could be connected end to end by engaging the horizontal slits 13 with a separate coupling bracket 80 to create an increased overall length for the vertical post of the wall-mount rack 1.

The coupling bracket 80 includes an upper and a lower horizontal end wall 81, 82, and is provided at two lateral

edges of a lower half with a forward extended side wall 83 each. All the end walls 81, 82 and the side walls 83 are extended forward. The receded sections 14 below the slits 13 of the vertical post 10 have a depth slightly larger than a material thickness of the coupling bracket 80. It is noted a lower one of the two aligned vertical posts 10 is in an inverted position, and the upper one of the two aligned vertical posts 10 is fixed to a wall surface prior to connecting with the lower vertical post 10. To connect the lower vertical post 10 to the upper one, which has already been fixed to the wall surface, first sidewardly slide the coupling bracket 80 into a gap between the wall surface and the receded sections 14 at the lower end of the upper vertical post 10, so that the horizontal upper end wall 81 of the coupling bracket 80 is located in the horizontal slits 13 of the upper vertical post 10. Then, align the horizontal slits 13 of the lower vertical post 10 with the horizontal lower end wall 82 of the coupling bracket 80, so that the lower vertical post 10 is correctly located below and aligned with the upper vertical post 10. Finally, fix the lower vertical post 10 to the wall surface. At this point, the two forward extended side walls 83 of the coupling bracket 80 are pressed against inner surfaces of the two lateral sides of the lower

vertical post 10. Since the vertical post 10 is fixed to the wall surface in a known manner, it is not described in details herein.

The multipurpose wall-mount rack according to the present invention needs only one type of supporting bracket that may be used to selectively support any one of a shelf, a slide-out basket, and a suit hanger bar. Therefore, the supporting brackets used with the multipurpose wall-mount rack of the present invention are simplified. Moreover, the provision of holes on two lateral sides of the vertical posts allows the mounting of a box-type container to and between two adjacent vertical posts, allowing the wall-mount rack to have more functions.

What is claimed is:

1. A multipurpose wall-mount rack, comprising at least two vertical posts, at least two supporting brackets, and at least one shelf;

each of the vertical posts being a U-sectioned post defining a front side, two lateral sides, and a rear open side; two longitudinal rows of spaced holes being formed on the front side and one longitudinal row of space holes being correspondingly formed on each lateral side of the vertical post; and the vertical posts being fixed to a wall surface with the rear open side facing toward the wall surface;

each of the supporting brackets being provided at a rear end with two pairs of vertically spaced hooks for extending into and hooking to the holes on the front side of the vertical post, such that the two supporting brackets may be mounted to the two vertical posts at the same height; the supporting bracket including two side walls and an elongate bottom wall extended between and connected to lower edges of the two side walls; the two side walls being correspondingly provided on respective top edge with

a plurality of retaining slots; and an elastic stopper being disposed at the rear end of the supporting bracket so as to block two rearmost ones of the retaining slots on the two side walls; and

the shelf including at least two transverse metal bars, which are located on the shelf corresponding to the retaining slots on the side walls of the supporting bracket; the shelf being fixedly supported on and between the two supporting brackets by correspondingly disposing two lateral ends of the transverse metal bars in the retaining slots on two inner ones of the side walls of the two supporting brackets; and the transverse metal bars disposed in the rearmost ones of the retaining slots on the two supporting brackets being stopped by the elastic stoppers from moving out of the rearmost retaining slots.

2. The multipurpose wall-mount rack as claimed in claim 1, further comprising at least one box-type container and at least two hooking members; the box-type container being a square case having an overall width slightly smaller and very close to a distance left between the two vertical posts, and

being symmetrically provided at two rear lateral ends near a top thereof with two rearward projected pins, each of which has a free end formed into a diametrically expanded head; and each of the hooking members being a flat member that is formed at an outer side with at least one downward extended hook portion and at a top with an open-topped slot; and

the two hooking members being hung on the two vertical posts by separately extending the hook portion thereof into two holes at the same height on two opposite inner lateral sides of the two vertical posts; and

the box-type container being mounted to the two vertical posts by resting the two pins in the slots of the two hooking members with the expanded heads located behind the slots.

3. The multipurpose wall-mount rack as claimed in claim 1, wherein the two rearmost retaining slots on the two side walls of the supporting bracket have a rearward opening each.

4. The multipurpose wall-mount rack as claimed in claim

1, wherein the elastic stopper includes a reversed U-shaped member and an elastic element, and is movable upward and downward along a guide slot; and the elastic element normally pushes the reversed U-shaped member to an elevated position to locate behind and close the rearmost retaining slots on the supporting bracket.

5. The multipurpose wall-mount rack as claimed in claim 4, wherein the reversed U-shaped member has a top defining a slightly forward and downward inclined surface.

6. The multipurpose wall-mount rack as claimed in claim 1, wherein the shelf is a metal-wire shelf including a plurality of parallelly arranged transverse metal bars and two longitudinal metal bars separately perpendicularly connected to two lateral ends of the transverse metal bars; and the two lateral ends of the transverse metal bars being located corresponding to and disposed in the retaining slots to be perpendicular to the supporting brackets.

7. The multipurpose wall-mount rack as claimed in claim 1, wherein the shelf is a board-type shelf being

provided along each lateral side of a lower bottom surface with a plurality of U-shaped metal bars corresponding to the retaining slots on the side walls of the supporting bracket; the U-shaped metal bar including a horizontal bottom section that is extended in a direction perpendicular to that of the retaining slots, and two vertical side sections; and outer ones of the vertical side sections of the U-shaped metal bars being pressed against the inner surface of the side wall when the board-type shelf has been mounted to the supporting bracket with the U-shaped metal bars received in the retaining slots.

8. The multipurpose wall-mount rack as claimed in claim 1, wherein at least one of the plurality of retaining slots on the supporting bracket is an L-shaped retaining slot.

9. The multipurpose wall-mount rack as claimed in claim 1, further comprising at least one slide-out basket and at least two rails; each of the two rails being provided at predetermined positions with two L-shaped hook tabs, and each of the two side walls of the supporting bracket being correspondingly provided with a rear and a front insertion hole for

the L-shaped hook tabs to insert thereinto, such that the rail is connected to the supporting bracket; and the slide-out basket being provided at tops of two lateral side walls thereof with two outward extended portions, which are slidably rested on the two rails connected to two inner ones of the side walls of two adjacent supporting brackets.

10. The multipurpose wall-mount rack as claimed in claim 1, further comprising at least one suit hanger bar and at least two supporting hooks; each of the supporting hooks being provided at a lower free end with a supporting recess, on which the suit hanger bar is supported, and at a top with an upward projected tab, which is extended in the same direction as that of the elongated bottom wall of the supporting bracket; and wherein the elongated bottom wall of the supporting bracket is provided at a predetermined position with a longitudinally extended narrow slot, into which the upward projected tab on the supporting hook is extended to thereby connect the supporting hook to a lower side of the supporting bracket.

11. The multipurpose wall-mount rack as claimed in claim

10, wherein the upward projected tab on the top of the supporting hook is connected only at a near middle portion to the top of the supporting hook, so that a front and a rear portion of the tab are longitudinally projected from the near middle portion; and the tab has an overall length longer than that of the narrow slot provided on the elongated bottom wall of the supporting bracket.

UK Intellectual Property Office

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Application No:	GB0711098.4	**Examiner:**	Mr Hal Young
Claims searched:	1-11	**Date of search:**	27 July 2007

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A		GB2144974 A (GUILLAUMOND)
A		US5921412 A (MERL)
A		US3701325 A (STREATER)
A		US6024333 A (MIDWEST)
A		GB2370753 A (ELFA)
A		US5538213 A (BROWN)

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application

Field of Search:

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A4B

Worldwide search of patent documents classified in the following areas of the IPC

A47B

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Subclass	Subgroup	Valid From
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ELECTRIC STEERING LOCK DEVICE

Inventor(s): DOI IZUMI; NOMA HIDEKI; NAKANISHI MASAYUKI ± (DOI IZUMI, ; NOMA HIDEKI, ; NAKANISHI MASAYUKI)

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Classification: **- international:** ***B60R25/0215***
- cooperative: **B60R25/02153 (EP)**

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Abstract of JP2013022972 (A)

PROBLEM TO BE SOLVED: To provide an electric steering lock device in which heat damage due to overheating of an electric motor is prevented with a simple constraction without increasing cost.SOLUTION: The electric steering lock device performs unlock processing in a normal mode by controlling an electric motor based upon a preset electric power supply holding time in which electric power supply to the electric motor and an electric power supply stop time in which the electric power supply is stopped. If movement of a lock bolt to an unlock position is not detected although the unlock processing in the normal mode is performed on receiving an unlock command from an operator, the mode of unlock processing to be executed with a next unlock command from the operator is switched to a motor overheat protection mode in which an electric power supply holding time is set to be shorter than the electric power supply holding time in the normal mode, in order that a duty ratio calculated from the electric power supply holding time and electric power supply stop time is smaller than a duty ration in the normal mode.

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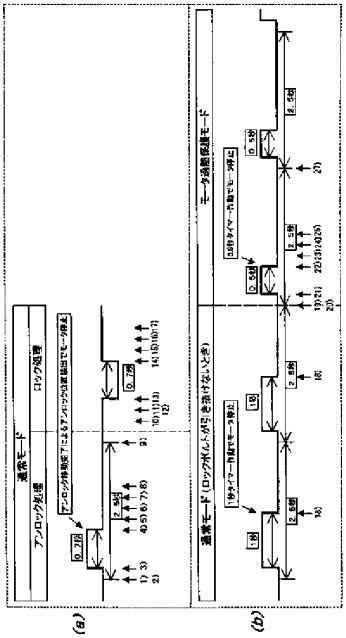
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(54)【発明の名称】電動ステアリングロック装置

(57)【要約】
【課題】コストアップを伴うことなく簡単な構成で電動モータの過熱による熱害の発生を防ぐことができる電動ステアリングロック装置を提供すること。
【解決手段】電動ステアリングロック装置において、予め設定された電動モータへの通電を維持する通電維持時間及び通電を休止する通電休止時間に基づいて電動モータを制御して通常モードのアンロック処理を行い、運転者からのアンロック指令を受信して通常モードのアンロック処理を行ったにも拘わらずロックボルトのアンロック位置への移動を検出できない場合には、運転者からの次回のアンロック指令によって実行されるアンロック処理のモードを、通電維持時間及び通電休止時間から計算されるデューティ比が通常モード時のデューティ比よりも小さくなるように、通電維持時間が通常モード時の通電維持時間よりも短く設定されたモータ過熱保護モードに切り替える。
【選択図】図４



【特許請求の範囲】
【請求項１】
車両のステアリングシャフトに係合するロック位置とその係合が解除されるアンロック位置との間を移動可能なロックボルトと、
該ロックボルトを移動させる電動モータと、
該電動モータへの通電を制御してロック／アンロック処理を行う制御手段と、
該制御手段に電気的に接続されて少なくとも前記ロックボルトがアンロック位置にあることを検出可能な位置検出手段と、
を備えた電動ステアリングロック装置において、
前記制御手段は、
予め設定された前記電動モータへの通電を維持する通電維持時間及び通電を休止する通電休止時間に基づいて前記電動モータを制御して通常モードのアンロック処理を行い、
運転者からのアンロック指令を受信して前記通常モードのアンロック処理を行ったにも拘わらず前記ロックボルトのアンロック位置への移動を検出できない場合には、運転者からの次回のアンロック指令によって実行されるアンロック処理のモードを、通電維持時間及び通電休止時間から計算されるデューティ比が前記通常モード時のデューティ比よりも小さくなるように、通電維持時間が前記通常モード時の通電維持時間よりも短く設定されたモータ過熱保護モードに切り替えることを特徴とする電動ステアリングロック装置。
【請求項２】
前記モータ過熱保護モード時の前記通電維持時間を、所定条件下における前記ロックボルトのロック位置からアンロック位置への移動を保障するアンロック保障通電時間よりも短く設定することを特徴とする請求項１記載の電動ステアリングロック装置。
【請求項３】
前記通電維持時間と前記通電休止時間から成るアンロック作動時間が前記通常モード時と前記モータ過熱保護モード時で同じになるよう前記モータ過熱保護モード時の通電休止時間を設定することを特徴とする請求項１又は２記載の電動ステアリングロック装置。
【請求項４】
前記制御手段は、運転者からのアンロック指令を受信する上位ＥＣＵと、該上位ＥＣＵからのロック／アンロック作動信号を受信すると前記電動モータへの通電を制御してロック／アンロック処理を実行するマイコンを備え、前記通電維持時間は前記マイコンによって制御されるとともに、前記通電休止時間は前記上位ＥＣＵによって制御され、
前記上位ＥＣＵは、アンロック処理を開始してから所定のアンロック作動時間内に前記アンロック指令を受信した場合には、前記アンロック作動時間が経過するまで待機し、前記アンロック作動時間経過後にアンロック処理を開始することによって前記通電休止時間を設定するよう構成したことを特徴とする請求項１～３の何れかに記載の電動ステアリングロック装置。

【発明の詳細な説明】
【技術分野】
【０００１】
本発明は、車両の駐車時にステアリングホイールの回転を電動でロックするための電動ステアリングロック装置に関するものである。
【背景技術】
【０００２】
近年、車両には盗難防止の目的で駐車時にステアリングホイールの回転を電動でロックするための電動ステアリングロック装置を備えたものがある。この電動ステアリングロック装置は、車両のステアリングシャフトに係合するロック位置とその係合が解除されるアンロック位置との間を移動可能なロックボルトと、該ロックボルトを移動させる電動モータと、該電動モータへの通電を制御してロック／アンロック処理を行う制御手段と、該制御手段に電気的に接続されて少なくとも前記ロックボルトがアンロック位置にあることを

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検出可能な位置検出手段を備えている。

【０００３】

斯かる電動ステアリングロック装置は、エンジン作動状態で運転者がエンジンＯＮ／ＯＦＦスイッチをＯＦＦ操作すると、これを検知した車体側の上位ＥＣＵは、エンジンを停止させ、安全が確認されたことを条件に電動ステアリングロック装置に対してロック要求を行う。電動ステアリングロック装置は、このロック要求を受けると、マイコン（マイクロコンピュータ）等の制御手段によって電動モータを駆動制御し、該電動モータによってロックボルトを移動させてこれをステアリングシャフトに係合させることによってステアリングホイールの回転をロックする。

【０００４】

他方、エンジン停止状態で運転者がエンジンＯＮ／ＯＦＦスイッチをＯＮ操作すると、これを検知した上位ＥＣＵは、電動ステアリングロック装置に対してアンロック要求を行う。電動ステアリングロック装置は、このアンロック要求を受けると、制御手段によって電動モータを駆動制御し、該電動モータによってロックボルトを移動させて該ロックボルトのステアリングシャフトへの係合を解除し、ステアリングホイールをアンロックしてステアリング操作を可能とする。

【０００５】

ところで、斯かる電動ステアリングロック装置においてロックとアンロックを短時間のうちに頻繁に繰り返すと、電動モータの過熱によってコイルが断線する等の熱害が発生する可能性がある。

【０００６】

そこで、特許文献１には、電動モータの作動時間を要素とする関係式から算出された値が所定の休止閾値よりも大きいと判断した場合には、電動モータの作動を強制的に休止させるとともに、前記算出値が所定の無効閾値よりも大きい場合には、電動モータの作動要求があってもこれを無効化するようにした電動ステアリングロック装置が提案されている。

【先行技術文献】

【特許文献】

【０００７】

【特許文献１】特開２００４－２１７００２号公報

【発明の概要】

【発明が解決しようとする課題】

【０００８】

電動ステアリングロック装置において電動モータの過熱によって引き起こされる熱害には、特許文献１において提示されたもの（ロックとアンロックを短時間のうちに頻繁に繰り返すことによる電動モータの過熱に起因するもの）以外に、ロックボルトがステアリングシャフトに対して強く係合されている場合（所謂噛み込み時）が考えられる。このような場合には、電動モータの駆動力ではロックボルトをステアリングシャフトから引き抜くことができず、電動モータが過負荷状態となって該電動モータに過大な電流が流れるため、電動モータが発熱する。そして、ロックボルトがステアリングシャフトから抜けるまでアンロック操作が繰り返されると電動モータが高温となり、該電動モータのコイルが断線する等の熱害が発生する可能性がある。

【０００９】

上記問題を解決するためには、バイメタル等によって構成された過熱保護装置を内蔵した電動モータを使用することが考えられるが、斯かる電動モータは大型でコストが高いという問題がある。

【００１０】

本発明は上記問題に鑑みてなされたものであり、その目的とする処は、コストアップを伴うことなく簡単な構成で電動モータの過熱による熱害の発生を防ぐことができる電動ステアリングロック装置を提供することにある。

【課題を解決するための手段】
【００１１】
上記目的を達成するため、請求項１記載の発明は、
車両のステアリングシャフトに係合するロック位置とその係合が解除されるアンロック位置との間を移動可能なロックボルトと、
該ロックボルトを移動させる電動モータと、
該電動モータへの通電を制御してロック／アンロック処理を行う制御手段と、
該制御手段に電気的に接続されて少なくとも前記ロックボルトがアンロック位置にあることを検出可能な位置検出手段と、
を備えた電動ステアリングロック装置において、
前記制御手段は、
予め設定された前記電動モータへの通電を維持する通電維持時間及び通電を休止する通電休止時間に基づいて前記電動モータを制御して通常モードのアンロック処理を行い、
運転者からのアンロック指令を受信して前記通常モードのアンロック処理を行ったにも拘わらず前記ロックボルトのアンロック位置への移動を検出できない場合には、運転者からの次回のアンロック指令によって実行されるアンロック処理のモードを、通電維持時間及び通電休止時間から計算されるデューティ比が前記通常モード時のデューティ比よりも小さくなるように、通電維持時間が前記通常モード時の通電維持時間よりも短く設定されたモータ過熱保護モードに切り替えることを特徴とする。
【００１２】
請求項２記載の発明は、請求項１記載の発明において、前記モータ過熱保護モード時の前記通電維持時間を、所定条件下における前記ロックボルトのロック位置からアンロック位置への移動を保障するアンロック保障通電時間よりも短く設定することを特徴とする。
【００１３】
請求項３記載の発明は、請求項１又は２記載の発明において、前記通電維持時間と前記通電休止時間から成るアンロック作動時間が前記通常モード時と前記モータ過熱保護モード時で同じになるよう前記モータ過熱保護モード時の通電休止時間を設定することを特徴とする。
【００１４】
請求項４記載の発明は、請求項１～３の何れかに記載の発明において、前記制御手段は、運転者からのアンロック指令を受信する上位ＥＣＵと、該上位ＥＣＵからのロック／アンロック作動信号を受信すると前記電動モータへの通電を制御してロック／アンロック処理を実行するマイコンを備え、前記通電維持時間は前記マイコンによって制御されるとともに、前記通電休止時間は前記上位ＥＣＵによって制御され、
前記上位ＥＣＵは、アンロック処理を開始してから所定のアンロック作動時間内に前記アンロック指令を受信した場合には、前記アンロック作動時間が経過するまで待機し、前記アンロック作動時間経過後にアンロック処理を開始することによって前記通電休止時間を設定するよう構成したことを特徴とする。
【発明の効果】
【００１５】
請求項１記載の発明によれば、運転者からのアンロック指令を受信して通常モードのアンロック処理を行ったにも拘わらずロックボルトのアンロック位置への移動を検出できない場合、即ち、ロックボルトがステアリングシャフトに噛み込んでいると判断した場合には、次回のアンロック処理のモードを通常モードからモータ過熱保護モードに切り替え、電動モータのデューティ比が通常モード時のそれよりも小さくなるように電動モータへの通電時間を短くしたため、運転者によってアンロック処理が何度も繰り返し行われた場合であっても、電動モータの過熱を抑えてコイルの断線等の熱害の発生を防ぐことができる。そして、このような効果は、アンロック処理のモードを切り替えることによって得られるため、過熱保護装置を内蔵した電動モータ等の使用が不要となり、大型化やコストアップを避けることができる。

【００１６】
ところで、通常モードにおける電動モータの通電維持時間は、一度のアンロック処理でロックボルトが必ずロック位置からアンロック位置まで移動するのに十分で、且つ、高い応答性が確保できる条件を満足し得る最短時間に設定されている。この通電維持時間を維持したまま、電動モータのデューティ比（＝通電維持時間／アンロック作動時間）を下げるためには通電休止時間を延ばせば良いが、給電休止時間を延ばすとアンロック作動時間（＝通電維持時間＋通電休止時間）が長くなり、運転者への応答性が悪くなってしまう。
【００１７】
本発明では、モータ過熱保護モードにおける電動モータの通電維持時間を通常モードのそれよりも短くして電動モータのデューティ比を下げるようにしたため、全体のアンロック作動時間を短縮することができ、運転者への応答性を損なうことなく、電動モータの発熱を抑制することができる。
【００１８】
又、電動モータは一般的に温度上昇に伴ってトルクが下がるが、本発明では、モータ過熱保護モードにおいては通電維持時間を短くし、より温度が低くてトルクが高いときに電動モータを作動させ、この動作を複数回行うことによってロックボルトをロック位置からアンロック位置へと移動させるようにしたため、アンロック処理を効率良く行うことができる。
【００１９】
請求項２記載の発明によれば、モータ過熱保護モード時の通電維持時間をアンロック保障通電時間よりも短く設定したため、１回のアンロック処理ではロックボルトをアンロック位置まで移動させることができない場合があるが、アンロック作動時間を短くすることによって運転者に対する応答性（例えば、運転者がエンジンＯＮ／ＯＦＦスイッチを操作してからアンロック失敗等のワーニングが点灯するまでの時間）は損なわれず、運転者に違和感を与えることなく、運転者の複数回のアンロック操作によってロックボルトをアンロック位置まで確実に移動させることができる。
【００２０】
請求項３記載の発明によれば、モータ過熱保護モード時のアンロック作動時間を通常モード時のそれと同じにすることによって、運転者に対する応答時間を一定にすることができ、運転者に違和感を与えることがない。
【００２１】
請求項４記載の発明によれば、上位ＥＣＵは、アンロック処理を開始してから所定のアンロック作動時間内にアンロック指令を受信した場合には、アンロック作動時間が経過するまで待機し、アンロック作動時間経過後にアンロック処理を開始することによって通電休止時間を設定するよう構成したため、上位ＥＣＵによって通電休止時間及びアンロック作動時間を管理することができ、電動モータのデューティ比の制御を容易に行うことができる。
【図面の簡単な説明】
【００２２】
【図１】本発明に係る電動ステアリングロック装置のロック状態を示す縦断面図である。
【図２】本発明に係る電動ステアリングロック装置のアンロック状態を示す縦断面図である。
【図３】本発明に係る電動ステアリングロック装置の制御システム構成図である。
【図４】本発明に係る電動ステアリングロック装置の処理フローを示すタイミングチャートである。
【発明を実施するための形態】
【００２３】
以下に本発明の実施の形態を添付図面に基づいて説明する。
【００２４】
［電動ステアリングロック装置の構成］

図１は本発明に係る電動ステアリングロック装置のロック状態を示す縦断面図、図２は同電動ステアリングロック装置のアンロック状態を示す縦断面図であり、図示の電動ステアリングロック装置１は、電動によって不図示のステアリングシャフト（ステアリングホイール）の回転をロック／アンロックするものであって、そのハウジング２は、非磁性体の金属（例えば、マグネシウム合金）で構成されたケース３と該ケース３の下面開口部を覆う金属製のリッド４によって構成されている。

【００２５】

上記ケース３は矩形ボックス状に成形されており、その上部には円弧状の凹部３ａが形成され、この凹部３ａには不図示の円筒状のステアリングコラムが嵌め込まれ、ケース３は、これに結着される不図示の円弧状ブラケットによってステアリングコラムに固定されている。尚、図示しないが、ステアリングコラム内には前記ステアリングシャフトが挿通しており、該ステアリングシャフトの上端にはステアリングホイールが結着され、ステアリングシャフトの下端はステアリングギヤボックスに連結されている。そして、運転者がステアリングホイールを回転操作すれば、その回転はステアリングシャフトを経てステアリングギヤボックスに伝達され、操舵機構が駆動されて左右一対の前輪が転舵されて所要の操舵がなされる。

【００２６】

前記ハウジング２には、ロック部材収納部２Ａと基板収納部２Ｂが形成されており、これらのロック部材収納部２Ａと基板収納部２Ｂとは上下方向に延びる細長い連通部２Ｃによって互いに連通している。

【００２７】

上記ロック部材収納部２Ａにはロック部材５が収納されており、このロック部材５は、下端部外周に雄ネジ部６ａが刻設された略円筒状のドライバ６と、該ドライバ６内に上下動可能に収容されたプレート状のロックボルト７とで構成されている。ここで、ロックボルト７には上下方向に長い長孔７ａが形成されており、ロックボルト７は長孔７ａに横方向に挿通するピン８によってドライバ６に連結されている。

【００２８】

そして、ロックボルト７は、ケース３に形成された矩形のロックボルト挿通孔３ｂ内に上下動可能に嵌合しており、これとドライバ６の隔壁６ｂ間に縮装されたスプリング９によって常時上方に付勢され、通常はロックボルト７の長孔７ａの下部がピン８に係合することによって該ロックボルト７はドライバ６と共に上下動する。

【００２９】

又、ドライバ６の上部外周の相対向する箇所には水平に延びる係合部としてのアーム６Ａと上下方向に長い回り止め部６Ｂが一体に形成されており、アーム６Ａは、ハウジング２（ケース３）に形成された前記連通部２Ｃに上下動可能に収容され、回り止め部６Ｂは、ケース３に形成された係合溝３ｃに係合してドライバ６の回転を阻止する。そして、アーム６Ａの先端部には横断面矩形の磁石収納部６ｃが形成されており、この磁石収納部６ｃには四角柱状の磁石１０が圧入によって収納されている。

【００３０】

更に、ハウジング２内に形成された前記ロック部材収納部２Ａには円筒状のギヤ部材１１が回転可能に収容されており、該ギヤ部材１１の下部外周はリッド４の内面（上面）に立設された前記ギヤ保持筒部４ａによって回転可能に保持されている。そして、このギヤ部材１１の下部外周にはウォームギヤ１１ａが形成され、内周には雌ネジ部１１ｂが形成されている。

【００３１】

上記ギヤ部材１１の内部には前記ドライバ６の下部が挿入されており、このドライバ６の下部外周に形成された前記雄ネジ部６ａは、ギヤ部材１１の内周に形成された前記雌ネジ部１１ｂが噛合している。そして、リッド４のギヤ保持筒部４ａの中心部に形成された円柱状のスプリング受け４ｂとドライバ６の隔壁６ｂの間にはスプリング１２が縮装されており、ロック部材５（ドライバ６とロックボルト７）はスプリング１２によって常時上

方に付勢されている。

【００３２】

又、ハウジング２に形成された前記ロック部材収納部２Ａには電動モータ１３が横置き状態で収納されており、この電動モータ１３の出力軸１３ａには小径のウォーム１４が形成され、このウォーム１４はギヤ部材１１の外周に形成された前記ウォームギヤ１１ａに噛合している。ここで、ウォーム１４とウォームギヤ１１ａは、電動モータ１３の出力軸１３ａの回転力をロック部材５の進退力に変換する駆動機構を構成している。

【００３３】

一方、ハウジング２に形成された前記基板収納部２Ｂには、その内面がロック部材５の作動方向と平行となるように基板１５が収納されており、この基板１５の内面上下のロック位置とアンロック位置に対応する位置には磁気検出センサであるホール素子１６，１７がそれぞれ設けられており、これらのホール素子１６，１７と前記磁石１０によって位置検出手段が構成され、この位置検出手段によって後述のようにロック部材５（ロックボルト７）の位置（ロック／アンロック位置）が検出される。

【００３４】

次に、以上のように構成された電動ステアリングロック装置１の動作（ロック／アンロック動作）について説明する。

【００３５】

不図示のエンジンが停止している状態では、図１に示すように、ロック部材５のロックボルト７は上限のロック位置にあって、その上端部がケース３のロックボルト挿通孔３ｂから凹部３ａに突出して不図示のステアリングシャフトに係合している。この状態では、ステアリングシャフトの回動がロックしており、このロック状態においては不図示のステアリングホイールを回転操作することができず、これによって車両の盗難が防がれる。

【００３６】

上記状態から運転者が不図示のエンジンＯＮ／ＯＦＦスイッチをＯＮ操作すると、電動モータ１３が起動され、その出力軸１３ａの回転がウォーム１４とウォームギヤ１１ａによって減速されつつ方向が直角に変換されてギヤ部材１１に伝達され、該ギヤ部材１１が回転されるため、該ギヤ部材１１の内周に刻設された雌ネジ部１１ｂに螺合する雄ネジ部６ａが形成されたドライバ６がスプリング１２の付勢力に抗して下動する。このようにドライバ６が下動すると、該ドライバ６に一体に形成されたアーム６Ａとピン８によってドライバ６に連結されたロックボルト７が下動する。

【００３７】

上述のようにドライバ６のアーム６Ａが下動してロックボルト７が図２に示すように下限のアンロック位置に達すると、磁石１０の磁力がホール素子１７によって検出されて電動モータ１３の駆動が停止され、該ロックボルト７の上端部がケース３のロックボルト挿通孔３ｂの内部に退避するため、ロックボルト７のステアリングシャフトへの係合が解除される。この結果、ステアリングシャフトのロックが解除されてアンロック状態となり、運転者によるステアリングホイールの回動操作が可能となって車両の走行が可能となる。

【００３８】

そして、車両が停止し、運転者がエンジンＯＮ／ＯＦＦスイッチをＯＦＦ操作してエンジンを切ると、電動モータ１３が逆転起動されてその出力軸１３ａが逆転される。すると、電動モータ１３の回転はウォーム１４とウォームギヤ１１ａを経てギヤ部材１１に伝達され、該ギヤ部材１１が逆転されるためにドライバ６が上動し、該ドライバ６に一体に形成されたアーム６Ａとピン８によってドライバ６に連結されたロックボルト７が上動する。

