

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

**Kubota North America Corporation,
Petitioner**

**IPR2025-00167
U.S. Patent No. 9,321,386**

**PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. § 312 AND 37 C.F.R. § 42.104**

(Claims 1-13, 15, 17, 19-30, 64-67)

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PETITIONER’S EXHIBIT LIST

EX1001	Vermeer Patent U.S. Patent No. 9,321,386 (the “’386 Patent”)
EX1002	Vermeer Patent Prosecution History Prosecution History of U.S. Patent No. 9,321,386
EX1003	First Declaration of Steven Velinsky under 37 C.F.R. § 1.68
EX1004	Appendix A of Velinsky Declaration
EX1005	Korean Patent No. 10-1041996 including original Korean language document, certified English translation, and certification of translation (“KR996”)
EX1006	JP2004017705A including original Japanese language document, certified English translation, and certification of translation (“JP705”)
EX1007	U.S. Patent No. 6,397,967 (“McIlwraith”)
EX1008	U.S. Patent No. 3,586,195 (“Beltrami”)
EX1009	U.S. Patent No. 6,695,568 (“Bares ’568”)
EX1010	U.S. Patent No. 6,832,659 (“Bares”)
EX1011	JPH 11140900 to Komatsu (“Komatsu”) (machine translation)
EX1012	U.S. Patent No. 6,474,933 (“Hoechst”)
EX1013	U.S. Patent Application Publication No. 2008/0197588 to Azure (“Azure”)
EX1014	Korean Patent No. 10-1023528 including original Korean language document, certified translation, and certification
EX1015	SAE International J2752 JUN2010 (“SAE J2752”), Surface Vehicle Recommended Practice, Personal Protection – Compact Tool Carriers

EX1016	International Organization for Standardization (ISO) 6165 (2012)
EX1017	International Organization for Standardization (ISO) 3457 (2003)
EX1018	International Organization for Standardization (ISO) 3411 (2007)
EX1019	Complaint, 4:24-cv-00799-P
EX1020	Toro Claim Construction, 4-17-CV-00076 (terminated)
EX1021	U.S. Patent Application Publication No. 2007/0128012 A1 (“Yamada”)
EX1022	U.S. Patent No. 8,545,163 (“Yasuda”)
EX1023	N. Sclater, et al., Mechanisms and Mechanical Devices Sourcebook, Fourth Edition, Table of Contents, Chapter 1, Chapter 5
EX1024	N. Nariman-Zadeh, et al., “Pareto optimal synthesis of four-bar mechanisms for path generation,” 26 March 2008
EX1025	Four-Bar Coupler-Point Curves, Chapter 6
EX1026	H Nolle, Linkage Coupler Curve Synthesis: A Historical Review – II. Developments after 1875*, 7 July 1973
EX1027	Wen-Tzong Lee, et al., “Developments in quantitative dimensional synthesis (1970-present): four-bar path and function generation” 2017
EX1028	Theory of Machines and Mechanisms, Shigley, J.E. and Uicker, J.J. Jr., McGraw Hill, 1980, Table of Contents, Chapter 1
EX1029	Reexam 90013915 PH
EX1030	Reexam 90014109 PH
EX1031	Reexam 90014124 PH
EX1032	U.S. Patent Publication Appl. 2010/0168933 (“Rorabaugh”)
EX1033	U.S. Patent Publication Appl. 2009/0116943
EX1034	United States District Court – National Judicial Caseload Profile
EX1035	U.S. Patent No. 3,828,873 (“Oestmann”)
EX1036	CV of Steven Alan Velinsky

I. INTRODUCTION

Pursuant to 35 U.S.C. §§311, 314(a), and 37 C.F.R. §42.100, Kubota North America Corporation (“Petitioner”) respectfully request the Board institute review and find unpatentable claims 1-13, 15, 17, 19-30, and 64-67 (hereinafter, the “Challenged Claims”) of U.S. Patent No. 9,321,386 (“the ’386 Patent,” EX1001).

The ’386 Patent describes a compact tool carrier having standing or walk-behind operation with a loader arm mounted to a mainframe using linkage(s) and actuator. As shown below and confirmed in the Declaration of Dr. Velinsky (EX1003) this configuration of a loader was already known. The references presented in this Petition render obvious the Challenged Claims.

II. GROUNDS FOR STANDING

Petitioner certifies that the ’386 Patent is eligible for IPR and that Petitioner is not barred or estopped from requesting IPR challenging the patent claims. 37 C.F.R. §42.104(a).

III. NOTE

Petitioner cites to exhibits’ original page numbers except for non-English documents for which the certified translation is cited. **Emphasis** in quoted material has been added. Claim terms are generally presented in *italics*.

IV. BACKGROUND

The '386 Patent relates to earth-moving machinery and particularly to a machine type—a compact tool carrier—well-known as of the earliest claimed priority date. This section describes background technology related to the claimed subject matter predating the '386 Patent, supported by Dr. Velinsky's declaration. *See* EX1003, ¶¶4-38.

A. Compact Tool Carrier

The '386 Patent is titled “Low Profile Compact Tool Carriers,” which it continues to describe as tool-mounted machines capable of working in tight spaces for utility or do-it-yourself home projects. EX1001, Title, 1:12-36. These compact tool carriers are “self-propelled crawler[s] or wheeled machine[s] having an operating mass of less than 1500 kg with a rigid frame, having either a pedestrian operating positions or standing operator platform at the rear of the machine and either front-mounted interchangeable equipment or lift arms with an attachment bracket capable of coupling to interchangeable, front-mounted attachments.” EX1001, 1:21-28 (citing industry standard EX1015); EX1002, pp. 43-44. This type of equipment (compact tool carrier) may also be referred to as a compact utility loader (CUL) or a mini-skid steer. EX1003, ¶¶28-29; EX1030, p. 12.

B. Radial-Lift and Vertical-Lift Loaders

As Patent Owner has recognized, there are generally two conventional

configurations of loaders: a radial-lift loader and a vertical-lift loader, which are characterized by how the loader is attached to the equipment frame. EX1003, ¶¶30-38; EX1029, pp. 105-108, 150, 155-157. Each configuration was known well-before the '386 Patent and is based on basic engineering mechanisms. Radial-lift loaders implement a two-bar mechanism where the loader arm is attached to a frame by a direct pivot connection. EX1003, ¶¶30-31; EX1030, p. 13. The vertical-lift loader attaches the loader arm to a frame indirectly through intermediary parts—linkages and an actuator—configured in a four-bar mechanism. EX1003, ¶¶32-38 citing EX1001, FIG. 3; EX1005, Fig. 21; EX1026, EX1027; EX1029, p. 142 ('386 Patent inventor stating “[b]y using a linkage and actuator to support the loader (i.e., a vertical lift loader) as set forth in claim 1”); EX1030, p. 13.

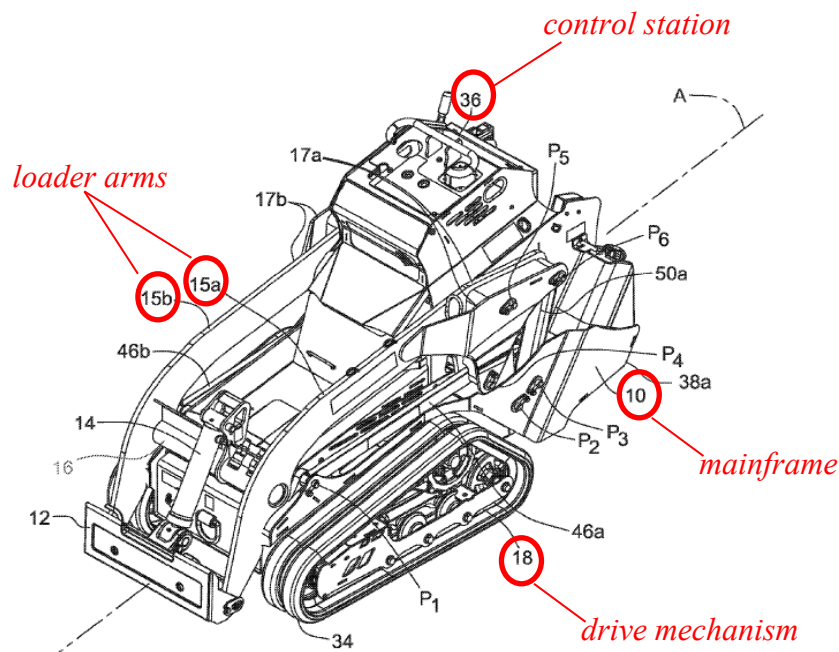
V. SUMMARY OF THE '386 PATENT

The '386 Patent issued April 26, 2016, and was subject to three (3) *ex parte* reexamination proceedings with certificates issued resulting in the '386 Patent having claims 1-15, 17, and 19-87. Petitioner was not a party to any of these proceedings.

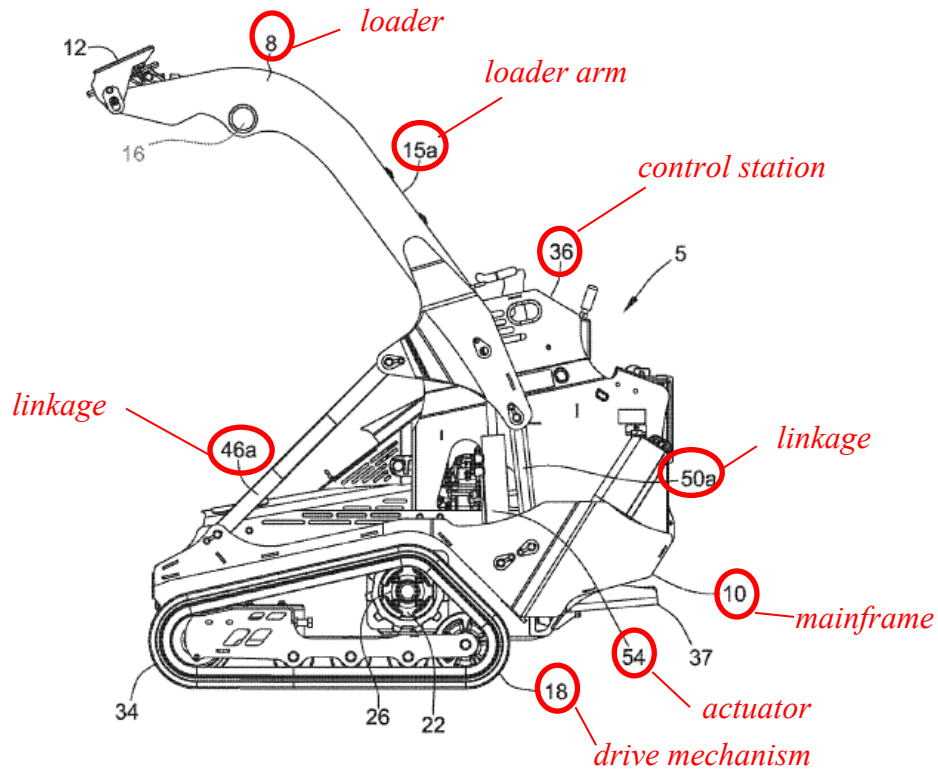
The '386 Patent relates to compact tool carriers designed for operation by an operator standing at the rear of the carrier. EX1001, 1:12-28. In its background, the '386 Patent asserts compact tool carriers “may be distinguished from much larger conventional skid steers in which an operator is seated in the operating position.”

EX1001, 1:32-36. A tool is provided as front-mounted attachments such as buckets, augers, and the like. EX1001, 1:28-31.

FIGS. 1 and 3 are illustrative of a compact tool carrier 5 including a loader 8 having loader arms 15a, 15b and supported by a mainframe 10. EX1001, 2:44-46. A drive mechanism 18 is attached to the mainframe 10 and may include tracks (as shown) or wheels. EX1001, 3:20-30. A control station 36 provides controls for propelling the carrier forward and raising and lowering the loader 8 operated by a user at the rear of the equipment. EX1001, 3:31-61. FIG. 1 is illustrative of the carrier with the loader in a down position; FIG. 3 below is illustrative of the carrier with the loader in a raised position. EX1001, 2:27-30.



EX1001, FIG. 1
(annotated)



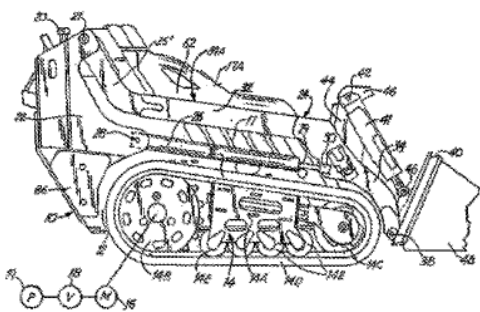
**EX1001, FIG. 3
(annotated)**

The first loader arm 15a is pivotally connected to a first side 38a of the mainframe 10 and the second loader arm 15b is pivotally connected to a second side of the mainframe 10. EX1001, 4:13-17. Each loader arm is attached to a respective side of the mainframe 10 by linkages 46a/50a and an actuator 54 (e.g., a hydraulic cylinder). EX1001, 4:13-60. Dr. Velinsky confirms this configuration was known to Persons of Ordinary Skill in The Art (POSITA) as a vertical lift loader based on a four-bar mechanism providing a path generation of the motion of the tool attachment plate 12. EX1003, ¶¶36, 39-41.

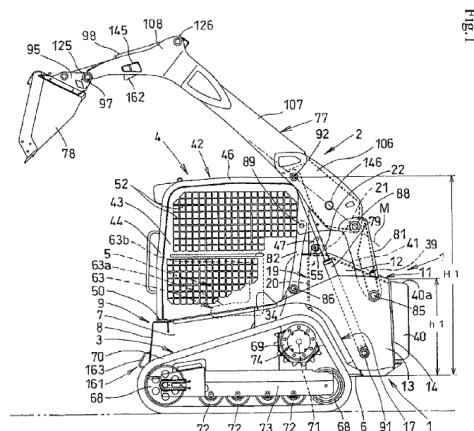
VI. PROSECUTION HISTORY

A. Original Prosecution

Applicant overcame a rejection based on a combination of Yasuda (EX1022), which illustrates the claimed loader configuration including its attachment to a mainframe, and Bares '568 (EX1009), which illustrates equipment having a control station for walk-behind operation. EX1002, p. 52.



EX1009, FIG. 1



EX1022, FIG. 1

After the rejection was maintained over Applicants' arguments against the combination, Applicant amended its claims to recite an *engine bracket spaced from the rear end of the mainframe* to distinguish from Yasuda's engine location. EX1002, pp. 8-21.

B. Reexamination Proceedings (90/013,915) (90/014,109) (90/014,124)

The '386 Patent was subject to two reexamination proceedings.¹ Like in the original prosecution, these proceedings turned on whether it was obvious to combine a compact tool carrier having stand-behind operation and a radial lift loader, with a vertical lift loader from a larger skid-steer equipment having an operator cabin. The Examiner, recognizing both vertical and radial lift loaders were well-known, concluded Patent Owner's evidence showed "those of ordinary skill in the art (the engineers, developers, managers, etc. at **Toro** [Third Party Requester]...did not find it obvious to employ a vertical lift loader arm arrangement on a [compact tool carrier]" and "In particular, the Declaration of L. Hartke [**'386 Patent named inventor**] is persuasive to show that designing a vertical lift having a four-bar linkage [vertical lift configuration] requires considerable experimentation and a combination such as [vertical lift and compact tool carrier] would not have been obvious at least because it would require undue experimentation." EX1030, p. 16. Thus, the Examiner found it would not have been obvious to modify the smaller

¹ Three reexamination requests resulted in two substantive reviews of the patent as two requests, involving the same art, targeting original claims and claims added in the first reexamination (EX1029), respectively were merged. Citations are to EX1030.

compact tool carrier to replace its radial lift loader with a vertical lift loader, disclosed in the cited art on a larger skid-steer and confirmed/allowed the claims. *Id.*

C. Previously Alleged Secondary Considerations

As indicated above, Patent Owner has, during previous *ex parte* proceedings, entered evidence supporting secondary considerations of the '386 Patent including its claim 1. Such evidence carries little weight in this *inter partes* proceeding. **First**, such factors must be assessed anew in light of this entirely different obviousness framework, which in context of the scope of claim 1, relies upon a secondary reference for only a minor, well-known limitation (*e.g.*, engine bracket). **Second**, Patent Owner's evidence relates entirely to the alleged non-obviousness of replacing a radial lift mechanism of a compact tool carrier with a vertical lift mechanism. A vertical lift mechanism on a compact tool carrier was known in the art as shown here by KR996. And "case law makes clear that 'objective evidence of nonobviousness **lacks a nexus** if it exclusively relates to a feature that was 'known in the prior art'[".]” *See Yita LLC v. Macneil IP LLC*, 69 F.4th 1356, 1364 (Fed. Cir. 2023) citing *Rambus Inc. v. Rea*, 731 F.3d 1248, 1257 (Fed. Cir. 2013). For example, "if the feature that creates the commercial success was known in the prior art, the success is not pertinent." *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1312. **Third**, Vermeer's evidence should not be given substantial weight as it suffers from numerous deficiencies including improper weight of declarations from interested

parties (i.e., inventor of the '386 Patent); alleged praise based on Patent Owner's presentation of being first to provide vertical lift, which it was not; statements particular to a third-party Toro and its development process that have no relevance here; reliance on performance data constrained to one vertical lift mechanism in comparison with one radial lift mechanism, which merely recognizes a predictable different lift path². **Finally**, secondary considerations, even if they do exist, would not overcome the clear obviousness shown here. *See Genentech, Inc. v. Sandoz, Inc.*, 55F.4th 1368, 1378 (Fed. Cir. 2022).

D. Prosecution History Summary

Throughout original prosecution and reexaminations, Patent Owner repeatedly overcame challenges to its claims that relied upon an obviousness framework of placing a known vertical lift loader onto a known compact tool carrier. *See also*, EX1003, ¶¶42-47. This obviousness framework is not relied upon in the present petition. Here a primary reference, KR996, that was not of record shows it was known in the art to provide, in a single embodiment, a compact tool carrier

² “To be particularly probative, evidence of unexpected results must establish that there is a difference between the results obtained and those of the closest prior art, and that the difference would not have been expected [by POSITA].” *Bristol-Myers Squibb Co. v. Teva Pharms. USA, Inc.*, 752 F.3d 967, 977 (Fed. Cir. 2017).

having a vertical lift style loader.

VII. EFFECTIVE PRIORITY DATE OF THE '386 PATENT

The '386 Patent is based on a provisional application filed on February 20, 2015. Determining whether the '386 Patent is entitled to an earlier priority date is unnecessary in this proceeding, however, as all of the cited and relied-upon prior art predates the earliest claimed date. Accordingly, Petitioner has not undertaken a priority date analysis. Petitioner does not waive any right or opportunity it may have to dispute the priority date of the '386 Patent in this or another forum where the issue is relevant. EX1003, ¶48.

VIII. LEVEL OF ORDINARY SKILL IN THE ART

POSITA in February 2015 (the earliest effective filing date claimed) would have had at least a Bachelor of Science degree in Mechanical or Agricultural Engineering and two years of experience in the design of vehicles, or have had equivalent knowledge and experience. Lack of professional experience can be remedied by additional education, and vice versa. EX1003, ¶¶17-20.

IX. CLAIM CONSTRUCTION

Claim terms in IPR are construed according to their “ordinary and customary meaning” to those of skill in the art. 37 C.F.R. §42.100(b). Petitioner submits, for the purposes of this proceeding and the grounds presented herein, no claim term

requires express construction.³ *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017). EX1003, ¶49. Petitioner may argue that some claims are indefinite under 35 U.S.C. §112. Such issues are outside the scope of this proceeding and do not preclude the Board’s evaluation of grounds presented below.