【００３９】

而して、上述のようにドライバ６のアーム６Ａが上動して磁石１０の中心がロック位置近傍の検知範囲に達すると、磁石１０の磁力がホール素子１６によって検出されて電動モータ１３の駆動が停止され、図１に示すようにロックボルト７の上端部がケース３の凹部３ａから突出して不図示のステアリングシャフトに係合するため、ステアリングシャフト

の回転がロックされるロック状態となり、駐車時における車両の盗難が防がれる。尚、ロックボルト７のステアリングシャフトの係合溝への係合が良好に行われない場合には、該ロックボルト７に形成された長孔７ａ内をピン８が相対移動することができる範囲でロックボルト７がスプリング９の付勢力に抗して下動するため、ロックボルト７に過大な負荷が作用することがない。

【００４０】

［電動ステアリングロック装置のシステム構成］

次に、電動ステアリングロック装置１のシステム構成を図３に基づいて説明する。

【００４１】

図３は本発明に係る電動ステアリングロック装置１のシステム構成図であり、電動ステアリングロック装置１側には制御手段としてＥＣＵ１８が設けられ、車体側には同じく制御手段である上位ＥＣＵ１９が搭載されている。この上位ＥＣＵ１９には、運転者によって操作されるエンジンＯＮ／ＯＦＦスイッチ（図示せず）が電気的に接続されており、該上位ＥＣＵ１９は、不図示のタイマー手段及び記憶手段を備えている。

【００４２】

上記ＥＣＵ１８には、電源であるバッテリ（ＢＡＴＴ）２０から電動モータ１３に供給される駆動電流の極性を切り替え／遮断して前記ロック部材５の移動を制御するモータ駆動制御部２１と、該モータ駆動制御部２１を制御して前記電動モータ１３をロック／アンロック動作させるマイコン（マイクロコンピュータ）２２と、前記バッテリ２０から前記モータ駆動制御部２１及び前記マイコン２２への電源供給経路を遮断／導通する電源規制手段である第１スイッチ部２３と第２スイッチ部２４等が設けられている。尚、第１スイッチ部２３と第２スイッチ部２４は電源供給経路に直列的に設けられている。

【００４３】

ここで、上記モータ駆動制御部２１は、ロックリレー２５とアンロックリレー２６、マイコン２２からの指令によってロックリレー２５とアンロックリレー２６をそれぞれ駆動制御するロックリレー駆動回路２７とアンロックリレー駆動回路２８を備えている。又、マイコン２２には、前記ホール素子１６，１７（図１及び図２参照）によってロック部材５（ロックボルト７）のロック位置を検出する位置検出回路（ＬＯＣＫ）２９とアンロック位置を検出する位置検出回路（ＵＮＬＯＣＫ）３０が接続されるとともに、ＥＥＰＲＯＭ等の記憶手段３１が接続されている。尚、マイコン２２にはタイマー手段３２が内蔵されている。又、マイコン２２と前記上位ＥＣＵ１９との間では通信回路３３を介してロック／アンロック指令信号、故障状態等のＬＩＮ通信が行われる。

【００４４】

而して、マイコン２２、電動モータ１３、ロックリレー２５、アンロックリレー２６、位置検出回路（ＬＯＣＫ）２９、位置検出回路（ＵＮＬＯＣＫ）３０及び通信回路３３の電源は前記第１及び第２スイッチ部２３，２４の後から取られており、従って、第１及び第２スイッチ部２３，２４がＯＦＦされると、マイコン２２への通電が遮断されてマイコン２２は非作動状態となる。尚、第２スイッチ部２４からマイコン２２に至る電源供給経路の途中には定電圧出力回路３４とリセット回路３５が設けられている。

【００４５】

他方、車体側の上位ＥＣＵ１９と不図示のエンジンの点火装置（イグニッション）の電源は第１及び第２スイッチ部２３，２４の前から取られており、点火装置に電源を供給するＩＧ電源ラインの途中には、上位ＥＣＵ１９によって駆動制御されるＩＧリレー３６が設けられており、ＩＧ電源（イグニッション電源）は上位ＥＣＵ１９によって制御される。

【００４６】

ところで、本実施の形態では、前述のようにバッテリ２０からモータ駆動制御部２１及びマイコン２２への電源供給経路を遮断／導通する電源規制手段として第１及び第２スイッチ部２３，２４を設けたが、これらの第１及び第２スイッチ部２３，２４は上位ＥＣＵ１９によってＯＮ／ＯＦＦ制御されるため、マイコン２２の電源のＯＮ／ＯＦＦは上位Ｅ

ＣＵ１９によって制御される。

【００４７】

従って、上位ＥＣＵ１９が第１及び第２スイッチ部２３，２４の一方側をＯＮ制御、他方側をＯＦＦ制御している場合、これらの第１及び第２スイッチ部２３，２４が正常であればマイコン２２の電源が遮断されるが、このとき、マイコン２２の電源が遮断されなければ、ＯＦＦ制御されている他方側のスイッチ部２３又は２４が故障しているものと判断することができる。このため、専用の故障検出回路等を設けることなく、簡単な構成で第１及び第２スイッチ部２３，２４の故障を検出することができる。ここで、図３に示すように、前記ＩＧ電源ラインは第１スイッチ部２３に接続され、上位ＥＣＵ１９から出力される電源供給信号は第２スイッチ部２４に入力される。尚、第１スイッチ部２３に入力されるＩＧ電源は第１スイッチ部２３内で反転制御され、上位ＥＣＵ１９によってＩＧ電源がＯＮされた場合には第１スイッチ部２３がＯＦＦされ、ＩＧ電源がＯＦＦされた場合には第１スイッチ部２３がＯＮされる。これは、エンジンが始動不能であるＩＧ電源ＯＦＦの状態では、第１スイッチ部２３をＯＮとして電動ステアリングロック装置１を作動可能とし、エンジンが始動可能であるＩＧ電源ＯＮの状態では、第１スイッチ部２３をＯＦＦとして電動ステアリングロック装置１を作動不能とするためである。

【００４８】

而して、本発明に係る電動ステアリングロック装置１においては、ロックボルト７をロック位置からアンロック位置へと移動させるアンロック処理がなされるが、通常モードにおいては、予め設定された電動モータ１３への通電を維持する通電維持時間及び通電を休止する通電休止時間に基づいて電動モータ１３が制御される。

【００４９】

［アンロック処理（通常モード時）］

ここで、電動ステアリングロック装置１の通常モード（ロックボルト７が引き抜ける場合）におけるアンロック処理の流れを図４（ａ）に示すタイミングチャートに従って以下に説明する。尚、図４において付した番号１）～２７）は、下記の処理項目ごとに付した番号１）～２７）に対応している。

【００５０】

１）エンジン停止中に運転者がエンジンＯＮ／ＯＦＦスイッチをＯＮ操作すると、上位ＥＣＵ１９は、電源供給信号を出力して第２スイッチ部２４をＯＮし、電動ステアリングロック装置１に電源を供給する。ここで、エンジン停止中はＩＧ電源が遮断されているために第１スイッチ部２３はＯＮ状態にある。又、上位ＥＣＵ１９は、電動モータ１３のアンロック処理時間を設定するタイマー（２．５秒）を開始する。

【００５１】

２）上位ＥＣＵ１９は、マイコン２２と暗号コードのやり取りを行い、暗号化されたアンロック作動信号（通常モード）を送信する。

【００５２】

３）マイコン２２は、アンロック作動信号を受信すると、電動モータ１３の通電維持時間を設定するためのタイマー（１秒）を開始し、アンロックリレー駆動回路２８を介してアンロックリレー２６にＯＮ信号を送信して電動モータ１３をアンロック作動させる。

【００５３】

４）マイコン２２は、ロックボルト７がロック位置からアンロック位置まで移動すると、位置検出回路（ＵＮＬＯＣＫ）３０によってロックボルト７がアンロック位置まで移動したことを検出し、アンロックリレー２６へのＯＮ信号をＯＦＦとして電動モータ１３への通電を遮断する。この場合、電動モータ１３は、タイマー監視による通電維持時間（１秒）よりも短い時間（０．７秒）でＯＦＦされる。尚、このときの電動モータ１３の通電時間（０．７秒）は、バッテリ２０の電圧及び気温等によって後述するアンロック保障通電時間（１秒）を超えない範囲で変化する。

【００５４】

５）マイコン２２は、上位ＥＣＵ１９に対してアンロック確定信号（ロックボルト７が

アンロック位置まで移動したか否かの信号）を送信する。

【００５５】

６）上位ＥＣＵ１９は、アンロック処理が成功したか否かの結果を不図示のインジケータに表示する（例えば、成功は緑点灯、失敗は赤点滅等）。

【００５６】

７）上位ＥＣＵ１９は、電源供給信号をＯＦＦとし、第２スイッチ部２４をＯＦＦにして電動ステアリングロック装置１への電源の供給を遮断する。

【００５７】

８）上位ＥＣＵ１９は、「アンロック処理成功」の場合、ＩＧリレー３６をＯＮしてＩＧ電源をＯＮし、エンジン始動処理を行う。

【００５８】

９）上位ＥＣＵ１９は、「アンロック処理失敗」の場合。１）のタイマー開始から２．５秒の間に、運転者によるエンジンＯＮ／ＯＦＦスイッチの操作を検出した場合には、その２．５秒が経過するまで待機し、２．５秒経過後にマイコン２２に対して１）の処理を開始して次のロック処理を行う。

【００５９】

［ロック処理（通常モード時）］

次に、電動ステアリングロック装置１の通常モードでのロック処理の流れを図４（ａ）に基づいて以下に説明する。

【００６０】

１０）エンジン作動中に運転者がエンジンＯＮ／ＯＦＦスイッチをＯＦＦ操作すると、上位ＥＣＵ１９は、ＩＧリレー３６をＯＦＦし、ＩＧ電源を遮断してエンジンを停止させる。

【００６１】

１１）ＩＧ電源の遮断に連動して第１スイッチ部２３がＯＮ状態となる。上位ＥＣＵ１９は、電源供給信号を出力して第２スイッチ部２４をＯＮし、バッテリ２０から電動ステアリングロック装置１に電源を供給する。

【００６２】

１２）上位ＥＣＵ１９は、マイコン２２と暗号コードのやり取りを行い、暗号化されたロック作動信号をマイコン２２に送信する。

【００６３】

１３）マイコン２２は、上位ＥＣＵ１９からロック作動信号を受信すると、通電維持時間を設定するためのタイマー（１秒）を開始し、ロックリレー駆動回路２７を介してロックリレー２５にＯＮ信号を送信して電動モータ１３を作動させる。

【００６４】

１４）マイコン２２は、ロックボルト７がアンロック位置からロック位置まで移動すると、位置検出回路（ＬＯＣＫ）２９によってロックボルト７がロック位置まで移動してことを検出し、ロックリレー２５へのＯＮ信号をＯＦＦして電動モータ１３への通電を遮断する。

【００６５】

１５）マイコン２２は、ロック確定信号（ロックボルト７がロック位置まで移動したか否かの信号）を上位ＥＣＵ１９に対して送信する。

【００６６】

１６）上位ＥＣＵ１９は、ロック処理が成功したか否かの結果を電動ステアリングロック装置１に設けられた不図示のインジケータに表示する（例えば、成功は緑点灯、失敗は赤点滅等）。

【００６７】

１７）上位ＥＣＵ１９は、電源供給信号をＯＦＦとし、第２スイッチ部２４をＯＦＦとして電動ステアリングロック装置１への電源の供給を遮断する。

【００６８】

尚、このロック処理は、アンロック処理と比べて電動モータ１３への負荷は小さいため、アンロック処理のように電動モータ１３の作動時間（２．５秒等）の設定はなされない。

【００６９】

［アンロック処理（通常モード：ロックボルトが引き抜けない場合）］

次に、電動ステアリングロック装置１の通常モードにおいてロックボルト７が引き抜けない場合）のアンロック処理の流れを図４（ｂ）に基づいて以下に説明する。

【００７０】

このアンロック処理においては、ロックボルト７が引き抜ける場合の前記アンロック処理１）～９）のうち、４）の処理が下記の処理１８）のように変わり、他の１）～３）及び５）～９）の処理に変更はない。

【００７１】

１８）マイコン２２は、ロックボルト７がステアリングシャフトに噛み込んでアンロック位置まで移動しない場合には、位置検出回路（ＵＮＬＯＣＫ）３０によってロックボルト７がアンロック位置まで移動したことを検知することができないため、ロックボルト７の位置検出によっては電動モータ１３への通電が遮断されることはなく、通常維持時間タイマー（１秒）が経過すると、アンロックリレー２６へのＯＮ信号をＯＦＦとして電動モータ１３への通電を遮断する。

【００７２】

例えば、図４（ｂ）に示すように、通電維持時間（アンロック保障通電時間）を１秒、アンロック作動時間を２．５秒、通電休止時間を１．５秒に設定した場合の電動モータ１３のデューティ比（＝通電維持時間／アンロック作動時間）は１／２．５＝０．４となる。ここで、アンロック保障通電時間は、気温及びバッテリ２０の電圧がエンジンが掛からない程度まで低下したときに、仮に電動モータ１３を作動させた場合のアンロック完了までに通電される平均時間に対して余裕を持って多少大きめの値に設定される。

【００７３】

ところで、本発明に係る電動ステアリングロック装置１においては、上位ＥＣＵ１９が運転者からのアンロック指令を受信して通常モードのアンロック処理を行ったにも拘わらずロックボルト７のアンロック位置への移動を検出できない場合には、運転者からの次回のアンロック指令によって実行されるアンロック処理のモードを、通電維持時間及び通電休止時間から計算されるデューティ比が前記通常モード時のデューティ比よりも小さくなるように、通電維持時間が通常モード時の通電維持時間よりも短く設定されたモータ過熱保護モードに切り替えるようにしている。

【００７４】

ここで、モータ過熱保護モード時の通電維持時間は、所定条件下におけるロックボルト７のロック位置からアンロック位置への移動を保障するアンロック保障通電時間よりも短く設定されている。

【００７５】

又、本実施の形態では、通電維持時間と通電休止時間から成るアンロック作動時間が前記通常モード時と後述のモータ過熱保護モード時で同じになるようモータ過熱保護モード時の給電休止時間が設定される。

【００７６】

更に、本実施の形態では、通電維持時間はマイコン２２によって制御され、通電休止時間は上位ＥＣＵ１９によって制御されるが、上位ＥＣＵ１９は、アンロック処理を開始してから所定のアンロック作動時間内にアンロック指令を受信した場合には、アンロック作動時間が経過するまで待機し、アンロック作動時間経過後にアンロック処理を開始することによって通電休止時間を設定する。

【００７７】

［アンロック処理（モータ過熱保護モード）］

次に、電動ステアリングロック装置１のモータ過熱保護モード（ロックボルト７が引き

抜けない場合）でのアンロック処理の流れを図４（ｂ）に基づいて以下に説明する。

【００７８】

１９）エンジン停止中に運転者がエンジンＯＮ／ＯＦＦスイッチをＯＮ操作すると、上位ＥＣＵ１９は、電源供給信号を出力し、第２スイッチ部２４をＯＮにしてバッテリ２０から電動ステアリングロック装置１に電源を供給する。このとき、ＩＧ電源はＯＦＦのため、第１スイッチ部２３はＯＮ状態にある。又、上位ＥＣＵ１９は、電動モータ１３のアンロック処理時間を設定するタイマー（２．５秒）を開始する。

【００７９】

２０）上位ＥＣＵ１９は、直前のアンロック処理において「アンロック処理失敗」が２回連続して発生した場合には、マイコン２２と暗号コードのやり取りを行い、暗号化されたアンロック作動信号（モータ過熱保護モード）を送信する。

【００８０】

２１）マイコン２２は、上位ＥＣＵ１９からアンロック作動信号を受信すると、通電維持時間を設定するためのタイマー（０．５秒）を開始し、アンロックリレー駆動回路２８を介してアンロックリレー２６にＯＮ信号を送信して電動モータ１３をアンロック作動させる。

【００８１】

２２）マイコン２２は、位置検出回路（ＵＮＬＯＣＫ）３０によってロックボルト７がアンロック位置まで移動したことを検出することができない場合には、通電維持時間タイマー（０．５秒）が経過すると、アンロックリレー２６へのＯＮ信号をＯＦＦとして電動モータ１３への通電を遮断する。

【００８２】

２３）マイコン２２は、アンロック確定信号（ロックボルト７がアンロック位置まで移動したか否かの信号）を上位ＥＣＵ１９に対して送信する。

【００８３】

２４）上位ＥＣＵ１９は、アンロック処理が成功したか否かを不図示のインジケータに表示する（例えば、成功は緑点灯、失敗は赤点滅等）。

【００８４】

２５）上位ＥＣＵ１９は、電源供給信号をＯＦＦとし、第２スイッチ部２４をＯＦＦとして電動ステアリングロック装置１の電源を遮断する。

【００８５】

２６）上位ＥＣＵ１９は、「アンロック処理成功」の場合には、ＩＧリレー３６をＯＮとし、ＩＧ電源をＯＮしてエンジン始動処理を行う。

【００８６】

２７）上位ＥＣＵ１９は、「アンロック処理失敗」の場合、１９）のタイマー開始から２．５秒の間に、運転者によるエンジンＯＮ／ＯＦＦスイッチの操作を検出した場合には、その２．５秒が経過するまで待機し、２．５秒経過後にマイコン２２に対して１９）の処理を開始してアンロック処理を行う。

【００８７】

尚、このモータ過熱保護モードにおいては、通電維持時間を０．５秒、アンロック作動時間を２．５秒、通電休止時間を２．０秒に設定したため、電動モータ１３のデューティ比は０．５／２．５＝０．２となって、通常モード時のデューティ比０．４よりも小さく設定される。

【００８８】

以上のように、本実施の形態に係る電動ステアリングロック装置１においては、運転者からのアンロック指令を受信して通常モードのアンロック処理を行ったにも拘わらずロックボルト７のアンロック位置への移動を検出できない場合、即ち、ロックボルト７がステアリングシャフトに噛み込んでいると判断した場合には、次回のアンロック処理のモードを通常モードからモータ過熱保護モードに切り替え、電動モータ１３のデューティ比が通常モード時のそれよりも小さくなるように電動モータ１３への通電時間を短くしたため、

運転者によってアンロック処理が何度も繰り返し行われた場合であっても、電動モータ１３の過熱を抑えてコイルの断線等の熱害の発生を防ぐことができる。そして、このような効果は、アンロック処理のモードを切り替えることによって得られるため、過熱保護装置を内蔵した電動モータ等の使用が不要となり、大型化やコストアップを避けることができる。

【００８９】

又、本実施の形態では、モータ過熱保護モードにおける電動モータ１３の通電維持時間を通常モードのそれよりも短くして電動モータ１３のデューティ比を下げるようにしたため、全体のアンロック作動時間を短縮することができ、運転者への応答性を損なうことなく、電動モータ１３の発熱を抑制することができる。

【００９０】

ところで、電動モータ１３は一般的に温度上昇に伴ってトルクが下がるが、本実施の形態では、モータ過熱保護モードにおいては通電維持時間を短くし、より温度が低くてトルクが高いときに電動モータ１３を作動させ、この動作を複数回行うことによってロックボルト７をロック位置からアンロック位置へと移動させるようにしたため、アンロック処理を効率良く行うことができる。

【００９１】

又、本実施の形態に係る電動ステアリングロック装置１においては、モータ過熱保護モード時の通電維持時間をアンロック保障通電時間よりも短く設定したため、１回のアンロック処理ではロックボルト７をアンロック位置まで移動させることができない場合があるが、アンロック作動時間を短くすることによって運転者に対する応答性（例えば、運転者がエンジンＯＮ／ＯＦＦスイッチを操作してからアンロック失敗等のワーニングが点灯するまでに時間）は損なわれず、運転者に違和感を与えることなく、運転者の複数回のアンロック操作によってロックボルト７をアンロック位置まで確実に移動させることができる。

【００９２】

更に、本実施の形態では、モータ過熱保護モード時のアンロック作動時間を通常モード時のそれと同じにするようにしたため、運転者に対する応答時間を一定にすることができ、運転者に違和感を与えることがない。

【００９３】

尚、本実施の形態においては、通電維持時間（通常モード）を０．１秒、通電維持時間（モータ過熱保護モード）を０．５秒、アンロック作動時間を２．５秒、アンロック保証通電時間を１．０秒として設定しているが、これはあくまで一例を示したもので、この数値に限定されるものではなく、例えば、通電維持時間（モータ過熱保護モード）及びアンロック作動時間は、通電維持時間（モータ過熱保護モード）とアンロック作動時間とから計算される電動モータ１３のデューティ比が、アンロック処理を繰り返し行った場合でも、電動モータ１３の温度が所定の値を超えないように予め試験等で算出した上限のデューティ比を超えない範囲において任意に設定が可能である。

【００９４】

又，本実施の形態において、上位ＥＣＵ１９は、アンロック作動時間を設定するタイマーを、マイコン２２への電源供給と同時にカウントを開始するように構成しているが、これに限定されるものではなく、例えば、マイコン２２へのアンロック作動信号の送信を「アンロック処理の開始」として、マイコン２２へのアンロック作動信号の送信と同時にアンロック作動時間を設定するタイマーのカウントを開始するようにしても良い。この場合、上位ＥＣＵ１９は、タイマー開始からアンロック作動時間（２．５秒）の間に、運転者によるエンジンＯＮ／ＯＦＦスイッチの操作を検出した場合には、そのアンロック作動時間（２，５秒）が経過するまで待機し、アンロック作動時間（２．５秒）が経過した後にマイコン２２に対してアンロック作動信号を返信するように構成すれば良い。

【００９５】

更に、本実施の形態においては、直前のアンロック処理において「アンロック処理失敗

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」が２回連続して発生した場合には、次回のアンロック処理をモータ過熱保護モードに移行するように構成しているが、これに限定されるものではなく、例えば、直前の１回の「アンロック処理失敗」によりモータ過熱保護モードに移行するように攻勢しても良く、或いは直前の連続する３回以上の「アンロック処理失敗」によりモータ過熱保護モードに移行するように構成しても良い。又、「アンロック処理失敗」が連続する場合に限らず、所定時間内に所定回数の「アンロック処理失敗」が発生した場合に、モータ過熱保護モードに移行するように構成しても良い。

【符号の説明】

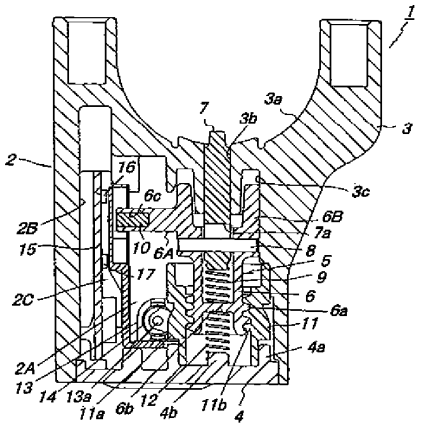
【００９６】

１	電動ステアリングロック装置
２	ハウジング
２Ａ	ハウジングのロック部材収納部
２Ｂ	ハウジングの基板収納部
２Ｃ	ハウジングの連通部
３	ケース
３ａ	ケースの凹部
３ｂ	ケースのロックボルト挿通孔
３ｃ	ケースの係合溝
４	リッド
４ａ	リッドのギヤ保持筒部
４ｂ	リッドのスプリング受け
５	ロック部材
６	ドライバ
６Ａ	ドライバのアーム
６Ｂ	ドライバの回り止め部
６ａ	ドライバの雄ネジ部
６ｂ	ドライバの隔壁
６ｃ	ドライバの磁石収納部
７	ロックボルト
７ａ	ロックボルトの長孔
８	ピン
９	スプリング
１０	磁石
１１	ギヤ部材
１１ａ	ギヤ部材のウォームギヤ
１１ｂ	ギヤ部材の雌ネジ部
１２	スプリング
１３	電動モータ
１３ａ	電動モータの出力軸
１４	ウォーム
１５	基板
１６，１７	ホール素子
１８	ＥＣＵ
１９	上位ＥＣＵ
２０	バッテリ
２１	モータ駆動制御部
２２	マイコン
２３	第１スイッチ部
２４	第２スイッチ部
２５	ロックリレー

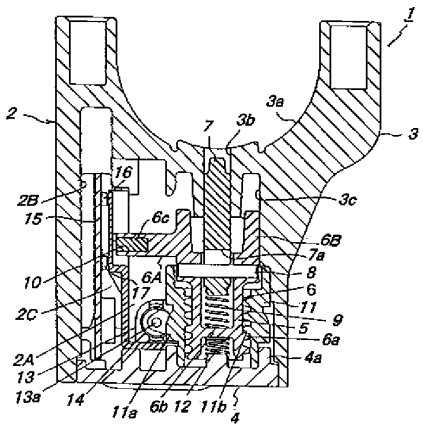
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２６　アンロックリレー
２７　ロックリレー駆動回路
２８　アンロックリレー駆動回路
２９　位置検出回路（ＬＯＣＫ）
３０　位置検出回路（ＵＮＬＯＣＫ）
３１　記憶手段
３２　タイマー手段
３３　通信回路
３４　定電圧回路
３５　リセット回路
３６　ＩＧリレー

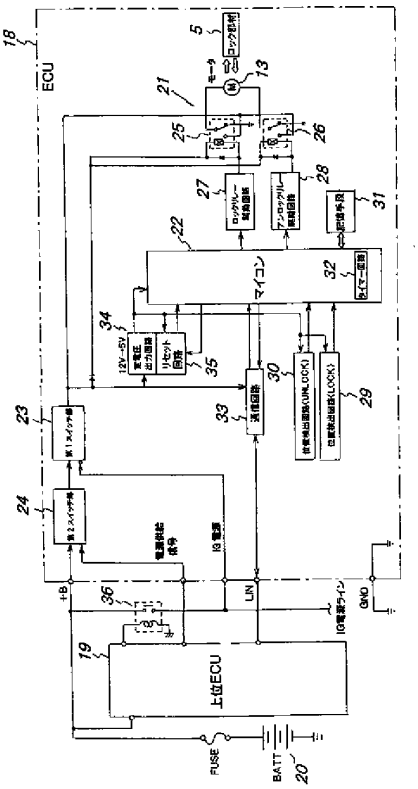
【図１】



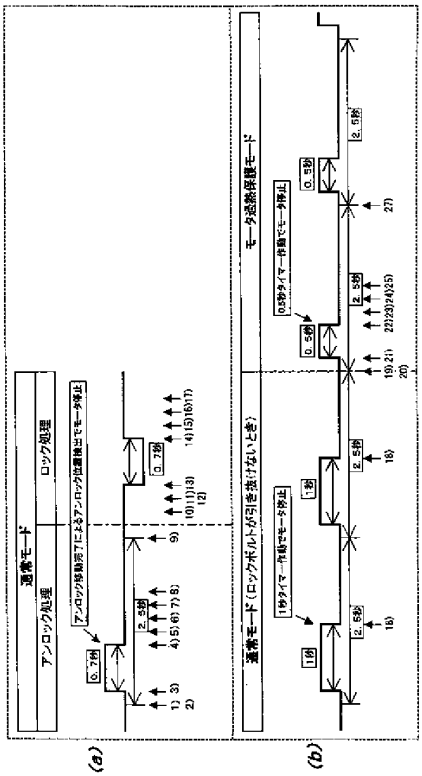
【図２】



【図３】


ECU
マイコン
上位ECU
+B
LIN
IG電源ライン
GND
FUSE
BATT

【図４】


通常モード
ロック処理
アンロック処理
モータ通電保護モード
(a)
(b)

Espacenet

Bibliographic data: JP2013022976 (A) — 2013-02-04

CAR WASHING MACHINE

Inventor(s): FUKUNAGA MASAKAZU; UEDA DAISUKE ± (FUKUNAGA MASAKAZU, ; UEDA DAISUKE, ; 福永 雅一, ; 植田 大輔)

Applicant(s): DAIFUKU KK ± (DAIFUKU CO LTD, ; 株式会社ダイフク)

Classification: **- international:** ***B60S3/06***
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Application number: JP20110156487 20110715 Global Dossier

Priority number(s): JP20110156487 20110715

Also published as: CN102874226 (A) CN102874226 (B) JP5637090 (B2)

Abstract of JP2013022976 (A)

PROBLEM TO BE SOLVED: To provide a car washing machine which washes a vehicle to be washed, without damaging it.SOLUTION: In the car washing machine WA, a top brush 4 for washing a top surface of the vehicle CA to be washed is arranged in an upper section of a car washing machine body 1 relatively moving in a longitudinal direction with respect to the vehicle CA to be washed, astride the vehicle CA to be washed. The car washing machine includes: two wires 63A and 63B which are connected to the top brush 4 and which suspend both ends in the axial direction 4A of the top brush 4; a winder 81 which winds the wires 63A and 63B; a lifting and lowering motor 65 which lifts and lowers the top brush by winding and unwinding the wires 63A and 63B via the winder 81; and a looseness detecter 75 which detects the looseness of the wires 63A and 63B.

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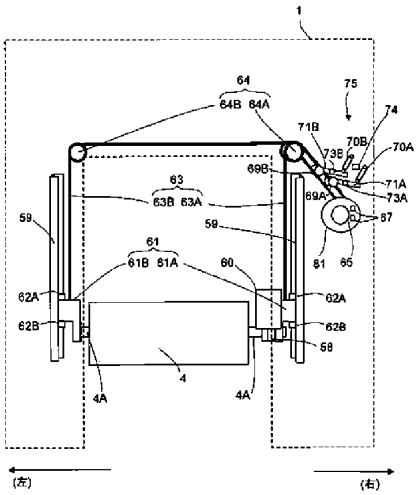
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最終頁に続く

(54)【発明の名称】洗車機

(57)【要約】
【課題】
本発明は、被洗浄車両を傷つけずに洗浄する洗車機を提供する。
【解決手段】
被洗浄車両ＣＡを跨いで前記被洗浄車両ＣＡに対して前後方向に相対移動する洗車機本体１の上部に前記被洗浄車両ＣＡの上面を洗浄するトップブラシ４を配した洗車機ＷＡにおいて、前記トップブラシ４に接続して前記トップブラシ４の軸方向４Ａの両端を吊り下げる２本のワイヤ６３Ａ、６３Ｂと、前記ワイヤ６３Ａ、６３Ｂを巻き取る巻取部８１と、前記巻取部８１を介して前記ワイヤ６３Ａ、６３Ｂの巻き取り及び繰り出しを行うことにより前記トップブラシを昇降させる昇降モータ６５と、前記ワイヤ６３Ａ、６３Ｂの緩みを検出する緩み検出部７５と、を備えたことを特徴とする。
【選択図】図３



【特許請求の範囲】
【請求項１】
被洗浄車両を跨いで前記被洗浄車両に対して前後方向に相対移動する洗車機本体の上部に前記被洗浄車両の上面を洗浄するトップブラシを配した洗車機において、
前記トップブラシに接続して前記トップブラシの軸方向の両端を吊り下げる２本のワイヤと、
前記ワイヤを巻き取る巻取部と、
前記巻取部を介して前記ワイヤの巻き取り及び繰り出しを行うことにより前記トップブラシを昇降させる昇降モータと、
前記ワイヤの緩みを検出する緩み検出部と、
を備えたことを特徴とする洗車機。
【請求項２】
前記緩み検出部は、
前記洗車機本体に回動自在に配されるレバーと、
前記レバーの一端に軸支されるローラーと、
前記ローラーを前記ワイヤに押し付ける方向に付勢する付勢部と、
前記レバーの変位を検出する検出センサと、
を備えたことを特徴とする請求項１に記載の洗車機。
【請求項３】
前記洗車機本体の上部に配した滑車を介して前記ワイヤが前記巻取部に巻回され、前記ローラーが前記滑車と前記巻取部との間の前記ワイヤに当接し、前記滑車の中心と前記巻取部の中心とを結ぶ線上に向かう方向に付勢されることを特徴とする請求項２に記載の洗車機。
【請求項４】
前記緩み検出部の検出によって前記ワイヤの緩みを検出した時に、前記トップブラシが前記ワイヤに正常な張力が復元する位置まで上昇することを特徴とする請求項１～３のいずれかに記載の洗車機。
【請求項５】
緩みを検知した時間が所定時間続くと、前記洗車機本体の洗浄動作を停止することを特徴とする請求項４に記載の洗車機。
【請求項６】
前記ワイヤの巻き取り量を検知する巻取センサを備え、前記巻取センサ及び前記昇降モータは前記トップブラシに対して一方の側方に配されることを特徴とする請求項１～５のいずれかに記載の洗車機。
【請求項７】
２本の前記ワイヤを１つの前記検出センサによって検出することを特徴とする請求項２～６のいずれかに記載の洗車機。
【発明の詳細な説明】
【技術分野】
【０００１】
本発明は、給油所等に設置して被洗浄車両の洗車を行う洗車機に関する。
【背景技術】
【０００２】
給油所等に設置される従来の洗車機は特許文献１に開示される。この洗車機は被洗浄車両の前後に開口部が形成された門型の洗車機本体を備えている。洗車機本体が被洗浄車両を跨いで被洗浄車両に対して前後に相対移動する。
【０００３】
洗車機本体には被洗浄車両の上面を洗浄するトップブラシと、トップブラシの重量に対応するつり合いおもりと、がワイヤに接続される。トップブラシの左右両端は長さの違うワイヤを介して吊り下げられ、それぞれのワイヤは右側部に設けられたつり合いおもりに

接続される。トップブラシは自重により相対移動する被洗浄車両に沿って被洗浄車両の上面と当接して洗浄する。

【先行技術文献】

【特許文献】

【０００４】

【特許文献１】特開昭５４－１１８６６３号公報

【発明の概要】

【発明が解決しようとする課題】

【０００５】

しかしながら、特許文献１に開示される洗車機はトップブラシに接続されるワイヤが緩むと、トップブラシの昇降動作が正常に動作せず被洗浄車両を破損する危険がある。

【０００６】

本発明は、被洗浄車両を傷つけずに洗浄する洗車機を提供することを目的とする。

【課題を解決するための手段】

【０００７】

上記目的を達成するために本発明は、被洗浄車両を跨いで前記被洗浄車両に対して前後方向に相対移動する洗車機本体の上部に前記被洗浄車両の上面を洗浄するトップブラシを配した洗車機において、前記トップブラシに接続して前記トップブラシの軸方向の両端を吊り下げる２本のワイヤと、前記ワイヤを巻き取る巻取部と、前記巻取部を介して前記ワイヤの巻き取り及び繰り出しを行うことにより前記トップブラシを昇降させる昇降モータと、前記ワイヤの緩みを検出する緩み検出部と、を備えたことを特徴とする。

【０００８】

この構成によると、被洗浄車両を跨ぐ洗車機本体に被洗浄車両の上面を洗浄するトップブラシが配される。洗車機本体が設定された洗車条件に基づいて、被洗浄車両に対して前後方向に相対移動しながらトップブラシを用いて洗浄を行う。トップブラシの両端はワイヤにより吊り下げられ、昇降モータにより巻取部を介してワイヤの巻き取り及び繰り出しを行って昇降される。洗車機本体にはワイヤの緩みを検出する緩み検出部が設けられ、ワイヤの緩みを検知するとトップブラシの昇降異常と判断して所定の動作が行われる。

【０００９】

また、本発明は上記構成の洗車機において、前記緩み検出部は、前記洗車機本体に回動自在に配されるレバーと、前記レバーの一端に軸支されるローラーと、前記ローラーを前記ワイヤに押し付ける方向に付勢する付勢部と、前記レバーの変位を検出する検出センサと、を備えたことを特徴とする。

【００１０】

また、本発明は上記構成の洗車機において、前記洗車機本体の上部に配した滑車を介して前記ワイヤが前記巻取部に巻回され、前記ローラーが前記滑車と前記巻取部との間の前記ワイヤに当接し、前記滑車の中心と前記巻取部の中心とを結ぶ線上に向かう方向に付勢されることを特徴とする。

【００１１】

また、本発明は上記構成の洗車機において、前記緩み検出部の検出によって前記ワイヤの緩みを検出した時に、前記トップブラシが前記ワイヤに正常な張力が復元する位置まで上昇することを特徴とする。

【００１２】

また、本発明は上記構成の洗車機において、緩みを検知した時間が所定時間続くと、前記洗車機本体の洗浄動作を停止することを特徴とする。

【００１３】

また、本発明は上記構成の洗車機において、前記ワイヤの巻き取り量を検知する巻取センサを備え、前記巻取センサ及び前記昇降モータは前記トップブラシに対して一方の側方に配されることを特徴とする。

【００１４】

また、本発明は上記構成の洗車機において、２本の前記ワイヤを１つの前記検出センサによって検出することを特徴とする。

【発明の効果】

【００１５】

本発明によると、被洗浄車両を傷つけずに洗浄する洗車機を提供することができる。

【図面の簡単な説明】

【００１６】

【図１】本発明の実施形態の洗車機の全体構成を示す側面図

【図２】本発明の実施形態の洗車機本体の構成を示す正面図

【図３】本発明の実施形態の洗車機本体の要部構成を示す正面図

【図４】本発明の実施形態の緩み検出部を示す正面図

【発明を実施するための形態】

【００１７】

本発明の第１実施形態を図面を参照して説明する。図１、図２は本実施形態の洗車機を示す側面図、正面図である。洗車機ＷＡは洗車機本体１を備え、洗車機本体１の進入経路上にはリモートパネル７Ａが配される。被洗浄車両ＣＡはリモートパネル７Ａの面前で停車し、リモートパネル７Ａの操作によって洗車の受け付け等を行う。

【００１８】

洗車機本体１は前後に開口し、被洗浄車両ＣＡを跨ぐ門型に形成される。洗車機本体１の底面には地面に設けられた左右一対のレール２上に配される車輪３が設けられる。これにより、洗車機本体１はレール２上を走行して被洗浄車両ＣＡに対して前後に相対移動する。

【００１９】

洗車機本体１には被洗浄車両ＣＡをブラッシングする複数の回転するブラシを設けている。ブラシはトップブラシ４、サイドブラシ５及びロッカーブラシ６から成っている。トップブラシ４は被洗浄車両ＣＡの上面を洗浄し、水平な回転軸（軸方向）４Ａ（図３参照）に布（織布、編布、不織布等）や樹脂繊維から成るブラシ毛を放射状に固着して形成される。

【００２０】

サイドブラシ５は左右一対設けられ、被洗浄車両ＣＡの両側面と前後面に摺動して被洗浄車両ＣＡを洗浄する。ロッカーブラシ６は左右一対設けられ、被洗浄車両ＣＡのタイヤを含む側面下部を洗浄する。サイドブラシ５及びロッカーブラシ６もトップブラシ４と同様の回転軸及びブラシ毛を有している。

【００２１】

洗車機本体１の一方の側方には洗剤やワックス等の各種液剤を貯液する複数の貯液タンク（不図示）を収納するタンク収納部５０が配される。タンク収納部５０の上方には市水及び各貯液タンクからの液剤を電磁弁等を介して分配する分配配管部５１が設けられる。分配配管部５１には第１、第２浄水ノズル１１、１３、第１、第２洗剤ノズル１２、１５、撥水コートノズル１４、ワックスノズル１６が導出される。

【００２２】

第１、第２浄水ノズル１１、１３は洗車機本体１の手前側及び奥側にそれぞれ配され、被洗浄車両ＣＡに対して市水を噴射する。第１、第２洗剤ノズル１２、１５は洗車機本体１の手前側及び奥側にそれぞれ配され、被洗浄車両ＣＡに対して洗剤を噴射する。撥水コートノズル１４は洗車機本体１の奥側に配され、被洗浄車両ＣＡに対して撥水コート剤を噴射する。ワックスノズル１６は洗車機本体１の奥側に配され、被洗浄車両ＣＡに対してワックスを噴射する。

【００２３】

また、洗車機本体１には被洗浄車両ＣＡを乾燥させるトップ送風ノズル２１とサイド送風ノズル２２とを設けている。洗車機本体１の中央上部にはトップ送風ノズル２１が設けられ、両側方にはサイド送風ノズル２２が設けられる。トップ送風ノズル２１及びサイド

送風ノズル２２はブロワ２０からの送風を被洗浄車両ＣＡに対して吹き付けて乾燥させる。

【００２４】

洗車機本体１の前面上部には車両センサ８が設けられている。車両センサ８は光電センサや超音波センサ等から成り、洗車機本体１に進入する被洗浄車両ＣＡの外面形状を検知する。

【００２５】

洗車機本体１の一方の側方の前面には操作パネル７が配される。操作パネル７はリモートパネル７Ａと同様の操作ボタンを備え、被洗浄車両ＣＡから降車したユーザ等の操作により洗車の受け付けや洗車条件の設定を行う。

【００２６】

洗車条件の設定としてはシャンプー、ワックス掛け、撥水コート等を水洗いに追加するボタンが操作パネル７及びリモートパネル７Ａに設けられる。また、高級なシャンプー、高級なワックス、高級な撥水コート、特殊なコート等を行うボタンも設けられている。さらに、フロントガード有り、フェンダーポール有り、ドアミラー有り、リヤワイパー有り、該当装備品無し等の装備品設定ボタンが設けられている。

【００２７】

図３は洗車機本体１のトップブラシ４の要部構成を示す正面図である。トップブラシ４の回転軸４Ａはトップブラシ４の中心から左右方向に伸び、左右に設けられたホルダ６１によって回転自在に支持される。トップブラシ４を回転させる回転モータ６０は右側方に配されて伝達機構５８を介してトップブラシ４の回転軸４Ａに連結される。これにより回転モータ６０はトップブラシ４を回転させる。

【００２８】

ホルダ６１はワイヤ６３Ａに接続される右側方のホルダ６１Ａとワイヤ６３Ｂに接続される左側方のホルダ６１Ｂとから構成される。ホルダ６１Ａ、Ｂにはそれぞれ上下に配される第１ガイドローラ６２Ａ及び第２ガイドローラ６２Ｂが軸支される。

【００２９】

洗車機本体１の両側部には上下方向に伸びる案内部５９が設けられる。案内部５９は水平断面図がコ字状に形成され、第１ガイドローラ６２Ａ及び第２ガイドローラ６２Ｂが当接して転動する。これによりホルダ６１Ａ、６１Ｂは案内部５９の案内によって上下に移動可能になっている。

【００３０】

右側方のホルダ６１Ａの上部はワイヤ６３Ａに接続され、上方に配される滑車６４Ａを介して巻取部８１へ接続される。ホルダ６１Ｂの上部はワイヤ６３Ｂに接続され、上方に配される滑車６４Ｂ及び滑車６４Ａを介して巻取部８１へ接続される。

【００３１】

巻取部８１は昇降モータ６５のモータ軸６５Ａと連結されており、昇降モータ６５の巻回によってホルダ６１Ａ及びホルダ６１Ｂは昇降する。これにより、トップブラシ４はワイヤ６３により吊り下げられて被洗浄車両ＣＡとの距離を一定に維持される。そして、昇降モータ６５の駆動によりワイヤ６３の巻き取り及び繰り出しを行うことにより昇降自在になっている。

【００３２】

洗車機本体１にはワイヤ６３の巻き取り量を検知する巻取センサ６７が設けられ、巻取センサ６７はトップブラシ４に対して昇降モータ６５と同じ右側方に配される。このためトップブラシ４の高さ位置を正確に把握するとともに、洗車機本体１を小型化して配線を簡素化することができる。

【００３３】

滑車６４Ａと巻取部８１との間にはワイヤ６３Ａ、６３Ｂの緩みを検出する緩み検出部７５が配される。緩み検出部７５はワイヤ６３Ａ、６３Ｂに対応して一対の引っ張りバネ７０Ａ、７０Ｂと、レバー７１Ａ、７１Ｂと、ローラー６９Ａ、６９Ｂと、を備える。ま

た、レバー７１Ａ、７１Ｂの変位を検出する検出センサ７４が１つ設けられる。なお、７３Ａ、７３Ｂはそれぞれレバー７１Ａ、７１Ｂの軸部を示している。

【００３４】

図４は緩み検出部７５の正面図を示している。図を簡略化するために一方のワイヤ６３Ａの緩みを検出する構成を記載しており、ワイヤ６３Ｂについても同様である。洗車機本体１にはレバー７１Ａが軸部７３Ａで回動自在に支持される。引っ張りバネ７０Ａは一端を洗車機本体１に接続され、他端をレバー７１Ａの下部に接続される。これにより、レバー７１Ａが図中、反時計回りに付勢される。

【００３５】

ローラー６９Ａはレバー７１Ａの上端に軸支され、滑車６４Ａと巻取部８１との間のワイヤ６３Ａに当接する。この時、ローラー６９Ａは引っ張りバネ７０Ａによって滑車６４Ａの中心６４Ｃと巻取部８１の中心８１Ａとを結ぶ線Ｔ上に向かう方向（Ｆ方向）に付勢される。これにより、滑車６４Ａ及び巻取部８１からワイヤ６３Ａの脱落を防止することができる。

【００３６】

上記構成により、洗車機本体１が設定された洗車条件に基づいて被洗浄車両ＣＡに対して前後方向に相対移動する。そして、被洗浄車両ＣＡには貯液タンク５０から液剤が供給され、洗車機本体１に設けた回転ブラシが被洗浄車両ＣＡに摺動して被洗浄車両ＣＡが洗車される。この時、車両センサ８の検知によってトップブラシ４は昇降モータ６５の駆動により被洗浄車両ＣＡの上面に沿って一定の距離を維持して昇降し、被洗浄車両ＣＡの上面を傷つけずに洗浄することができる。

【００３７】

例えば、トップブラシ４が下降して被洗浄車両ＣＡの上面を洗浄中に装備品のフェンダーミラー、ルーフキャリアなどにトップブラシ４が乗り上げるとワイヤ６３に緩みが発生する。この時、検出センサ７４の検知によってワイヤ６３の緩みを検出し、緩み検出部７５は異常動作であると判定する。そして、制御部（不図示）を介して操作パネル７による表示などによって報知してもよい。この時、巻取部８１を巻回することによりトップブラシ４はワイヤ６３に正常な張力が復元する高さ位置まで上昇される。これにより、被洗浄車両ＣＡの上面を傷つけることを抑えることができる。

【００３８】

さらに、緩み検出部７５が緩みを検知した時間が２～３秒続くと、前記洗車機本体の洗浄動作を全て停止する。これにより、確実に被洗浄車両ＣＡの破損を防止することができる。

【００３９】

本実施形態によると、洗車機本体１にはトップブラシ４を吊り下げるワイヤ６３と、ワイヤ６３を巻き取る巻取部８１と、ワイヤ６３の巻き取り及び繰り出しを行うことによりトップブラシ４を昇降させる昇降モータ６５と、ワイヤの緩みを検出する緩み検出部７５と、が設けられる。このため、トップブラシ４は被洗浄車両ＣＡの上面に沿って一定の距離を維持して昇降するため、被洗浄車両ＣＡの上面を傷つけずに洗浄することができる。また、ワイヤ６３の緩みを検出する緩み検出部７５を設けたので、ワイヤ６３の絡み付きなどによるトップブラシ４の昇降の異常を容易に判別することができる。従って、運転停止や報知等を行って被洗浄車両ＣＡの破損を防止することができる。

【００４０】

また、緩み検出部７５は、洗車機本体１に回動自在に配されるレバー７１Ａ、７１Ｂと、レバー７１Ａ、７１Ｂの一端に軸支されるローラー６９Ａ、６９Ｂと、ローラー６９Ａ、６９Ｂをワイヤ６３Ａ、６３Ｂに押し付ける方向に付勢する付勢部７０Ａ、７０Ｂと、レバー７１Ａ、７１Ｂの変位を検出する検出センサ７４と、を備える。このため、ワイヤ６３Ａ、６３Ｂの緩みの検出を容易に行うことができる。

【００４１】

また、ローラー６９Ａ、６９Ｂが滑車６４Ａと巻取部８１との間のワイヤ６３Ａ、６３

Ｂに当接し、滑車６４Ａの中心６４Ｃと前記巻取部８１の中心８１Ａとを結ぶ線Ｔ上に向かう方向Ｆに付勢される。このため、ワイヤ６３Ａ、６３Ｂに緩みが発生してもワイヤ６３Ａ、６３Ｂの滑車６４Ａの巻回位置は維持し易くなる。

【００４２】

また、緩み検出部７５の検出によってワイヤ６３Ａ、６３Ｂの緩みを検出した時に、トップブラシ４がワイヤ６３Ａ、６３Ｂに正常な張力が復元する位置まで上昇するため、このため、被洗浄車両の上面をより傷つけずに洗浄能力を維持できる。

【００４３】

また、緩みを検知した時間が所定時間続くと、洗車機本体１の洗浄動作を停止するため、被洗浄車両ＣＡをより確実に傷つけ難くする。

【００４４】

また、ワイヤ６３の巻き取り量を検知する巻取センサ６７を備え、巻取センサ６７及び昇降モータ６５はトップブラシ４に対して側方に配される。このため、洗車機本体１を小型化することができる。

【００４５】

また、２本のワイヤ６３Ａ、６３Ｂを１つの検出センサ７４によって検出することを特徴とする。このため、配線を簡素化するとともに、洗車機本体１の小型化することができる。

【００４６】

本実施形態において、巻取センサ６７及び昇降モータ６５はトップブラシ４に対して左側方に配されてもよい。

【産業上の利用可能性】

【００４７】

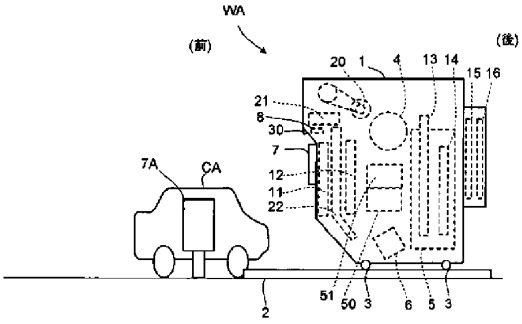
本発明によると、給油所等に設置して被洗浄車両の洗車を行う洗車機に利用することができる。

【符号の説明】

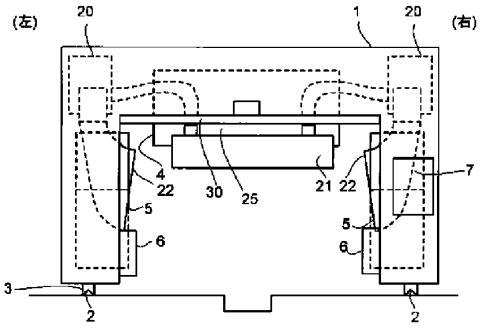
【００４８】

１	洗車機本体
４	トップブラシ
４Ａ	回転軸
５	サイドブラシ
６	ロッカーブラシ
７	操作パネル
７Ａ	リモートパネル
６０	回転モータ
６３Ａ、６３Ｂ	ワイヤ
６５	昇降モータ
６７	巻取センサ
６９Ａ、６９Ｂ	滑車
７０Ａ、７０Ｂ	引っ張りバネ
７１Ａ、７１Ｂ	レバー
７３Ａ、７３Ｂ	軸部
７４	検出センサ
７５	緩み検出部
８１	巻取部
ＣＡ	被洗浄車両
ＷＡ	洗車機

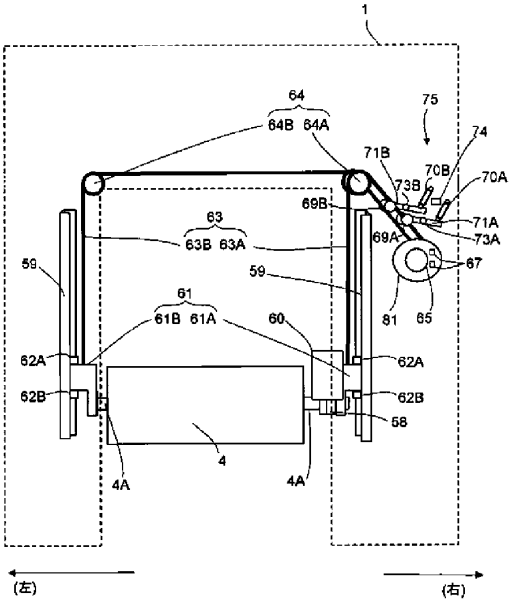
【図１】


WA
(前)
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21
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7A
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51 50 3 6 5 3

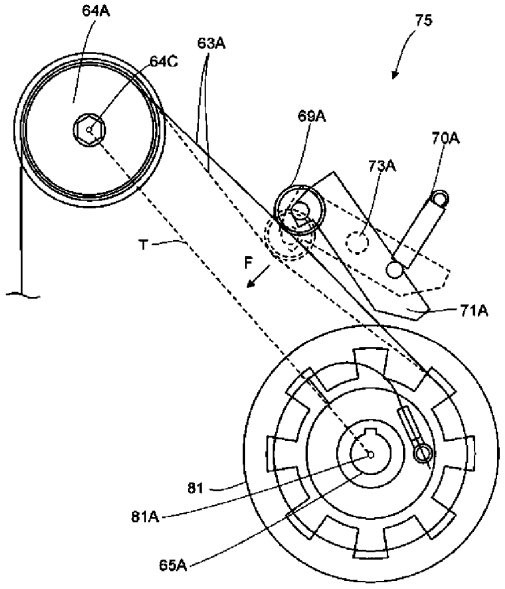
【図２】


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(右)
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6
3
2
2

【図３】


1
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64B 64A
75
74
71B
70B
70A
73B
69B
71A
73A
63
63B 63A
69A
67
59
59
61
61B 61A
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81
65
62A
62A
62B
62B
58
4
4A
4A
(左)
(右)

【図４】


64A
64C
63A
75
69A
70A
73A
T
F
71A
81
81A
65A

フロントページの続き

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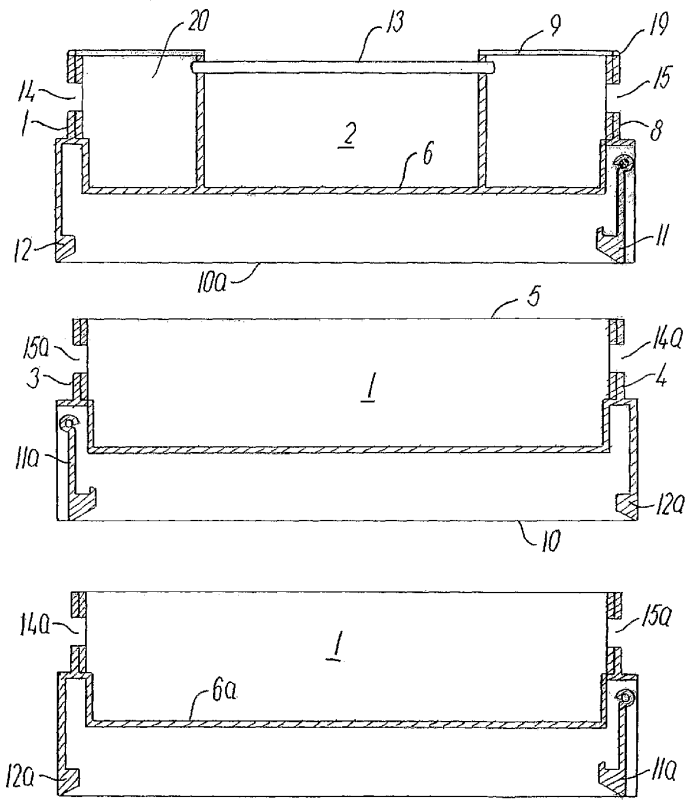
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[Continued on next page]

(54) Title: A STORAGE DEVICE COMPRISING TWO PARTS



(57) Abstract: A storage device for coupling at least one box (1) and at least one cover (2), having a carrier grip (13), together is formed by a lock or a snap lock (11, 11a), which is provided in the one gable (3, 8) or side wall of the cover or the box, while a locking pin (12, 12a) is provided in the opposite gable (4, 7) or side wall. The snap lock is adapted to engage a gripper flange (14, 14a), which is provided at the top of the gable (3, 8) or side wall of the box or the cover, while the locking pin (12, 12a) is adapted to engage a locking edge (15, 15a), which is provided in the opposite gable (4, 7) or side wall of the box or the cover. The invention provides a storage device, where a cover and a box may be coupled to and be disconnected from each other by a lateral movement of the cover or the box under the action of the carrier grip (13), so that the snap lock is not loaded by the weight of the cover in connection with the separation. In addition, assembly and separation of cover or box to/from the box or the cover may take place in a few seconds.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

A storage device comprising two parts

The invention relates to a storage device comprising two parts, such as two boxes or a box and a cover, which parts may be stacked and coupled together, wherein each part has two opposed gables and a coupling means at each gable for detachably coupling the two parts together in a stacked state, wherein the coupling means at the one gable of the one part is arranged to cooperate with the coupling means at the one gable of the other part, wherein the coupling means at the other gable of the one part is arranged to cooperate with the coupling means at the other gable of the other part, and wherein the coupling means of both parts at the one gable are formed by a first coupling means having a snap lock function.
The invention moreover relates to use of the storage device.

Boxes having covers which may be coupled together are provided in several embodiments and sizes and are used in a multitude of connections. In particular for use as tool boxes, there are many types which are configured with various gadgets.

Boxes having covers are known, wherein covers and boxes may be coupled together in a mutual order by means of snap locks provided in the covers, and may thus be adapted to various needs.
The box systems thus known are extremely flexible, but may be vitiated by the drawback that the release of boxes and covers from each other is performed in that a user grips the snap locks in the gables of the boxes and/or the covers by both hands, which means that the weight of the boxes and the covers being released is transferred to the snap locks. To prevent breaking of these, they must therefore be made very sturdy.

Accordingly, an object of the invention is to provide a storage device for boxes having covers, where the weight of the cover or covers and/or the

box or boxes is not transferred to the snap lock.

The object of the invention is achieved by a storage device of the type defined in the introductory portion of claim 1, which is characterized in that the coupling means of the two parts at the other gable are formed by a second coupling device, wherein both coupling means may be coupled together with and be detached from each other by lateral displacement of the two parts relative to each other.

Hereby, the cover and the box may be detached from each other by release of the snap lock, so that the entire weight is not transferred to the snap lock, since parts of the cover are supported by the box or the cover, while the snap lock is released.

It should also be noted that assembly and disassembly of the cover on/from the box takes place in a few seconds, and consequently is very time-saving and simple and convenient for a user to handle.

Expediently, as stated in claim 2, the two coupling means in said second coupling means are formed by a pin, which is provided in the lower portion of the other gable of the part disposed at the top of the stack, as well as an edge arranged to engage the pin, said edge being provided in the upper portion of the other gable of the part disposed at the bottom of the stack.

Hereby, a simple and effective attachment of the cover to the box is achieved when the snap lock is in engagement. The same will apply if it is desired to couple two boxes or two covers together.

To completely prevent transfer of any weight from the cover to the snap lock, it is advantageous if, as stated in claim 3, the cover is provided with a recessed carrier grip at its upper side, whereby the carrier grip absorbs the entire weight of the cover and the boxes and covers coupled together below the cover, which it might be desired to have removed from the underlying

boxes and/or covers.

As stated in claim 4, it is expedient that the snap lock function is configured as a snap lock, which is configured as a moulded part in the gable or side wall of the cover or the box, which may engage the edge which is provided in the gable or the side wall of the cover or the box.

If a more sturdy, but also more expensive snap lock is desired, it is advantageous if, as stated in claim 5, the snap lock is formed by a gripper part which is spring-biased.

If, as stated in claim 6, the cover is provided with an edge at the top of both gables or side walls, and the cover is provided with a snap lock at the bottom of its one gable or sidewall and is provided with a locking pin in its other gable or side wall, and, as stated in claim 7, the box is provided with an edge at the top of both gables or side walls and with a snap lock at the bottom of the one gable and with a locking part at the bottom of the opposite gable, an arbitrary number of boxes and covers may be coupled together in a simple manner in an arbitrary order.

As mentioned, the invention also relates to use.
This use is defined in claim 8.

The advantage of this use is that the costs of packaging, pallets, sheeting, shipment and storage space may be reduced considerably relative to the costs associated with tool boxes assembled at the factory, since a compact concept is involved here.
With this packaging system, combined with the extremely quick assembly concept, the costs may thus be reduced to 30 – 40% of the corresponding costs of tool boxes assembled at the factory.