X. RELIEF REQUESTED AND THE REASONS FOR THE REQUESTED RELIEF

Petitioner asks that the Board institute a trial for *inter partes* review and cancel the Challenged Claims in view of the analysis below.

A. Challenged Claims

Petitioner challenges claims 1-13, 15, 17, 19-30, and 64-67 of the ’386 Patent (“Challenged Claims”) by this Petition and concurrently files two additional petitions to challenge other claims of the ’386 Patent.⁴ Patent Owner has declined to identify which of the 85 claims of the ’386 Patent it asserts in the co-pending litigation. *See* EX1019 (asserting “at least claim 1”).

³ A district court previously discussed construction of certain claim terms in the ’386 Patent. *See* EX1020. Petitioner was not a party to that case, which involves different points of dispute from this proceeding.

⁴ Claims 16 and 18 have been canceled; claim 14 is not challenged.

B. Prior Art Patents and Printed Publications

The following references are pertinent to the grounds of unpatentability explained below:

1. KR 10-1041996 (“KR996”) (EX1005); stemming from Korean Application 10-2009-0033050, which was published as 10-1041996 on June 16, 2011 (and published as 10-2009-0110253 in October, 2009); prior art under 35 U.S.C. §102(a)(1).
2. JP 2004-17705 (“JP705”) (EX1006); filed June 13, 2002; published January 22, 2004; prior art under 35 U.S.C. §102(a)(1).
3. U.S. Patent No. 6,397,967 (“McIlwraith”) (EX1007); filed December 22, 1999; issued June 4, 2002; prior art under 35 U.S.C. §102(a)(1).
4. U.S. Patent No. 3,586,195 (“Beltrami”) (EX1008); filed December 23, 1968; issued June 22, 1971; prior art under 35 U.S.C. §102(a)(1).

KR996, JP705, and McIlwraith were not cited during prosecution of the ’386 Patent. Beltrami was cited in a reexamination proceeding of the ’386 Patent, but not discussed.

C. Statutory Grounds for Challenges

This Petition, supported by the declaration of Dr. Velinsky (EX1003 and EX1004 providing Appendix A of the declaration)(*see also*, EX1036), requests cancellation of claims 1-13, 15, 17, 19-30, and 64-67 under the following Grounds:

Grounds	Claims	Basis
#1	1–13, 21-22, 64	35 U.S.C. § 103 over KR996 and JP705
#2	65	35 U.S.C. § 103 over KR996, JP705, and McIlwraith
#3	15, 17, 19-20, 23-30, 66, 67	35 U.S.C. § 103 over KR996, JP705, and Beltrami

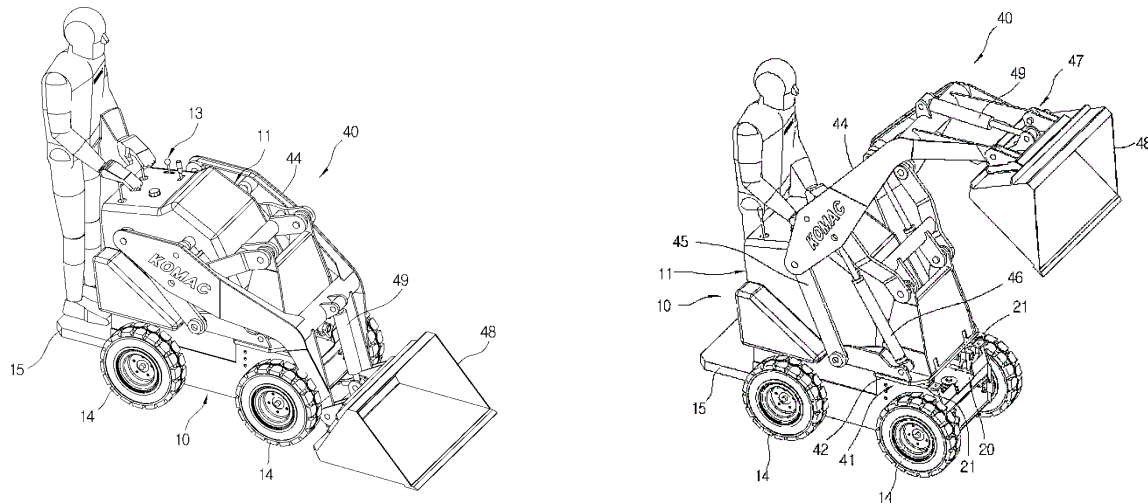
See also, EX1003, ¶50. Petitioner’s §103 obviousness grounds rely on the combined teachings of the references and not on a physical incorporation of elements. *See in re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012). “The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference[.]” *Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (quoting *in re Keller*, 642 F.2d 413, 425 (C.C.P.A. 1981)). Instead, the question is whether “a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention[.]” *Id.* (quoting *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1361 (Fed. Cir. 2007)). *See also, in re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc) (explaining that whether one reference can be incorporated in another is “basically irrelevant” since the test for obviousness is “not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole”).

Petitioner also cites below to prior art as evidence of the background knowledge of POSITA and to provide context what POSITA would have understood from the prior art. *See Yeda Research v. Mylan Pharm. Inc.*, 906 F.3d 1031, 1041-1042 (Fed. Cir. 2018) (affirming the use of “supporting evidence relied upon to support the challenge”); 37 C.F.R. §42.104(b).

D. Ground 1 : KR996 and JP705

1. KR996 (EX1005)

KR996 is entitled “Environmentally Friendly Construction Equipment for Building Deconstruction Work.” EX1005, (54). KR996 describes construction equipment that “can enter narrow buildings and carry out dismantling work inside the building” and “effectively perform difficult tasks in narrow spaces, allowing for efficient operations such as building interior demolition, road maintenance, snow removal, and towing.” EX1005, [0001]-[0002]. In particular, KR996 provides a vehicle 10 to which, interchangeably, a loader unit 40 or an arm unit 60 is attached. EX1005, [0041], Figs. 1-13, 21 illustrating the loader unit 40 and Figs. 14-20, 22 illustrating the arm unit 60. Fig. 21, reproduced below, illustrates a side view of the vehicle with the loader unit 40. EX1005, [0113]-[0114].



EX1005, Fig. 8 (portion), Fig. 9

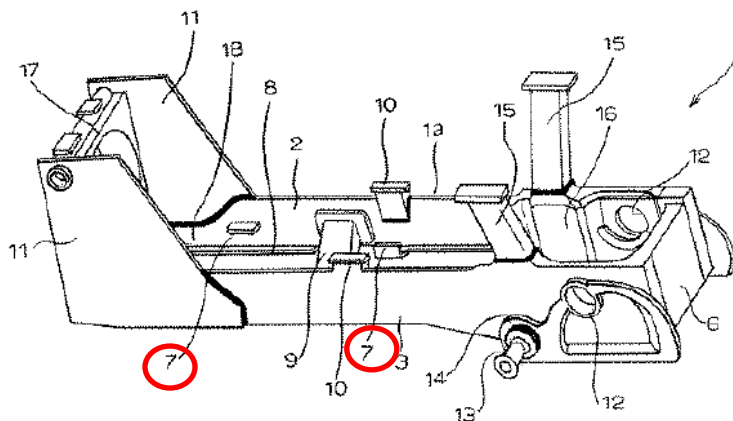
Dr. Velinsky confirms KR996's loader is a vertical lift style, four-bar mechanism.

EX1003, ¶¶51-52.

2. JP705 (EX1006)

JP705 discusses “a main frame for a work vehicle such as a bulldozer, hydraulic excavator, or other construction or civil engineering machine, and more particularly relates to a main frame for a work vehicle that enables easy and reliable installation of various on-board devices such as an engine, a transmission, and the like.” EX1006, [0001]. A main frame 1 has a pair of parallelly extending left and right side plates 2, 3. EX1006, [0019]. Mounting parts such as parts 7 and 8 extend from the sides. EX1003, ¶53. “A pair of left and right mounting parts 7 and 7 for

mounting an engine, a steering device, and the like (not depicted) are provided near the upper surfaces of the side plates 2 and 3 and protrude from the inner side surfaces in the width direction of the frame.” *Id.*



EX1006, FIG. 1
(annotated)

3. Reasons to combine KR996 and JP705 (KR996-JP705)

KR996 and JP705 are analogous art to the '386 Patent because they are in the same field of endeavor, pertaining to working vehicles including construction or agricultural machines (*i.e.*, earth-moving equipment). EX1003, ¶54; EX1005, Abstract, [0001], FIG. 21; EX1006, Abstract, [0001], FIG. 1; EX1001, 1:17-48, 2:44-3:2, FIG. 1. For example, JP705 suggests applying its teachings to an excavator, which is similarly a function of KR996 and the '386 Patent. EX1006, [0017]; EX1005, [0005]; EX1001, 1:28-31 (“auger”). Further, KR996 and JP705 are

analogous art to the '386 Patent because they are reasonably pertinent to a same problem faced by the inventor—mounting components onto a frame to effectuate the operation of a vehicle. EX1005, Fig. 12; EX1006, [0006]-[0008], FIG. 1; EX1001, 4:4-16, 5:52-55, FIG. 6.

POSITA would have been motivated to combine the teachings of JP705, and in particular, its mounting parts as an engine bracket to KR996's vehicle to produce predictable and beneficial results as discussed below. EX1003, ¶¶55-62. First, the vehicle of KR996 has an engine disposed within its frame to provide energy to propel the vehicle. EX1003, ¶56 citing EX1005, Fig. 10; EX1014, [0002], Fig. 3; EX1016, p. 7; EX1017, p. 9; EX1013, [0003]. It follows that an engine bracket would secure the engine within the frame, this is a common technique. EX1003, ¶¶57-58. While KR996 does not detail how its engine is secured to its mainframe, JP705 does detail providing a mounting surface for just such an engine in a substantially similar vehicle. JP705's mounting surfaces are provided by mounting parts 7 (*engine bracket*) that extend from the frame—beneficially providing a mounting surface for receiving an engine to effectuate the vehicle's operation by securing the engine and allowing the engine to serve as structural support. EX1003, ¶58.

Using JP705's mounting parts 7 (*engine bracket*) extending from a side of KR996's frame provides a benefit of avoiding use of additional parts to secure the engine in the vehicle. EX1003, ¶¶57-61. JP705 suggests providing mounting parts

extending from a frame reduces the number of fastening parts (such as a bolt, nut, collar, or the like) required and this reduction of parts allows for a reduction in component costs and weight. EX1006, [0008], [0016]. And this formation of JP705's mounting parts integrally with the mainframe through conventional welding also prepares the receiving surface as advantageously, a "smooth, continuous surface." *See* EX1003, ¶¶57-60 citing EX1006, [0016], [0031]. Further, integrating the mounting parts extending from a frame side allows for efficient loading of an engine onto the available, prepared, designated mounting surface. EX1006, [0013], [0018], [0022]. POSITA would recognize these same benefits would be gained by implementing JP705's mounting parts 7 for mounting an engine in KR996's vehicle. EX1003, ¶61.

Thus, this combination is merely applying a known technique to a known device (e.g., JP705's recognition of a well-known technique of mounting an engine in a vehicle using an engine bracket, with KR996's vehicle having a frame and engine) ready for improvement (e.g., providing an easily accessible mounting surface extending from the frame suitable to receive the engine) to yield predictable results. EX1003, ¶61; *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380–81 (Fed. Cir. 2023) (“[t]here is a motivation to combine when a known technique ‘has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way,’ using the ‘prior

art elements according to their established functions.”)

Combining JP705’s engine bracket with KR996’s frame would have been predictable and had a reasonable expectation of success given both JP705 and KR996 relate to similar vehicle types with an engine mounted between sides of a frame. There is limited range of options of placement of an engine bracket, and extending from the sides of the frame as illustrated in JP705 would have been a straightforward and simple matter of utilizing the engine mounting feature for its known function. JP705 recognizes welding operations to form the mounting parts extending from the frame can be performed “stably[], easily, and efficiently.” EX1006, [0016]. Further, in evaluating the suggested frame of KR996 (*see* Fig. 10), POSITA would recognize available space on the sidewalls of KR996’s frame to provide JP705’s engine bracket extending therefrom. EX1003, ¶62.

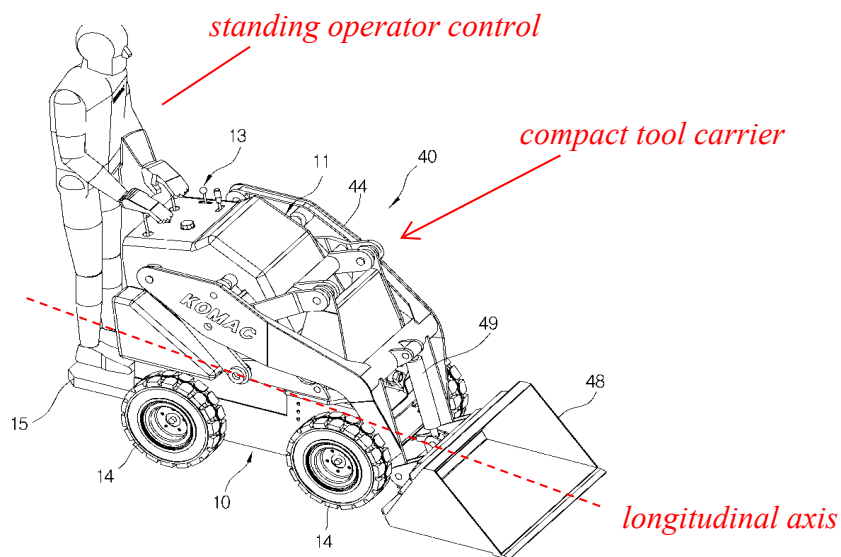
4. Claim 1

[1.0] *A compact tool carrier configured for standing or walk-behind operator control and having a longitudinal axis and a mass of less than about 1500 kg, the compact tool carrier comprising:*

To the extent the preamble is limiting, KR996 discloses it. EX1003, ¶¶63-69.

As discussed above, KR996 describes a self-propelled vehicle (*compact tool*

carrier)⁵ capable of carrying equipment for building deconstruction work, providing maneuverability in small spaces, and having the functionality of a mini skid loader when attaching a bucket. EX1005, Abstract, [0001]-[0012]. KR996's compact tool carrier is configured for *standing or walk-behind operator control* and has a *longitudinal axis*.



**EX1005, Fig. 8 (portion)
(annotated)**

See also, EX1005, [0033] (“**foldable safety step** is installed on the loader on the **lower rear part** of the vehicle, allowing **operator to board**”), [0049]. This is the

⁵ KR996's vehicle is a *compact tool carrier* of the same configuration as in '386 Patent (EX1001, 2:59-3:3). EX1003, ¶66.

same configuration for operator control as provided in the '386 Patent. EX1001, 3:38-43 (“As used herein, ‘standing operation’ generally refers to operation in which the operator stands on a platform attached to the compact tool carrier while ‘walk-behind operation’ generally refers to operation in which the operator stands on the surface supporting the compact tool carrier 5.”).

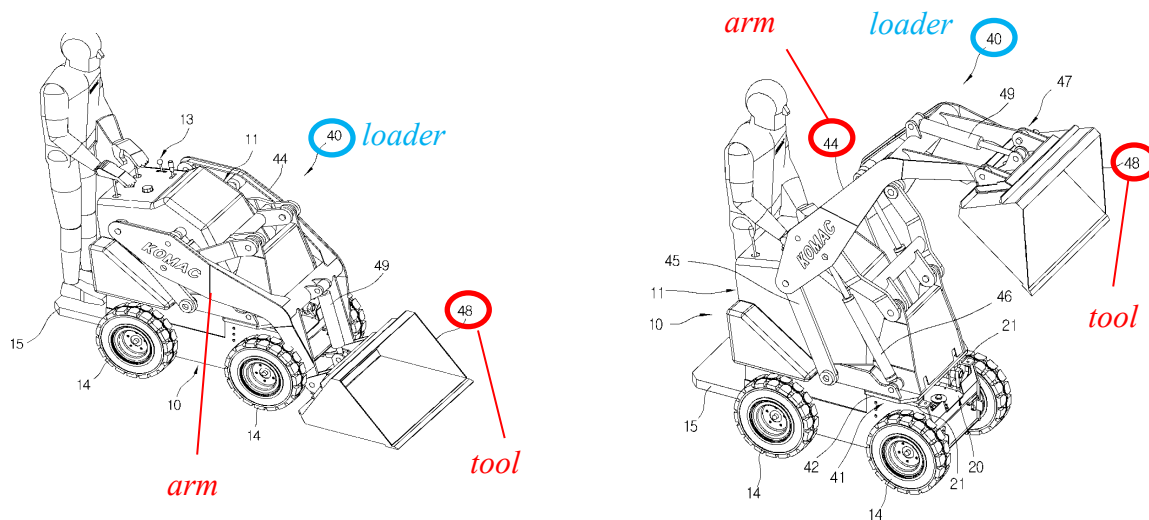
POSITA would readily appreciate the KR996 vehicle has *a mass of less than about 1500 kg* based on its illustrations, suitable tasks, and operator position. EX1003, ¶67 citing EX1005, [0002]. Further, recognized standards covering the KR996 vehicle define a weight of *less than about 1500 kg*, as recognized by the '386 Patent. EX1003, ¶68 citing EX1016, Organization for Standardization (ISO) 6165 (2012), p. 7, which states compact tool carriers having an operator standing platform are less 1500 kg; EX1015, Society of Automotive Engineers (SAE), J2752 June 2010, p. 2; EX1001, 1:19-26. POSITA would recognize a benefit to keeping the weight of KR996 vehicle less than 1500 kg to assist in maneuverability, comply with these standards, and on the suggestion of JP705 desire to minimize the frame. EX1003, ¶¶68-69.

Thus, KR996 teaches a vehicle that provides the *compact tool carrier*.

[1.1] *a loader having an arm, the loader being adapted to carry a tool;*

KR996 provides *a loader* including loader unit 40, moveable between a down position and a vertically raised position and *having* a boom 44 (*an arm*). EX1005,

(57), [0016], [0036], [0040], [0054], [0131], Figs. 8-9. The loader unit 40 is *adapted to carry a tool* as shown by bucket 48 (*tool*) attached to loader unit 40 and its boom 44. EX1005, claim 1, [0054], [0074]-[0075], Figs. 8-9; *see also*, EX1001, 1:28-31 (“tools such as buckets, augers...and the like.”)



**EX1005, Fig. 8 (portion) and Fig. 9
(annotated)**

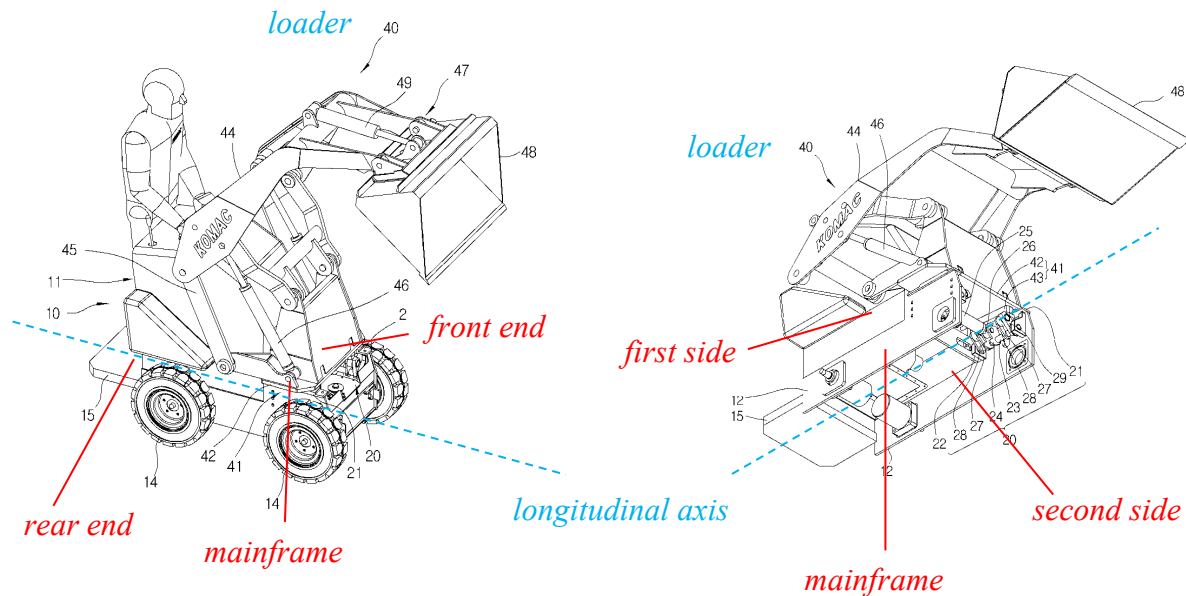
Thus, KR996 teaches [1.1]. EX1003, ¶¶70-72.