The invention will now be explained more fully with reference to the drawing, in which

fig. 1 shows a storage device according to the invention on a box having a cover, where the cover is separated from the box,

fig. 2 shows the storage device of fig. 1 during the coupling-together of the cover and the box,

fig. 3 shows the storage device of fig. 1 and fig. 2, where the cover and the box are coupled together,

fig. 4 shows a second embodiment of the invention, where two boxes are seen in perspective before they are assembled,

fig. 5 shows a third embodiment seen from the side and how the storage device is configured with a cover and two boxes,

fig. 6 shows the storage device according to the invention used in another embodiment, while

fig. 7 shows how boxes and covers with the storage device of fig. 4 may be stacked.

Figs. 1 – 3 show a box having a cover, where there is only one set of locking means which cooperate on a box and a cover, while figures 4 and 5 show boxes and covers, where cooperating locking means are provided both at the top and at the bottom of the boxes and the covers.

The figures show a box 1 which has gables 3, 4, a bottom 6a.
In the gables of the box near the open upper part of the box, the gable 3 is

provided with a coupling means in the form of a locking edge 15a, while the opposite gable 4 is provided with a coupling means in the form of a gripper flange 14a.

At the bottom of the gables of the box (only figs. 4 and 5), a coupling means in the form of a snap lock 11a is provided near the open lower part 10 of the box, while a coupling means in the form of a locking edge 12a is provided in its opposite gable.

The numeral 2 designates a cover which has gables 7, 8, a lid 9 and an open lower part 10a as well as a carrier grip 13.

A coupling means in the form of a locking pin 12 and another coupling means in the form of a snap lock 11 are provided at the bottom of the one gable of the cover, said snap lock having spring properties so that a hook on the snap lock is affected by a force directed inwardly against the gable.
A locking means in the form of a gripper flange 14 is provided at the top (only figs. 4 and 5) of the one gable of the cover, while another locking means in the form of a locking edge 15 is provided in the opposite gable.
Further, the cover may be provided with a lid 9, below which an insert part intended to store small tools, screws, nails and the like may be placed.

The mode of operation of the locking system will now be explained more fully with reference to figures 1 – 3.
From the position shown in fig. 1 where a user (not shown) has gripped the carrier grip 13, the gable 7 is moved down, so that the locking pin 12 engages the locking edge 15a.
Then, the cover 2 is pressed down in the direction of the arrow 16, following which the snap lock 11 engages the locking edge 14a, so that the cover 2 is secured to the box 1 by the locking system, which is formed by the snap lock 11, the locking pin 12, the gripper flange 14a and the locking edge 15a.

When, subsequently, the cover 2 is to be detached from the box, a user grips the carrier grip 13 by the one hand and releases the snap lock 11 from the gripper flange 14a by the other hand, following which the cover is lifted and displaced to the right, whereby the cover may be detached from the box.

When the cover is coupled together with and separated from the box, the cover remains in almost the same horizontal plane, as lateral displacements take place during the operations.

In addition, the snap lock 11 will never have to absorb the weight of the cover, which may optionally contain tools and the like.

The storage device according to the invention may be used in connection with the coupling-together of several boxes and covers of the type which is described in the applicant's above-mentioned DK Patent Application No. PA 2004 01454, as will be explained now in connection with figures 6 and 7.

Fig. 6 shows a box system which consists of a box 1 with a mounted cover 2, and a tray 18 having a carrier grip 17 is arranged inside the box 1, where the tray may e.g. contain small tool parts, nails, screws and the like.

The box has obliquely inwardly extending walls, which means that they may be stacked as shown at the bottom of fig. 7.

Moreover, the tray 18 may be moved into the cover 2 and be stacked as shown in fig. 7.

Hereby, an extremely compact system is provided, which occupies minimum space during transport and during storage at wholesalers and at retailers.

Thus, just an assembled box with cover and tray, as shown in fig. 6, need be displayed in a sales room, and when a consumer wants to buy a box with cover, he just takes a box from a first stack and then a cover with tray from a second stack, which may subsequently be coupled together in a few seconds by the locking system according to the invention.

PATENT CLAIMS

1. A storage device comprising two parts, such as two boxes or a box and a cover, which parts may be stacked and coupled together, wherein each part has two opposed gables and a coupling means at each gable for detachably coupling the two parts together in a stacked state, wherein the coupling means at the one gable of the one part is arranged to cooperate with the coupling means at the one gable of the other part, wherein the coupling means at the other gable of the one part is arranged to cooperate with the coupling means at the other gable of the other part, and wherein the coupling means of both parts at the one gable are formed by a first coupling means having a snap lock function, c h a r a c t e r i z e d in that the coupling means of the two parts at the other gable are formed by a second coupling device, wherein both coupling means may be coupled together with and be detached from each other by lateral displacement of the two parts relative to each other.

2. A storage device according to claim 1, c h a r a c t e r i z e d in that the two coupling means in said second coupling means are formed by a pin, which is provided in the lower portion of the second gable of the part disposed at the top of the stack, as well as an edge arranged to engage the pin, said edge being provided in the upper portion of the other gable of the part disposed at the bottom of the stack.

3. A storage device according to claim 1 or 2, c h a r a c t e r i z e d in that the cover is provided with a recessed carrier grip at its upper side.

4. A storage device according to claims 1 – 3, c h a r a c t e r i z e d in that the snap lock function is configured as a snap lock, which is configured as a moulded part in the gable or side wall of the cover or the box, which may engage the edge which is provided in the gable or side wall of the cover or

the box.

5. A storage device according to claims 1 – 3, c h a r a c t e r i z e d in that the snap lock is formed by a gripper part which is spring-biased.

6. A storage device according to claims 1 – 5, c h a r a c t e r i z e d in that the cover is provided with an edge at the top of both gables or side walls, and that the cover is provided with a snap lock at the bottom of its one gable or side wall and is provided with a pin at its other gable or side wall.

7. A storage device according to claims 1 – 6, c h a r a c t e r i z e d in that the box is provided with an edge at the top of both gables or side walls and is provided with a snap lock at the bottom of the one gable and is provided with a pin at the bottom of the opposite gable.

8. Use of a storage device according to claims 1 – 7 in connection with boxes and covers which are shaped conically.

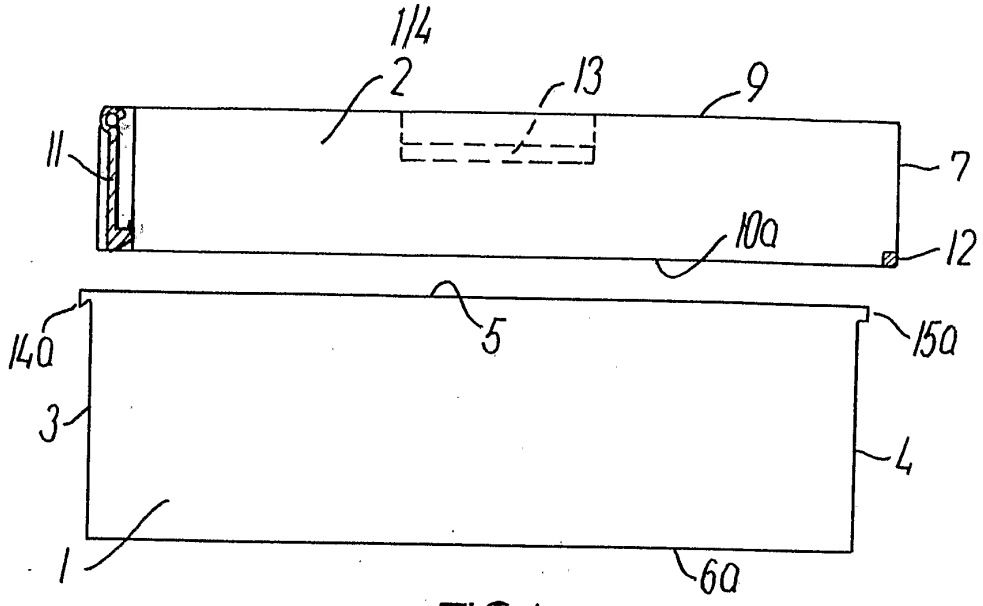


FIG.1

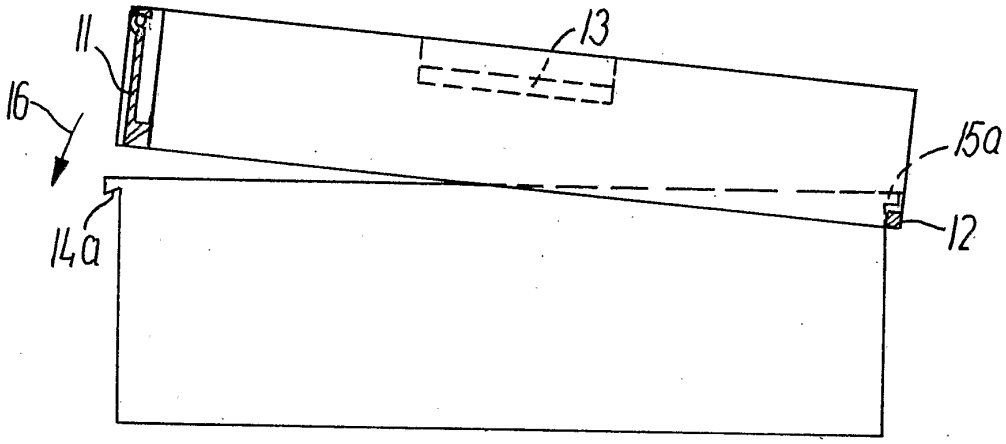


FIG.2

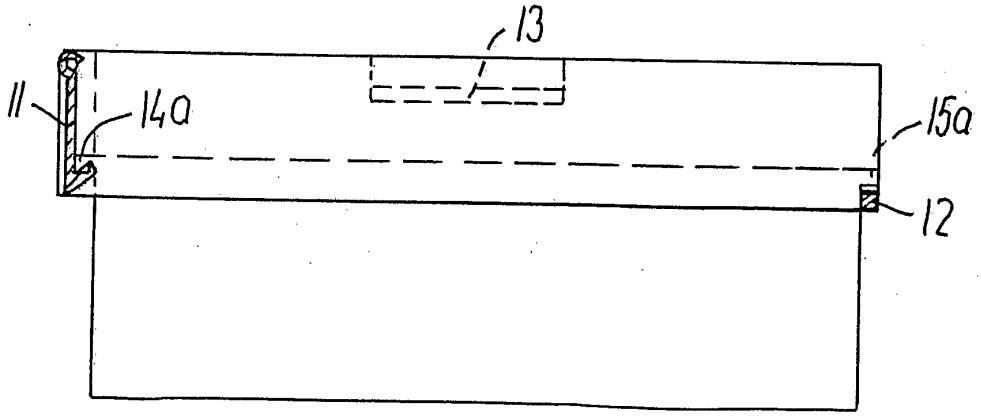


FIG.3

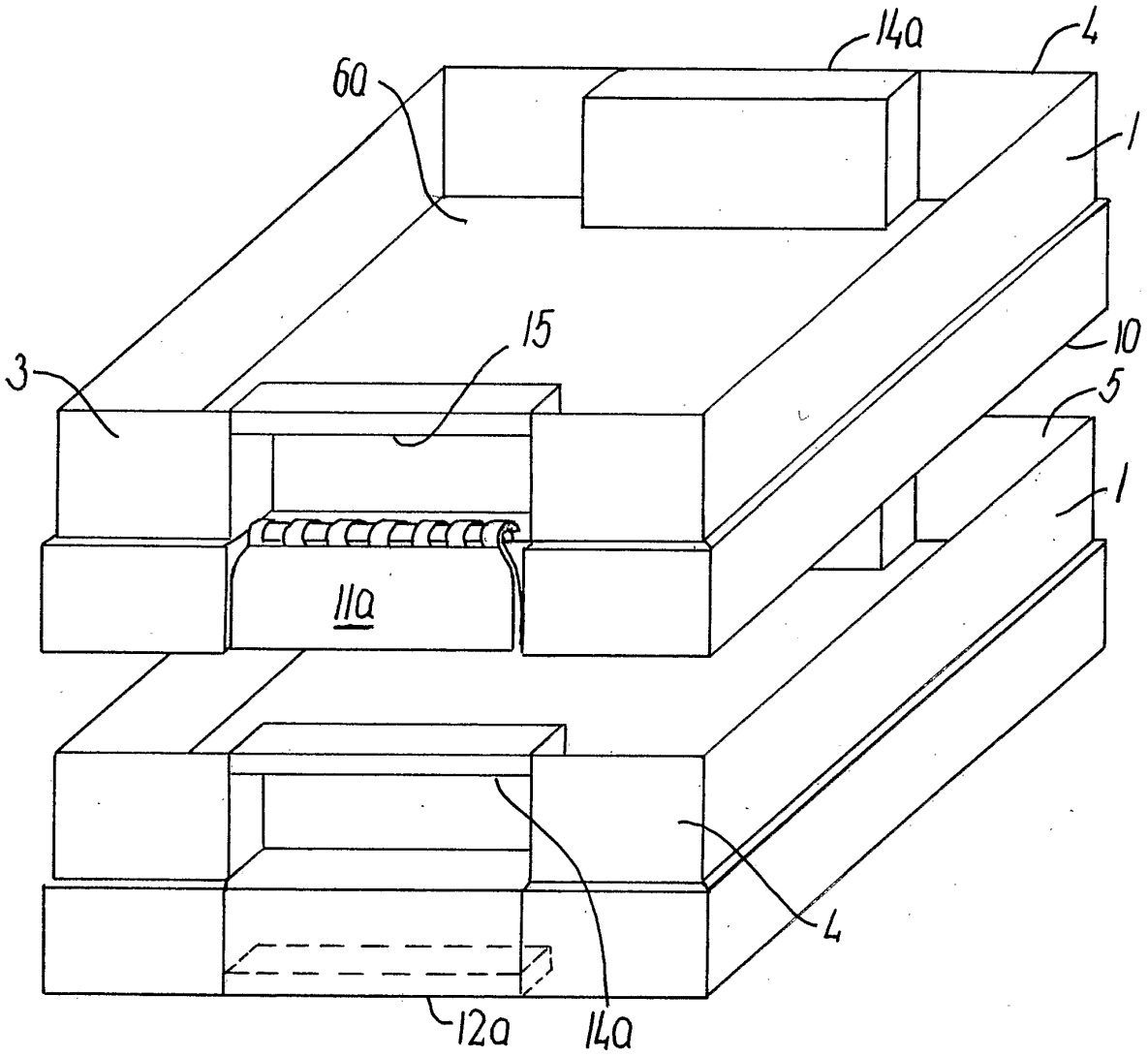


FIG. 4

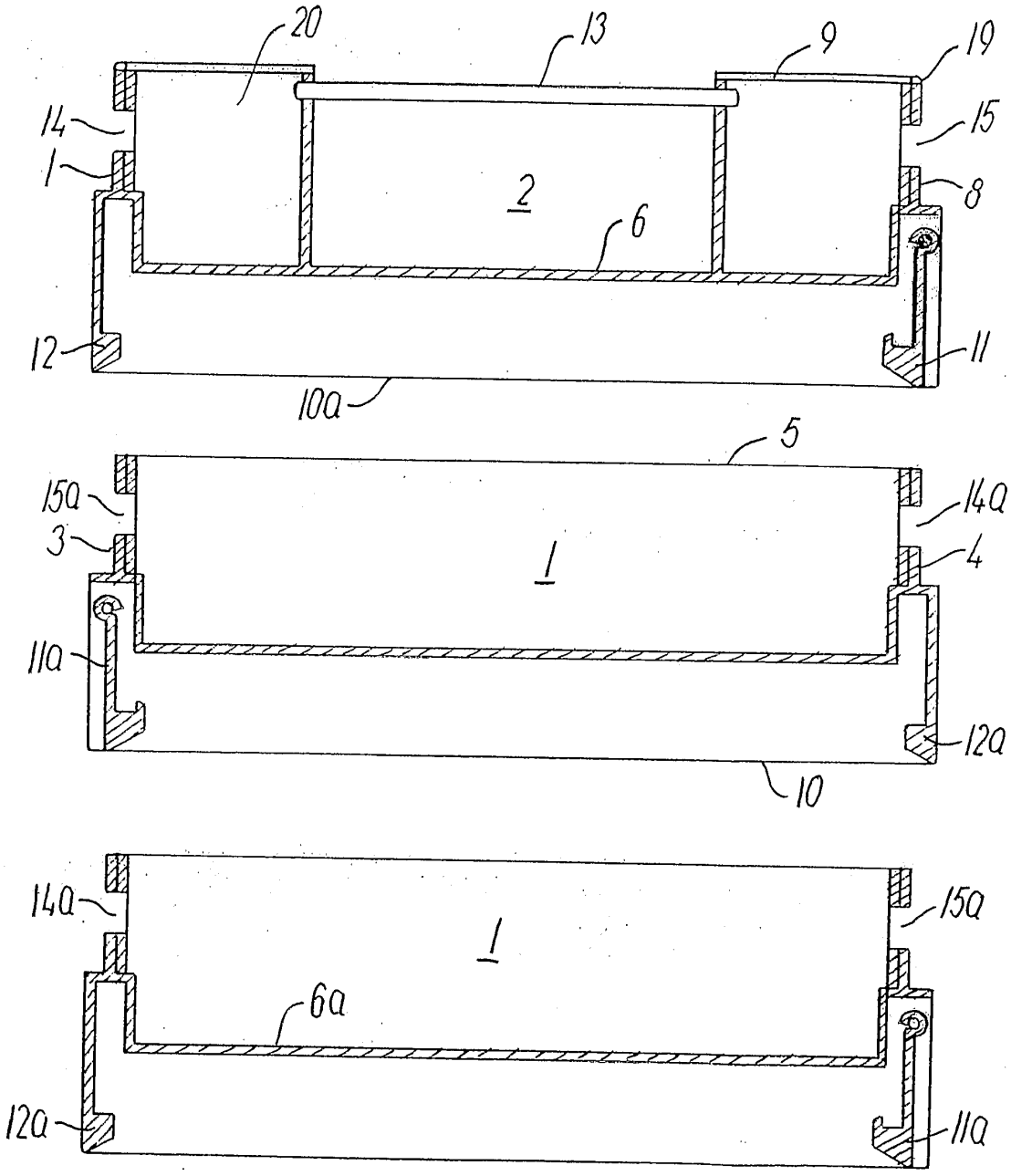

20
13
9
19
14
15
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2
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11
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12a
11a

FIG.5

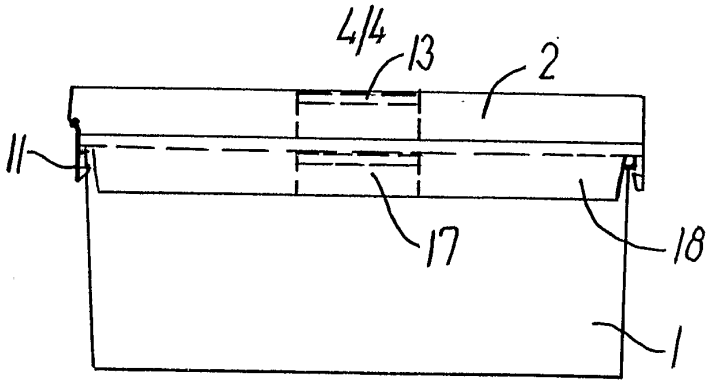


FIG. 6

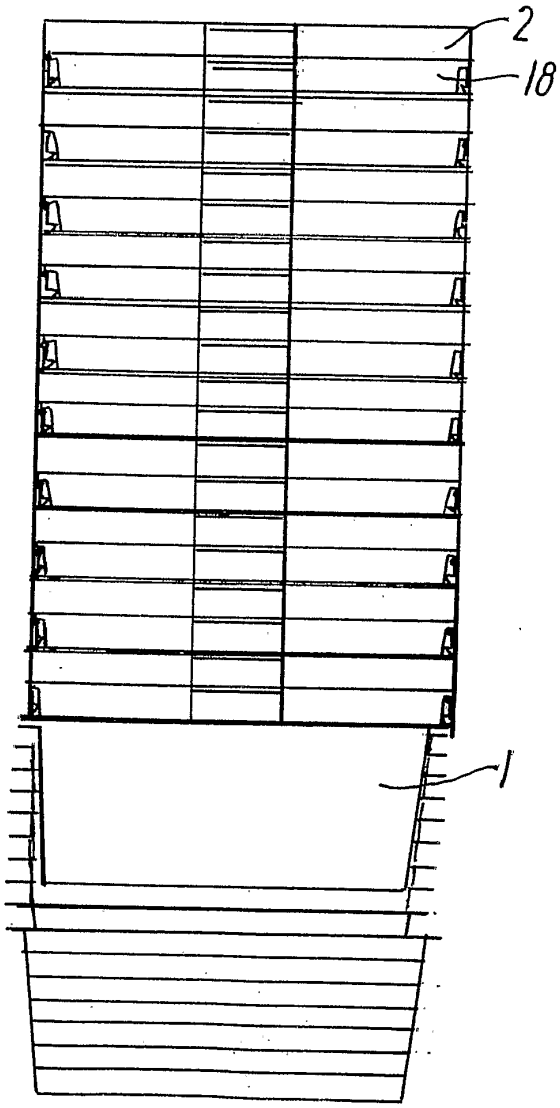


FIG. 7

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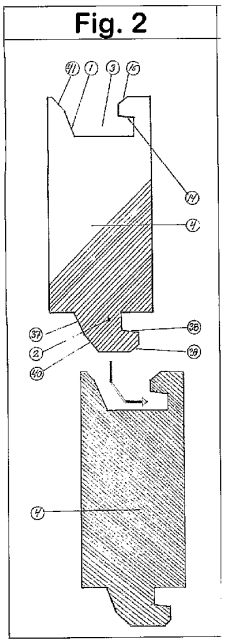
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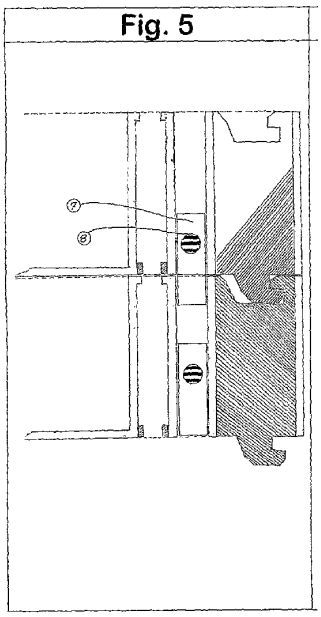
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(54) **Title**: STORAGE ARRANGEMENT CONSISTING OF TWO PARTS SUCH AS TWO CASES OR ONE CASE AND ONE LID





(57) **Abstract**: u / The storage facility for coupling of at least one box and at least one lid is comprised of coupling units as shown in Fig. 2, bottom bridge 2 on the top box and top bridge 3 on the lower box. These must be tightly engaged via the conic flanges 14 + 38 and subsequently locked in the gear via transport lock 7. The primary objective of the invention is to provide a new and functional storage system for tools, equipment and minor parts, which makes it easy to locate what you are looking for and where the objects are easy and fast accessible. Furthermore, it is possible to produce the invention in an inexpensive way and still make it robust and easy to assemble as well as disassemble in only a few seconds.

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Storage arrangement consisting of two parts such as two cases or one case and one lid.

The invention concerns a storage arrangement that includes two parts such as two cases or one case and one lid, which parts can be stacked and connected to each other and where each part has two opposite gables and by a coupling unit in each of the two gable corners for separable connection of the two parts in stacked condition, caused by the four coupling units having one in each corner, is arranged to cooperate with the coupling units of an underlying case or lid, which also are placed in the four corners.

The bottom part of each case is in each of the four corners provided with a bottom bridge and in the four corners of the top part with a top bridge. When the bottom bridges of the top case are placed above the opposite top bridges of the lower case they will easily get in gear and with a slight sidewards push be brought into a tight and compact condition. A transport lock placed in tight connection to one of the connecting bridges (bottom- and top bridges), can be activated outside the case with a little downwards push and provide a blocking for separation of the four sets of connecting bridges and as such also for separation of the two cases or case and lid.
As such cases can be connected unlimited. A craftsman f. inst. can have a set of cases (tower) existing of six – eight cases on top of each other. The value of tools and technical equipment in f. inst. six – eight cases can be extremely high and it can be desirable to lock the whole system (tower). A lock against theft can be integrated in the system with a blocking lock only operational inside the cases. A spring loaded security lock in full height of all cases can be activated with a downwards push and then be locked with a little twist. If f. inst. six cases are stacked on top of each other it will be possible with a push on the security lock on the top case to activate all the security locks of all underlying cases. On the top case a lid with a handgrip can be placed and on the lid can be placed a lock, f. inst. a digital code lock. During this, the whole case system (tower) is locked.

Cases with lids that can be connected are available in various designs and sizes and are being used in many connections. Many tool cases are available with various features.

Normally tool cases and stackable cases are designed with a hinged lid. There are stackable cases with hinged lid that in principle can be stacked and connected unlimited.

The coupling for these case systems normally takes place with snaplocks and/or locking clips. Snaplocks can be springloaded and provide automatic locking. Locking clips normally have to be operated by hand for both locking and unlocking. The disadvantages by these locking clips are that they by low temperature can be tight and difficult to operate (broken nails). They can also be worn, break into pieces and because it is a separate component it can fall off and disappear, where after the system does not work anymore. With a well known case system the coupling is made via four locking clips per case. By coupling of f. inst. six cases it means five cases with each four locking clips = in total twenty locking clips to be pressed in locking position. By separating the case system the process has to be repeated with twenty times finger releases. Furthermore it is a well known disadvantage by existing coupling systems that the coupling is not tight and compact and leaves a space in between the cases from 1,5 to 3,0 mm when lifting in the top case or top lid (accordion effect).

Coupling with snaplocks can be automatic in the locking process and as such very quick. Very often these snaplocks are separate components that can be worn, come to pieces or fall off. In addition these locks will not establish a tight and compact coupling and therefore not provide the desired breaking strength and wearing quality.

The purpose with the invention is to provide a connecting bridge for stackable cases and lids that can raise the desired and needed demand for strength and to avoid breakage in connection with daily use, wear and tear and in addition a simple and quick operational system. Other points and

functions are also a part of the invention and are described following.

The purpose with the invention is considered by a storage arrangement as described in the introduction to claim 1 that is characteristic by that in each of the four corners of the storage arrangement (case) a connecting bridge is moulded together from top to bottom of the case. The connecting bridge is constructed with a top bridge on top and in bottom a bottom bridge.

By coupling of two cases the bottom bridges of the top case will meet the top bridges of the lower case and they will easily fall in gear because of the conical catch flanges on both top- and bottom bridges. The final coupling is made by a slight sideward push on the top case. To secure this coupling, are by at least one of the four connecting bridges moulded together two vertical houses for locking (columns). In one of these is placed a vertical lock (transport lock) that can be operated from outside the case and with a slight downwards push bring the transport lock in a blocking position and secure that all four top bridges and bottom bridges are in gear.

The other vertical column for locking can be used as a security lock as described following.

Because of the special design of the conical top- and bottom bridges the coupling can happen very quick and a push on the locking knob placed outside the case will bring the transport lock in blocking position tight to the connecting bridge.

The four connecting bridges are placed in the outer corners of the cases and as such providing optimal strength and stability in the coupling. The connecting bridges including top- and bottom bridges are moulded together with the gable, sidewall and bottom of the cases and as such providing optimal strength and stability.

The connecting bridges are moulded together with the case and as such there are no loose components that can be worn, go apart, fall off and disappear.

Because of the construction where all the basic elements of the case are moulded together a very advantageous and inexpensive cost price can be obtained.

Alternatively to four connecting bridges per case it could be considered for lighter and private use only to use two connecting bridges, f. inst. one in each gable of the case. Because of the construction with the conical locking frames on top- and bottom bridges and combined with the accuracy available by plastic moulded subjects it will be possible to avoid accordion effect because the coupling will be tight and without wobble.

This also provides a robust impression in connection with the security lock and use of the system (tower) as a sack trolley.

The transport lock keeping the top- and bottom bridges in tight gear can be activated by a locking knob placed outside the cases. The process of locking and unlocking will only take one second.

The locking column for the security lock is moulded together with the case and the connecting bridge for optimal strength and stiffness. The security lock is in same height as the outer dimension of the case and is equipped with a push spring that at all time will try to position the security lock within the height of the case.

The security lock is being activated by a downward push from above and will after four to six mm's movement provide a total blocking and as such secure the coupling. The security lock has a locking arm that can be twisted, get in gear and fix the locking.

If f. inst. six cases are stacked on top of each other the six security locks will in principle be in contact with each other meaning that when the security lock of the top case is activated downwards the security locks of all underlying cases will be brought in blocking position and the final locking with the small locking arm is only needed inside the top case. The security lock can only be operated inside the cases. When the small locking arm in the vertical house for locking is turned back again the push spring will bring all six locks back to the starting point. Upon the top case will be placed a lid with an integrated lock f. inst. a digital padlock and the whole system is locked up.

As such the security lock is extremely quick to operate for unlocking the

system (tower) f. inst. consisting of six cases. Some users could choose to use the security lock as transport lock because only one action (one second) is needed for locking or unlocking the whole tower.
Both transport- and security locks are very robust and strong caused by the construction in which they are placed in the vertical houses moulded together with the gables, sidewalls and bottom of the cases.

The four bottom bridges can be provided with small rubber shoes and then be used as feet, which will protect against dust and scratches on the cases as well and on tables, shelves and floors on which the cases might be placed.

By a selection of extension walls (cases without bottom) existing height of the cases can be enlarged and the volume of the cases will also be enlarged. The extension walls also have a connecting bridge in each of the four corners and can as such be coupled and locked random with the other cases. If f. inst a case is 100 mm high and two extension frames of each 100 mm are placed on top the height of the case will be 300 mm.

With a case system, as here mentioned, with extreme tight and compact connection it is obvious to provide a rolling transport of the set (tower). A bottom box has two wheels that only will obtain contact to the foundation by a 15° backwards inclination. Because the whole set (tower) is very compact and stiff it will in principle be possible to transport it as an ordinary sack trolley.

A transparent lid (possibly disposable) means that a supplier of machines, hand tools, accessories, screws, bolts, etc. can prepare and pack "a set", place the transparent lid on top of the case and seal it. With this the end user (final customer) is secured, that "the set" is complete in the buying situation and when sealing is broken.

A small opening locked with a transparent plate in the walls of the cases provides a visual view to the contents of the cases. The transparent plate is placed in an insert frame and can easily be replaced by a not transparent plate on which can be indicated contents etc. Without any indications this plate will simply just block for view into the case.

The invention also concerns the practical use.

With the previous mentioned basic ideas and features the modern craftsmen can look forward to a more organised and structured separation, handling and transport of tools, equipment, etc.

With the quick disassembly and assembly of the cases, combined with the visual overview of the contents the craftsmen can choose and couple together exact the cases needed for today's work. The transport of the set is wheeled (sack trolley concept).

Following the invention will be described with reference to the enclosed drawings and photos.

Fig. 1 showing two connecting bridges assembled and disassembled.

Fig. 2 showing two connecting bridges disassembled and with more details inclusive conical locks and catch flanges.

Fig. 3 showing two cases in which the connecting bridges in the corner unit are moulded together with the houses for transport- and security lock.

Fig. 4 showing the same as Fig. 3 but now with the transport lock in both cases.

Fig. 5 showing the same as Fig. 4 but with the transport lock of the top case in blocking position.

Fig. 6 showing the two cases with both transport- an security lock in neutral position.

Fig. 7 showing the same as Fig. 6 but with the security lock in blocking position on both top- and bottom case.

Fig. 8 showing transport- and security lock in the four possible positions in respectively 8A – 8B – 8C – 8D. The gable of the case is marked on 8A.

Fig. 9 showing a set of stacked cases (tower) where one of the two integrated transport wheels can be seen lowest at right.

Fig. 10 showing a set of cases (tower) with lid, code lock and carrying-grip.

Fig. 11 showing an extension frame without bottom but with the four connecting bridges.

Fig. 12 showing a 100 mm high standard case.

Fig. 13 showing a 100 mm high standard case with a 100 mm high extension frame placed and the transport lock is locked.

Fig. 14 showing a standard case with two extension frames on top.

Fig. 15 showing a case with a drill and a cable reel as a packed set. Closing of the case can be done with a transparent lid that can be sealed. It means that both the retailer and the end user can be sure that the set is complete.

Fig. 16 showing a case with an inside insert frame with a transparent window for view into the contents of the case.

Fig. 17 showing a case like in Fig. 16 on which the transparent window is replaced be a plate for indication of the contents.

Following the invention will be described with reference to the enclosed drawings/photos and the reference numbers used.

On Fig. 1 is shown the basic drawing of the connecting bridge (4) on which the bottom bridge (2) is framed like a downwards positive L-profile (male) which falls in gear with the top bridge (3) of the underlying case which is framed like a negative L-profile (female).

On Fig. 2 is shown the top bridge (3) with a direct frame (1) which will meet the catch flange (40) on the bottom bridge (2). To simplify and make an easy and safe placing of the top case on the lower case are both top bridge (3) and bottom bridge (2) provided with conical catch flanges (15 + 41) and (39 + 40). To secure a right and compact coupling both top bridge (3) and bottom bridge (2) are constructed with conical locking frames (14 + 38). When top case (10) is placed on top of the lower case (11) the direct frame (1) and the conical catch flange (40) will automatically bring the coupling parts in gear. A slight sideward push will bring the connecting bridges (4) in tight gear and as shown on Fig. 5 the transport lock (7) will block for disassembly and keep the connecting bridges in tight and compact coupling. The transport lock (7) can be activated outside the case by locking knob (8). As it appears on Fin. 5 the transport lock (7) is placed very close to the connecting bridges (4) and thus the coupling is free from wobbles and slack and at the same time robust and almost impossible to break open.

On Fig. 6 is shown the security lock (9) placed in mutual connection with connecting bridge (4) and transport lock (7). Security lock (9) is assembled with a push spring (18) and the set is placed in house for security lock (12) and fixed with a press bushing (17) which at the same time controls and supports the locking tap (19).

As it appears on Fig. 6 and Fig. 7 the two security locks (9) are in contact with each other. When the security lock (9) of the top case is pushed downwards it will automatically move the security lock (9) in the lower case downwards. At the same time the locking tap (19) of the top case is positioned in blocking position with the house for security lock (12) on the lower case.

It means that the security lock (9) of all upon each other placed cases can be activated by just activating the security lock (9) of the top case. Following the final locking can be made by a little twist with locking arm (13). A fine point could be to use the security lock as transport lock. All stacked cases locked via one activation of the security lock (9) of the top

case. Spend of time: 1 second.

All shown examples only show open cases stacked and with a lid on top. If one want a case cases with lids stacked, meaning a case + a lid + a case + a lid etc., it is possible because both the transport lock (7) and security lock (9) can be integrated in the separate lid which then can be stacked and locked with the same system as in the cases, although with a hole in the lid for activating the security lock (9).

On Fig. 9 and Fig. 10 is shown a stacked set (tower 36) with the special bottom case (24) in which the two transport wheels (20) are integrated. The tower (36) is finally on top closed with a lid (21) with carrying grip (23) and a code lock (22).

Fig. 11 shows an extension frame (27) without bottom. The corner unit (5) can also be seen here.

Fig. 12 shows a standard case (28) with bottom and connecting bridge (4) and top bridge (3).

Fig. 13 shows a standard case (28) and an extension frame (27) coupled together.

Fig. 14 shows the same example but with two extension walls (27). As it can be seen it gives a great flexibility to adjust cases in different heights.

Fig. 15 shows a standard case (28) in which a drill and a cable reel is placed. This kind of "combination-pack" is often used by manufacturers as promotional idea for machines, accessories, screws, bolts, nails, plugs etc. It is highly essential for as well manufacturer, retailer and the final end user to be sure that "the set" is complete.
The innovation is here that a transparent lid (29) is placed in a

countersinked frame (32). A sealing can be made by a warm-up/melting into the frame or alternatively via one or two hot melted straps. A carrying grip (30) as well as a hole (31) for the security lock (9) is a possibility, when the transparent lid is wanted for future and continuous use. The transport lock (7) can be operated from outside with the locking knob (8).

Fig. 16 shows the case with a transparent window (33) that inside the case is pushed down in an insert frame (34). The same insert frame (34) is used on Fig. 17 but with the transparent window replaced by a plate (35) for indication of contents.

Patent Claim

1. Storage facility comprising two or more boxes or a box and a lid, all parts that can be stacked and interconnected and where the boxes or lids have opposite facing gables and where the connecting bridge (4) is placed in the four corners or with one connecting bridge (4) on each of the opposite facing gables, whereby the bottom bridge (2) of the upper box or lid interconnects with the top bridge (3) of the below box or lid characterized by the bottom bridge (2) of the top box or lid being shaped as a downward pointing L profile (male part), which interconnects with the top bridge (3) of the below box, which is shaped as an L profile (female part).

2. Storage facility according to requirement 1 characterized by having the four connecting parts in the four outer corners of the boxes or lids.

3. Storage facility according to requirements 1-2 characterized by the connecting parts being cast together with the bottom and side walls of the boxes and the top and side walls of the lids.

4. Storage facility according to requirements 1-3 characterized by the connecting parts being cast together with boxes or lids and connecting via the four cast-in connecting parts.

5. Storage facility according to requirements 1-4 characterized by a construction that allows injection moulding of box and connecting parts or lid and connecting parts in one process.

6. Storage facility according to requirements 1-5 characterized by one or more of the connecting parts being cast together with a locking column.

7. Storage facility according to requirements 1-6 characterized by a construction that creates very close contact between connected boxes and lids.

8. Storage facility according to requirements 1-7 characterized by one or more of the connecting bridge being cast together with a cavity in which a security lock is placed.

9. Storage facility according to requirements 1-8 characterized by having a plexiglass in front of the catch on the locking device.

10. Storage facility according to requirements 1-9 characterized by the security locks' proximity to the connecting bridges and the fact that the security locks will interact with the below security locks, when the boxes or lids are placed on top of each other.

11. Storage facility according to requirements 1-10 characterized by having small soft rubber buttons underneath the four bottom bridges.

12. Storage facility according to requirements 1-11 characterized by wall systems, which are boxes without bottoms and with the same connecting system as boxes and lids.

13. Storage facility according to requirements 1-12 characterized by having transparent glass or plexiglass in the box gables or sides.

14. Storage facility according to requirements 1-13 characterized by having one bottom box with two transport wheels.

Fig. 1

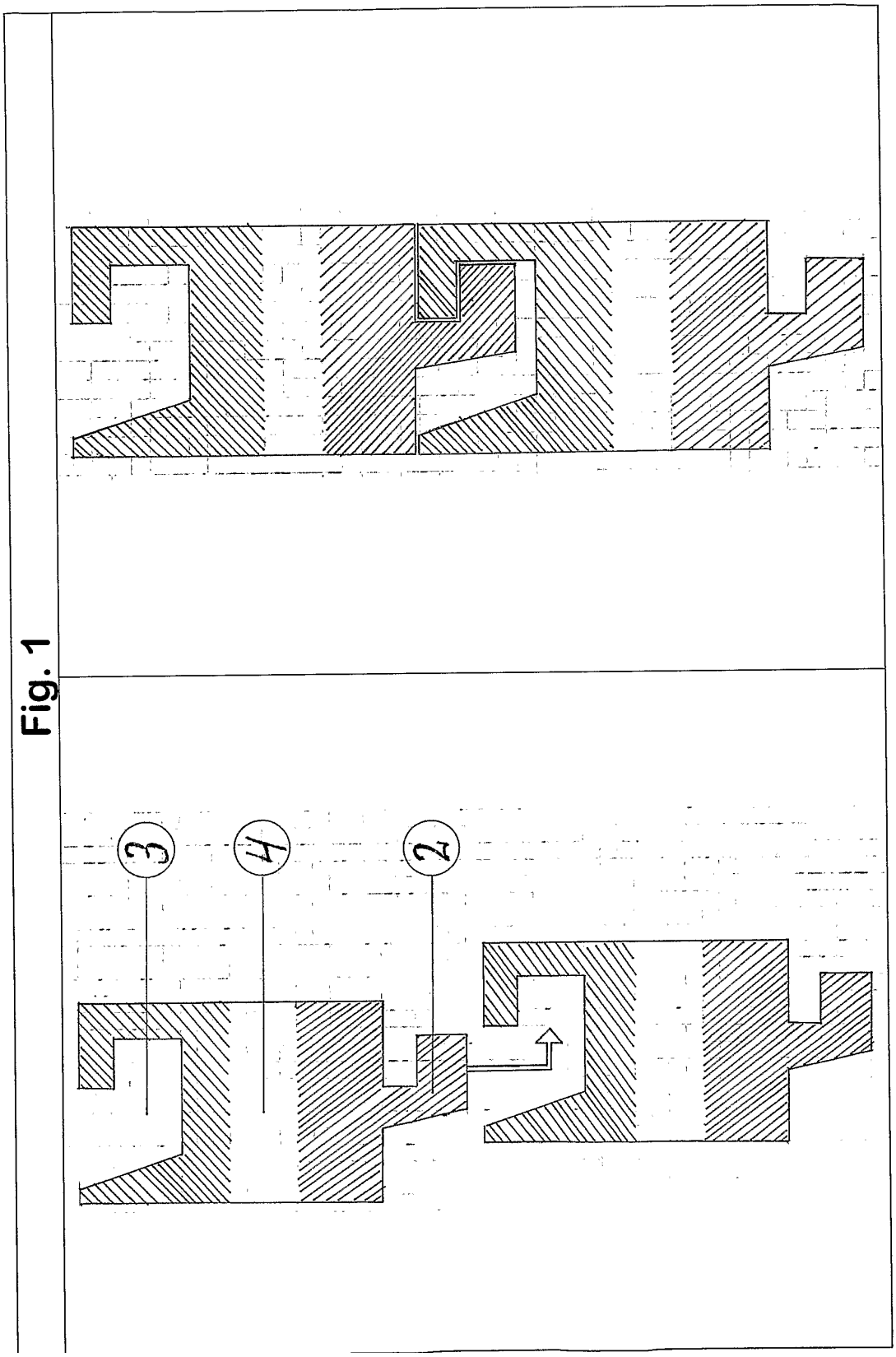


Fig. 4

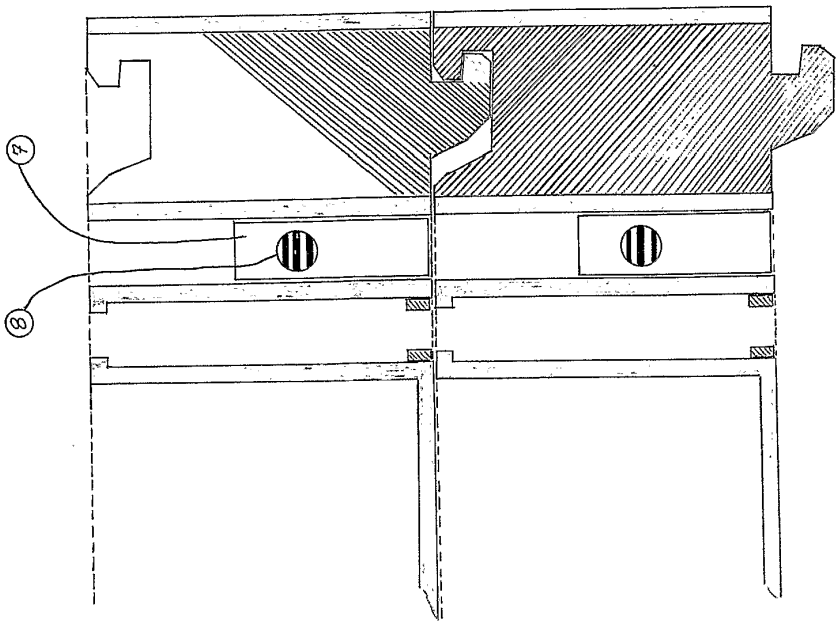


Fig. 3

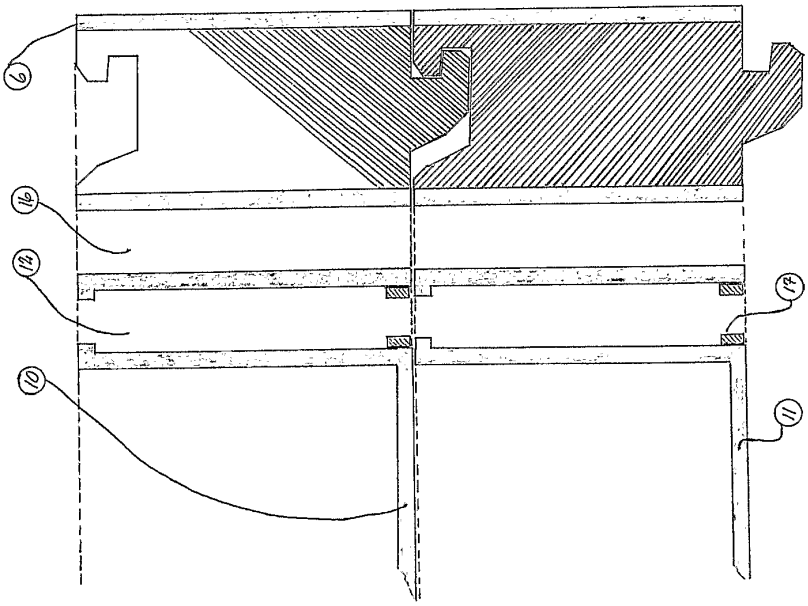


Fig. 2

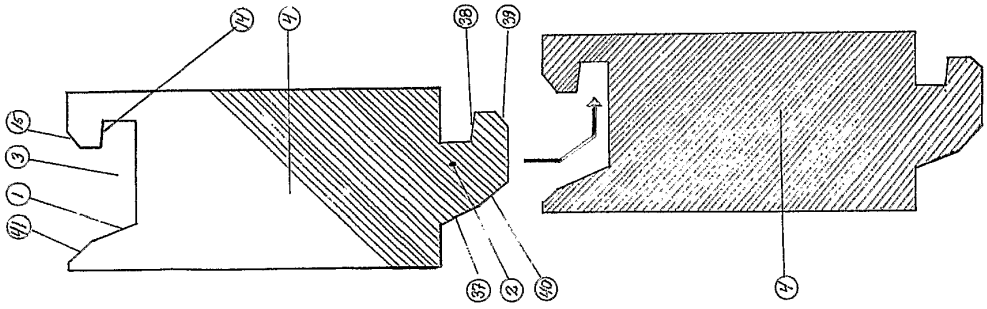


Fig. 7

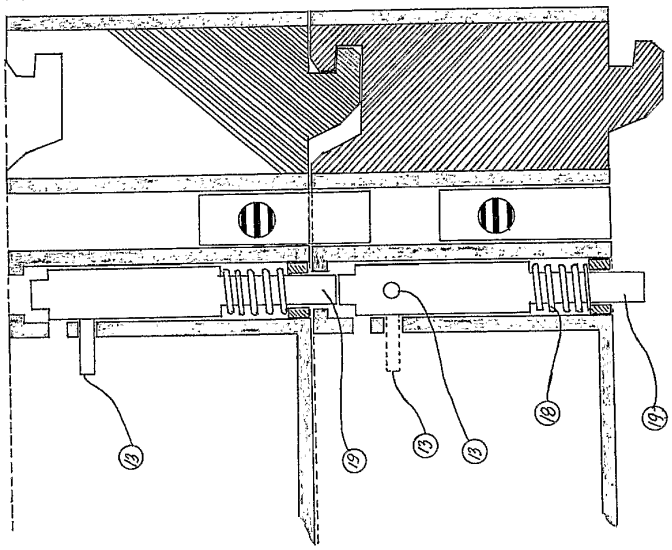


Fig. 6

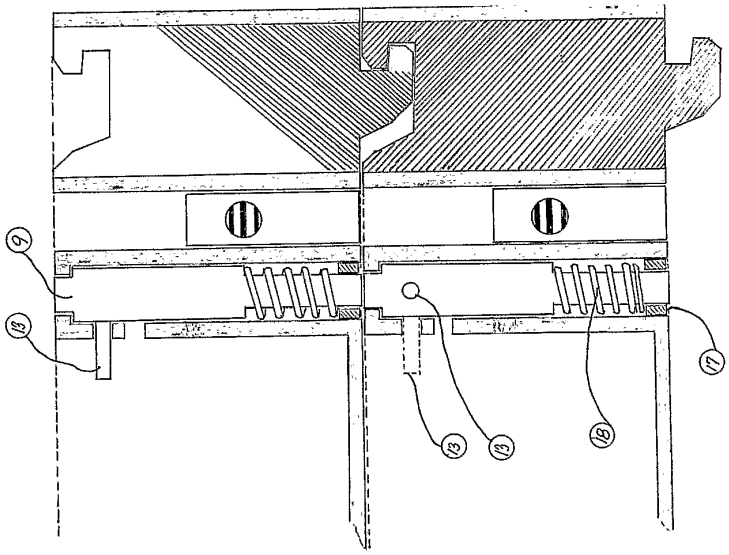
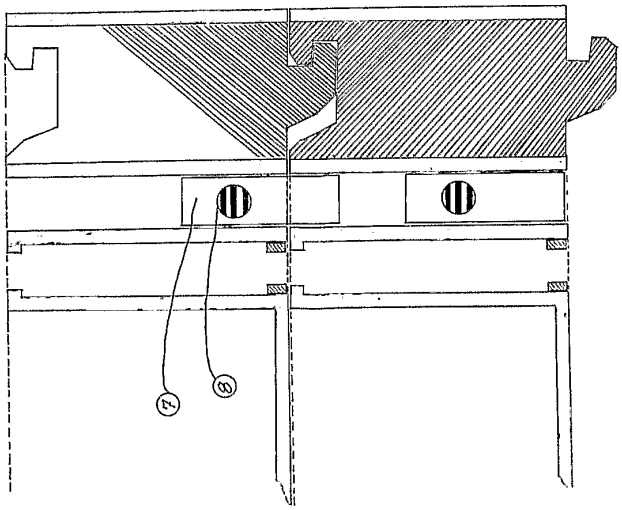


Fig. 5



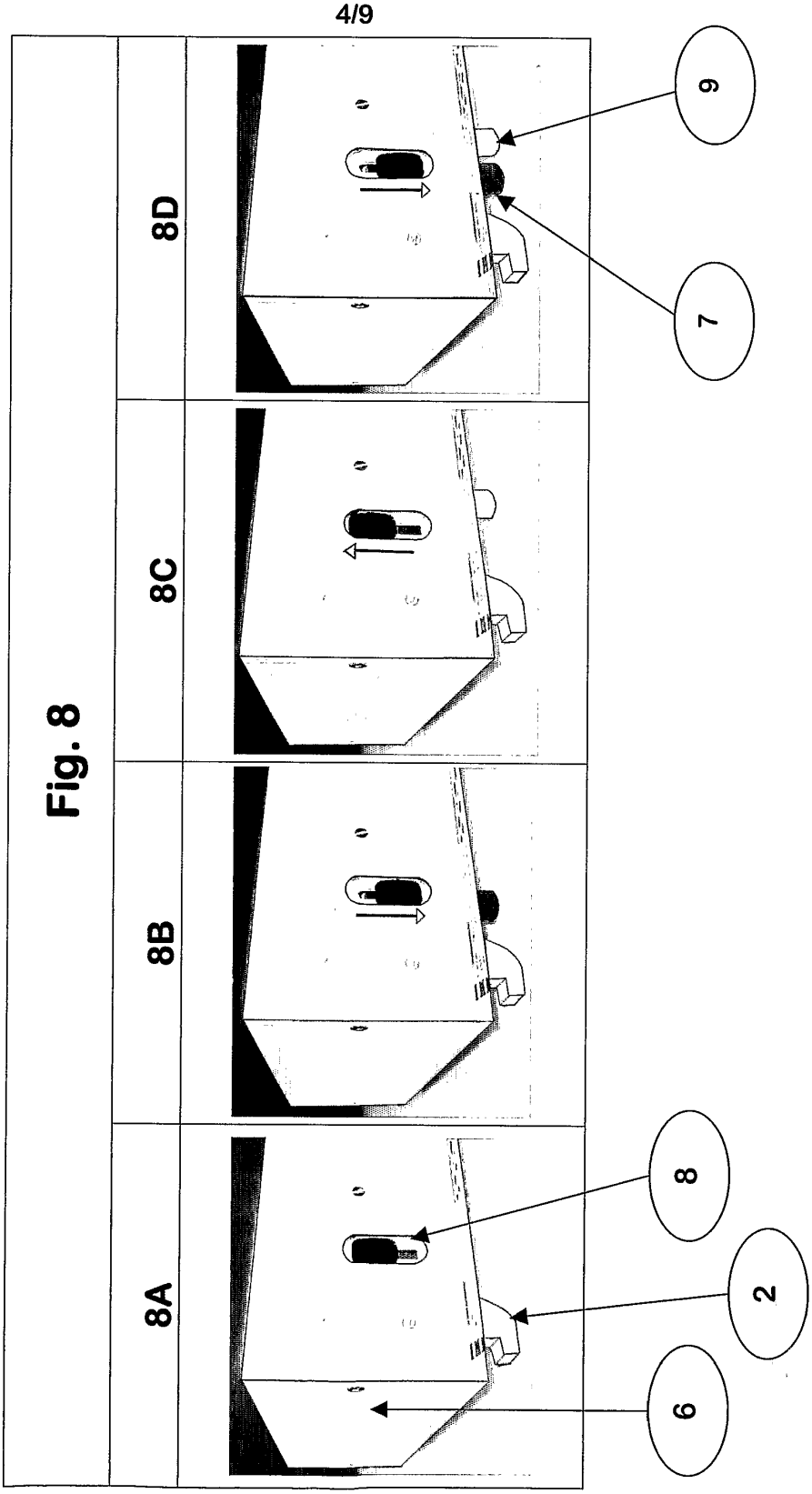


Fig. 8

Fig. 9

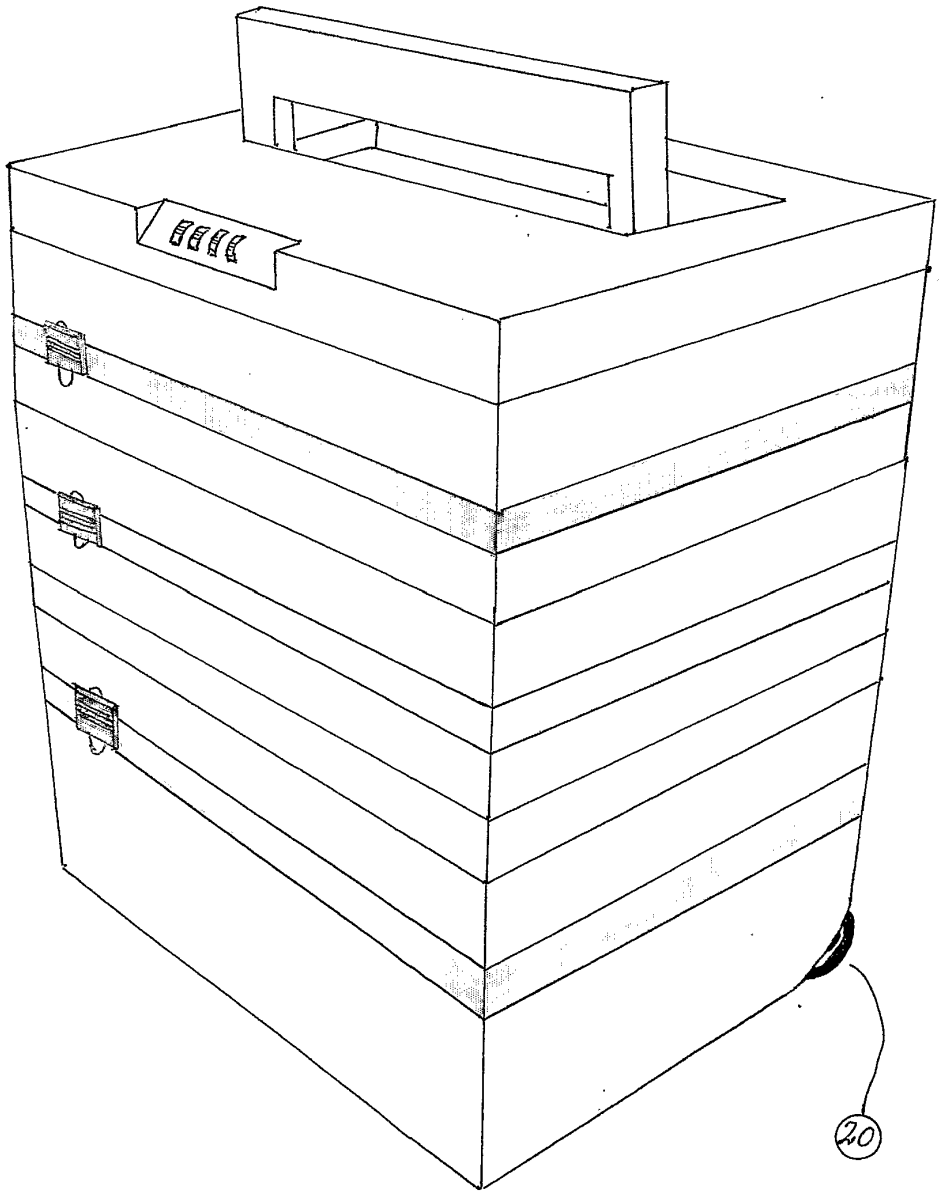


Fig. 10

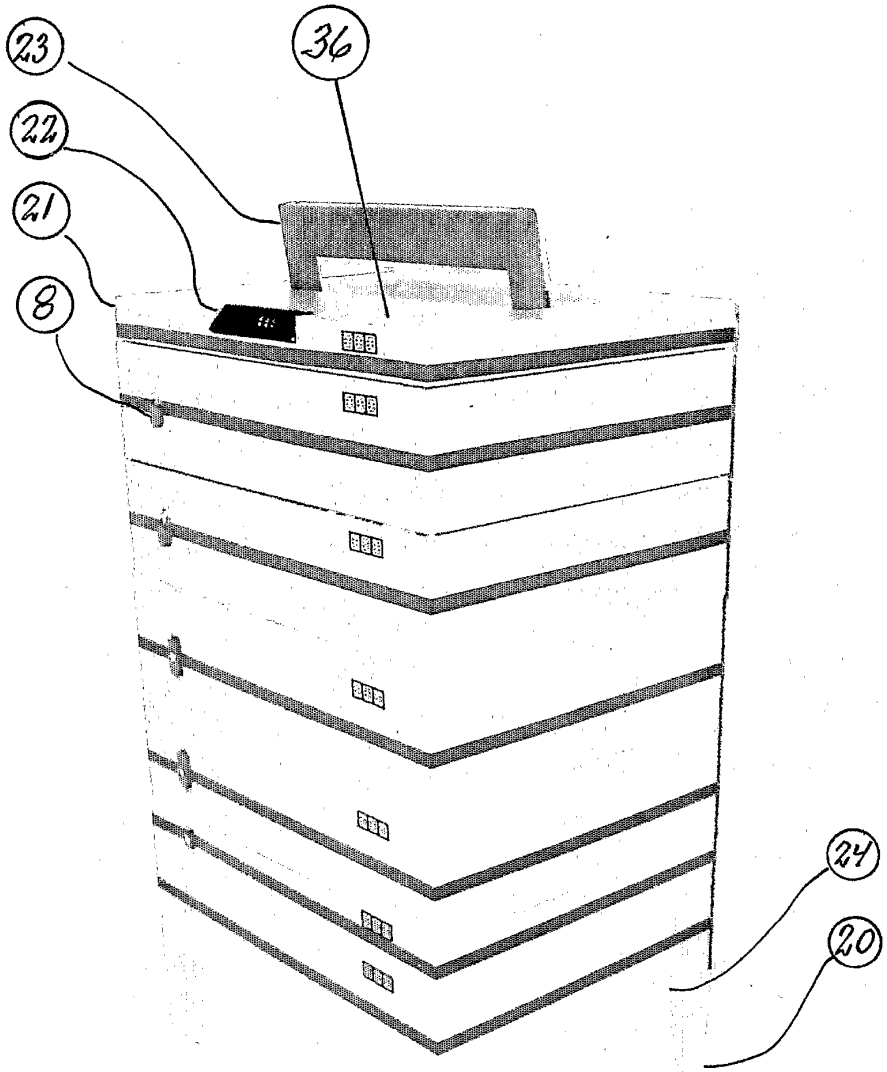


Fig. 11

Fig. 12

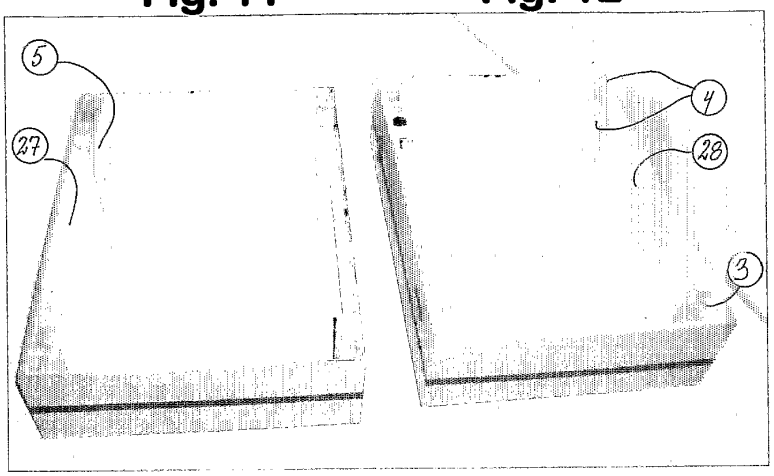


Fig. 13

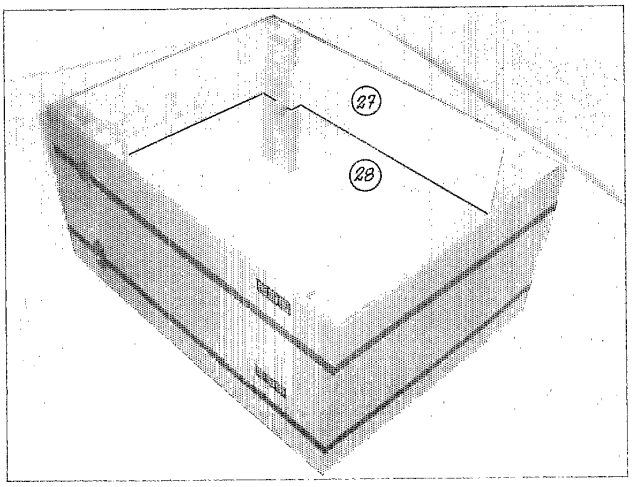
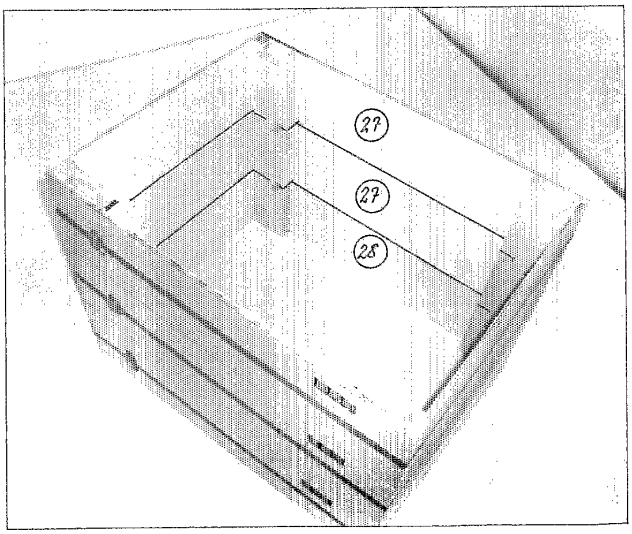