[1.2a] a mainframe for supporting the loader, the mainframe having a first side and a second side, and having a front end and a rear end relative to the longitudinal axis,

KR996’s vehicle includes a *mainframe*⁶ for supporting the loader unit 40

⁶ Patent Owner has stated “‘Mainframe’ is used in the ‘386 Patent to describe the body of the compact tool carrier that supports the loader. This is how the

(loader) and having respective *first/second side[s]* and *front/rear end[s]* relative to the longitudinal axis. EX1003, ¶¶73-74; EX1005, Figs. 8-10.



**EX1005, Figs. 9, 10
(annotated)**

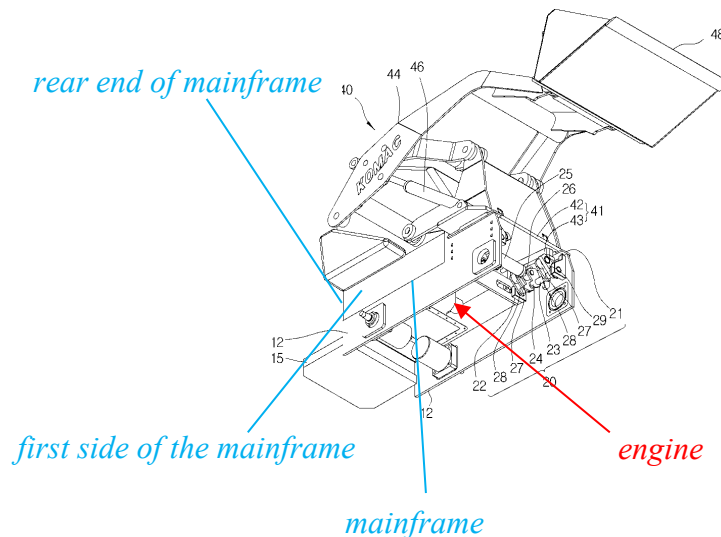
specification uses the term ‘mainframe.’” EX0130, p. 45 (emphasis omitted). “The mainframe 10 includes bracket portions 40a, 40b [] through which various pivot linkages are attached.” EX1001, 4:8-10. KR996 similarly provides a *mainframe* that includes main body 11 of KR996 and its sides 12 as well as other portions of KR996’s illustrated vehicle such as those portions that support the loader by providing attachment to the actuator and links that mount the loader to the vehicle. See also EX1001 FIG. 7.

KR996's weight-bearing frame is *for supporting the loader* as the loader unit 40 including its boom 44 is attached to the mainframe by way of the linkages and actuator connecting to the loader arm, discussed below. Thus, KR996 teaches [1.2a]. EX1003, ¶¶73-75.

[1.2b] *the mainframe comprising an engine bracket that extends from the first side toward the second side for mounting an engine to the mainframe, the engine bracket being spaced from the rear end of the mainframe,*

KR996 in view of JP705 renders obvious this limitation. EX1003, ¶¶76-83.

First, as discussed in [1.2a], the vehicle of KR996 includes a *mainframe* for supporting the loader unit 40 (loader). EX1003, ¶¶73-75. KR996's vehicle also includes an engine for propelling the vehicle mounted within this mainframe.

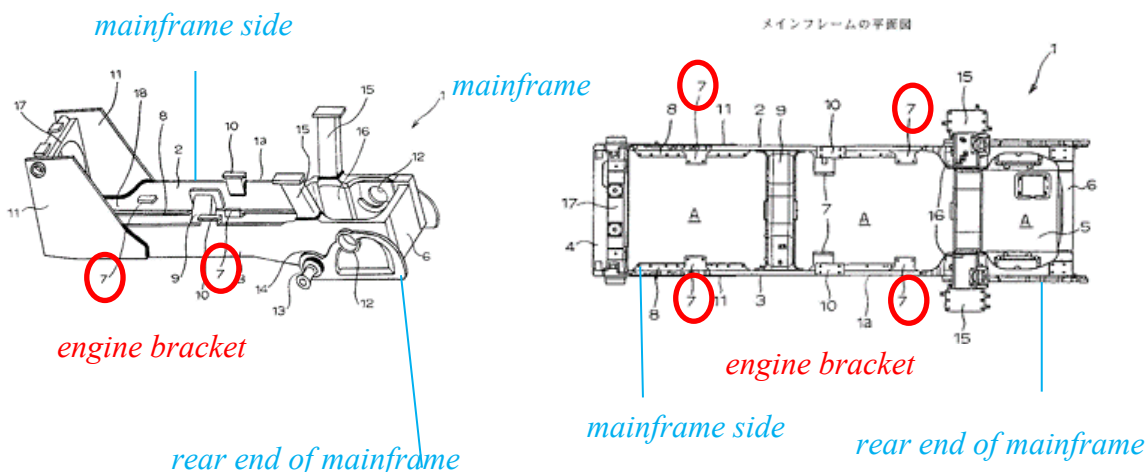


**EX1005, Fig. 10
(annotated)**

EX1003, ¶77 citing EX1005, Figs. 10, 12, claims 1-2, [0002]-[0005].

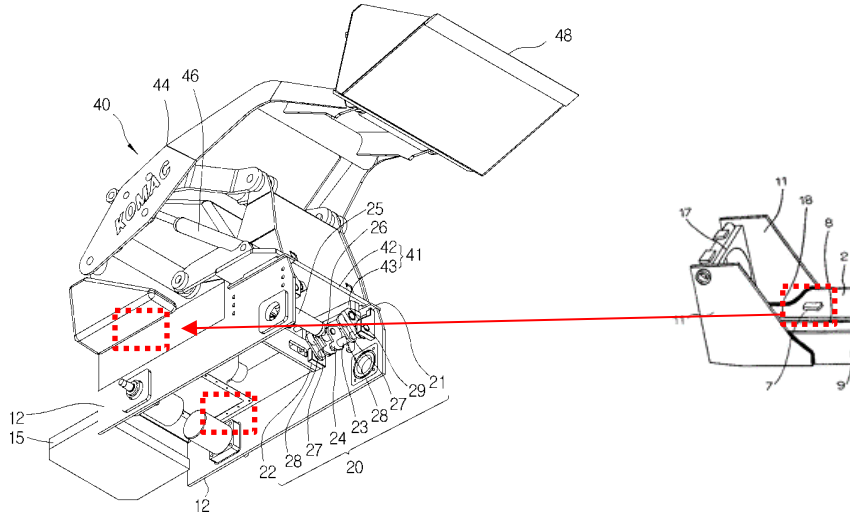
KR996's engine and its relative location in the vehicle, is illustrated by KR996's Figs. 10, 12 and confirmed by EX1014, a Korean patent publication having the same inventor, assignee, and directed to a substantially similar "green building deconstruction work" vehicle and further illustrating an engine. EX1003, ¶78 citing EX1014, (54), FIG. 3.

It was well-known in the art that a compact tool carrier such as KR996 typically uses an engine bracket to support and secure the engine in place. EX1003, ¶57. POSITA would have been motivated to apply the teachings of JP705 (EX1006) to provide a surface for mounting the engine of KR996's vehicle for the reasons discussed above. EX1003, ¶¶54-62. JP705 describes mounting parts 7 (and 8) extending from a side of a main body 1a of a mainframe 1 to mount an engine. EX1006, [0019], [0001], FIGS. 1, 3. "[T]he term 'mounting part' refers to a site with a mounting seat surface formed in a portion of the frame's main body for attaching various attachment members[.]" EX1006, [0018]. The mounting parts 7 are particularly described as for "**mounting an engine**" and therefore provide an *engine bracket...for mounting an engine to the mainframe*. EX1006, [0019].



**EX1006, FIGS. 1 and 3
(annotated)**

The mounting part 7 (*engine bracket*) extends from a respective side 2[3] of the frame toward an opposing side 2[3] and is spaced from the rear end of the mainframe. EX1006, FIGS. 1, 3. It would have been obvious to implement the mounting part 7 (*engine bracket*) of JP705 similarly extend[ing] from the first side of KR996's frame toward the second side for mounting the engine of KR996's vehicle as discussed above in the reasons to combine. EX1003, ¶¶54-62, 80-83. KR996's engine is spaced from the rear end of mainframe, and the JP705 engine bracket is similarly spaced from the rear end of a mainframe, thus, POSITA would have recognized to position JP705's mounting parts 7 a distance from the rear end of the mainframe of KR996. EX1003, ¶82.

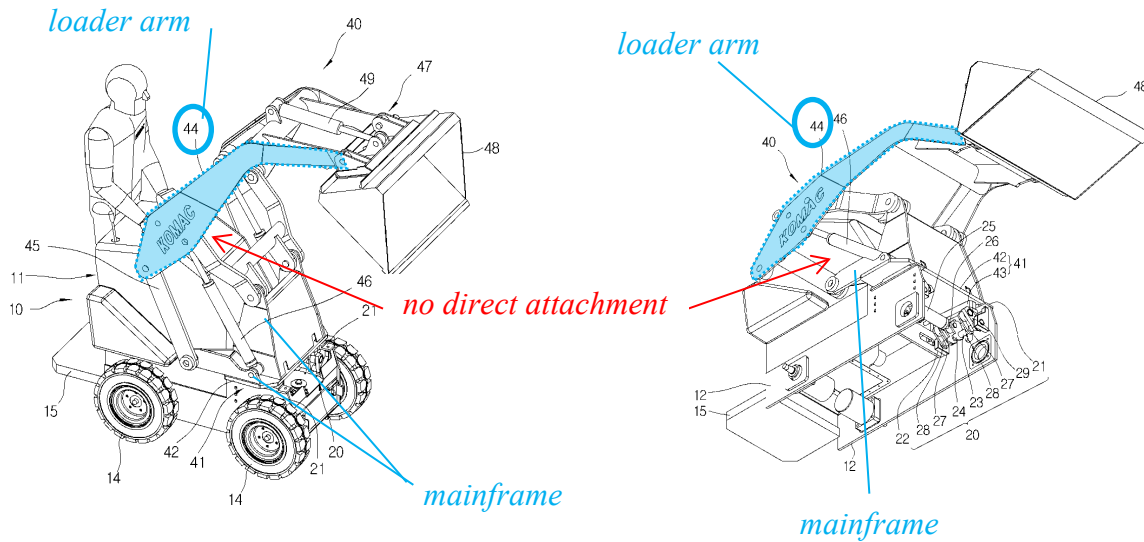


**EX1005, Fig. 10, EX1006, FIG. 1 (portion)
(annotated)**

Thus, KR996 in view of JP705 renders obvious element [1.2b]. EX1003, ¶¶76-83.

[1.2c] *the loader arm not being directly attached to the mainframe;*

KR996 illustrates its loader unit 40's boom 44 (*loader arm*) *not being directly attached to the mainframe*; rather, boom 44 is attached only by intermediary parts such as boom cylinder 46 and link 45, which are discussed in more detail in [1.3], [1.4] below.



**EX1005, Figs. 9, 10
(annotated)**

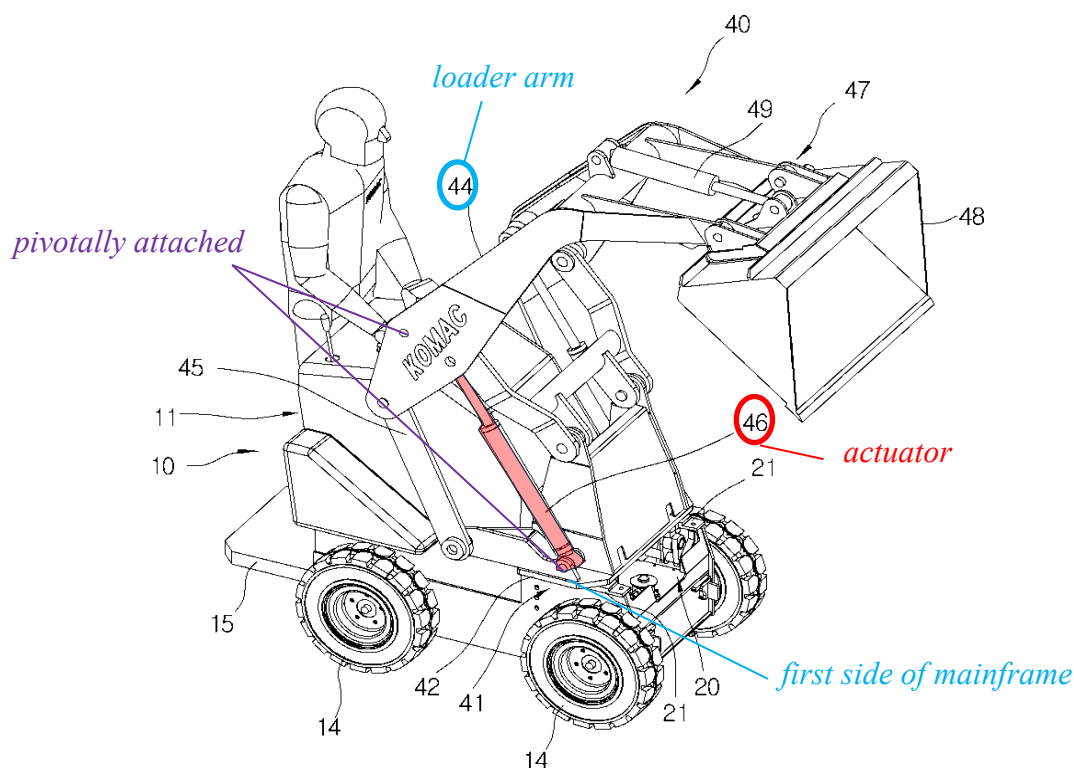
Dr. Velinsky explains this is a feature of a four-bar mechanism shown by his schematic illustrations. EX1003, ¶86. Thus, [1.2c] is taught by KR996. EX1003, ¶¶84-87.

[1.3] a linkage pivotally attached to the first side of the mainframe and pivotally attached to the loader arm;

KR996 illustrates link 45 (linkage) is pivotally attached to the first side of the mainframe at a first pivot point and pivotally attached to the boom 44 (loader arm) at a second pivot point. EX1003, ¶¶89-92; EX1005, Figs. 5, 8-10, 21, [0054] (“A boom (44) connected by a link (45)...”), [0134]. Fig. 9 is illustrative:

[1.4] *an actuator pivotally attached to the first side of the mainframe and pivotally attached to the loader arm; and*

KR996 describes a boom cylinder 46 (*actuator*) that drives the boom 44. EX1005, [0054], *see also*, claim 1, [0134], Figs. 1-13, 21. Fig. 9 is illustrative of the boom cylinder 46 (*actuator*) *pivotally attached to the first side of the mainframe and pivotally attached the boom 44 (loader arm)*. Fig. 9 is illustrative:



**EX1005, Fig. 9
(annotated)**

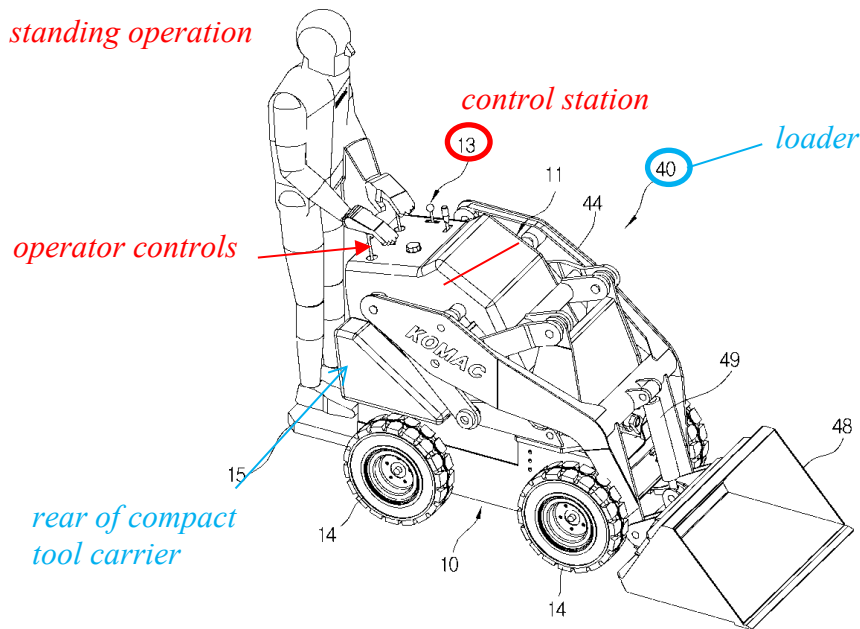
The attachment at each end of the link highlighted above is pivotable as it is a joint that allows for rotary motion, which is shown by KR996's Figs. 8-9. Dr. Velinsky

confirms the boom cylinder is *pivotably attached* to effectuate the raising and lowering of the boom 44 in the loader mechanism of KR996. EX1003, ¶¶95-97 citing describing cylinder as an interchangeable term with actuator and discussing the pivotable connection of the actuator driving a four-bar mechanism.

Thus, [1.4] is taught by KR996. EX1003, ¶¶94-98.

[1.5] a control station having operator controls for propelling the compact tool carrier forward and for raising and lowering the loader, the control station being mounted toward the rear of the compact tool carrier and adapted to allow for standing or walk-behind operation.

KR996 describes a control unit 13 (*control station*) having *operator controls* to “**operate the equipment** while the worker is on board at the rear” that is *mounted towards the rear* of the compact tool carrier. EX1005, [0042], Figs. 1, 8-9. The control unit 13 controls moving the vehicle including *propelling the compact tool carrier forward*. EX1005, Abstract (“when the vehicle **moves forward**...when the vehicle **moves backward**”), [0016]-[0017], [0033] (“...allowing the **operator to board...when driving**”), [0042] (“a control unit (13) to **operate the equipment while the worker** is on board at the rear”), [0072], claim 1. The control station 13 also controls the *raising and lowering* of the boom 44 (arm of *loader*): “When the loader unit (40) is coupled to the vehicle (10)...the **control unit (13)** of the vehicle (10) can be operated to **operate the loader unit (40)**.” EX1005, [0072]. The control station 13 is *mounted toward the rear* of the vehicle (*compact tool carrier*).