Fig. 14



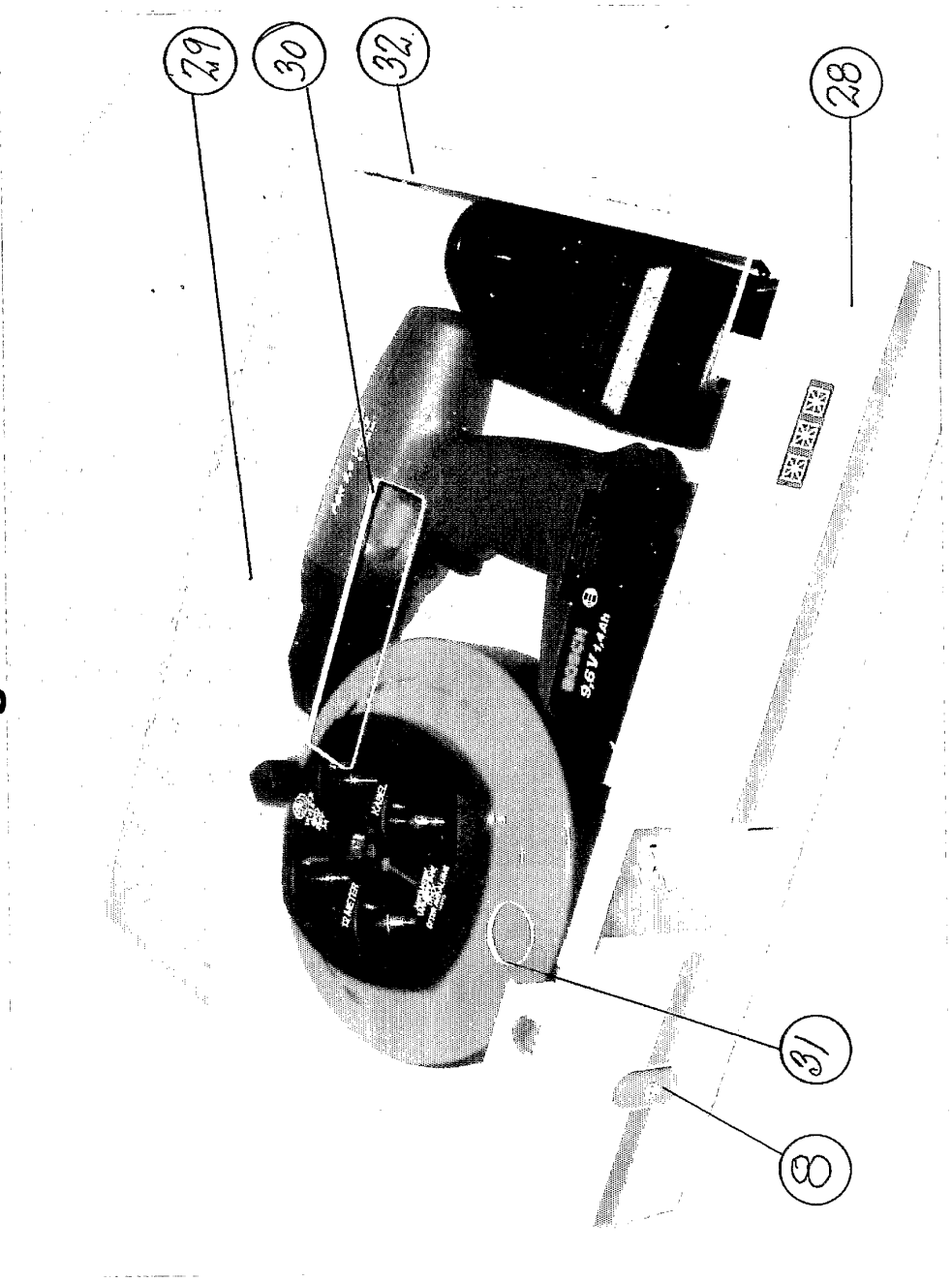


Fig. 15

Fig. 16

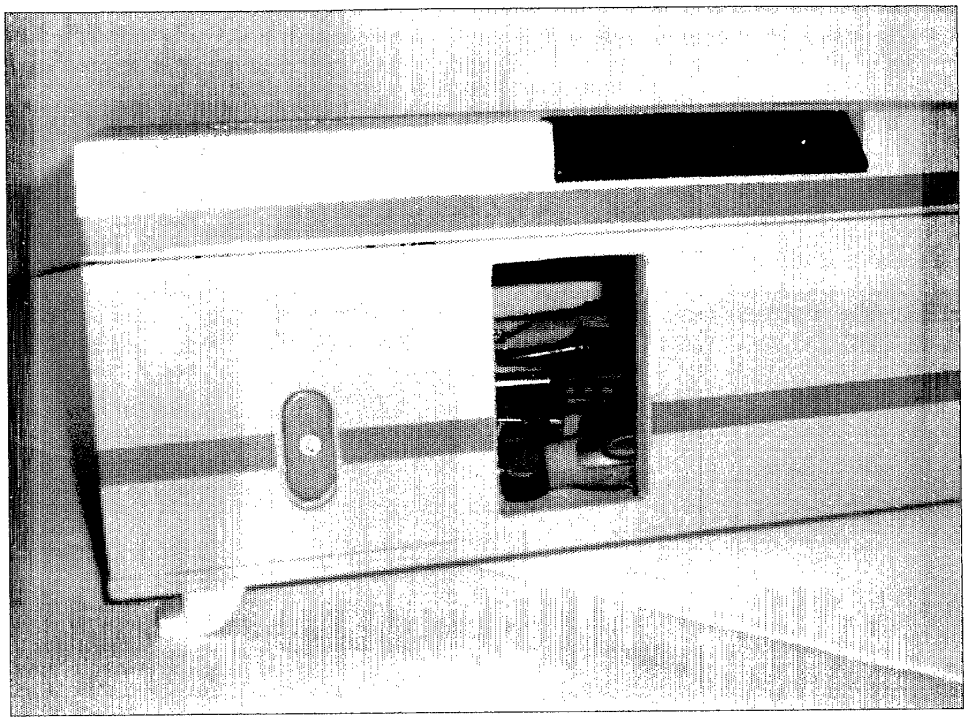
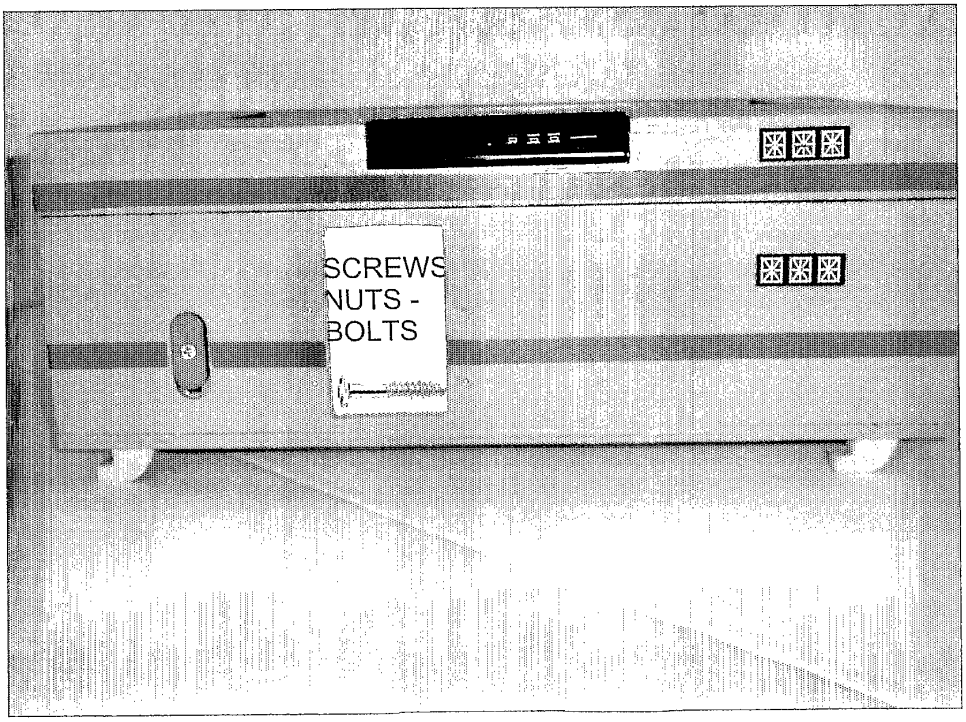


Fig. 17



INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK2009/000107

A. CLASSIFICATION OF SUBJECT MATTER

B65D 21/032 (2006.01), B25H 3/02 (2006.01)
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)

B65D, B25H, E05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2005/021221 A1 (CARBONE) 10/March/2005	1-14
A	US 4293072 A (HILL et al.) 6/October/1981	1-14

☐ 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
06 August 2009	18 August 2009
Name and mailing address of the ISA/ Nordic Patent Institute Helgeshøj Allé 81, 2630 Taastrup, Denmark	Authorized officer Lisbet Hansen

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/DK2009/000107

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Espacenet

Bibliographic data: WO2011009480 (A1) — 2011-01-27

ADAPTER DEVICE FOR A PORTABLE CLEANING APPLIANCE AND CLEANING DEVICE HAVING AN ADAPTER DEVICE AND A CLEANING APPLIANCE

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Classification: **- international:** ***A47L9/00; B25H3/00***
- cooperative: **A47L9/0009 (EP); A47L9/009 (EP); B25H3/00 (EP)**

Application number: WO2009EP59320 20090720 Global Dossier

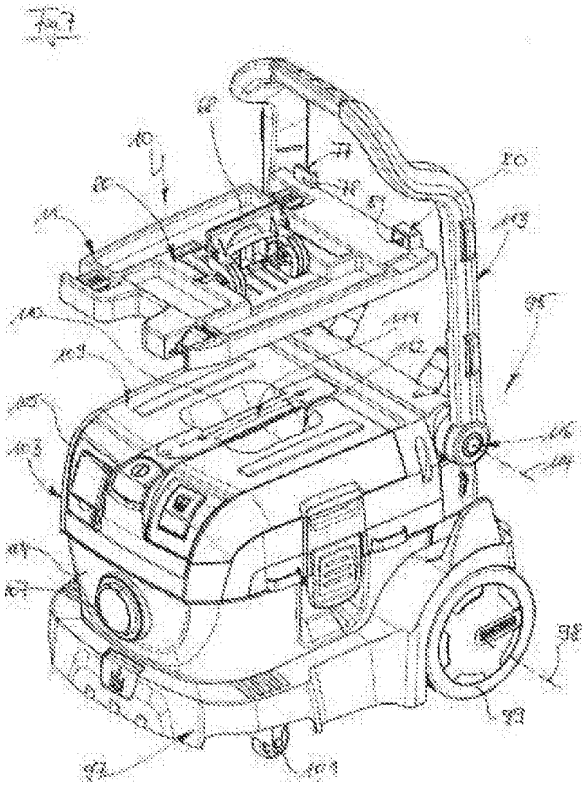
Priority number(s): WO2009EP59320 20090720

Also published as: CN102469899 (A) CN102469899 (B) DK2456341 (T3) EP2456341 (A1) EP2456341 (B1) more

Abstract of WO2011009480 (A1)

The invention relates to an adapter device (10) for the arrangement of a container (120) on the housing (105) of a portable cleaning appliance (95). The adapter device (10) comprises an adapter plate (11), which can be placed on the top surface (109) of the housing (105) and which has a storage surface (20) on the top side for placing the container (120), and a locking device (60) for detachably locking the adapter plate (11) to the housing (105) of the cleaning appliance (95) without tools. The invention further relates to a cleaning device comprising a cleaning appliance (95) and such an adapter device (10).

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IPR2024-01400



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Klein Tools v. Milwaukee Electric Tool, Keter Home and Garden Products
IPR2024-01400

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

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(43) Internationales Veröffentlichungsdatum
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20. Juli 2009 (20.07.2009)

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(75) Erfinder/Anmelder *(nur für US)*: **RICKLEFSEN, Dirk** [DE/DE]; Poststrasse 23, 73773 Aichwald/Aichelberg (DE). **HESS, Stefan** [DE/DE]; Schwalbenweg 37, 71397 Leutenbach (DE). **HENSEL, Maic** [DE/DE]; Glemsweg 6, 71522 Backnang (DE).

(74) Anwalt: **HOEGER, STELLRECHT & PARTNER PATENTANWÄLTE**; Uhlandstrasse 14c, 70182 Stuttgart (DE).

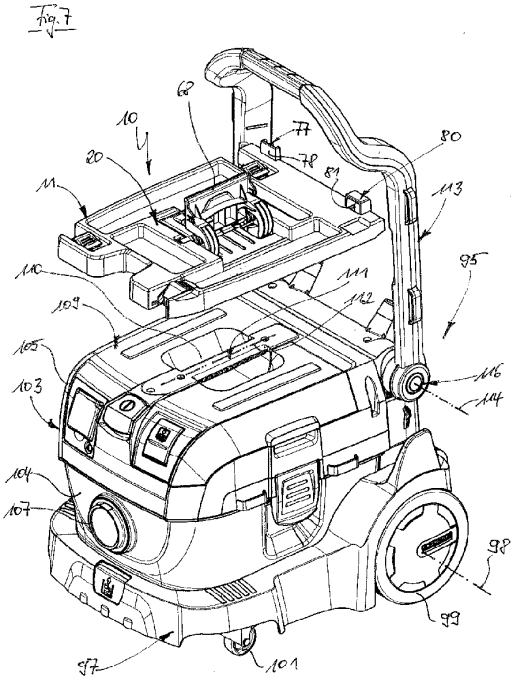
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(84) Bestimmungsstaaten *(soweit nicht anders angegeben, für jede verfügbare regionale Schutzrechtsart)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), eurasisches (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI,

[Fortsetzung auf der nächsten Seite]

(54) Title: ADAPTER DEVICE FOR A PORTABLE CLEANING APPLIANCE AND CLEANING DEVICE HAVING AN ADAPTER DEVICE AND A CLEANING APPLIANCE

(54) Bezeichnung : ADAPTERVORRICHTUNG FÜR EIN TRAGBARES REINIGUNGSGERÄT SOWIE REINIGUNGSEINRICHTUNG MIT EINER ADAPTERVORRICHTUNG UND EINEM REINIGUNGSGERÄT



(57) Abstract: The invention relates to an adapter device (10) for the arrangement of a container (120) on the housing (105) of a portable cleaning appliance (95). The adapter device (10) comprises an adapter plate (11), which can be placed on the top surface (109) of the housing (105) and which has a storage surface (20) on the top side for placing the container (120), and a locking device (60) for detachably locking the adapter plate (11) to the housing (105) of the cleaning appliance (95) without tools. The invention further relates to a cleaning device comprising a cleaning appliance (95) and such an adapter device (10).

(57) Zusammenfassung: Adaptervorrichtung (10) für die Anordnung eines Behälters (120) am Gehäuse (105) eines tragbaren Reinigungsgerätes (95). Die Adaptervorrichtung (10) umfasst eine Adapterplatte (11), die auf die Deckfläche (109) des Gehäuses (105) aufsetzbar ist und oberseitig eine Stellfläche (20) aufweist zum Abstellen des Behälters (120), sowie eine Verriegelungseinrichtung (60) zum werkzeuglosen lösbaren Verriegeln der Adapterplatte (11) mit dem Gehäuse (105) des Reinigungsgerätes (95). Reinigungseinrichtung mit einem Reinigungsgerät (95) und einer derartigen Adaptervorrichtung (10).

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SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Veröffentlicht:

— *mit internationalem Recherchenbericht (Artikel 21 Absatz 3)*

Adaptervorrichtung für ein tragbares Reinigungsgerät sowie Reinigungseinrichtung mit einer Adaptervorrichtung und einem Reinigungsgerät

Die Erfindung betrifft eine Adaptervorrichtung für die Anordnung eines Behälters am Gehäuse eines tragbaren Reinigungsgerätes.

Außerdem betrifft die Erfindung eine Reinigungseinrichtung mit einem tragbaren Reinigungsgerät, das ein Gehäuse aufweist, und mit einer Adaptervorrichtung der voranstehenden Art.

Tragbare Reinigungsgeräte kommen beispielsweise in Form tragbarer Staubsauger oder tragbarer Hochdruckreinigungsgeräte zum Einsatz. Sie werden zum Beispiel auf Baustellen aber auch an sonstigen Einsatzorten benutzt. Die Reinigungsgeräte können vom Benutzer getragen werden. Häufig sind die Reinigungsgeräte auch verfahrbar und weisen hierzu geeignete Laufräder auf.

Die Reinigungsgeräte werden zum Transport zu einem Einsatzort in vielen Fällen in einem Transportfahrzeug positioniert, und da in den meisten Fällen der Stauraum des Transportfahrzeuges beschränkt ist, werden auf den Reinigungsgeräten während des Transportes Behälter abgestellt, beispielsweise Werkzeugkoffer oder sonstige Behälter, die Utensilien aufnehmen. Erreicht das Transportfahrzeug sein Ziel, so werden die Behälter ebenso wie das Reinigungsgerät dem Transportfahrzeug entnommen und anschließend zum eigentlichen Einsatzort getragen.

Aus der EP 0 916 302 B1 ist ein Reinigungsgerät in Form eines Staubsaugers bekannt, dessen Gehäuse oberseitig eine Deckfläche ausbildet mit einer Vertiefung, in die ein Behälter eingesetzt werden kann. Der Behälter ist dadurch auf der Deckfläche des Gehäuses gegen Verrutschen gesichert. Zusätzlich kann der Behälter mit Hilfe von Arretierungselementen in der Vertiefung der Deckfläche arretiert werden. Dies hat den Vorteil, dass der Staubsauger zusammen mit dem Behälter vom Benutzer in Form einer einzigen Transporteinheit bewegt werden kann. Allerdings ist es erforderlich, dass der Behälter exakt die Ausmaße der Vertiefung an der Deckfläche des Staubsaugers aufweist. Behälter und Staubsauger müssen also in ihren Ausmaßen exakt aneinander angepasst sein.

Aufgabe der vorliegenden Erfindung ist es, eine Vorrichtung bereitzustellen, mit deren Hilfe ein Behälter am Gehäuse eines tragbaren Reinigungsgerätes angeordnet werden kann zum gemeinsamen Transport des Reinigungsgerätes zusammen mit dem Behälter.

Diese Aufgabe wird erfindungsgemäß durch eine Adaptervorrichtung mit den Merkmalen von Patentanspruch 1 gelöst. Die erfindungsgemäße Adaptervorrichtung umfasst eine Adapterplatte, die auf das Gehäuse des Reinigungsgerätes aufsetzbar ist. Außerdem umfasst die Adaptervorrichtung eine Verriegelungseinrichtung, mit deren Hilfe die Adapterplatte werkzeuglos mit dem Gehäuse des Reinigungsgerätes lösbar verriegelt werden kann. Die Adapterplatte weist oberseitig eine Stellfläche auf zum Abstellen des Behälters.

In die Erfindung fließt der Gedanke mit ein, dass durch die Bereitstellung einer Adapterplatte, die einerseits, nämlich auf ihrer Unterseite, an das Gehäuse eines tragbaren Reinigungsgerätes angepasst ist, und die andererseits, nämlich auf ihrer Oberseite, eine ebene Stellfläche für einen zusammen mit dem

Reinigungsgerät zu transportierenden Behälter aufweist, auf einfache Weise eine kompakte Transporteinheit bestehend aus dem Behälter, der Adapterplatte und dem Reinigungsgerät gebildet werden kann zum gemeinsamen Transport. Die Adapterplatte ist auf das Gehäuse des Reinigungsgerätes aufsetzbar und kann anschließend mittels der Verriegelungseinrichtung mit dem Gehäuse des Reinigungsgerätes werkzeuglos verriegelt werden. Die Verriegelungseinrichtung wirkt mit dem Gehäuse des Reinigungsgerätes zusammen. Oberseitig kann auf die Adapterplatte der Behälter, beispielsweise ein Werkzeug- oder Zubehörkoffer, aufgesetzt werden. Der Behälter kann bei Bedarf von der Adapterplatte abgenommen werden, zusätzlich kann auch die Adapterplatte vom Reinigungsgerät gelöst werden. Das Verriegeln und Entriegeln der Adapterplatte mit dem Gehäuse des Reinigungsgerätes erfolgt ohne Einsatz eines speziellen Werkzeuges, insbesondere ist es nicht erforderlich, die Adapterplatte mit dem Reinigungsgerät beispielsweise zu verschrauben.

Die Adaptervorrichtung erweitert somit die Einsatzmöglichkeiten des Reinigungsgerätes dahingehend, dass ein Behälter, vorzugsweise ein Werkzeug- oder Zubehörkoffer, auf dem Reinigungsgerät abgestellt und gemeinsam mit diesem transportiert werden kann.

Vorzugsweise ist die Adapterplatte mittels der Verriegelungseinrichtung mit einem hintergreifbaren Gehäuseteil des Gehäuses des Reinigungsgerätes werkzeuglos lösbar verriegelbar. Als hintergreifbares Gehäuseteil kann beispielsweise eine Gehäuselasche, ein hintergreifbarer Gehäusevorsprung oder dergleichen zum Einsatz kommen. Zusätzliche Verriegelungselemente am Reinigungsgerät können dadurch entfallen.

Von besonderem Vorteil ist es, wenn die Adapterplatte mittels der Verriegelungseinrichtung mit einem Tragegriff des Reinigungsgerätes werkzeuglos lös-

bar verriegelbar ist. Der Tragegriff ist bevorzugt an einer Oberseite des Gehäuses des Reinigungsgerätes angeordnet. Der Tragegriff ist üblicherweise sehr stabil ausgestaltet und an das Gewicht des Reinigungsgerätes angepasst, so dass die Verriegelung der Adapterplatte mit dem Tragegriff mechanisch sehr belastbar ausgestaltet werden kann.

Günstigerweise umfasst die Verriegelungseinrichtung mindestens ein Verriegelungsglied, das zwischen einer Verriegelungsstellung und einer Freigabestellung hin und her bewegbar an der Adapterplatte gehalten ist. In der Verriegelungsstellung des mindestens einen Verriegelungsgliedes ist die Adapterplatte unbeweglich am Gehäuse des Reinigungsgerätes festgelegt. Hierzu kann das mindestens eine Verriegelungsglied beispielsweise ein an der Oberseite des Reinigungsgerätes angeordnetes hintergreifbares Gehäuseteil, insbesondere einen Tragegriff hintergreifen oder umgreifen. Soll die Adapterplatte vom Reinigungsgerät gelöst werden, so kann hierzu das mindestens eine Verriegelungsglied ohne Einsatz eines Werkzeuges in seine Freigabestellung überführt werden, in der es das Gehäuse freigibt.

Besonders vorteilhaft ist es, wenn die Verriegelungseinrichtung eine vom Benutzer ergreifbare Verriegelungshandhabe aufweist, die mit dem mindestens einen Verriegelungsglied verbunden ist. Mittels der Verriegelungshandhabe kann der Benutzer das mindestens eine Verriegelungsglied auf einfache Weise ohne Einsatz eines zusätzlichen Werkzeuges zwischen seiner Verriegelungsstellung und seiner Freigabestellung hin und her bewegen.

Bei einer vorteilhaften Ausführungsform steht die Verriegelungshandhabe in der Freigabestellung des mindestens einen Verriegelungsgliedes aus der Stellfläche der Adapterplatte hervor und in der Verriegelungsstellung des mindestens einen Verriegelungsgliedes steht die Verriegelungshandhabe aus der

Stellfläche der Adapterplatte nicht hervor. Die Stellfläche wird bei einer derartigen Ausgestaltung von der Verriegelungshandhabe allenfalls dann beeinträchtigt, wenn die Verriegelungshandhabung eine Position einnimmt, in der das mindestens eine Verriegelungsglied seine Freigabestellung einnimmt. In dieser Stellung kann die Adapterplatte vom Reinigungsgerät abgenommen werden. Befindet sich jedoch das mindestens eine Verriegelungsglied in seiner Verriegelungsstellung, so ist die Verriegelungshandhabe derart angeordnet, dass sie aus der Stellfläche nicht hervorsteht und daher das Abstellen eines Behälters auf der Stellfläche nicht beeinträchtigt.

Es kann beispielsweise vorgesehen sein, dass die Verriegelungshandhabe plattenförmig ausgestaltet ist, wobei sie in der Verriegelungsstellung des mindestens eines Verriegelungsgliedes in der Ebene der Stellfläche oder unterhalb der Ebene der Stellfläche verläuft.

Damit der Benutzer die Verriegelungshandhabe auf einfache Weise ergreifen kann, ist es von Vorteil, wenn die Verriegelungshandhabe hintergreifbar ist.

Das mindestens eine Verriegelungsglied ist bei einer vorteilhaften Ausführungsform der Erfindung um eine Schwenkachse verschwenkbar. Es kann somit zwischen seiner Verriegelungsstellung und seiner Freigabestellung hin und her geschwenkt werden. Die Schwenkachse ist bevorzugt parallel zu einer Längsachse eines oberseitig am Gehäuse des Reinigungsgerätes angeordneten Tragegriffs ausrichtbar.

Günstigerweise umfasst die Verriegelungseinrichtung zwei starr miteinander verbundene und im Abstand zueinander angeordnete Verriegelungsglieder. Dies erhöht die mechanische Belastbarkeit der Verriegelungseinrichtung und der mit dem Tragegriff verriegelten Adapterplatte.

Bevorzugt verbindet die Verriegelungshandhabe die beiden Verriegelungsglieder starr miteinander.

Das mindestens eine Verriegelungsglied ist vorteilhafterweise haken- oder bügelartig ausgestaltet und untergreift in der Verriegelungsstellung ein Gehäuseteil des Reinigungsgerätes, beispielsweise einen Tragegriff.

Bei einer bevorzugten Ausführungsform weist die Adapterplatte oberseitig eine erste Vertiefung auf, die die Verriegelungshandhabe aufnimmt. In der Verriegelungsstellung des mindestens einen Verriegelungsgliedes kann die Verriegelungshandhabe vollständig in die erste Vertiefung der Adapterplatte eintauchen, so dass die Stellfläche der Adapterplatte durch die Verriegelungshandhabe nicht beeinträchtigt ist.

Besonders vorteilhaft ist es, wenn die Verriegelungshandhabe in der Verriegelungsstellung des mindestens einen Verriegelungsgliedes die erste Vertiefung zumindest teilweise abdeckt und die Stellfläche der Adapterplatte erweitert.