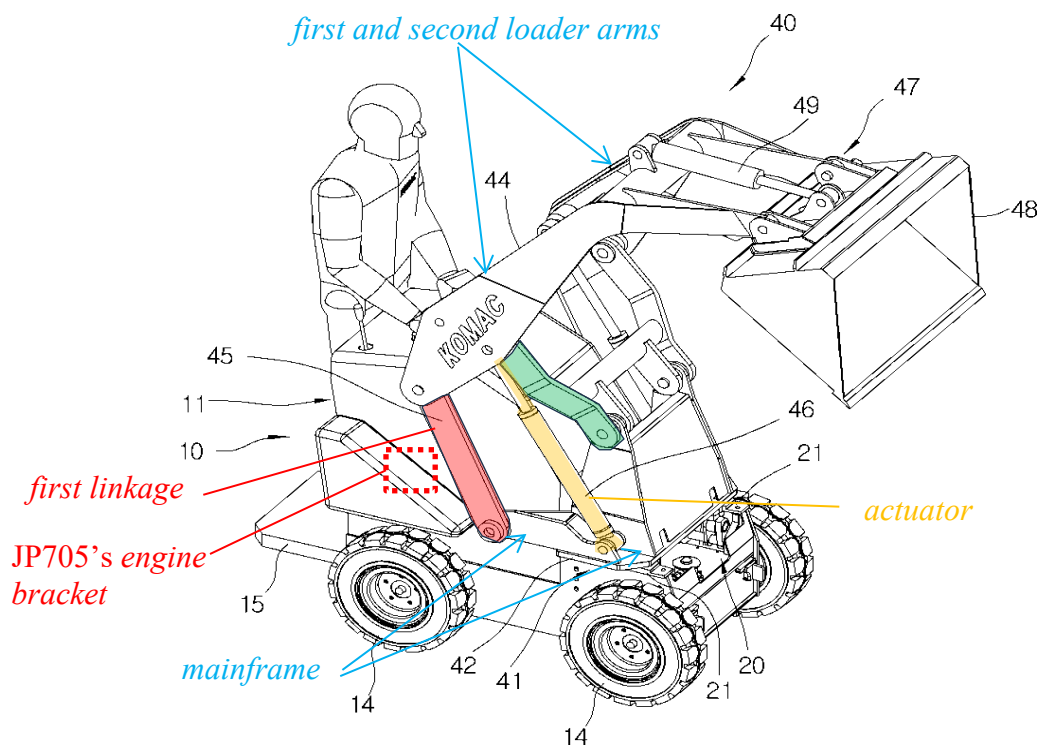
**EX1005, Fig. 8 (portion)
(annotated)**

EX1003, ¶100.

As illustrated by the figures of KR996 and discussed in [1.0], the vehicle including its controls 13 (*control station*) is *adapted to allow for standing or walk-behind operation*. EX1005, Figs. 8-9, [0033]. This claim term uses the disjunctive “or” meaning one or the other, or both. To the extent Patent Owner argues both standing operation and walk-behind operation are required, KR996 supports this. EX1003, ¶101 citing EX1005, claim 18, [0033], “folding [] step;” EX1013 illustrating a folding step provides both walk-behind and standing/riding platform operation, [0004]–[0006], [0008], FIG. 4. Thus, [1.5] is taught by KR996. EX1003,

¶¶99-102.

Therefore, KR996's vehicle providing stand-behind operation from a step 15 with a boom 44 (*loader arm*) attached to its mainframe only by link(s) (*linkage*) and boom cylinder (*actuator*) renders obvious claim 1 in combination with JP705's *engine bracket*.



**EX1005, Fig. 9
(annotated)**

EX1003, ¶102.

5. Claim 2

[2] *The compact tool carrier as set forth in claim 1 wherein the mainframe incorporates a single weldment.*

KR996 in view of JP705 (KR996-JP705) renders obvious claim 1, and as discussed above in [1.2b] and the reasons to combine KR996-JP705, it would have been obvious to provide JP705's engine bracket, which is attached by welding (*weldment*), in KR996's frame, thus providing its mainframe *incorporates a single weldment*.⁷

Further, POSITA would have found it obvious to form other portions of the mainframe of KR996 as part of a *single weldment* as use of welding to join components of a support frame for a loader apparatus was a well-known method of attachment. EX1003, ¶105 citing EX1009, EX1022, EX1010. POSITA would recognize there are known trade-offs in the design choice between a single weldment and attachment by, for example, nuts and bolts. EX1003, ¶106 considering factors such as aesthetics, manufacturability, reliability. This is confirmed by the prosecution that led to the '386 Patent, where the Examiner found claim 2 to be an

⁷ The '386 Patent does not define a "single weldment," but does, with respect to a different component, contrast a "single weldment" with use of "fasteners (e.g., nuts and bolts)." See EX1001, 2:53-56.

obvious a design choice, a determination not disputed by the Applicant. EX1002, p. 95. And case law affords similar construction design choices are *prima facie* obvious. *In re Larson*, 340 F.2d 965, 968 (CCPA 1965) (court affirms rejection of claims including “that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice.”)

To the extent Patent Owner argues certain components of the mainframe are required to be coupled by a weldment, JP705 illustrates a main frame (*mainframe*) that consists of one *single weldment*. EX1006, [0019] (“The main frame 1 is constructed from cast steel for welding construction...”). Providing the mainframe of KR996 as a welded structure as taught in JP705 would have been a predictable application of JP705’s general teachings of benefits of welding, as discussed above with reference to an engine bracket. EX1003, ¶107 citing EX1010 implementing a unitary frame on a compact loader.

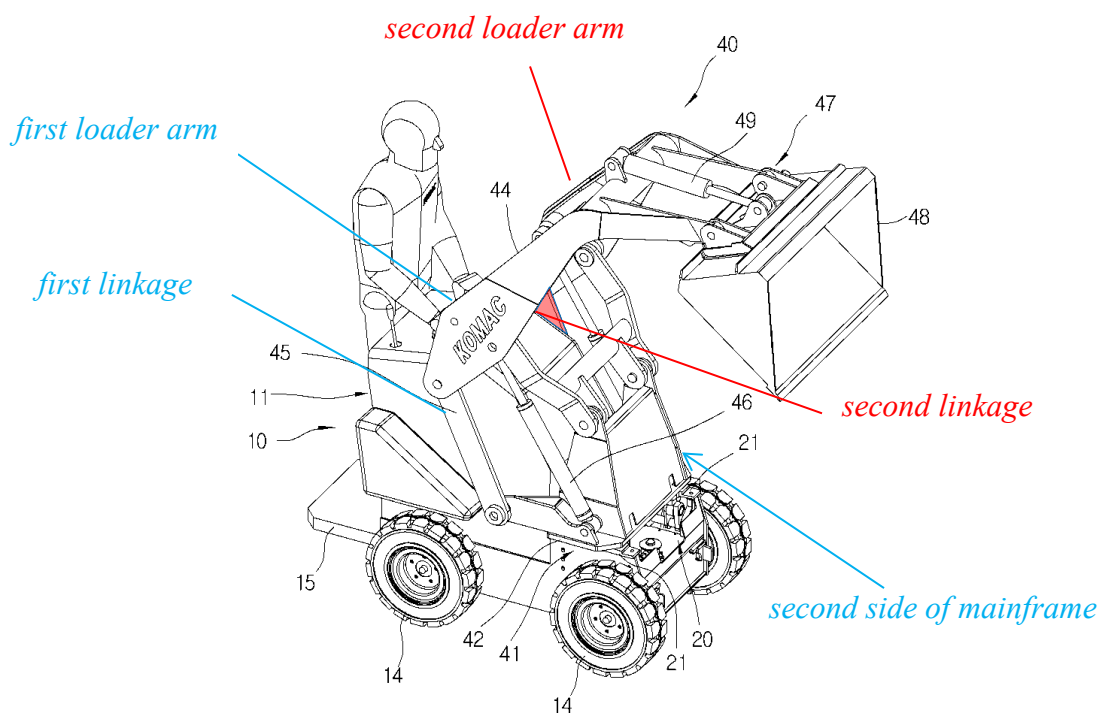
Thus, claim 2 is rendered obvious by KR996-JP705. EX1003, ¶¶103-108.

6. Claim 3

[3] *The compact tool carrier as set forth in claim 1 wherein the loader arm is a first loader arm and the linkage is a first linkage, the loader comprising a second loader arm and the compact tool carrier comprising a second linkage pivotally attached to the second side of the mainframe and pivotally attached to the second loader arm.*

KR996-JP705 render obvious claim 1 and as shown in [1.1], [1.3], KR996 provides a boom 44 (*loader arm*) and a link 45 (*linkage*) attached to a first side of

its mainframe that provide a *first loader arm* and a *first linkage*. KR996 also describes a second boom 44 (*second loader arm*), which is connected to a *second side* of the vehicle through second set of intermediary parts including a link 45 (*second linkage*) pivotally attached to the second loader arm, just like the first loader arm, and the second side of the mainframe EX1003, ¶¶110, 90-92; EX1005, claim 1, [0054], [0133], Figs. 1-13, 21.



EX1005, Fig. 9
(annotated)

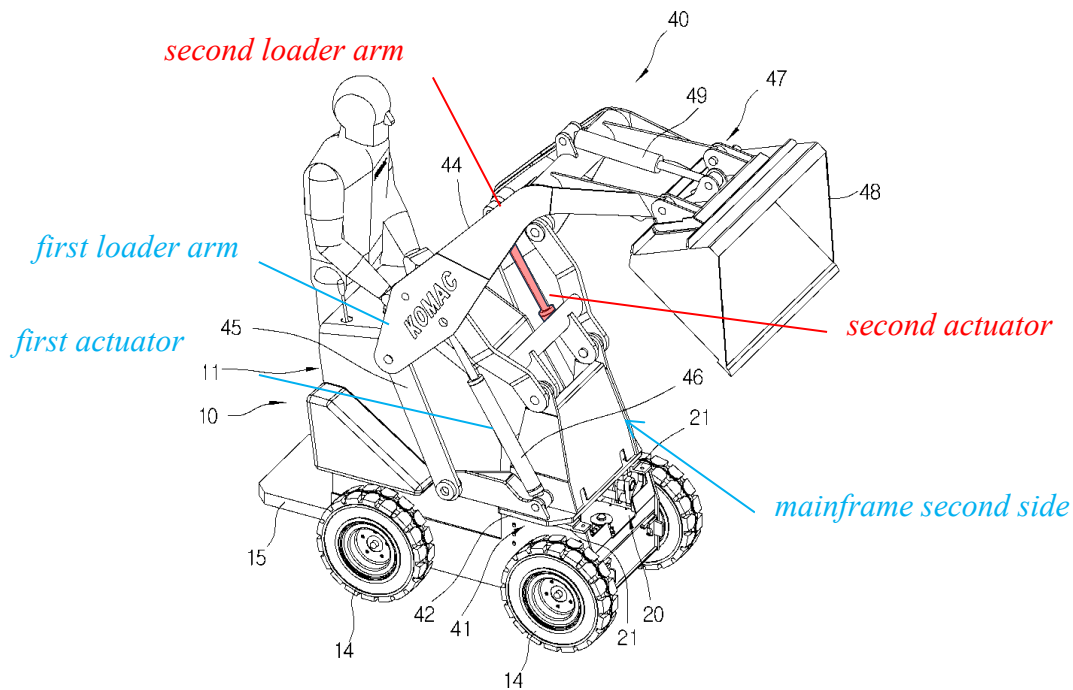
Figures, such as Figs. 1, 5, 11, and POSITA's desire for weight distribution, confirm the two sides of the KR996 vehicle have the same loader mechanism configuration.

EX1003, ¶111. The link (*second linkage*) is *pivotally attached* to the second side of the mainframe and the second boom 44, just as discussed above [1.3]. EX1003, ¶¶90-92, 110. Thus, claim 3 is rendered obvious by KR996-JP705. EX1003, ¶¶109-111.

7. Claim 4

[4] *The compact tool carrier as set forth in claim 3 wherein the actuator is a first actuator, the compact tool carrier comprising a second actuator, the second actuator being pivotally attached to the second side of the mainframe and pivotally attached to the second loader arm.*

KR996-JP705 render obvious claim 3 and KR996 provides boom cylinder 46 (*actuator*) of [1.4] is a *first actuator*. KR996 also describes another boom cylinder 46 (*second actuator*) that drives the second boom 44 (*second loader arm*) and is attached to a *second side* of the mainframe. EX1005, [0054], claim 1, [0134], Figs. 1-13, 21. Fig. 9 is an exemplary illustration of the boom cylinder 46 (*second actuator*) that is *pivotally attached* to the second side of the *mainframe* and the second boom 44 (*second loader arm*).



**EX1005, Fig. 9
(annotated)**

Figures, such as Figs. 1, 5, 11, confirm the two sides of the KR996 vehicle have the same loader mechanism configuration. EX1003, ¶113. The boom cylinder (*second actuator*) is *pivotally attached* to the second side of the mainframe substantially as discussed above [1.4]. EX1003, ¶¶96-97, 113.

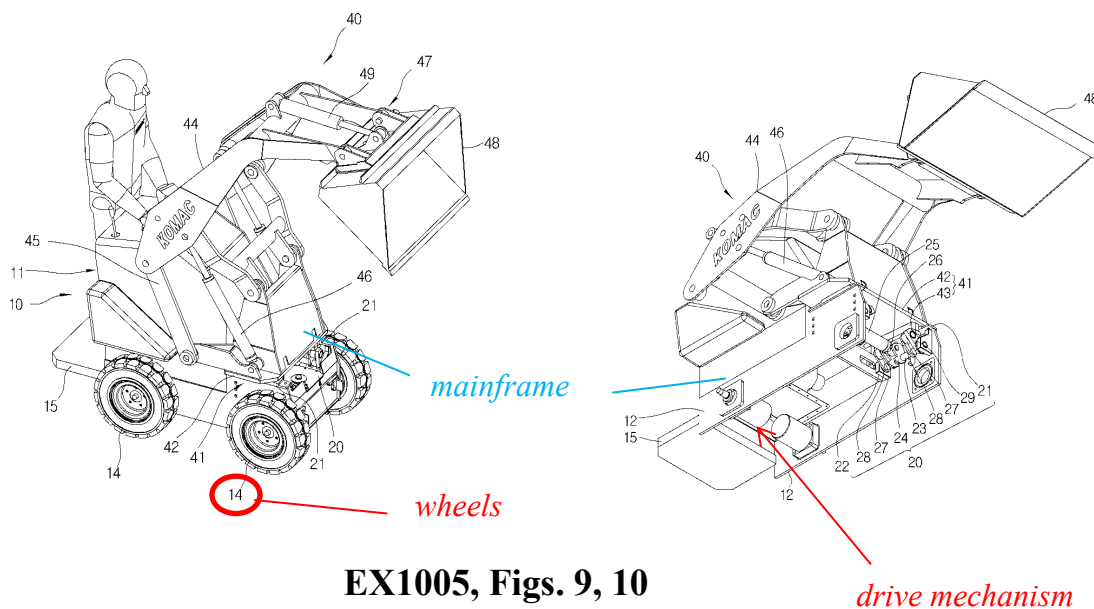
Thus, claim 4 is rendered obvious by KR996-JP705. EX1003, ¶¶112-114.

8. Claim 5

[5] *The compact tool carrier as set forth in claim 1 comprising a drive mechanism comprising tracks or wheels, the drive mechanism being attached to the mainframe.*

KR996-JP705 renders obvious claim 1 and KR996 also describes *a drive mechanism* including “wheels (14)” (*wheels*). EX1005, [0042], Figs. 1, 8-10. The

drive mechanism is attached to the *mainframe* at a rotational axis as illustrated in the representative figures below, just the same as described in the '386 Patent. See EX1001, 1:67-2:3.



**EX1005, Figs. 9, 10
(annotated)**

Thus, claim 5 is rendered obvious by KR996-JP705. EX1003, ¶¶115-117.

9. Claim 6

[6] *The compact tool carrier as set forth in claim 1 comprising an engine to propel a drive mechanism, the engine being attached to the engine bracket.*

KR996-JP705 renders obvious claim 1 and KR996 also discloses *a drive mechanism* including wheels 14 (see [5]) and *an engine* (see [1.2b]). It would be obvious to *attach[]* the *engine* to the mounting parts 7 (*engine bracket*) of JP705 extending from KR996's mainframe as discussed above as this is merely

effectuating the stated purpose of these mounting parts (“for mounting an engine”). EX1006, [0019]. POSITA would understand that the *drive mechanism* is propelled by the engine as this is a standard vehicle operation. EX1003, ¶119 citing EX1009, FIGS. 1-2, 2:34-47, EX1010, 2:35-46.

Thus, claim 6 is rendered obvious by KR996-JP705. EX1003, ¶¶118-120.

10. Claim 7

[7] *The compact tool carrier as set forth in claim 1 wherein the actuator is a hydraulic cylinder.*

KR996-JP705 renders obvious claim 1 and the *actuator* of [1.3] is a hydraulic cylinder as KR996 describes the feature as a “boom **cylinder** 46,” and KR996 uses the term “boom cylinder” interchangeably with a “hydraulic cylinder.” *See* EX1005, [0003]. Further, POSITA would recognize a cylinder such as a boom cylinder 46 is commonly a *hydraulic cylinder*. EX1003, ¶¶121-122.

Thus, claim 7 is rendered obvious by KR996 and JP705. *Id.*

11. Claim 8

[8] *The compact tool carrier as set forth in claim 1 wherein each loader arm incorporates a single weldment.*

KR996-JP705 render obvious claim 1 and as discussed in [1.1] and [3], KR996 provides for two booms 44 *each* providing a *loader arm*. The drawings of KR996 suggest each boom 44 is formed as a *single weldment* (e.g., without fasteners). EX1003, ¶124; EX1005, Figs. 1, 4, 7-8, 21. Further, POSITA would have

found it obvious to form a loader arm that *incorporates a single weldment* for substantially similar reasons as discussed above in [2] and the mainframe as this is merely a choice in the method of forming the component with predictable benefits of reliable connection, reduction in fastening parts, and smooth surfaces. EX1003, ¶¶124, 105-107. *See also*, EX1002, p. 53, which found one piece construction to be *prima facie* obvious, which the Applicant did not dispute.

Thus, claim 8 is rendered obvious by KR996-JP705. EX1003, ¶¶123-124.

12. Claim 9

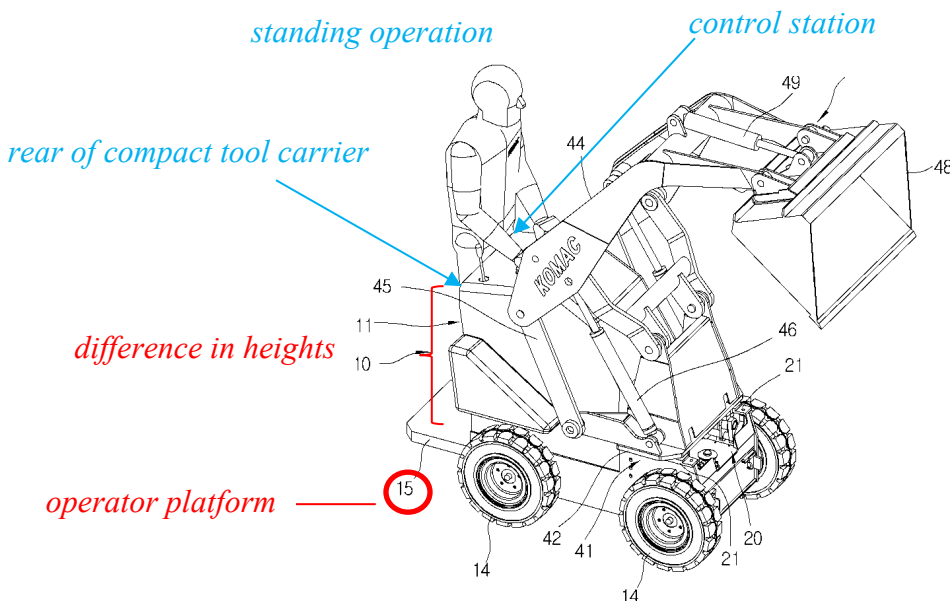
[9] *The compact tool carrier as set forth in claim 1 wherein the control station is mounted toward the rear of the compact tool carrier, the compact tool carrier comprising an operator platform for standing operation of the compact tool carrier, the difference between the height of the control station and the height of the platform being at least 90 cm.*

KR996-JP705 render obvious claim 1 and KR996 further teaches this element. EX1003, ¶¶125-129.

First, KR996 illustrates the control unit 13 (*control station*) of [1.5] is *mounted toward the rear* of the vehicle (*compact tool carrier*). EX1005, Figs. 8-9, 21.