Wie bereits erläutert, ist die Adaptervorrichtung für tragbare Reinigungsgeräte vorgesehen. Damit das Reinigungsgerät auch dann getragen werden kann, wenn die Adapterplatte mit dem Gehäuse des Reinigungsgerätes verriegelt ist, ist bei einer vorteilhaften Ausführungsform der Erfindung vorgesehen, dass die Adaptervorrichtung eine Trageeinrichtung aufweist mit mindestens einem Tragegriff, der vom Benutzer umgreifbar ist. Ist die Adapterplatte mit dem Gehäuse des Reinigungsgerätes verriegelt, so kann mit Hilfe des Tragegriffes der Adaptervorrichtung die komplette Reinigungseinrichtung bestehend aus dem Reinigungsgerät und der Adaptervorrichtung getragen werden.

Günstigerweise ist der Tragegriff der Adaptervorrichtung zwischen einer Tragestellung, in der er aus der Stellfläche der Adapterplatte hervorsteht, und einer Ruhestellung, in der er aus der Stellfläche der Adapterplatte nicht hervorsteht, hin und her bewegbar. Der Tragegriff ist somit zum Tragen der Adaptervorrichtung mitsamt dem Reinigungsgerät für den Benutzer auf einfache Weise im Bereich der Stellfläche zugänglich, aus der er in seiner Tragestellung hervorsteht. Soll jedoch ein Behälter auf die Stellfläche abgestellt werden, so kann der Tragegriff der Adaptervorrichtung in eine Ruhestellung überführt werden, in der er aus der Stellfläche nicht hervorsteht und damit die Größe der Stellfläche auch nicht beeinträchtigt.

Bevorzugt ist der Tragegriff der Adaptervorrichtung um eine Schwenkachse verschwenkbar. Dies erleichtert das Überführen des Tragegriffes der Adaptervorrichtung aus seiner Ruhestellung in seine Tragestellung und zurück in die Ruhestellung. In jeder Stellung ist der Tragegriff der Adaptervorrichtung für den Benutzer auf einfache Weise zugänglich. Die Schwenkachse ist bevorzugt parallel zu einer Längsachse eines oberseitig am Gehäuse des Reinigungsgerätes angeordneten Tragegriffs ausrichtbar.

Es kann vorgesehen sein, dass die Adapterplatte oberseitig eine zweite Vertiefung aufweist, die den Tragegriff aufnimmt. In seiner Ruhestellung kann der Tragegriff der Adaptervorrichtung vollständig in die zweite Vertiefung der Adapterplatte eintauchen. Bei Bedarf kann der Benutzer den Tragegriff der Adaptervorrichtung aus der zweiten Vertiefung der Adapterplatte entnehmen und in seine Tragestellung überführen, in der er aus der Stellfläche hervorsteht.

Von Vorteil ist es, wenn der Tragegriff der Adaptervorrichtung in seiner Ruhestellung die zweite Vertiefung zumindest bereichsweise ausfüllt und die Stellfläche der Adapterplatte erweitert.

Günstigerweise ist die Trageeinrichtung der Adaptervorrichtung an der Adapterplatte verschwenkbar gelagert.

Von Vorteil ist es, wenn die Verriegelungseinrichtung an der Trageeinrichtung der Adaptervorrichtung gehalten ist. Dies vereinfacht die Handhabung der Adaptervorrichtung sowohl beim Verriegeln mit dem Gehäuse des Reinigungsgerätes als auch beim Tragen zusammen mit dem Reinigungsgerät. Außerdem ermöglicht es die Halterung der Verriegelungseinrichtung an der Trageinrichtung, in einem ersten Montageschritt die Verriegelungseinrichtung an der Trageinrichtung zu montieren, und in einem zweiten Montageschritt kann dann die aus der Verriegelungseinrichtung und der Trageinrichtung bestehende Baueinheit an der Adapterplatte montiert werden. Dadurch können die Montagekosten gering gehalten werden.

Es kann vorgesehen sein, dass die Verriegelungseinrichtung und die Trageinrichtung starr miteinander verbunden und beweglich an der Adapterplatte gehalten sind. Hierbei kann vorgesehen sein, dass die aus der Verriegelungseinrichtung und der Trageeinrichtung bestehende Baueinheit zwischen einer ersten Stellung, in der das mindestens eine Verriegelungsglied ein Gehäuseteil des Reinigungsgerätes hintergreift und der Tragegriff der Adaptervorrichtung seine Ruhestellung einnimmt, über eine zweite Stellung, in der das mindestens eine Verriegelungsglied ebenfalls das Gehäuseteil des Reinigungsgerätes hintergreift, der Tragegriff der Adaptervorrichtung aber seine Tragestellung einnimmt, und einer dritten Stellung, in der das mindestens eine Verriegelungsglied das Gehäuseteil des Reinigungsgerätes freigibt und der Tragegriff der

Adaptervorrichtung eine Außerbetriebstellung einnimmt, hin und her bewegt werden kann. Je nach Stellung der aus der Verriegelungseinrichtung und der Trageeinrichtung bestehenden Baueinheit kann die Adapterplatte mit dem Gehäuseteil des Reinigungsgerätes verriegelt oder entriegelt sein und es kann der Tragegriff der Adaptervorrichtung seine Ruhestellung oder auch seine Tragestellung einnehmen.

Bei einer bevorzugten Ausgestaltung der Erfindung ist die Verriegelungseinrichtung an der Trageeinrichtung beweglich gelagert ist. Dies gibt die Möglichkeit, die Verriegelungseinrichtung relativ zur Trageeinrichtung zu bewegen. Insbesondere kann bei einer derartigen Ausführungsform das mindestens eine Verriegelungsglied zwischen seiner Verriegelungsstellung und seiner Freigabestellung hin und her bewegt werden, ohne dass dabei die Trageeinrichtung ihre Lage relativ zur Adaptervorrichtung verändern muss. Umgekehrt kann der Tragegriff seine Position relativ zur Adaptervorrichtung verändern, ohne dass die Stellung der Verriegelungseinrichtung verändert werden muss. Es kann dadurch der Tragegriff zwischen seiner Ruhestellung und seiner Tragestellung hin und her bewegt werden, ohne dass dies die Verriegelung der Adapterplatte mit dem Gehäuse des Reinigungsgerätes beeinflusst.

Bei einer vorteilhaften Ausführungsform ist vorgesehen, dass die Verriegelungseinrichtung an der Trageeinrichtung verschwenkbar gelagert ist.

Günstigerweise sind die Verriegelungseinrichtung und die Trageeinrichtung an der Adapterplatte gehalten, wobei sie unabhängig voneinander jeweils um mindestens 90° um eine gemeinsame Schwenkachse verschwenkbar sind. Hierbei kann die gemeinsame Schwenkachse parallel zu einer Längsachse eines oberseitig am Gehäuse des Reinigungsgerätes angeordneten Tragegriffs ausrichtbar sein.

Die Montage der Adaptervorrichtung wird bei einer vorteilhaften Ausführungsform dadurch vereinfacht, dass die Verriegelungseinrichtung mit der Trageeinrichtung verrastbar ist.

Wie bereits erläutert, kann auf die Stellfläche der Adapterplatte ein Behälter, beispielsweise ein Werkzeug- oder Zubehörkoffer abgestellt werden. Hierbei ist es von Vorteil, wenn die Adapterplatte mindestens ein aus der Stellfläche hervorstehendes Anschlagelement aufweist, an das der Behälter anlegbar ist. Das Anschlagelement erleichtert die Positionierung des Behälters auf der Stellfläche der Adapterplatte.

Günstigerweise weist mindestens ein Anschlagelement eine Ausnehmung auf zur Aufnahme eines Vorsprunges des Behälters. Der Behälter kann beispielsweise zapfenförmige Vorsprünge aufweisen, die von einer Ausnehmung eines Anschlagelementes der Adaptervorrichtung aufgenommen werden.

Besonders vorteilhaft ist es, wenn die Adaptervorrichtung mindestens ein Arretierungselement aufweist zum Arretieren des Behälters an der Stellfläche der Adapterplatte. Ein unbeabsichtigtes Lösen des Behälters von der Stellfläche kann dadurch zuverlässig verhindert werden.

Bevorzugt ist mindestens ein Arretierungselement in einer oberseitigen Vertiefung der Adapterplatte beweglich, insbesondere verschwenkbar gelagert. Es kann zum Arretieren des Behälters aus der zugeordneten Vertiefung der Adapterplatte herausbewegt, insbesondere herausgeschwenkt werden, um dann mit einem komplementären Arretierungselement des Behälters zusammenzuwirken.

Wie eingangs erwähnt, betrifft die Erfindung nicht nur eine Adaptervorrichtung der voranstehend genannten Art sondern auch eine Reinigungseinrichtung mit einer derartigen Adaptervorrichtung und mit einem tragbaren Reinigungsgerät.

Bevorzugt umfasst das Reinigungsgerät ein hintergreifbares Gehäuseteil, beispielsweise eine Gehäuselasche oder einen Gehäusevorsprung oder dergleichen, und die Verriegelungseinrichtung der Adaptervorrichtung wirkt mit dem hintergreifbaren Gehäuseteil zusammen zum werkzeuglosen lösbaren Verriegeln der Adapterplatte mit dem Gehäuse. Zusätzliche Verriegelungselemente am Reinigungsgerät sind folglich zum Verriegeln der Adapterplatte nicht erforderlich.

Von ganz besonderem Vorteil ist es, wenn das Reinigungsgerät einen Tragegriff aufweist und die Adapterplatte der Adaptervorrichtung mittels der Verriegelungseinrichtung mit dem Tragegriff werkzeuglos lösbar verriegelbar ist.

Der Tragegriff ist bei einer vorteilhaften Ausgestaltung der Erfindung an der Oberseite des Gehäuses des Reinigungsgerätes angeordnet. Insbesondere kann vorgesehen sein, dass der Tragegriff in eine oberseitige Deckfläche des Gehäuses integriert ist, auf die die Adapterplatte aufsetzbar ist.

Das Reinigungsgerät ist bevorzugt als Staubsauger ausgestaltet. Es kann allerdings auch vorgesehen sein, dass das Reinigungsgerät in Form eines Hochdruckreinigers ausgebildet ist.

Bei einer besonders bevorzugten Ausführungsform der erfindungsgemäßen Reinigungseinrichtung weist das Reinigungsgerät einen verfahrbaren Sockel auf, an dem Laufräder drehbar gelagert sind, sowie ein auf dem Sockel angeordnetes Reinigungsaggregat mit einem Griffbügel, wobei das Reinigungsag-

gregat das Gehäuse aufweist, mit dem die Adapterplatte verriegelbar ist, und wobei der Griffbügel in einer aufgerichteten Stellung im Wesentlichen senkrecht zur Stellfläche der am Gehäuse arretierten Adapterplatte ausgerichtet ist. Bei einer derartigen Ausführungsform ist das Reinigungsgerät mittels des Sockels verfahrbar, und nach Verriegeln der Adapterplatte mit dem Gehäuse des Reinigungsgerätes kann ein Behälter auf die Stellfläche der Adapterplatte aufgestellt werden, der sich dann auch am aufgerichteten Griffbügel abstützen kann. Der Griffbügel ist in seiner aufgerichteten Stellung im Wesentlichen senkrecht zur Stellfläche der Adapterplatte ausgerichtet. Der Behälter kann daher über die Adapterplatte hinausragen und sich in seinem hinausragenden Bereich am Griffbügel abstützen.

Von besonderem Vorteil ist es, wenn das Reinigungsgerät zusammen mit mindestens einem auf der Stellfläche der Adapterplatte angeordneten Behälter um eine gemeinsame Drehachse von zwei Laufrädern verschwenkbar ist. Das Reinigungsgerät kann dann zusammen mit der am Reinigungsgerät arretierten Adaptervorrichtung und dem mindestens einen Behälter nach Art einer Sackkarre verfahren werden. Der Behälter ist mittels der Adaptervorrichtung zuverlässig auf dem Reinigungsgerät positionierbar, bevorzugt ist er an der Adapterplatte arretierbar. Hierbei ist es von besonderem Vorteil, wenn der Behälter oberseitig einen Tragegriff aufweist, so dass der Benutzer den Behälter zusammen mit der Adaptervorrichtung und dem Reinigungsgerät tragen kann, nachdem zuvor in einem ersten Schritt die Adapterplatte am Gehäuse des Reinigungsgerätes arretiert wurde und danach der Behälter an der Adapterplatte arretiert wurde. Der Benutzer kann dann wählen, ob er die komplette Reinigungseinrichtung mitsamt dem oberseitig angeordneten Behälter um die gemeinsame Drehachse zweier Laufräder des Reinigungsgerätes verschwenkt und das Reinigungsgerät mit dem Behälter nach Art einer Sackkarre verfährt, oder ob er, beispielsweise zur Überwindung einer Stufe, den Behälter mitsamt

dem Reinigungsgerät und der dazwischen angeordneten Adaptervorrichtung am Tragegriff des Behälters anhebt.

Die nachfolgende Beschreibung einer bevorzugten Ausführungsform der Erfindung dient im Zusammenhang mit der Zeichnung der näheren Erläuterung. Es zeigen:

Figur 1: eine perspektivische Darstellung einer erfindungsgemäßen Adaptervorrichtung;

Figur 2: eine Draufsicht auf die Adaptervorrichtung aus Figur 1;

Figur 3: eine Schnittansicht der Adaptervorrichtung längs der Linie 3-3 in Figur 2;

Figur 4: eine Darstellung der Adaptervorrichtung nach Art einer Explosionszeichnung;

Figur 5: eine perspektivische Darstellung der Adaptervorrichtung, wobei ein Tragegriff seine Tragestellung und eine Verriegelungseinrichtung ihre Verriegelungsstellung einnehmen;

Figur 6: eine perspektivische Darstellung der Adaptervorrichtung, wobei der Tragegriff seine Ruhestellung und die Verriegelungseinrichtung ihre Freigabestellung einnehmen;

Figur 7: eine perspektivische Darstellung einer erfindungsgemäßen Reinigungseinrichtung nach Art einer Explosionszeichnung mit einem Reinigungsgerät und einer Adaptervorrichtung, wobei eine Verrie-

gelungseinrichtung der Adaptervorrichtung ihre Freigabestellung einnimmt;

Figur 8: eine perspektivische Darstellung der Reinigungseinrichtung, wobei die Adaptervorrichtung mit dem Reinigungsgerät verriegelt ist;

Figur 9: eine perspektivische Darstellung der Reinigungseinrichtung, wobei die Adaptervorrichtung mit dem Reinigungsgerät verriegelt ist und ein Tragegriff der Adaptervorrichtung seine Tragestellung einnimmt, und

Figur 10: eine perspektivische Darstellung der Reinigungseinrichtung mit zwei darauf angeordneten Behältern.

In den Figuren 1 bis 6 ist eine erfindungsgemäße Adaptervorrichtung 10 dargestellt, die auf die Deckfläche eines Gehäuses eines in den Figuren 7 bis 10 dargestellten Reinigungsgerätes aufgesetzt werden kann und ihrerseits eine Stellfläche bildet für einen Behälter, wie er beispielsweise in Figur 10 dargestellt ist.

Die Adaptervorrichtung 10 weist eine Adapterplatte 11 auf, die in der Draufsicht im Wesentlichen rechteckförmig ausgestaltet ist, wobei sie an einem vorderen Rand 12 eine zentrale Einbuchtung 13 aufweist. Ein hinterer Rand 15 der Adapterplatte 11 ist geradlinig ausgebildet, und ein erster Längsrand 16 weist ebenso wie ein zweiter Längsrand 17 eine geringfügig konvex nach außen gekrümmte Gestalt auf. Die beiden Längsränder 16 und 17 sind einander abgewandt und verbinden jeweils den hinteren Rand 15 mit dem vorderen Rand 12.

Die Oberseite 19 der Adapterplatte 11 weist eine ebene Stellfläche 20 auf sowie eine mittige, im Wesentlichen U-förmige erste Vertiefung 22 und eine sich daran anschließende, rechteckförmige zweite Vertiefung 24, an die sich, dem zweiten Längsrand 17 benachbart, eine dritte rechteckförmige Vertiefung 26 anschließt. Dem ersten Längsrand 16 benachbart weist die Adapterplatte 11 auf ihrer Oberseite 19 eine vierte rechteckförmige Vertiefung 28 auf, und der zentralen Einbuchtung 13 benachbart ist zwischen der dritten und der vierten Vertiefung 26, 28 eine fünfte rechteckförmige Vertiefung 30 angeordnet.

Im Übergangsbereich zwischen der ersten und der zweiten Vertiefung 22, 24 sind in die Oberseite 19 fluchtend zueinander eine erste Rastausnehmung 34 und eine zweite Rastausnehmung 36 eingeformt. In die beiden Rastausnehmungen 34 und 36 ist eine Trageeinrichtung 38 eingerastet. Die Trageeinrichtung 38 umfasst einen U-förmigen Tragbügel 40 mit einem ersten Tragschenkel 41 und einem zweiten Tragschenkel 42, die über einen stegartigen Tragegriff 43 einstückig miteinander verbunden sind. Auf ihren einander abgewandten Außenseiten 45 bzw. 46 tragen die beiden Tragschenkel 41 und 42 an ihrem freien Ende einen ersten Gelenkstift 48 bzw. einen zweiten Gelenkstift 49. Die beiden Gelenkstifte sind fluchtend zueinander ausgerichtet und können mit der ersten Rastausnehmung 34 bzw. mit der zweiten Rastausnehmung 36 verrastet werden. Die beiden Gelenkstifte 48 und 49 definieren eine Schwenkachse 51, die senkrecht zum hinteren Rand 15 verläuft und um die die Trageeinrichtung 38 verschwenkt werden kann, nachdem die Gelenkstifte 48 und 49 mit den Rastausnehmungen 34 und 36 verrastet wurden. Dies gibt die Möglichkeit, den Tragbügel 40 und damit auch den Tragegriff 43 zwischen einer Ruhestellung, in der er vollständig in die U-förmige erste Vertiefung 22 eintaucht, und einer Tragestellung, in der der Tragbügel 40 senkrecht zur Stellfläche 20 ausgerichtet ist und der Tragegriff 43 vom Benutzer umgriffen werden kann, hin und her zu schwenken. Der Tragbügel 40 und damit auch

der Tragegriff 43 steht in der Tragestellung, wie sie beispielsweise in Figur 5 dargestellt ist, aus der Stellfläche 20 hervor. In der Ruhestellung hingegen füllt der Tragbügel 40 die erste Vertiefung 22 vollständig aus und erweitert somit die ebene Stellfläche 20. Dies wird insbesondere aus Figur 1 deutlich.

An ihren einander zugewandten Innenseiten 54 bzw. 55 tragen die beiden Tragschenkel 41 und 42 fluchtend zu den Gelenkstiften 48 und 49 einen dritten Gelenkstift 57 bzw. einen vierten Gelenkstift 58. Mit diesen Gelenkstiften ist eine Verriegelungseinrichtung 60 der Adaptervorrichtung 10 verrastet. Die Verriegelungseinrichtung 60 weist hierzu zwei Rastklemmen 62, 63 auf, die mit dem dritten bzw. vierten Gelenkstift 57, 58 verrastet werden können, wobei die Verriegelungseinrichtung 60 um die Schwenkachse 51 relativ zur Trageeinrichtung 38 zwischen einer in Figur 5 dargestellten Verriegelungsstellung und einer in Figur 6 dargestellten Freigabestellung hin und her geschwenkt werden kann.

Die Verriegelungseinrichtung 60 umfasst ein erstes Verriegelungsglied in Form eines ersten Verriegelungsbügels 65 und ein zweites Verriegelungsglied in Form eines zweiten Verriegelungsbügels 66, die identisch ausgestaltet sind und über eine starre, plattenförmig ausgebildete Verriegelungshandhabe 68 miteinander verbunden sind. Den beiden Verriegelungsbügeln 65 und 66 ist im Boden 70 der zweiten Vertiefung 24 jeweils eine Durchbrechung 71 bzw. 72 zugeordnet, die in der Verriegelungsstellung der Verriegelungseinrichtung 60 von den Verriegelungsbügeln 65 bzw. 66 durchgriffen werden kann. In der Verriegelungsstellung stehen daher die Verriegelungsbügel 65 und 66 mit ihren freien Endabschnitten 74 bzw. 75 unterseitig aus der Adapterplatte 11 hervor. Dies wird insbesondere aus Figur 3 deutlich.

Die plattenförmige Verriegelungshandhabe 68 überdeckt in der Verriegelungsstellung der Verriegelungseinrichtung 60 zumindest einen Teilbereich der zweiten Vertiefung 24 und erweitert daher in der Verriegelungsstellung die Stellfläche 20. Vom Benutzer kann die Verriegelungshandhabe 68 in der Verriegelungsstellung der Verriegelungseinrichtung 60 hintergriffen werden. Der Benutzer kann hierzu im Übergangsbereich zwischen der zweiten Vertiefung 24 und der dritten Vertiefung 26 hinter die Verriegelungshandhabe 68 greifen. Anschließend kann er die Verriegelungshandhabe 68 zusammen mit den Verriegelungsbügeln 65 und 66 um die Schwenkachse 51 nach außen verschwenken in die in Figur 6 dargestellte Freigabestellung. In dieser Stellung erreichen die freien Endabschnitte 74 und 75 der Verriegelungsbügel 65 und 66 die Höhe des Bodens 70 der zweiten Vertiefung 24, sie stehen aber nicht mehr unterseitig aus der Adapterplatte 11 hervor.

Im Bereich des hinteren Randes 15 trägt die Adapterplatte 11 an ihrer Oberseite 19 einen aus der Stellfläche 20 herausragenden ersten Anschlag 77 mit einer im Wesentlichen senkrecht zur Stellfläche 20 ausgerichteten ersten Anschlagfläche 78. Und im Abstand zum ersten Anschlag 77 steht im Bereich des hinteren Randes 15 ein zweiter Anschlag 80 aus der Stellfläche 20 hervor, wobei der zweite Anschlag 80 der dritten Vertiefung 26 zugewandt eine rechteckförmige Ausnehmung 81 aufweist.

Im Bereich zwischen dem ersten Anschlag 77 und der vierten Vertiefung 28 weist die Adapterplatte 11 an ihrer Oberseite 19 eine sechste Vertiefung 83 auf, die in den ersten Längsrand 18 einmündet und in der ein erstes Arretierungselement in Form eines ersten Rastbügels 85 verschwenkbar gelagert ist.

Zwischen der vierten Vertiefung 28 und dem vorderen Rand 12 der Adapterplatte 11 ist in die Oberseite 19 eine siebte Vertiefung 87 eingeformt, die im

Wesentlichen identisch ausgestaltet ist wie die sechste Vertiefung 83 und die in den ersten Längsrand 16 einmündet. In der siebten Vertiefung 87 ist ein zweites Arretierungselement in Form eines zweiten Rastbügels 88 verschwenkbar gelagert. Der zweite Rastbügel 88 ist identisch ausgestaltet wie der erste Rastbügel 85.

Zwischen der dritten Vertiefung 26 und dem vorderen Rand 12 der Adapterplatte 11 ist in die Oberseite 19 eine achte Vertiefung 90 eingeformt, die im Wesentlichen identisch ausgestaltet ist wie die sechste und siebte Vertiefung, wobei sie allerdings um 90° gedreht ist und in den vorderen Rand 12 einmündet. In der achten Vertiefung 90 ist ein drittes Arretierungselement in Form eines dritten Rastbügels 91 verschwenkbar gelagert, der identisch ausgebildet ist wie der zweite Rastbügel 88 und der erste Rastbügel 85.

Wie bereits erwähnt, kommt die Adaptervorrichtung 10 für die Anordnung eines Behälters am Gehäuse eines tragbaren Reinigungsgerätes zum Einsatz. Ein derartiges Reinigungsgerät ist in den Figuren 7 bis 10 in Form eines Staubsaugers 95 dargestellt. Dieser umfasst einen Sockel 97 mit zwei um eine gemeinsame Drehachse 98 frei drehbaren hinteren Laufrädern, von denen in Zeichnung nur ein hinteres Laufrad 99 dargestellt ist, und mit zwei vorderen Laufrädern, von denen in der Zeichnung nur ein vorderes Laufrad 101 dargestellt ist. Mittels der Laufräder 99, 101 kann der Sockel 97 entlang einer Bodenfläche verfahren werden.

Auf den Sockel 97 ist ein Saugaggregat 103 aufgesetzt, das ein Gehäuseunterteil 104 und ein Gehäuseoberteil 105 aufweist. Das Gehäuseunterteil 104 bildet in üblicher Weise einen Schmutzsammelbehälter aus, in den über einen Saugeinlass 107 Saugluft zusammen mit Sauggut eingesaugt werden kann. An den Saugeinlass 107 kann in üblicher Weise ein Saugschlauch angeschlossen

werden, der an seinem freien Ende eine Saugdüse trägt. Derartige Saugschläuche und Saugdüsen sind dem Fachmann an sich bekannt und daher in der Zeichnung nicht dargestellt.

Das Gehäuseoberteil 105 nimmt in üblicher Weise eine Saugturbine auf, die von einem Elektromotor angetrieben wird. Mittels der Saugturbine kann der Schmutzsammelbehälter des Gehäuseunterteils 104 mit Unterdruck beaufschlagt werden.

An seiner Oberseite weist das Gehäuseoberteil 104 eine Deckfläche 109 auf mit einer zentralen Vertiefung 110, die stegartig von einem Tragegriff 111 überbrückt ist. Mittels des Tragegriffes 111 kann der Staubsauger 95 vom Benutzer getragen werden.

Am Gehäuseoberteil 105 ist in einem rückwärtigen Bereich ein im Wesentlichen U-förmiger Griffbügel 113 um eine Schwenkachse 114 verschwenkbar gelagert. Der Griffbügel 113 kann um die Schwenkachse 114 zwischen einer in den Figuren 7 bis 10 dargestellten ausgeschwenkten oder aufgerichteten Stellung und einer in der Zeichnung nicht dargestellten eingeschwenkten Stellung hin und her verschwenkt werden. Mittels einer Feststelleinrichtung 116, die am freien Ende zumindest eines Schenkels des Griffbügels 113 angeordnet ist, kann der Griffbügel 113 in seiner ausgeschwenkten Stellung arretiert werden.

Die Adaptervorrichtung 10 kann auf die Deckfläche 109 des Staubsaugers 95 aufgesetzt werden, wobei die Schwenkachse 51 der Trageinrichtung 38 und der Verriegelungseinrichtung 60 parallel zu einer Längsachse 112 des Tragegriffs 111 ausgerichtet ist. Anschließend kann die Adapterplatte 11 mit dem Tragegriff 114 des Staubsaugers 95 verriegelt werden, indem die Verriege-

lungseinrichtung 60 ausgehend von ihrer in Figur 7 dargestellten Freigabestellung in die in Figur 8 dargestellte Verriegelungsstellung verschwenkt wird. In der Verriegelungsstellung hintergreifen die freien Endabschnitte 74 und 75 der Verriegelungsbügel 65 und 66 den Tragegriff 111 des Staubsaugers 95. Der Tragegriff 111 bildet somit ein hintergreifbares Gehäuseteil des Staubsaugers 95 aus, mit dem die Adapterplatte 11 mittels der Verriegelungseinrichtung 60 werkzeuglos lösbar verriegelt werden kann. Die Adapterplatte 11 ist dadurch an der Deckfläche 109 unbeweglich gehalten. Anschließend kann auf die Stellfläche 20 der Adapterplatte 11 ein Behälter 120 aufgestellt werden, wie er in Figur 10 dargestellt ist. Auf den Behälter 120 kann ein weiterer Behälter 122 positioniert sein. Der Behälter 120 kann zur Ausrichtung an der Stellfläche 20 derart positioniert werden, dass er mit einem Seitenbereich an der ersten Anschlagfläche 78 des ersten Anschlages 77 anschlägt und mit einem seitlichen zapfenförmigen Vorsprung in die Ausnehmung 81 des zweiten Anschlages 80 eingreift. Anschließend kann der Behälter 120 mittels der Rastbügel 85, 88 und 91 an der Stellfläche 20 arretiert werden. Der Behälter 20 bildet dann gemeinsam mit der Adaptervorrichtung 10 und dem Staubsauger 95 eine kompakte Transporteinheit aus, die mittels der Laufräder 99 und 101 des Sockels 97 an einer Bodenfläche entlang verfahren werden kann. Außerdem kann die Transporteinheit um die gemeinsame Drehachse 98 nach hinten verschwenkt und dann nach Art einer Sackkarre bewegt werden.

Falls kein Behälter 120 auf der Stellfläche 20 der am Tragegriff 111 des Staubsaugers 95 arretierten Adapterplatte 11 aufgestellt ist, kann die Adaptervorrichtung 10 zusammen mit dem Staubsauger 95 vom Benutzer angehoben werden. Hierzu kann der Benutzer den Tragbügel 40 ausgehend von seiner Ruhestellung, in der er vollständig in die erste Vertiefung 22 eintaucht, in seine Tragestellung verschwenken, in der der Tragebügel und vor allem der Tragegriff 43 aus der Stellfläche 20 hervorstehen, so dass der Benutzer den

Tragegriff 43 mit einer Hand umgreifen kann. Dies wird insbesondere aus Figur 9 deutlich.

Die Adaptervorrichtung 10 gibt somit die Möglichkeit, auf den Staubsauger 95 einen Behälter 120 aufzustellen, obwohl die Deckfläche 109 des Staubsaugers 95 zumindest in Teilbereichen gewölbt und im Übrigen mit Erhebungen versehen ist. Hierzu definiert die Adapterplatte 11 auf ihrer Oberseite 19 eine ebene Stellfläche 20 zum Abstellen des Behälters 120, wobei die Stellfläche 20 zur leichteren Positionierung des Behälters 120 nach oben abstehende Anschläge 77 und 80 aufweist. Mittels der Verriegelungseinrichtung 60 kann die Adapterplatte 11 auf einfache Weise am Gehäuse 105 des Staubsaugers 95 arretiert werden, so dass die aus der Adaptervorrichtung 10 und dem Staubsauger 95 gebildete Reinigungseinrichtung vom Benutzer am Tragegriff 43 getragen werden kann.

Die Adaptervorrichtung 10 kann vom Benutzer bedarfsweise eingesetzt werden, wobei er sie ohne Einsatz eines speziellen Werkzeuges am Gehäuse 105 des Staubsaugers 95 festlegen und von dieser auch ohne Werkzeug wieder lösen kann.

PATENTANSPRÜCHE

1. Adaptervorrichtung für die Anordnung eines Behälters (120) am Gehäuse (105) eines tragbaren Reinigungsgerätes (95), dadurch gekennzeichnet, dass die Adaptervorrichtung (10) eine Adapterplatte (11) aufweist, die auf das Gehäuse (105) aufsetzbar ist und oberseitig eine Stellfläche (20) aufweist zum Abstellen des Behälters (120), sowie eine Verriegelungseinrichtung (60) zum werkzeuglosen lösbaren Verriegeln der Adapterplatte (11) mit dem Gehäuse (105) des Reinigungsgerätes (95).

2. Adaptervorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass die Adapterplatte (11) mittels der Verriegelungseinrichtung (60) mit einem hintergreifbaren Gehäuseteil (111) des Gehäuses (105) des Reinigungsgerätes (95) werkzeuglos lösbar verriegelbar ist.

3. Adaptervorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass die Adapterplatte (11) mittels der Verriegelungseinrichtung (60) mit einem Tragegriff (111) des Reinigungsgerätes (95) werkzeuglos lösbar verriegelbar ist, der an einer Oberseite des Gehäuses (105) des Reinigungsgerätes (95) angeordnet ist.

4. Adaptervorrichtung nach Anspruch 1, 2 oder 3, dadurch gekennzeichnet, dass die Verriegelungseinrichtung (60) mindestens ein Verriegelungsglied (65, 66) aufweist, das zwischen einer Verriegelungsstellung und einer Freigabestellung hin und her bewegbar an der Adapterplatte (11) gehalten ist.

5. Adaptervorrichtung nach Anspruch 4, dadurch gekennzeichnet, dass die Verriegelungseinrichtung (60) eine vom Benutzer ergreifbare Verriegelungshandhabe (68) aufweist, die mit dem mindestens einen Verriegelungsglied (65, 66) verbunden ist.

6. Adaptervorrichtung nach Anspruch 5, dadurch gekennzeichnet, dass die Verriegelungshandhabe (68) in der Freigabestellung des mindestens einen Verriegelungsgliedes (65, 66) aus der Stellfläche (20) der Adapterplatte (11) hervorsteht und in der Verriegelungsstellung des mindestens einen Verriegelungsgliedes (65, 66) aus der Stellfläche (20) der Adapterplatte (11) nicht hervorsteht.

7. Adaptervorrichtung nach Anspruch 5 oder 6, dadurch gekennzeichnet, dass die Verriegelungshandhabe (68) plattenförmig ausgestaltet ist und in der Verriegelungsstellung des mindestens einen Verriegelungsgliedes (65, 66) in der Ebene der Stellfläche (20) oder unterhalb der Ebene der Stellfläche (20) angeordnet ist.

8. Adaptervorrichtung nach einem der Ansprüche 4 bis 7, dadurch gekennzeichnet, dass das mindestens eine Verriegelungsglied (65, 66) um eine Schwenkachse (51) verschwenkbar ist.

9. Adaptervorrichtung nach einem der Ansprüche 4 bis 8, dadurch gekennzeichnet, dass die Verriegelungseinrichtung (60) zwei starr miteinander verbundene und im Abstand zueinander angeordnete Verriegelungsglieder (65, 66) aufweist.

10. Adaptervorrichtung nach Anspruch 9, dadurch gekennzeichnet, dass die Verriegelungshandhabe (68) die beiden Verriegelungsglieder (65, 66) starr miteinander verbindet.

11. Adaptervorrichtung nach einem der Ansprüche 4 bis 10, dadurch gekennzeichnet, dass das mindestens eine Verriegelungsglied (65, 66) haken- oder bügelartig ausgestaltet ist und in der Verriegelungsstellung ein Gehäuseteil (111) des Reinigungsgerätes (95) untergreift.

12. Adaptervorrichtung nach einem der Ansprüche 5 bis 11, dadurch gekennzeichnet, dass die Adapterplatte (11) oberseitig eine erste Vertiefung (22) aufweist, die die Verriegelungshandhabe (68) aufnimmt.

13. Adaptervorrichtung nach einem der voranstehenden Ansprüche, dadurch gekennzeichnet, dass die Adaptervorrichtung (10) eine Trageeinrichtung (38) aufweist mit mindestens einem Tragegriff (43), der vom Benutzer umgreifbar ist.

14. Adaptervorrichtung nach Anspruch 13, dadurch gekennzeichnet, dass der Tragegriff (43) zwischen einer Tragestellung, in der er aus der Stellfläche (20) der Adapterplatte (11) hervorsteht, und einer Ruhestellung, in der er aus der Stellfläche (20) der Adapterplatte (11) nicht hervorsteht, hin und her bewegbar ist.

15. Adaptervorrichtung nach Anspruch 13 oder 14, dadurch gekennzeichnet, dass der Tragegriff (43) der Adaptervorrichtung (10) um eine Schwenkachse (51) verschwenkbar ist.

16. Adaptervorrichtung nach Anspruch 14 oder 15, dadurch gekennzeichnet, dass die Adapterplatte (11) oberseitig eine zweite Vertiefung (24) aufweist, die den Tragegriff (43) aufnimmt.

17. Adaptervorrichtung nach einem der Ansprüche 13 bis 16, dadurch gekennzeichnet, dass die Trageeinrichtung (39) der Adaptervorrichtung (10) an der Adapterplatte (11) verschenkbar gelagert ist.

18. Adaptervorrichtung nach einem der Ansprüche 13 bis 17, dadurch gekennzeichnet, dass die Verriegelungseinrichtung (60) an der Trageeinrichtung (38) gehalten ist.

19. Adaptervorrichtung nach Anspruch 18, dadurch gekennzeichnet, dass die Verriegelungseinrichtung (60) an der Trageeinrichtung (38) beweglich gelagert ist.

20. Adaptervorrichtung nach einem der voranstehenden Ansprüche, dadurch gekennzeichnet, dass die Adapterplatte (11) mindestens ein aus der Stellfläche (20) hervorstehendes Anschlagelement (77, 80) aufweist, an das der Behälter (120) anlegbar ist.

21. Adaptervorrichtung nach Anspruch 20, dadurch gekennzeichnet, dass mindestens ein Anschlagelement (80) eine Ausnehmung (81) aufweist zur Aufnahme eines Vorsprunges des Behälters (120).

22. Adaptervorrichtung nach einem der voranstehenden Ansprüche, dadurch gekennzeichnet, dass die Adaptervorrichtung (10) mindestens ein Arretierungselement (85, 88, 91) aufweist zum Arretieren des Behälters (120) an der Stellfläche (20) der Adapterplatte (11).

23. Adaptervorrichtung nach Anspruch 22, dadurch gekennzeichnet, dass mindestens ein Arretierungselement (85, 88, 91) in einer oberseitigen Vertiefung (83, 87, 90) der Adapterplatte (11) beweglich gelagert ist.

24. Reinigungseinrichtung mit einem tragbaren Reinigungsgerät (95), das ein Gehäuse (104, 105) aufweist, und mit einer Adaptervorrichtung (10) nach einem der voranstehenden Ansprüche.

25. Reinigungseinrichtung nach Anspruch 24, dadurch gekennzeichnet, dass das Gehäuse (105) des Reinigungsgerätes (95) ein hintergreifbares Gehäuseteil (111) aufweist, mit dem die Verriegelungseinrichtung (60) zusammenwirkt zum werkzeuglosen lösbaren Verriegeln der Adapterplatte (11) mit dem Gehäuse (105).

26. Reinigungseinrichtung nach Anspruch 24 oder 25, dadurch gekennzeichnet, dass das Reinigungsgerät (95) einen Tragegriff (111) aufweist und die Adapterplatte (11) der Adaptervorrichtung (10) mittels der Verriegelungseinrichtung mit dem Tragegriff (111) werkzeuglos lösbar verriegelbar ist.

27. Reinigungseinrichtung nach Anspruch 24, 25 oder 26, dadurch gekennzeichnet, dass das Reinigungsgerät als Staubsauger (95) ausgestaltet ist.

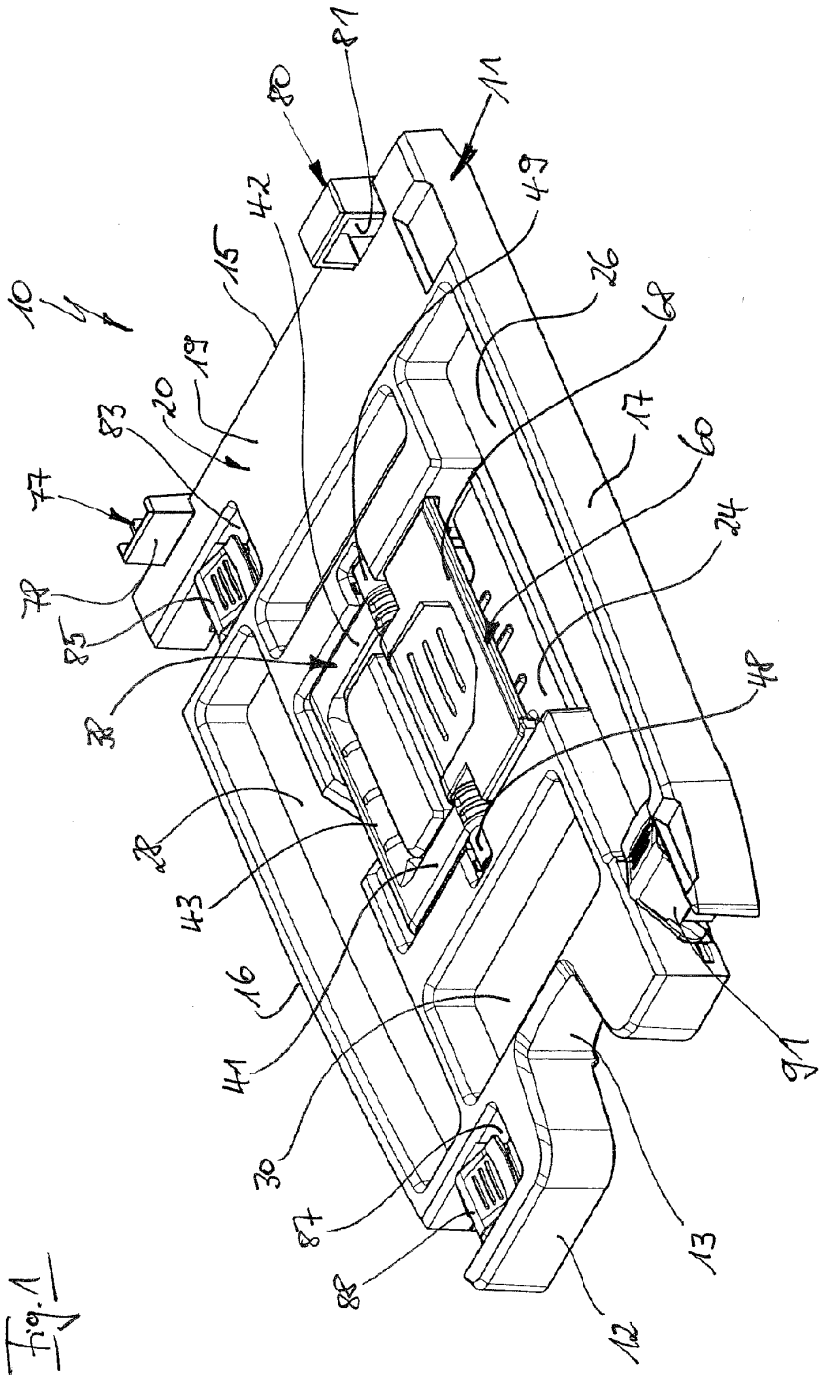

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Fig. 1

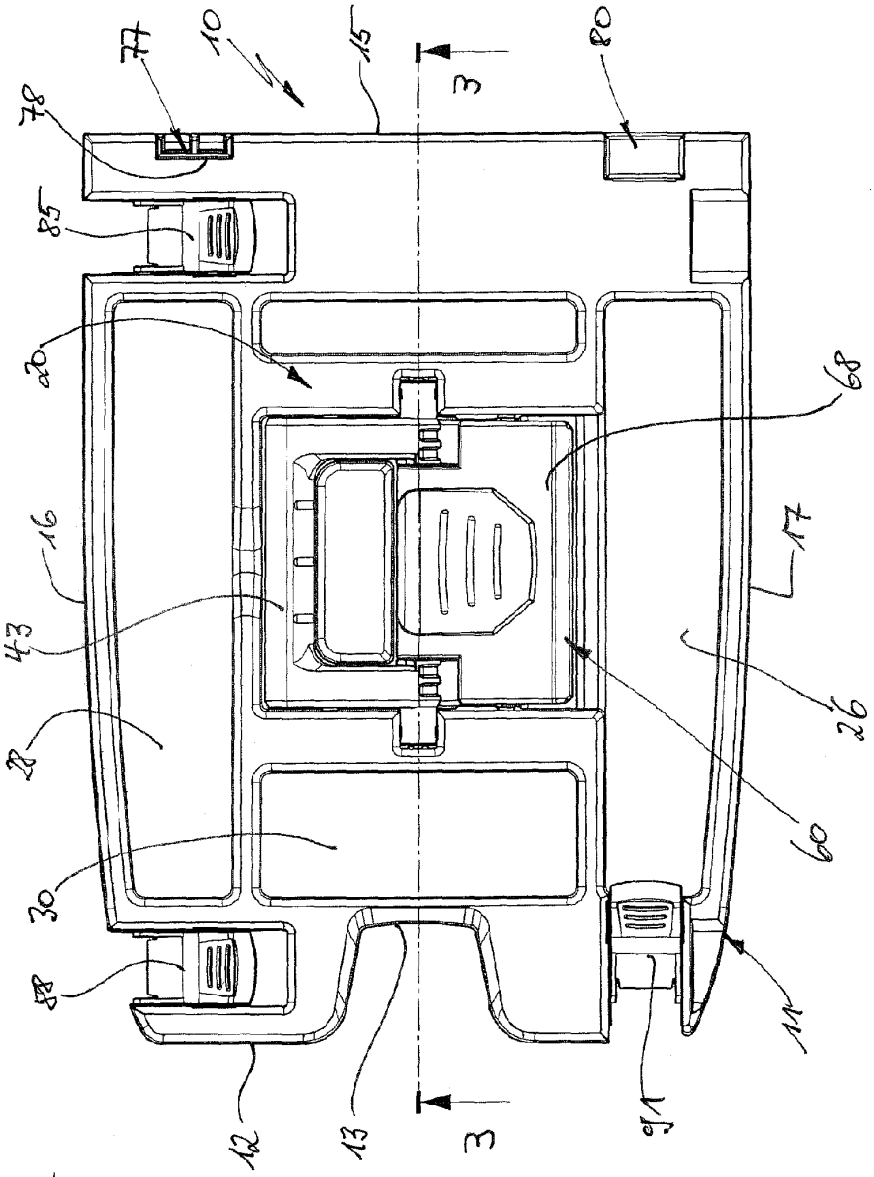


Fig.2

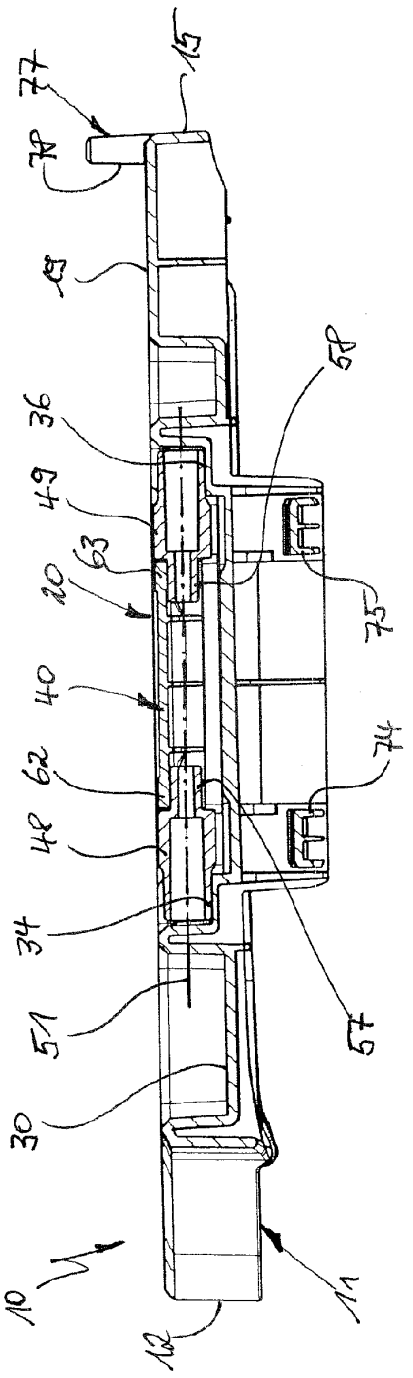


Fig. 3

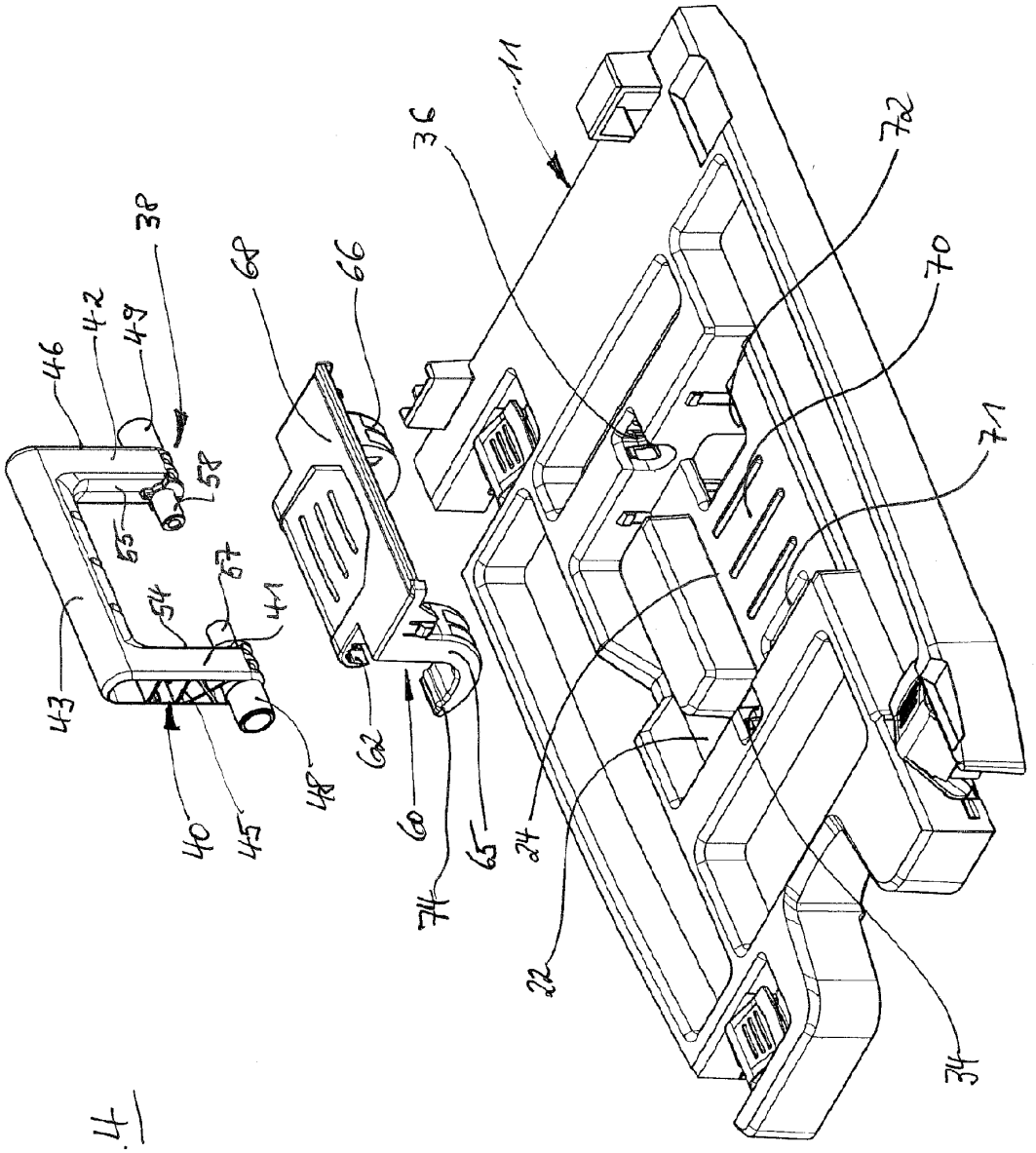

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Fig. 4

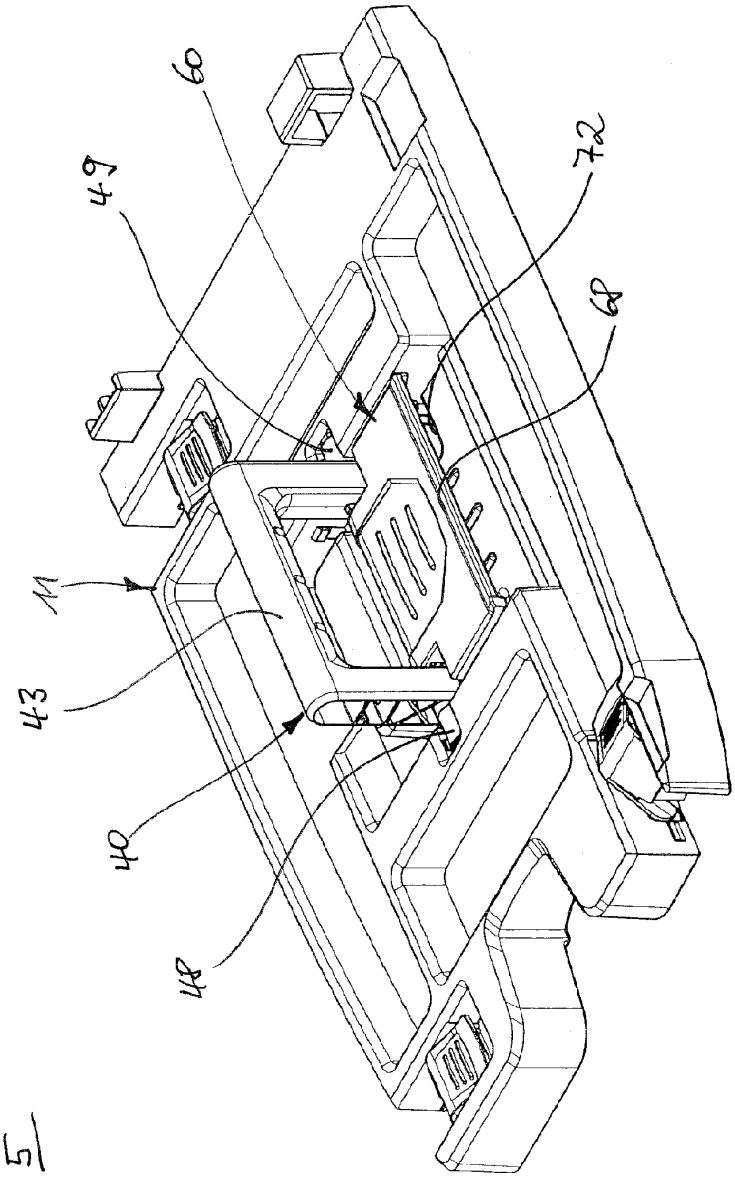


Fig. 5

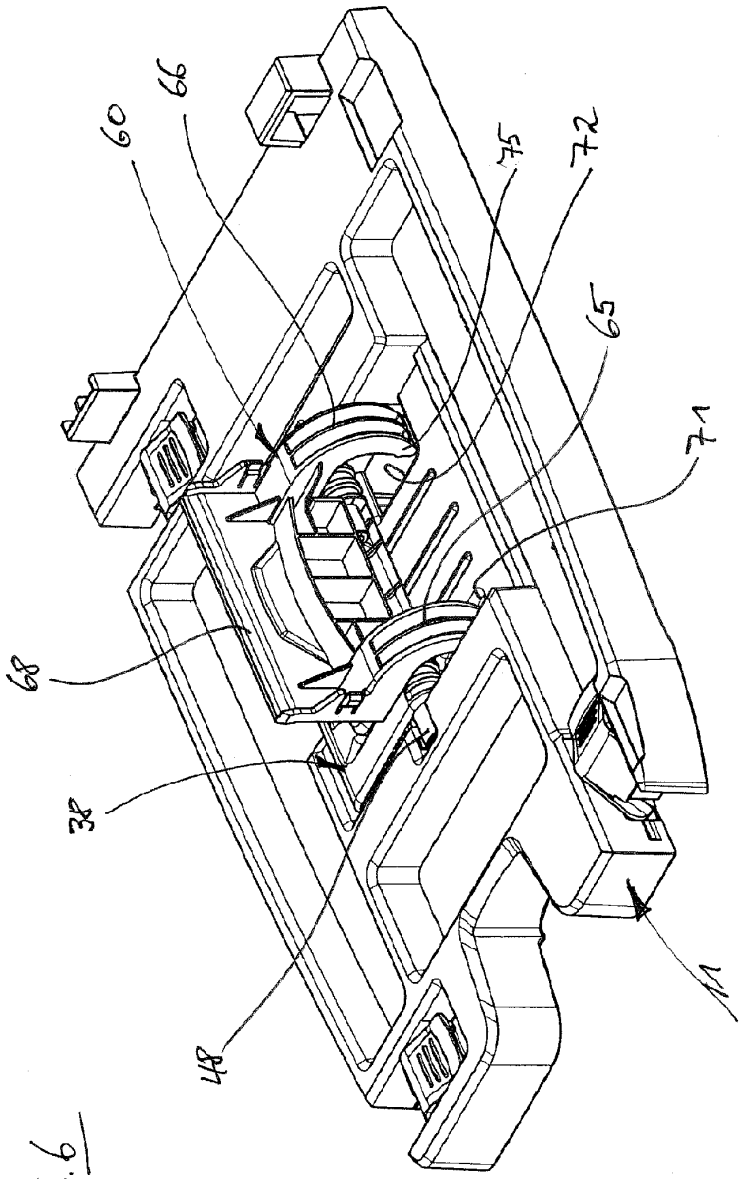


Fig. 6

Fig. 7

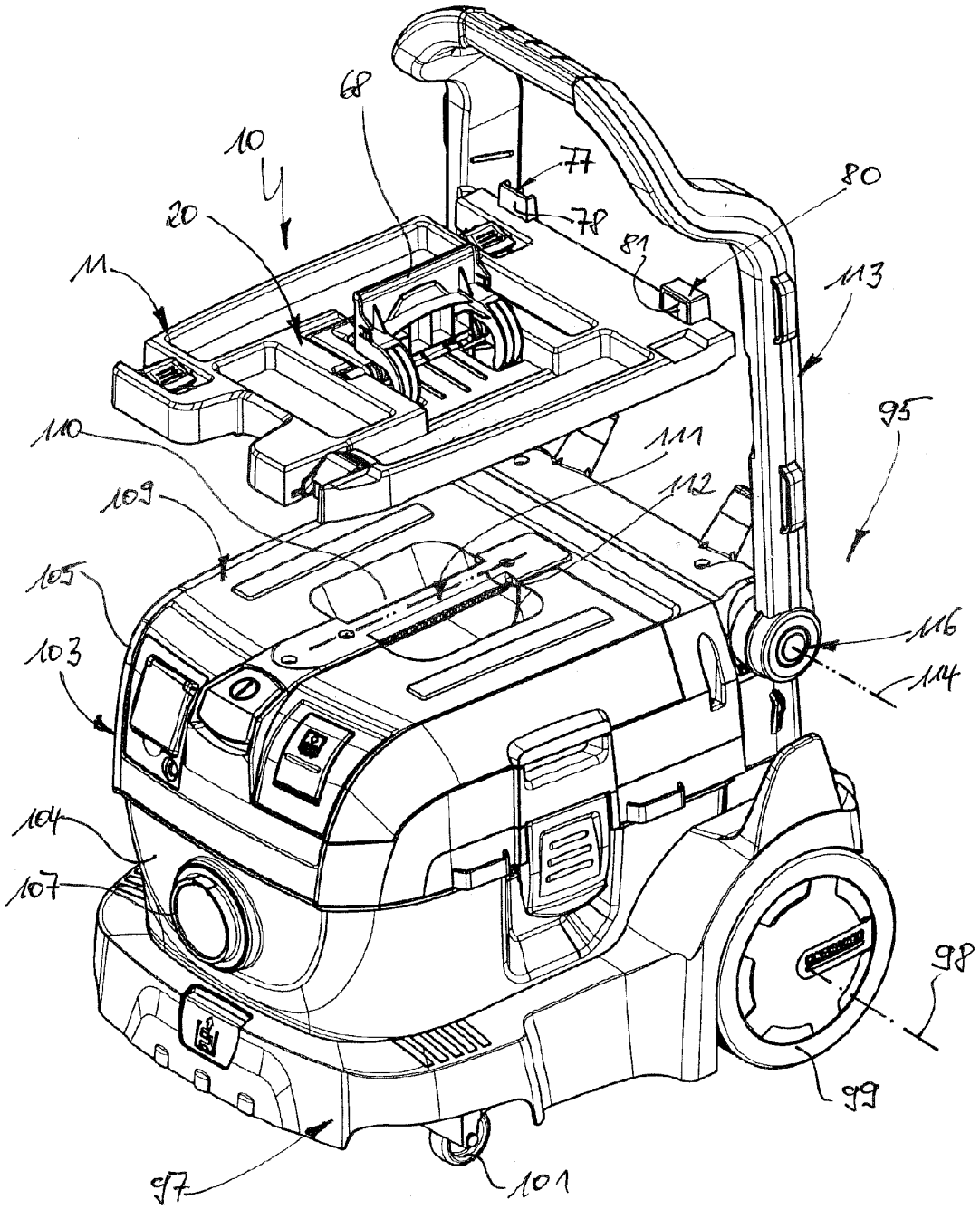

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Fig. 8