Second, KR996 describes the compact tool carrier includes a safety step 15 (*operator platform*) for *standing operation* of the vehicle (*compact tool carrier*). EX1005, Figs. 1, 7-10, 21, [0033] (“a **foldable safety step** is installed on the lower rear part of the vehicle, allowing the **operator to board** and alight from the vehicle

when driving and fold it towards the body of the vehicle when stopped”), [0049], [0118].



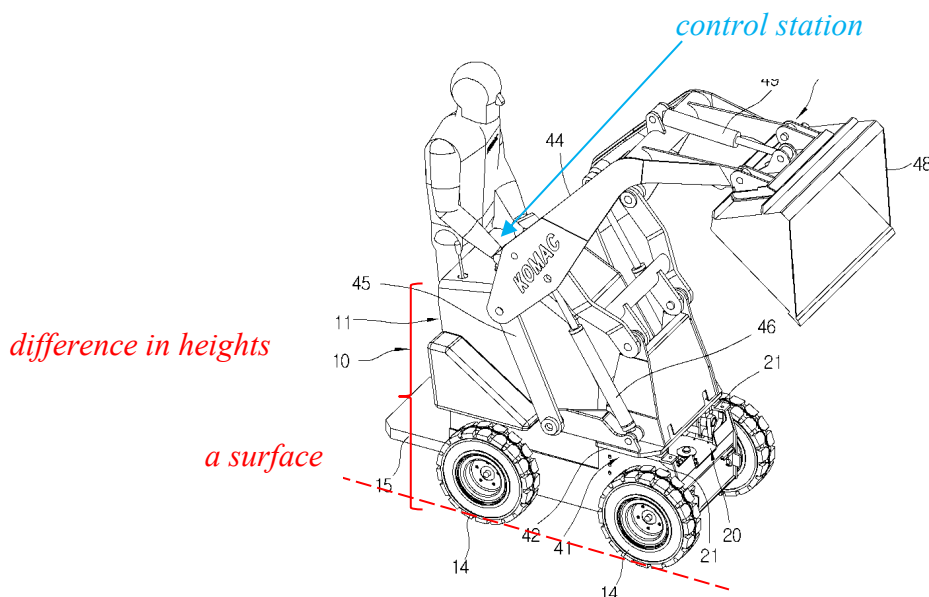
**EX1005, Fig. 9
(annotated)**

Third, KR996 teaches a *difference between the height of the control station and the height of the platform being at least 90 cm*. EX1003, ¶128. The illustrations of the control unit 13 (*control station*) show an operator having the controls below a waist level such that the controls are easily accessed by the operator while positioned on the step 15 (*platform*). Thus, the difference in height between the control unit 13 and the step 15 would have been recognized to be at least 90 cm. *Id.* citing EX1018, industry standard defining operator height. Thus, claim 9 is rendered obvious by KR996-JP705. EX1003, ¶¶125-129.

13. Claim 10

[10] *The compact tool carrier as set forth in claim 1 wherein the control station is mounted toward the rear of the compact tool carrier, and the height of the control station from a surface supporting the compact tool carrier is at least 90 cm.*

KR996-JP705 renders obvious claim 1, KR996 also shows control unit 13 (*control station*) is mounted toward the rear of the vehicle (*compact tool carrier*). See [9]. POSITA would recognize KR996 teaches *the height of the control station from a surface supporting the compact tool carrier is at least 90 cm.* EX1003, ¶131 The difference in height between the control unit 13 and the step 15 would have been at least 90cm for the reasons discussed in [9]; the surface supporting the vehicle (*compact tool carrier*), e.g., the ground, is below the step 15. Thus, the height from the control unit 13 (*control station*) to the ground surface *is at least 90 cm.*



**EX1005, Fig. 9
(annotated)**

Thus, claim 10 is rendered obvious by KR996-JP705. EX1003, ¶¶130-132.

14. Claim 11

[11] A method for operating the compact tool carrier as set forth in claim 1, the method comprising standing behind the compact tool carrier and operating the control station to propel the compact tool carrier forward and/or raise or lower the loader.

KR996 discloses the *compact tool carrier* as in [1.0]-[1.5], and also discloses [a] *method for operating* it. See EX1005, claim 8, [0033], [0049]. As discussed above in [1.5] and [9], KR996 describes a safety step 15 allowing an operator to stand behind the vehicle and operate the control unit 13 (*control station*) to propel the vehicle (*compact tool carrier*) forward and/or raise or lower the loader unit 40 (*loader*) including boom 44. “The vehicle (10) is equipped with a **control unit** (13)

to **operate the equipment** while the worker is on board at the rear...” EX1005, [0042]. “[T]he **control unit** (13) of the vehicle (10) can be operated to **operate the loader unit** (40).” EX1005, [0072].

Thus, claim 11 is rendered obvious by KR996-JP705. EX1003, ¶¶133-134.

15. Claim 12

[12] *The method as set forth in claim 11 wherein the control station is operated while standing on an operator platform or while standing on a surface supporting the compact tool carrier.*

KR996-JP705 renders obvious claim 11 and KR996 describes a safety step 15 providing *an operator platform* that allows for the vehicle to be *operated while an operator is standing on it*. See EX1005, Figs. 1, 7-10, 21, [0033], claim 18, [0049], [0118]. See also, [1.4] discussing a walk-behind operation.

Thus, claim 12 is rendered obvious by KR996-JP705. EX1003, ¶¶135-137.

16. Claim 13

[13] *The compact tool carrier as set forth in claim 1 further comprising a tool attached to the loader, the tool being selected from the group consisting of a bucket, auger, fork, stump grinder, tiller, and roller.*

KR996-JP705 renders obvious claim 1 as discussed in [1.1], KR996 describes a *tool* of a “bucket (48)” (*bucket*). EX1005, claim 1, [0054], [0074]-[0075].

Thus, claim 13 is rendered obvious by KR996-JP705. EX1003, ¶¶138-139.

17. Claim 21

[21] *The compact tool carrier as set forth in claim 1 wherein the linkage is a first linkage, the first linkage being pivotally attached to the first side of the mainframe at a first pivot point and pivotally attached to the loader arm at a second pivot point, the actuator being attached to the mainframe at a third pivot point and pivotally attached to the loader arm at a fourth pivot point, the compact tool carrier further comprising a second linkage pivotally attached to the first side of the mainframe at a fifth pivot point and pivotally attached to the loader arm at a sixth pivot point, wherein as the loader travels from a down position to a vertically raised position, the first, second, third, fourth, fifth, and sixth pivot points are (1) disposed between the operator controls and a bottom of the mainframe and/or (2) disposed forward of the control station*

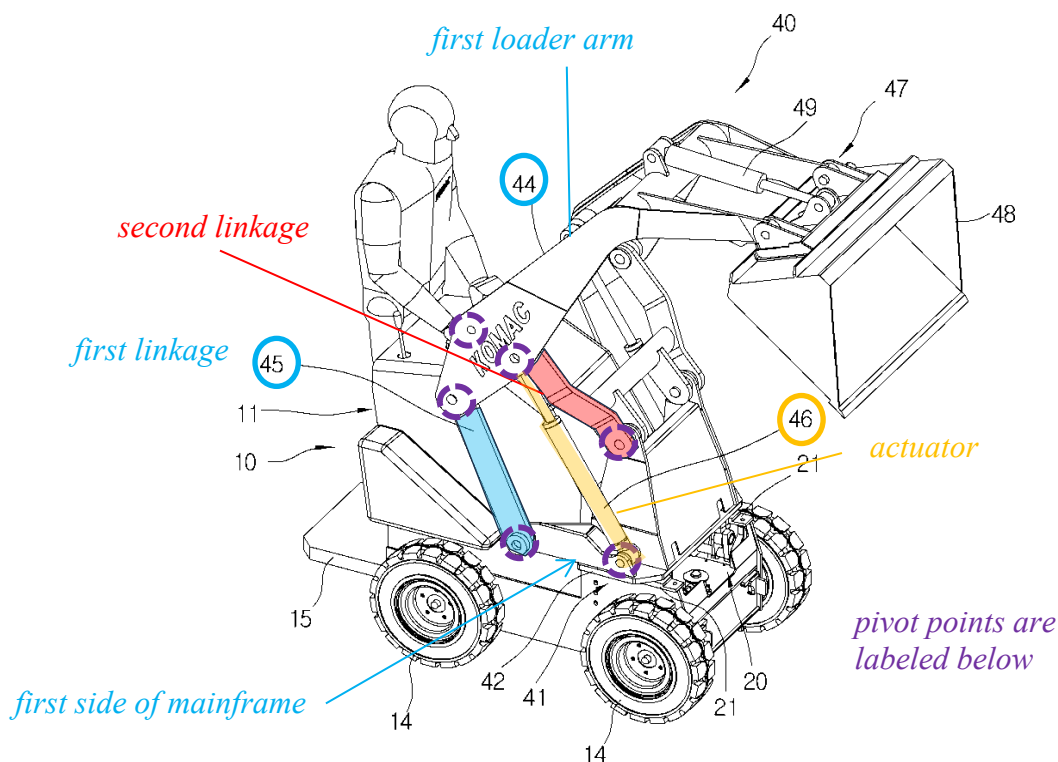
KR996-JP705 renders obvious claim 1, and KR996 also teaches this claim.

First, KR996's link 45 (*linkage*) and boom cylinder 46 (*actuator*) discussed in [1.3], [1.4] provide a *first linkage* and an *actuator* each attached to the *first side* of the KR996 frame (*mainframe*) and boom 44 (*loader arm*) at respective pivot points, which provide the claimed *first pivot point*, *second pivot point*, *third pivot point*, and *fourth pivot point* respectively. See annotation below.

Second, KR996 also illustrates an additional link (*second linkage*) also *pivotally attached to a first side of the mainframe at a fifth pivot point and pivotally attached to the boom 44 (loader arm) at a sixth pivot point*. EX1003, ¶142; EX1005, Figs. 8-10, claim 1, [0054], [0134]. The attachment at each end of the link highlighted above is pivotable as it is a joint that allows for rotary motion, which is shown by KR996's Figs. 8-9. Dr. Velinsky confirms the nature of the attachment is

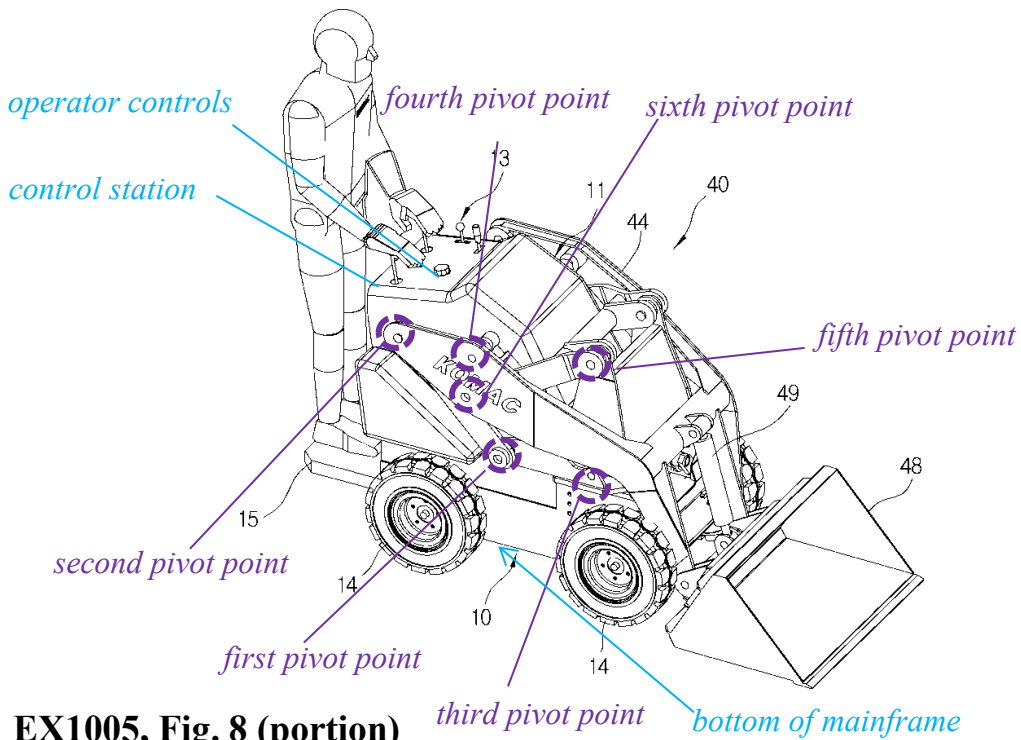
pivotable just as discussed with respect to link 45 of the four-bar mechanism.

EX1003, ¶¶90-92, 141-142.

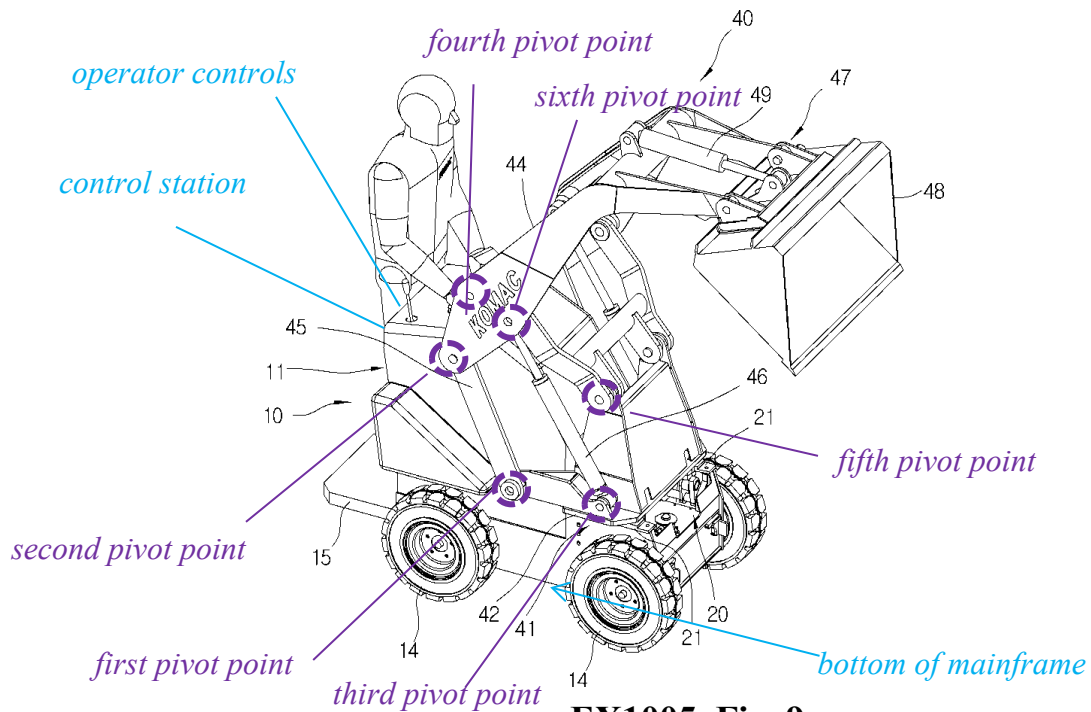


**EX1005, Fig. 9
(annotated)**

KR996 teaches as the loader travels from a down position (Fig. 8) to a vertically raised position (e.g., Fig. 9), the *first, second, third, fourth, fifth, and sixth pivot points* are (1) disposed between the *operator controls* provided by control unit 13 and a bottom of the mainframe and/or (2) disposed forward of the control unit 13 (*control station*).



EX1005, Fig. 8 (portion)
(annotated)



EX1005, Fig. 9
(annotated)

During the movement of the loader between the illustrated positions above⁸, the pivot points are also located as claimed as the loader travels between positions.

EX1003, ¶143; *see also*, EX1005, Figs. 7, 12-13, 21.

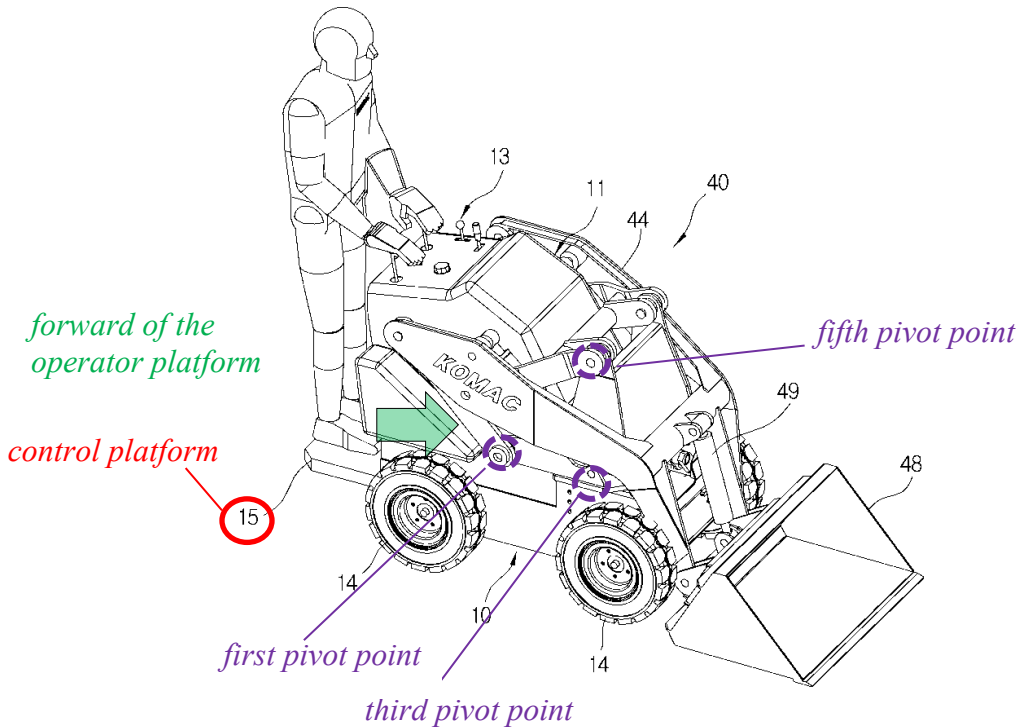
Thus, claim 21 is rendered obvious by KR996-JP705. EX1003, ¶¶140-143.

18. Claim 22

[22] *The compact tool carrier as set forth in claim 21 further comprising an operator platform for standing operation of the operator controls of the control station, the operator platform being located toward a rear of the compact tool carrier such that the first pivot point, third pivot point, and fifth pivot point are disposed forward of the operator platform.*

KR996-JP705 renders obvious claim 21 and KR996 describes safety step 15 (*operator platform*) for *standing operation* of the *operator controls* of control unit 13 (*control station*), the step 15 (*operator platform*) being located *toward a rear* of the vehicle (*compact tool carrier*) such that the *first pivot point, third pivot point, and fifth pivot point* (those attachments of the linkages/actuator and mainframe) are disposed forward of the *operator platform*.

⁸ There is not extent of vertical lift required by the claim.



**EX1005, Fig. 8 (portion)
(annotated)**

See also, EX1005, claim 18, [0033], [0049], [0118], Figs. 1, 7, 9-10, 21.

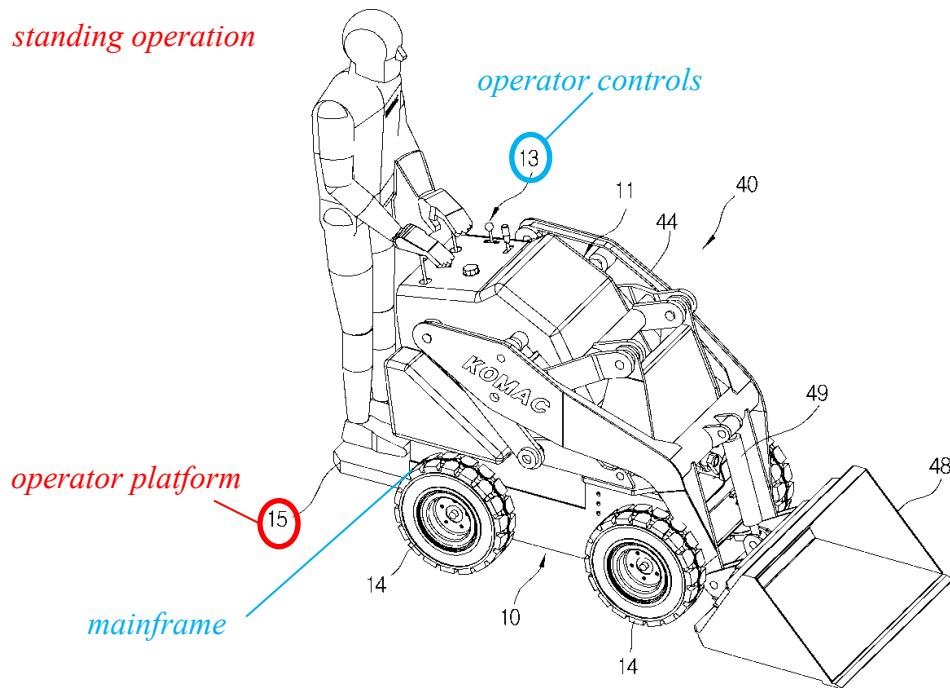
Thus, claim 22 is rendered obvious by KR996-JP705. EX1003, ¶¶144-146.

19. Claim 64

[64] The compact tool carrier as set forth in claim 1 further comprising an operator platform for standing operation of the operator controls of the control station, the operator platform extending from the mainframe.

KR996-JP705 renders obvious claim 1 and KR996 also describes a safety step 15 (operator platform) for standing operation of the operator controls of the control unit 13 (control station), the operator platform extending from the mainframe.

EX1005, Figs. 1, 7-10, 13, 21, [0033], [0049], [0118], claim 18.



**EX1005, Fig. 8 (portion)
(annotated)**

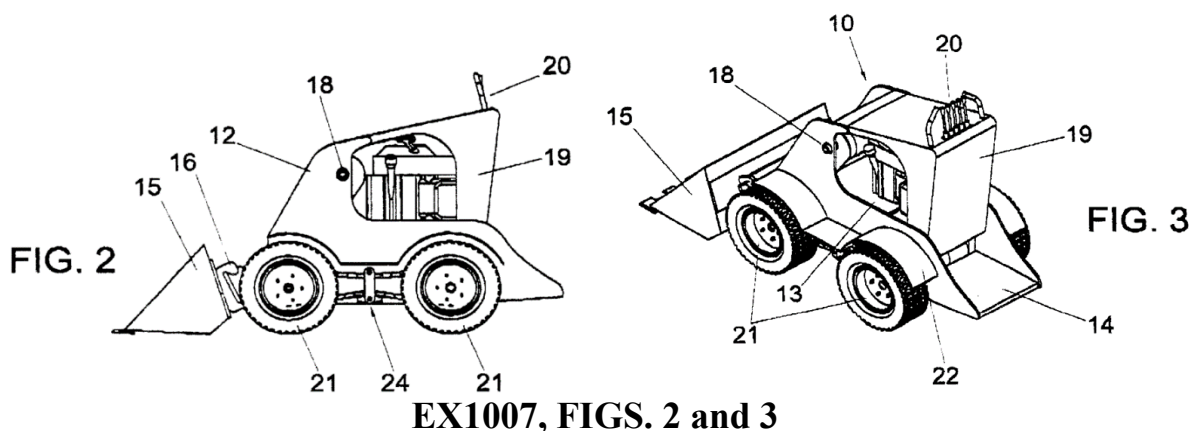
Thus, claim 64 is rendered obvious by KR996-JP705. EX1003, ¶¶147-149.

E. Ground 2 : KR996, JP705, and McIlwraith

1. McIlwraith

McIlwraith “is directed to a compact multi-purpose skid-steer mini-loader.”

EX1007, 1:4-5, 3:8-12. FIGS. 2-3 of McIlwraith illustrate side and rear-perspective views of the small skid-steer.



McIlwraith describes its small skid-steer includes a chassis having two side plates 11, 12. EX1007, 3:9-12. And McIlwraith also describes “[a] tread plate 14 [that] extends between the rear ends of the side plates 11, 12 , as shown in FIG. 3. The tread plate 14 serves as a platform on which the operator stands (and rides) during operation of the mini-loader.” EX1007, 3:19-22. *See also*, EX1003, ¶¶150-151.

2. Reasons to Combine McIlwraith with KR996-JP705

McIlwraith, like KR996 and JP705, is in the same field of endeavor as the ’386 Patent, pertaining to working vehicles including construction or agricultural machines (e.g., earth-moving equipment). EX1003, ¶152; EX1005, Abstract, [0001], FIG. 21; EX1006, Abstract, [0001], FIG. 1; EX1001, 1:17-47, 2:44-3:3, FIG. 1; EX1007, 1:8-27. Further, each of KR996-JP705, McIlwraith and the ’386 Patent are addressing small vehicles comprising a loader arm and having a stand or walk-behind operation. EX1001, 1:17-36, FIG. 1; EX1005, Figs. 8-9; EX1007, 1:8-27, FIGS. 1-3, 3:19-24. KR996-JP705, McIlwraith and ’386 Patent are also each

reasonably pertinent to a same problem faced by the inventor of operator safety for such a vehicle. EX1003, ¶¶152-153 citing EX1005, [0010]-[0011], [0034], FIG. 21; EX1001, 2:66-3:3; EX1007, FIG. 1.

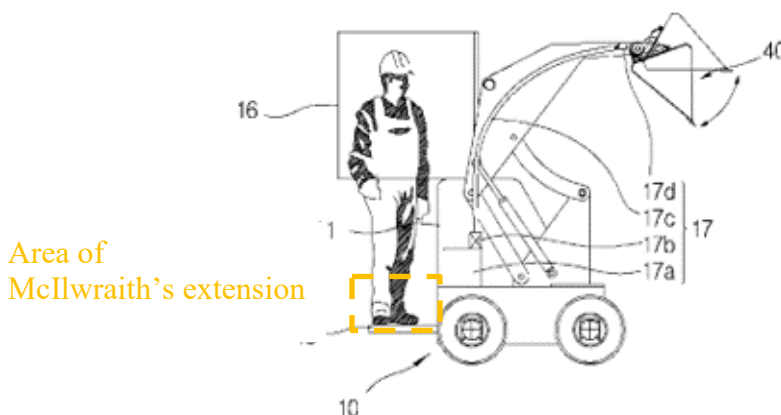
POSITA would have been motivated to combine the teachings of McIlwraith with KR996-JP705 to produce a predictable and beneficial configuration of the operator's environment. EX1003, ¶153. POSITA would have easily applied the teachings of McIlwraith with respect to extending the frame adjacent to the operator platform to KR996's similarly configured frame and operator platform. *Id.* Further, POSITA would have recognized a benefit in McIlwraith's configuration as it provides operator protection suggested by industry standards. EX1003, ¶153 citing EX1017 (ISO 3457). ISO 3457 would have suggested to POSITA to provide McIlwraith's extension of the mainframe to provide a barrier between the KR996's operator and drive mechanism as should a hazard exist, a "guard that restricts the movement of a person's body or a part of it, in order to avoid its contact with a machine component or exposure to other, similar hazards" is required. EX1017, pp. 1. By providing the extension of the frame of McIlwraith to KR996, a barrier is provided between an operator and potential hazards (e.g., avoiding contact with the drive mechanism and/or debris generated). POSITA would have had a reasonable expectation of success in implementing the configuration as it merely extends a portion of the existing frame adjacent the safety step 15 of KR996 adjacent the

operator. EX1003, ¶¶152-153.

3. Claim 65

[65] *The compact tool carrier as set forth in claim 64 wherein least a portion of the operator platform is forward of the rear end of the mainframe.*

KR996-JP705 renders obvious claim 64 and KR996 provides a safety step 15 (*operator platform*) on which an operator stands and that extends from the mainframe. EX1005, Figs. 1, 7-10, 21. McIlwraith similarly describes a step at the rear of a compact loader on which the operator stands during operation—“tread plate 14.” EX1007, 3:19-24, FIGS. 1-3. McIlwraith illustrates a portion of a mainframe – side plates 11, 12 – extend such that the tread plate 14 (*operator platform*) is at least partially within a pocket defined by the extension of the frame and thus, is *forward of the rear end of the mainframe*. FIG. 3 of McIlwraith is illustrative:



**EX1005, Fig. 21
(annotated)**

Thus, claim 65 is rendered obvious by KR996-JP705 and McIlwraith. EX1003, ¶¶154-157.

F. Ground 3 : KR996, JP705, and Beltrami

1. Beltrami (EX1008)

Beltrami, a patent issued in June 1971, is directed to digging and lifting devices “fitted on tractors or like tracked, half-tracked, wheeled or like self-propelling means, which comprise a standard bucket adapted to be driven upwardly...to dump the soil or other excavated material.” EX1008, 1:5-15. Beltrami begins by reviewing an “already well known” loader configuration with arm(s) supporting a bucket at one end and with an opposite end(s) directly, pivotally connected with a stationary pivot point providing a curved lift path. EX1008, 1:16-

52, 2:41-3:7; FIG. 1. POSITA would recognize this as the radial lift loader. EX1003, ¶¶30-31, 158-159.

Recognizing drawbacks of a radial lift, Beltrami describes a **vertical** lift loader where the arms are not directly connected to the body of the vehicle rather attached using two connecting rods (i.e., linkages) and a hydraulic jack (i.e., actuator), which are pivotally attached to raise the loader arm and mounted bucket in a more vertical manner. *See* EX1008, FIGS. 2-4, 1:57-2:25, 3:12-34. Beltrami recognizes a desire to keep the pivot point connections between the intermediate parts and the mainframe “**in such a low position on the vehicle** that no supporting frame is needed...and finally a lifting can be performed without having the equipment center of gravity undergo an unnecessarily large shifting.” EX1008, 3:35-45.

2. **Reasons to combine KR996-JP705**

Reasons to combine KR996-JP705 are provided above with reference to Ground 1. EX1003, ¶¶54-62.

3. **Reasons to combine KR996-JP705 and Beltrami**

KR996-JP705 and Beltrami are analogous art to the '386 Patent because they are in the same field of endeavor of earth-moving machinery. EX1003, ¶161 EX1001, 1:17-36; EX1005, Abstract; EX1008, 1:5-15. Further, each of KR996-JP705 and Beltrami, like the '386 Patent, are directed to earth-moving machinery

with a vertical lift style loader. EX1001, FIG. 1; EX1005, Fig. 9; EX1008, Fig. 2-6. KR996-JP705 and Beltrami and the '386 Patent are also reasonably pertinent to a same problem faced by the inventor—producing a more vertical lift path for the tool attachment in operation. EX1001, 1:19-39; EX1005, Figs. 8-9; EX1008, 1:24-40.

POSITA would have been motivated to combine the teachings of Beltrami including locating the pivot point attachment of intermediary parts **low** on the mainframe and KR996-JP705 to produce a predictable and beneficial vehicle configuration. EX1003, ¶¶162-166. As discussed above, KR996 and Beltrami describe a similar loader configuration of a four-bar mechanism that uses intermediate parts of linkages and an actuator pivotally attached to a mainframe to drive the loader arm. EX1005, Figs. 8-9; EX1008, Figs. 2-3, 6. Beltrami explains the well-known knowledge in vehicle design and four-bar mechanisms generally: the locations of the pivot point connections between each of these intermediate parts and the mainframe are result-affecting variables that can be selected based on desired performance. EX1008, 4:35-50 (“The **path** [] can be modified at the convenience both in the manufacturing stage e.g. by an **arrangement of pivot points...**”); 5:61-65 (“Even in the latter embodiment **the shape of the path** 125 can be **modified** by the previously specified means adapted to **change the position of pivot points** and in particular of pivot points 109 and 112 [pivot points between vehicle frame and rods (links)].”) Thus, POSITA would have recognized that a design of a vehicle such

as KR996 includes determining pivot point locations, because it was well-known that pivot point locations are result-affecting design variables for desired performance, as explained by Beltrami. EX1003, ¶162.

In considering the pivot point locations, POSITA would have had reason to further apply Beltrami's teachings of locating the pivot point attachments between the intermediate parts (linkage(s)/actuator) and the mainframe **low** on the mainframe, near the rotational axis such that the distance between the pivot points and the axis is, for example, less than the distance between the axis and the ground/bottom of the mainframe. EX1003, ¶163. Beltrami describes that benefits of positioning the location of these pivot points low on the equipment include decreasing the frame requirements and maintaining a low center of gravity. EX1008, 3:35-41. POSITA would recognize that these benefits stem from basic engineering principles. EX1003, ¶163. And POSITA would also recognize these same benefits would be gained by providing the pivot points of the similarly configured loader of KR996 low on its frame, in particular, a relatively small vertical distance from the rotational axis of the drive mechanism. *Id.* Thus, the proposed combination of Beltrami is merely applying a known technique to a known device (*e.g.*, Beltrami's technique of providing low pivot points in a vehicle using intermediate parts for connecting a loader arm, with KR996's using pivotally attached connection between the loader arm and intermediate parts) ready for improvement (*e.g.*, decreasing the

frame requirements and/or lowering the center of gravity) to yield predictable results. EX1003, ¶¶164-165. *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380–81 (Fed. Cir. 2023).

The results of combining Beltrami’s technique with KR996-JP705 would have been predictable and with a reasonable expectation of success since both KR996 and Beltrami relate to similar vehicles with a vertical lift loader. Modifying the vehicle of KR996-JP705 to provide lower pivot points would have been a straightforward and simple matter well within the skills of POSITA during a typical vehicle design process. EX1003, ¶166. And Dr. Velinsky has confirmed the functionality of these lower pivot point connections. EX1003, ¶¶186-202 discussing four-bar mechanisms and simulation of Appendix A (EX1004).

4. Claim 15

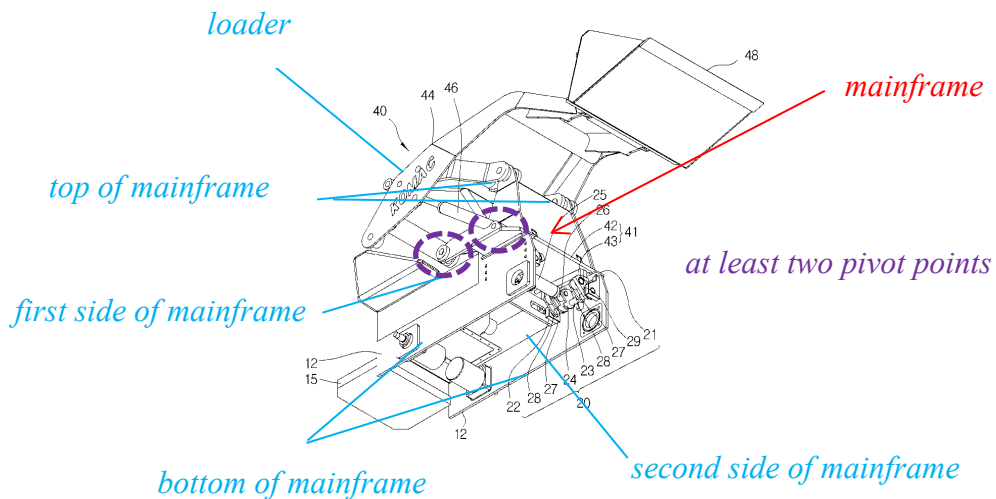
Claim 15 shares many limitations with claim 1, with additional limitations to a drive mechanism of claim 5 and pivot point locations, which are discussed below the following cross-referencing table. EX1003, ¶¶167-202.

		See the analysis at:
[15.0]	<i>A compact tool carrier comprising:</i>	[1.0]
[15.1]	<i>a loader adapted to carry a tool;</i>	[1.1] discussing loader 40 and boom 44 carrying

		bucket 48 (<i>tool</i>)
[15.2a]	<i>a mainframe for supporting the loader, the mainframe having a first side and a second side, and having a front end and a rear end relative to the longitudinal axis,</i>	[1.2a]
[15.2b]	<i>the mainframe comprising an engine bracket that extends from the first side toward the second side for mounting an engine to the mainframe, the engine bracket being spaced from the rear end of the mainframe,</i>	[1.2b] including discussion of the engine bracket of JP705 in combination with KR996's mainframe
[15.2c]	<i>each side [of the mainframe] having a top and a bottom, the first side of the mainframe having at least two pivot points relative to the loader,</i>	See below
[15.2d]	<i>the loader not being directly attached to the mainframe;</i>	[1.2c]
[15.3]	<i>a linkage pivotally attached to the first side of the mainframe at a pivot point and pivotally attached to the loader;</i>	[1.3] including link 45 (<i>linkage</i>)
[15.4]	<i>an actuator pivotally attached to the first side of the mainframe at a pivot point and pivotally attached to the loader;</i>	[1.4] including boom cylinder 46 (<i>actuator</i>)

[15.5a]	<i>a drive mechanism comprising tracks or wheels for propelling the compact tool carrier over a supporting surface, the drive mechanism being attached to the mainframe about a rotational axis, the compact tool carrier having a bottom at which the drive mechanism contacts the supporting surface, the rotational axis and bottom of the compact tool carrier being separated by a vertical distance D1, the rotational axis and the bottom of the first side of the mainframe being separated by a vertical distance D5,</i>	[5] including KR996's wheels 14 (<i>drive mechanism</i>) and below
[15.5b]	<i>the rotational axis and the pivot point at which the linkage is attached to the mainframe being separated by a vertical distance D2, the rotational axis and the pivot point at which the actuator is attached to the mainframe being separated by a vertical distance D4, D2 and D4 each being less than 1.5 times D1 and each being less than twice D5; and</i>	See below
[15.6]	<i>a control station having operator controls for propelling the compact tool carrier forward and for raising and/or lowering the loader, the control station being mounted toward the rear of the compact tool carrier and adapted to allow for standing or walk-behind operation.</i>	[1.5] including control unit 13 (<i>control station</i>)

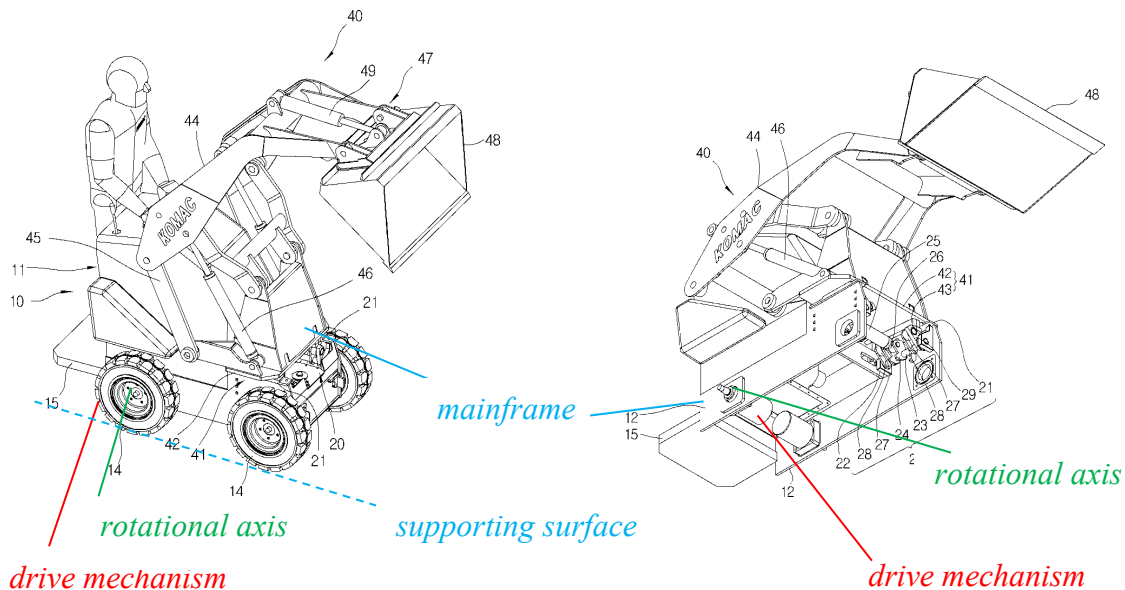
As to [15.2c], each side of the mainframe of KR996 has a *top* and a *bottom*, the *first side of the mainframe* has *at least two pivot points* relative to the loader as illustrated by the pivot point attachment with link 45 and boom cylinder 46.



EX1005, Fig. 10
(annotated)

Thus, KR996 teaches [15.2c]. EX1003, ¶¶168-169.

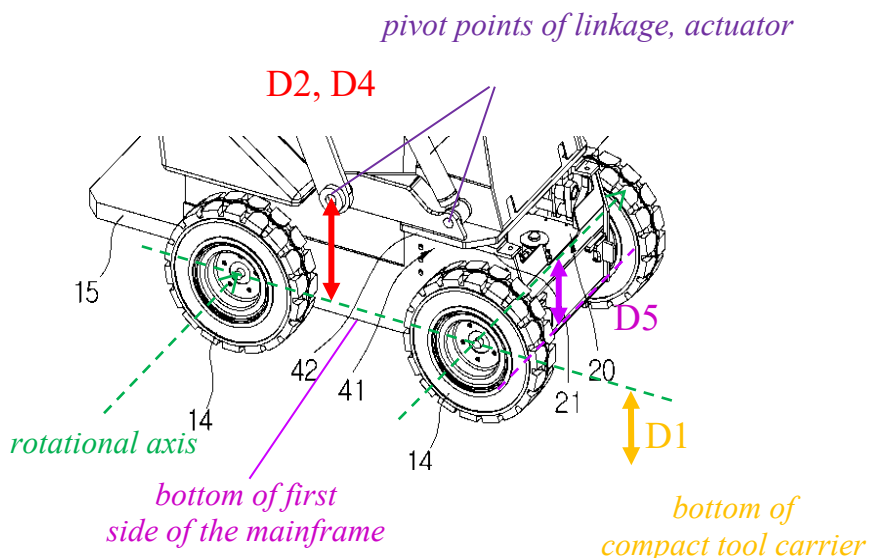
As to [15.5a], KR996 describes a *drive mechanism* including “wheels (14)” (*wheels*) for *propelling* the vehicle (*compact tool carrier*) over a supporting surface (*e.g.*, ground). EX1003, ¶170; EX1005, [0042], Figs. 1, 8-10. The *drive mechanism* is attached to the mainframe *about a rotational axis*. EX1003, ¶170 citing EX1001, 1:67-2:3.



**EX1005, Figs. 9, 10
(annotated)**

KR996's vehicle (*compact tool carrier*) has a *bottom* at which the wheels 14 (*drive mechanism*) contact the *supporting surface* (e.g., ground). EX1003, ¶¶171-173; *see also*, claim [10]. The rotational axis and bottom of the compact tool carrier are separated by a *vertical distance D1*. EX1003, ¶171 explaining D1 is a typical variable selected in the design of the vehicle (e.g., wheel size dependent). The rotational axis and the bottom of the first side of the mainframe are separated by a *vertical distance D5*. EX1003, ¶172 explaining D5 is a typical variable selected in

the design of the vehicle (e.g., support and clearance dependent).⁹ Annotated Fig. 9 is illustrative:



**EX1005, Fig. 9 (portion)
(annotated)**

Thus, [15.5a] is taught by KR996. EX1003, ¶¶170-174.

As to [15.5b], KR996 also teaches, including through plain inspection of its figures, that there is a *vertical distance D2* between the pivot point at which link 45 (*linkage*) is attached to the *mainframe* and the *rotational axis*. And there is a *vertical distance D4* between the pivot point at which boom cylinder 46 (*actuator*) is

⁹ Each of D1, D5 would also increase if applying the common configuration of a track assembly. EX1003, ¶171 citing EX1032-EX1033, EX1035.

attached to the *mainframe* and the *rotational axis*. See annotated Fig. 9 above. EX1003, ¶175.

By plain inspection of KR996's figures, *D2* and *D4* are each *less than 1.5 times D1* and each *less than twice D5*. Thus, KR996's figures suggest the configuration of Claim 15. EX1003, ¶176. Further, in light of Beltrami, POSITA would have had reason and found it beneficial to provide *D2* and *D4* each being *less than 1.5 times D1* and each being *less than twice D5* in KR996's vehicle as discussed above regarding reasons to combine Beltrami and further discussed below. EX1003, ¶¶101-166, 177-202.

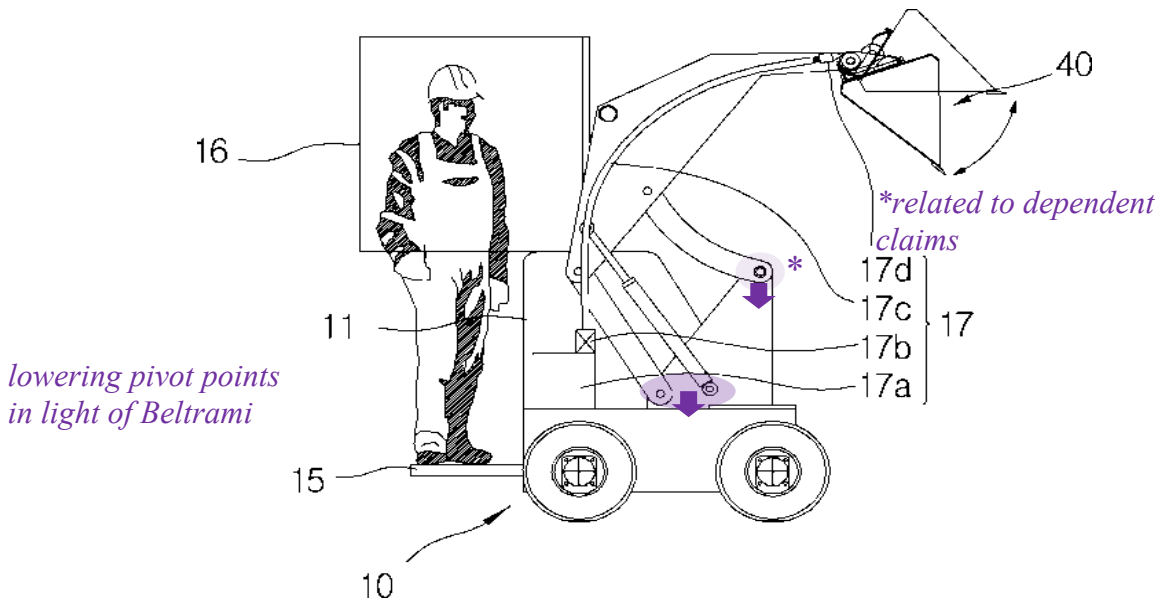
First, KR996 teaches the same vertical lift loader with pivot points between the same components as the '386 Patent. And optimization within prior art conditions or through routine experimentation supports a finding of obviousness. *In re Williams*, 36 F.2d 436, 438 (CCPA 1929) ("It is a settled principle of law that a mere carrying forward of an original patented conception involving **only change of form, proportions, or degree**, or the substitution of equivalents doing the same thing as the original invention, **by substantially the same means, is not such an invention as will sustain a patent**, even though the changes of the kind may produce better results than prior inventions.") Dr. Velinsky explains that it was a routine practice when designing a loader for a vehicle to consider placement of pivot points between linkages/actuator and the mainframe depending on the desired design

specifications. EX1003, ¶178-180. Beltrami also confirms that decades prior to the '386 Patent, modifying configuration of the relevant pivot points affected the design goals and was a known technique in designing such a four-bar loader mechanism for a vehicle. EX1008, 4:35-50.

Second, Beltrami teaches benefits in providing the pivot point attachment locations low on the vehicle (*i.e.*, minimizing D2, D4). Beltrami explains “[a]mongst the various advantages, the following ones are to be emphasized: the pivot points 24, 26 and 30 can be kept in such a low position on the vehicle that no supporting frame is needed; the arm can be lifted with nearly constant power input and speed; and finally a lifting can be performed without having the equipment gravity center to undergo an unnecessarily large shifting.” EX1008, 3:35-41, 2:69-75. POSITA would recognize that general physics principles dictate that lowering the attachment of the loader arm lowers the center of gravity, which reduces risk of tipping. EX1003, ¶181.

Thus, POSITA would have had the skillset, desire, and motivation to provide the pivot points low (*i.e.*, minimizing D2 and D4) to provide a compact size mainframe and a low center of gravity as taught by Beltrami by lowering the pivot

points and reducing D2 and D4 in the context of KR996 to the extent it is required.¹⁰



**EX1005, Fig. 21
(annotated)**

EX1003, ¶182.

Further, it would have been obvious to position the pivot points such that D2 and D4 are *less than 1.5 times D1* and *less than twice D5* as in this claim, or indeed any of the claimed relative dimensions that follow. Petitioner notes the '386 Patent provides **no** specific advantage, benefit, or surprising result to any one of the myriads of claimed relative dimensions related to these pivot points including those of Claim

¹⁰ These same reasons apply to lowering the pivot point attachment of the third pivot point and D3, discussed in the dependent claims below.

15. Instead, the '386 Patent espouses only general benefits in general terms:

By positioning the pivot points relatively low on the mainframe 10, the mass of the mainframe 10 and the resulting **cost** of the carrier 5 may be reduced. Further, such a low-profile mainframe 10 **improves visibility for the operator** and **allows the center of gravity** of the carrier 5 to be **lowered** which improves its stability.

EX1001, 5:62-67 (emphasis added). These same advantages of the location of pivot points locations—“relatively low”—were known well before the earliest priority date claimed by the '386 Patent. As discussed above, Beltrami explicitly recognizes advantages of a lower center of gravity and a reduction in frame. EX1008, 3:35-41 (“the pivot points 24, 26 and 30 **can be kept in such a low position on the vehicle that no supporting frame is needed...and finally a lifting can be performed without having the equipment gravity center** to undergo an unnecessarily large shifting.”), 2:69-75. POSITA would also have recognized providing pivot points low on the mainframe, and closer to the axis, for the exact same benefits touted in the '386 Patent. EX1003, ¶¶183-185 citing EX1012, 3:56-64 (“...the rear **pivot** of link 50 is substantially directly vertically above the rear axle 17, and it is **much closer to the axle** than in previous designs. The **number of structural components** between the points of attachment of the boom to the loader frame and the wheel attachment to the loader frame is **reduced**...the shorter load bearing paths **simplifies and**

reduces the costs in the overall load and carrying structure.”), EX1011 discussion of increased visibility and stability; EX1009 discussion of “visibility” and lowering the center of gravity, EX1006, [0010].

Thus, POSITA would have recognized not only that the location of the pivot point was a result-affecting design choice, but also the desire to make the pivot points relatively low (*i.e.*, minimizing D2 and D4 in the context of KR996) for the benefits discussed above and provide D2 and D4 each being *less than 1.5 times D1* and each being *less than twice D5*. As discussed above, there would have been a reasonable expectation of success as KR996 also teaches a vertical lift loader configuration having the same pivot point attachments, Beltrami merely adds suggestions a low configuration. EX1003, ¶¶186-187. And POSITA would recognize the resulting configuration was predictable and performed the same function of a four-bar mechanism loader with benefits such as less mainframe requirements and a lower center of gravity. EX1003, ¶¶188-202.

Thus, claim 15 is rendered obvious by KR996-JP705 and Beltrami. EX1003, ¶¶167-202.

5. Claim 17

[17] *The compact tool carrier as set forth in claim 15 wherein the second side of the mainframe comprises two pivot points, each vertical distance between the rotational axis and a pivot point being less than 1.5 times D1.*

KR996-JP705 in view of Beltrami renders obvious claim 15 and KR996 also

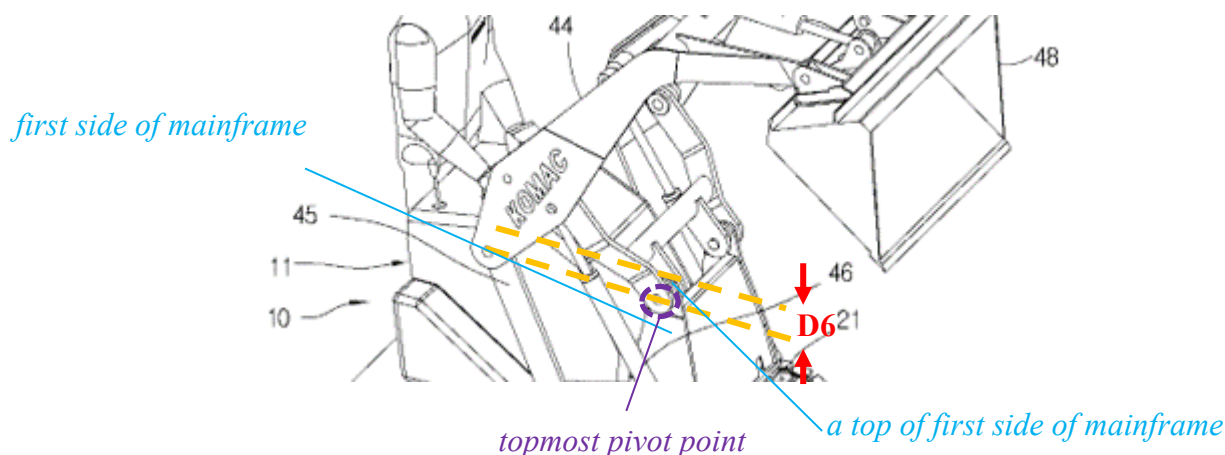
describes a *second side of the mainframe* that is substantially the same as the first side and similarly comprises *two pivot points* (e.g., link 45 and boom cylinder 46 attachment to mainframe) just as described in [15.2c]. And for the same reasons as discussed in [15.5b], it would have been obvious to configure the pivot points *less than 1.5 D1*. See also [3], [4], discussing pivot attachment on the second side of the mainframe.

Thus, claim 17 is rendered obvious by KR996-JP705 and Beltrami. EX1003, ¶¶203-205.

6. Claim 19

[19] *The compact tool carrier as set forth in claim 15 wherein the first side of the mainframe comprises a topmost pivot point, the topmost pivot point and the top of the first side of the mainframe being separated by a vertical distance D6, D6 being less than about 1.5 times D5.*

KR996-JP705 in view of Beltrami renders obvious claim 15 and KR996 also describes another link connected to the first side of the mainframe, which provides *a topmost pivot point*. See [21], [15.2c], Figs. 8-10. KR996 illustrates a *vertical distance D6* between this *topmost pivot point* and a *top of the first side of the mainframe*. Fig. 9 is illustrative:



**EX1005, Fig. 9 (portion)
(annotated)**

As to the claimed relative distance between D6 and D5, KR996's figures themselves reasonably suggest this was a known configuration. EX1003, ¶208. Further, POSITA would recognize advantages to minimizing the distance that the mainframe extends above the topmost pivot point including increasing visibility for the operator, providing a low center of gravity, and minimizing materials and consequently expenses for forming a frame. *Id.* citing EX1011, EX1008, EX1006.

Thus, claim 19 is rendered obvious by KR996-JP705 and Beltrami. EX1003, ¶¶206-210.

7. Claim 20

[20] The compact tool carrier as set forth in claim 15 further comprising a tool

attached to the loader, the tool being selected from the group consisting of a bucket, auger, fork, stump grinder, tiller, and roller.

KR996-JP705 in view of Beltrami renders obvious claim 15 and KR996 describes a *tool* of bucket 48 (*bucket*) *attached* to its loader unit 40. EX1005, [0054], [0074], [0136], Figs. 8-9.

Thus, KR996-JP705 and Beltrami render obvious claim 20. EX1003, ¶¶211-212.

8. Claim 23-24

[23, [24]] The compact tool carrier as set forth in claim 15 wherein D2 and D4 are each less than 1.75 [1.5] D5.

KR996-JP705 in view of Beltrami renders obvious claim 15 and as discussed above in [15.5b], POSITA would have knowledge and reason to minimize the distances between the pivot point attachments and the axis—D2 and D4—including to provide a low center of gravity and minimize materials and expenses for forming a frame. EX1003, ¶¶178-202. And POSITA would have reason to increase D5. EX1003, ¶ 172 including increasing material for distribution of stress of loader, drive mechanism, and other attachments.

The '386 Patent provides no surprising or unexpected result for any specific relationship, e.g., less than 2 as in claim 15, less than 1.75 as in claim 23, or less than 1.5 as in claim 24. *See* [15.5b], EX1001, 5:20-31. Thus, for the same reasons as discussed above with reference to [15.5b], it would have been obvious to configure

D2 and D4 each *less than 1.75* and *less than 1.5 D5*. And POSITA would also have the knowledge to arrange components to provide suitable functionality without interference. EX1003, ¶215. Thus, claims 23 and 24 are obvious over KR996-JP705 and Beltrami. EX1003, ¶¶213-216.

9. Claim 25-26

[25, [26]] *The compact tool carrier as set forth in claim 15 wherein D2 and D4 are each less than D1 [0.75 D1].*

KR996-JP705 in view of Beltrami renders obvious claim 15 and as discussed above, POSITA would have knowledge and reason to minimize the distances between the pivot point attachments and the axis—D2 and D4—including to provide a low center of gravity and minimize materials and expenses for forming a frame. EX1003, ¶¶178-202. And POSITA would have reason to increase D1. EX1003, ¶171 including desired wheel size relative to target terrain. And POSITA would also have the knowledge to arrange components to provide suitable functionality without interference. EX1003, ¶215.

The '386 Patent provides no surprising or unexpected result for any specific relationship claimed, e.g., less than 1.5 D1 as in claim 15, less than 1 as in claim 25, or less than 0.75 as in claim 26. *See* EX1001, 5:17-19. Thus, for the same reasons as discussed above with reference to [15.5b], it would have been obvious to position D2 and D4 each less than D1 and less than 0.75 D1 and claims 25 and 26 are obvious

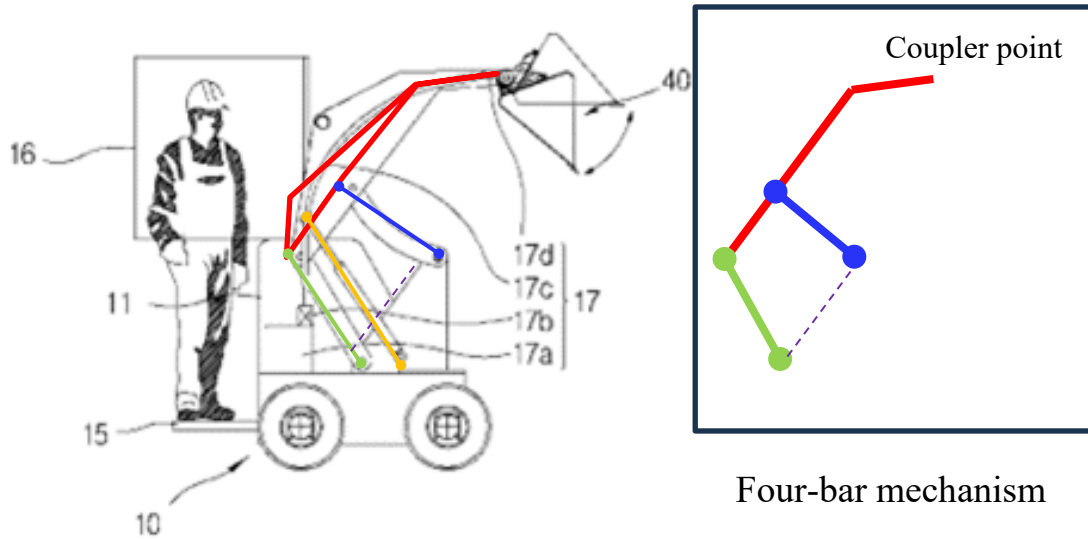
over KR996-JP705 and Beltrami. EX1003, ¶¶217-220.

10. Claim 27

[27] *The compact tool carrier as set forth in claim 15 wherein the linkage is a first linkage, the compact tool carrier further comprising a second linkage pivotally attached to the first side of the mainframe at a pivot point and pivotally attached to the loader, the rotational axis and the pivot point at which the second linkage is attached to the mainframe being separated by a vertical distance $D3$, $D3$ being less than 1.5 times $D1$.*

KR996-JP705 in view of Beltrami renders obvious claim 15 and the link 45 discussed in [15.3] is *a first linkage*, and KR996 includes another link pivotally attached to the first side of the mainframe and the loader providing *a second linkage*. See [21], EX1005, Figs. 8-9.

relative to the four-bar mechanism as illustrated and as modified in light of Beltrami's teachings:



EX1005, FIG. 21
(annotated)

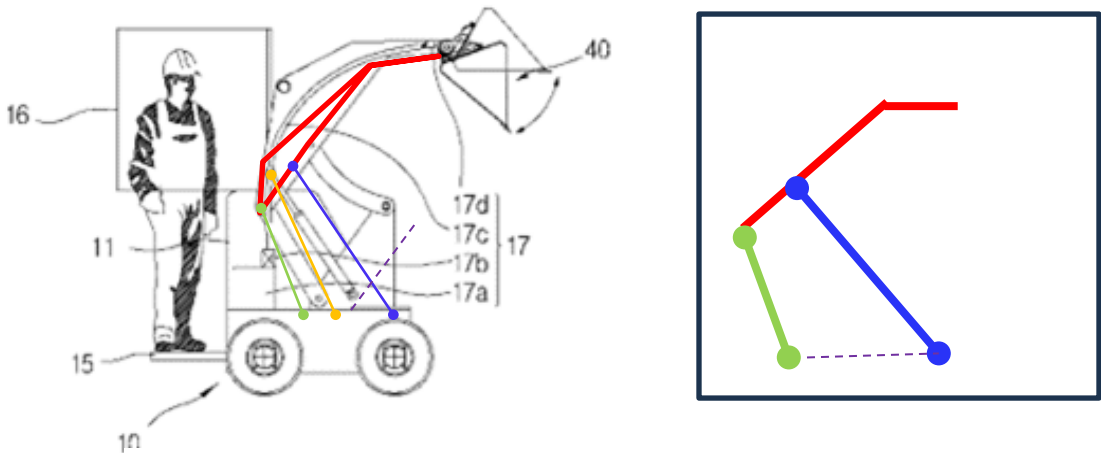
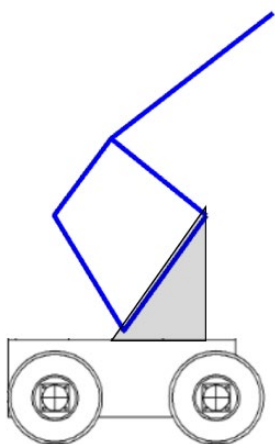


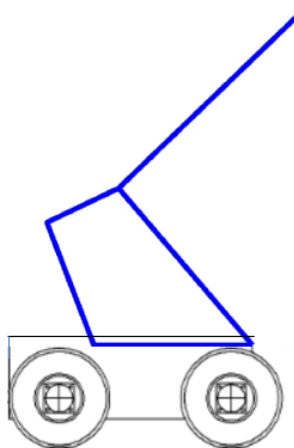
Figure A
(annotated)
with lowered pivot points

EX1003, ¶¶190-193. POSITA would have been readily able to modify the vehicle

to incorporate Beltrami's teachings to achieve benefits of keeping the pivot points low on the frame of the vehicle as discussed by Dr. Velinsky, including the kinematic simulation of the predictable functionality of the modified configuration provided in Appendix A (EX1004). The following screen shots are illustrative of one stage of the loader, which in each instance travels from a low to vertically raised position.



**Screen Shot of Simulation
in Appendix A of
KR996 as configured**



**Screen Shot of Simulation
in Appendix A of
KR996 as modified**

EX1003, ¶¶188-202, Appendix A (EX1004). POSITA would also have the knowledge to arrange components (e.g., mainframe, drive mechanism, lift mechanism) to provide suitable functionality. EX1003, ¶¶215-216.

Thus, claim 27 is rendered obvious by KR996-JP705 and Beltrami. EX1003, ¶¶221-225.

11. Claims 28-29

[28, 29] *The compact tool carrier as set forth in claim 15 wherein the linkage is a first linkage, the compact tool carrier further comprising a second linkage pivotally attached to the first side of the mainframe at a pivot point and pivotally attached to the loader, wherein the mainframe comprises a forward-most pivot point with (1) the pivot point at which the first linkage is attached to the mainframe, (2) the pivot point at which the actuator is attached to the mainframe, or (3) the pivot point at which the second linkage is attached to the mainframe being the forward-most pivot point, a vertical distance between the rotational axis and the forward-most pivot point being less than $D1$ [$0.75 D1$].*

KR996-JP705 in view of Beltrami renders obvious claim 15 and provides link 45 of [15.3] is a *first linkage* and KR996 also includes another link (*second linkage*) pivotally attached to the first side of the mainframe and the loader, which provides a *forward-most pivot point*. See [21], EX1005, Figs. 8-9. For substantially the same reasons as discussed above in [15.5b] and [27], POSITA would have had the knowledge and reason to provide the pivot point attachment of the forward link (*second linkage*) *less than 1.5 times $D1$* in the context of claim 28 (or *less than $0.75 D1$* in the context of claim 29) to position the attachment low on the vehicle for a predictable result of a low center of gravity and frame minimization. EX1003, ¶171 discussing $D1$, ¶¶178-202, 161-166, Appendix A discussing pivot point locations, ¶215 suitable arrangement of components.

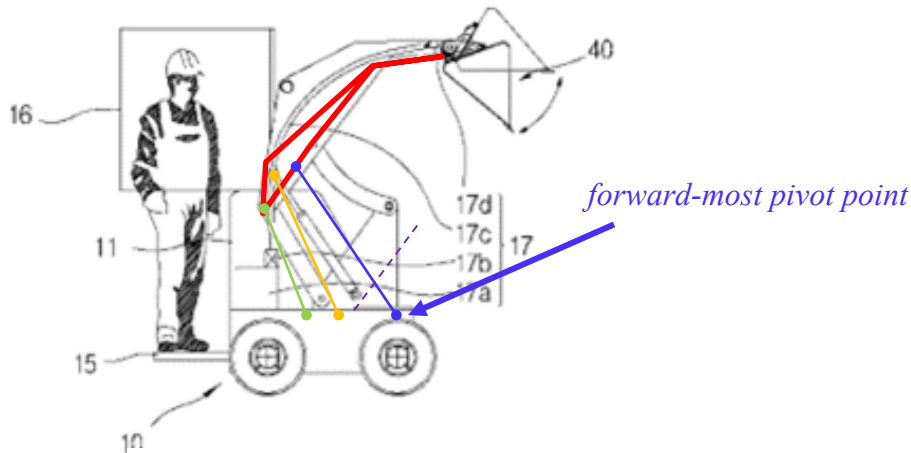


**Figure A
(annotated)
with lowered pivot points**

Thus, claims 28-29 are rendered obvious by KR996-JP705 and Beltrami.
EX1003, ¶¶226-229.

12. Claim 30

[30] The compact tool carrier as set forth in claim 15 wherein the linkage is a first linkage, the compact tool carrier further comprising a second linkage pivotally attached to the first side of the mainframe at a pivot point and pivotally attached to the loader, wherein the mainframe comprises a forward-most pivot point with (1) the pivot point at which the first linkage is attached to the mainframe, (2) the pivot point at which the actuator is attached to the mainframe, or (3) the pivot point at which the second linkage is attached to the mainframe being the forward-most pivot point, a vertical distance between the rotational axis and the forward-most pivot point being less than 1.5 D5.

KR996-JP705 in view of Beltrami renders obvious claim 15 including KR996 providing link 45 of [15.3] as a *first linkage* and another link (*second linkage*) pivotally attached to the first side of the mainframe and the loader, which provides

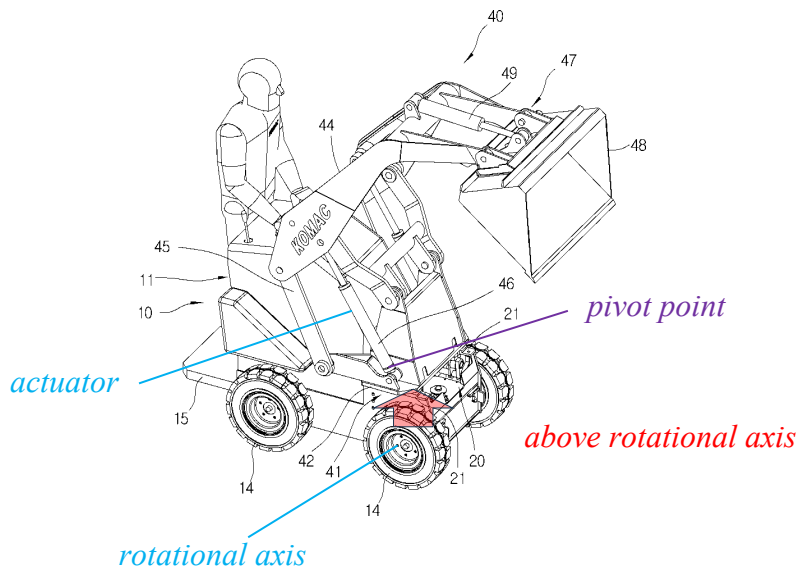
a *forward-most link*. See [21], [27], [29], EX1005, Figs. 8-9. For substantially the same reasons as discussed above in [15.5b], POSITA would have had reason to provide the pivot point attachment of the link (*second linkage*) and the mainframe *less than 1.5 D5* to position the attachment low on the vehicle mainframe for a predictable result of a low center of gravity and frame minimization. EX1003, ¶172 discussing D5, ¶¶178-202, 161-166, Appendix A discussing pivot point locations, ¶215 suitable arrangement of components. The analysis for [27] provides additional illustrations of any exemplary implementation.

Thus, claim 30 is rendered obvious by KR996-JP705 and Beltrami. EX1003, ¶¶230-232.

13. Claim 66

[66] *The compact tool carrier as set forth in claim 15 wherein the pivot point at which the actuator is attached to the first side of the mainframe is above the rotational axis.*

KR996-JP705 in view of Beltrami renders obvious claim 15 and provides the boom cylinder 46 (*actuator*) is attached to the first side of the mainframe at a pivot point disposed *above the rotational axis* of the drive mechanism (wheels 14).



**EX1005, Fig. 9
(annotated)**

POSITA would understand that this configuration is maintained in implementing the teachings of lowering the pivot point attachments as discussed above, which would continue to apply when implementing the teachings of Beltrami. EX1003, ¶¶234-235 citing EX1021.

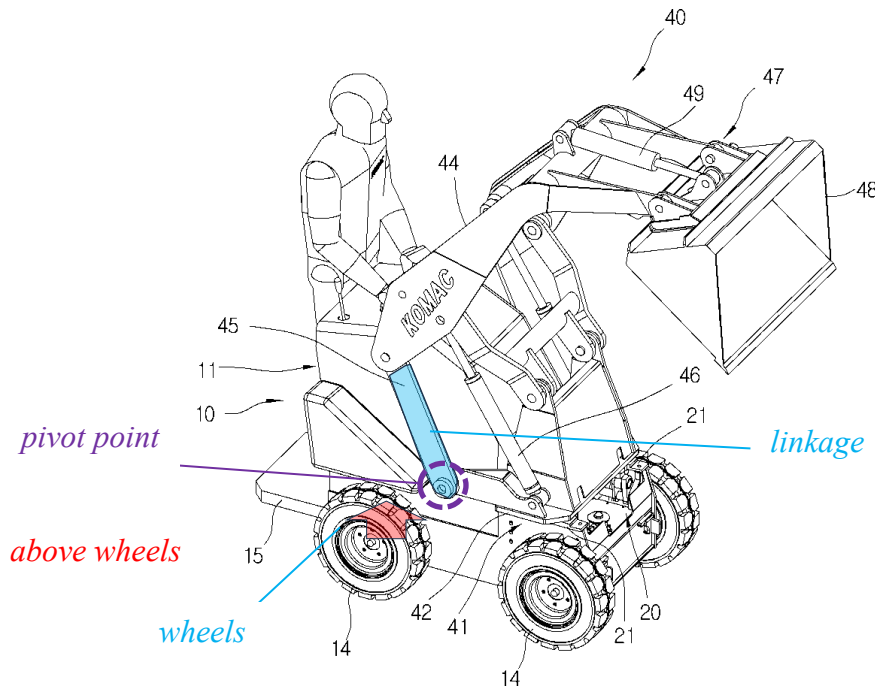
Thus, claim 66 is rendered obvious by KR996-JP705 and Beltrami. EX1003, ¶¶233-236.

14. Claim 67

[67] *The compact tool carrier as set forth in claim 15 wherein the pivot point at which the linkage is attached to the first side of the mainframe is disposed above the tracks or wheels.*

KR996-JP705 in view of Beltrami renders obvious claim 15 and illustrates the pivot point attachment of the link 45 (*linkage*) to *first side of the mainframe* is

disposed above the wheels 14 (wheels). See [15.3], [15.5a]. Fig. 8 is illustrative:



**EX1005, Fig. 9
(annotated)**

POSITA would understand that this configuration is maintained in implementing the teachings of lowering the pivot point attachments as discussed above. EX1003, ¶¶178-202, 161-166, 215, 235, Appendix A discussing pivot point locations, ¶215 suitable arrangement of components. Thus, claim 67 is rendered obvious by KR996-JP705 and Beltrami. EX1003, ¶¶237-240.

XI. DISCRETIONARY DENIAL IS INAPPROPRIATE

A. No basis for 35 U.S.C. § 325(d) denial

The combinations of references presented in the grounds above have not previously been presented to the Office. KR996, the primary reference, was not cited

or considered by the Examiner during prosecution of the '386 Patent nor before the Office in any of the reexamination proceedings. Further, predominately all of the analysis during the '386 Patent prosecution and reexamination was directed to an obviousness framework of placing a vertical lift configuration loader arm disclosed on a larger tractor onto a compact utility loader, which is **not** proposed here. In fact, the Examiner concluded the final reexamination proceeding of the '386 Patent reiterating that there was only one reference of record that included a vertical lift loader on a compact tool carrier.¹¹ Here, KR996, which was not of record, shows in a single embodiment, a vertical lift configuration of a loader arm on a compact utility carrier, and thus is not cumulative to the previous presentations.

JP705 and McIlwraith also do not appear to have been before the Examiner with respect to the '386 Patent; Beltrami was merely cited in an IDS in the reexamination, and none of these references were discussed nor applied in any rejection. Accordingly, the prior art, arguments and grounds raised here were not previously before to the Office. Accordingly, discretionary denial under 35 U.S.C. § 325(d) is not appropriate.

¹¹ “Ulinski (U.S. Patent 3,074,572[]) is the only reference of record which uses linkages to indirectly attach loader arms to a standing or walk-behind machine to achieve vertical lift.” EX1030, p. 13. Ulinski was distinguished on other features.

B. No basis for denial under the 35 U.S.C. §314/*Fintiv*

The Board balances six factors in considering denial under § 314. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (Mar. 20, 2020) (precedential). These factors strongly favor institution as this Petition presents compelling evidence of unpatentability of all Challenged Claims. And moreover, the district court case is in its very early stages, without a scheduling order or opening of fact discovery, as Patent Owner just served the August-filed complaint in September 2024. *See* EX1019. Petitioner has diligently worked to prepare the petitions. The current average time-to-trial for the district court hearing the co-pending litigation is 19.8 months (mid-May 2026). EX1034 (NDTX mean time); *In re Apple Inc.*, 979 F.3d 1332, 1350 (Fed. Cir. 2020). Here, the final written decision is due May 2026. If the median time-to-trial is around the same time or after the projected statutory deadline for the PTAB's final written decision, this weighs against discretion. Inefficiency concerns are minimal.

C. Discretionary denial under *General Plastic* is not appropriate

The '386 Patent has not been challenged in any prior IPR petition, so none of *General Plastic* discretionary institution factors apply to this Petition. *See General Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 at 16 (Sept. 6, 2016) (Section II.B.4.i. precedential).

XII. CONCLUSION

Petitioner has established a reasonable likelihood that the Challenged Claims are unpatentable.

Respectfully submitted,

Dated: November 15, 2024
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Registration No. 42,044

XIII. MANDATORY NOTICES UNDER 37 C.F.R §42.8

A. Real party-in-interest

Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner certifies that the real party-in-interest is Kubota North America Corporation (Petitioner) and Kubota Tractor Corporation. *See also, SharkNinja Operating LLC v. iRobot Corp.*, IPR2020-00734, Paper 11 (Oct. 6, 2020) (precedential) (no RPI analysis necessary at institution absent allegation of time bar or estoppel based on unnamed RPI).

B. Related matters

Pursuant to 37 C.F.R. § 42.8(b)(2), to the best knowledge of the Petitioner, the '386 Patent is or was involved in the following cases:

Case Heading	Number	Court	Filed	Status
<i>Vermeer Manufacturing Company, vs. Kubota North America Corporation and Kubota Tractor Corporation</i>	4:24-cv-00799-P	NDTX	August 20, 2024	Pending
<i>Vermeer Corporation vs. The Toro Company</i>	4-17-CV-00076	SDIA	Feb. 28, 2017	Terminated

Petitioner is also concurrently filing petitions for *inter partes* review (“IPR”) for the ’386 Patent and related patents:

Petition/Patent Number	Challenged Claims	Proceeding No.	Filing Date
9,321,386 Petition A	1-13, 15, 17, 19-30, 64-67	<i>IPR2025-00167</i>	November 14, 2024
9,321,386 Petition B	31-49, 70-79, 86-87	<i>IPR2025-00168</i>	November 14, 2024
9,321,386 Petition C	50-63, 68-69, 80-85	<i>IPR2025-00169</i>	November 14, 2024
9,975,750	1-36 (all claims)	<i>IPR2025-00170</i>	November 14, 2024
10,202,266	1-16, 19-28 (all claims)	<i>IPR2025-00171</i>	November 14, 2024

C. Lead and back-up counsel and service information

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Please address all correspondence in this proceeding to lead and back-up counsel. Petitioner consents to service in this proceeding by email at the addresses above.

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), Petitioner hereby certifies, in accordance with and reliance on the word count provided by the word-processing system used to prepare this Petition, that the number of words in this paper is 13,945. Pursuant to 37 C.F.R. § 42.24(d), this word count excludes the table of contents, table of authorities, mandatory notices under § 42.8, certificate of service, certificate of word count, appendix of exhibits, and any claim listing.

Dated: November 15, 2024

/David M. O'Dell/
David M. O'Dell
Lead Counsel for Petitioner
Registration No. 42,044

CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. § 42.6(e) and 37 C.F.R. § 42.105, service was made on Patent Owner as detailed below.

Date of service November 15, 2024

Manner of service FEDERAL EXPRESS

Documents served Petition for *Inter Partes* Review Under 35 U.S.C. § 312 and 37 C.F.R. § 42.104 of U.S. 9,321,386;
Petitioner's Notice Ranking Petitions and Explaining Material Differences Between Petitions for U.S. Patent No. 9,321,386;
Petitioner's Power of Attorney;
Petitioner's Exhibit List;
Exhibits EX1001-EX1036

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