

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Kubota North America Corporation,

IPR2025-00168
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 31-49, 70-79, and 86-87)

**SECOND DECLARATION OF STEVEN ALAN VELINSKY, PHD, PE
UNDER 37 C.F.R. § 1.68 IN SUPPORT OF PETITION FOR
INTER PARTES REVIEW**

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I, Steven Velinsky, do hereby declare as follows:

I. INTRODUCTION

1. I make this declaration based upon my own personal knowledge and, if called upon to testify, would testify competently to the matters stated herein.

2. I have been asked by Kubota North America Corporation (“Kubota”) to provide my expert opinion connection with the *Inter Partes* Review of U.S. Patent No. 9,321,386 (“’386 Patent”) concerning whether the ’386 Patent is unpatentable over certain prior art. This declaration is a statement of my opinions on issues relating to the patentability of Claims 31-49, 70-79, and 86-87 (“the Challenged Claims”) of the ’386 Patent. As I explain more fully below, it is my opinion that all the Challenged Claims would have been obvious to a person of ordinary skill in the art (“POSITA”) at the time of the alleged invention.

3. I am being compensated for my work in this matter at my standard hourly rate. I am also being reimbursed for reasonable and customary expenses associated with my work and testimony in this investigation. My compensation is not contingent on the outcome of this matter or the specifics of my testimony. I have no other financial interest in this proceeding.

4. I have reviewed and considered the following documents in connection with my analysis of the ’386 Patent:

a) U.S. Patent No. 9,321,386 (the ’386 Patent) (EX1001);

- b) relevant portions of the prosecution history of the '386 Patent (“’386 File History”), EX1002, EX1029, EX1030, EX1031;
- c) KR 10-1041996 (“KR996”) listing inventor Jo Bunggu (EX1005) stemming from Korean Application 10-2009-0033050, which was published as 10-1041996 on June 16, 2011;
- d) JP 2004 017705 (“JP705”) listing inventor Yoshitake Yamaguchi *et al.* (EX1006); filed June 13, 2002; published January 22, 2004.
- e) U.S. Patent No. 6,832,659 (“Bares ’659”) (EX1010), filed October 30, 2002 and issued December 21, 2004.

5. In forming the opinions expressed below, I have considered:

- a) the documents listed above;
- b) the relevant legal standards, including the standard for obviousness, and any additional authoritative documents as cited in the body of this declaration; and
- c) my own knowledge and experience based upon my work in the field of mechanical engineering and earth-moving equipment as described below, as well as the following materials including:

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”)
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)
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
EX1032	U.S. Patent Publication Appl. 2010/0168933 (“Rorabaugh”)
EX1033	U.S. Patent Publication Appl. 2009/0116943

6. Unless otherwise noted, all emphasis in any quoted material has been added.

II. QUALIFICATIONS AND PROFESSIONAL EXPERIENCE

7. My Curriculum Vitae (CV) is attached as EX1036. This exhibit also includes a list of my publications.

8. I earned a Ph.D. in Theoretical & Applied Mechanics from the University of Illinois at Urbana-Champaign in 1981. I earned a Bachelor of Science degree in Mechanical Engineering, State University of New York at Buffalo in 1977, and a Master of Science degree, also in Mechanical Engineering from University of Illinois at Urbana-Champaign, in 1979. After finishing my Ph.D. degree, I worked as an engineer for approximately two years in government laboratory and in industry. I am also a Registered Professional Engineer, State of California.

9. Since 1989, I have been Faculty Member (Associate Professor, Professor, Distinguished Professor, Distinguished Professor Emeritus) in the Department of Mechanical & Aerospace Engineering, University of California, Davis. Prior to UC Davis, I was a Faculty Member in the Department of Mechanical Engineering at the University of Wisconsin-Madison.

10. I was the Director of the Advanced Highway Maintenance & Construction Technology Research Center of Department of Mechanical &

Aerospace Engineering, at University of California, Davis from September 1991 to September 2016. In this research center, we applied advanced automation and mechatronics technologies to the design and development of automated highway maintenance and construction machines. These machines have been developed to address a wide variety of highway tasks including, for example, the dispensing and retrieval of highway cones, sealing of pavement cracks, collection of roadway debris, landscape maintenance, graffiti removal and plowing of snow, and involve the use of mechanisms to allow the tasks to be performed. Our typical projects involved detailed design, fabrication of the prototype equipment and qualification testing of the machines in actual highway operations.

11. I have received numerous awards and honors for my work in mechanical engineering. My recognition for the design of specific machines includes: the 1996 American Society of Mechanical Engineers' Leonardo DaVinci award, the 2001 California Transportation Foundation's Tranny Award, the 2001 California State Department of Transportation's Excellence in Transportation Award, and the 2002 California Transportation Foundation's Tranny Award. Additional awards, honors and professional activities include: Fellow of the American Society of Mechanical Engineers (ASME), 2007 American Society of Mechanical Engineers' Machine Design Award for lifetime contributions to the mechanical design field, 2005 American Society of Mechanical Engineers' Robert

E. Abbott Award for contributions to design engineering, Technical Editor of the international journal *Mechanics Based Design of Structures and Machines*, Chair of the Design Engineering Division of the American Society of Mechanical Engineers, and Vice President – Systems and Design of the American Society of Mechanical Engineers. I have also received the Society of Automotive Engineers' Ralph R. Teetor Award.

12. My areas of specialization are in the general area of mechanical systems analysis and design, and I have extensive experience in the design and development of devices and machinery for various applications including but not limited to vehicles, robots, and vehicle-based automated equipment. Moreover, I have been involved in the detailed analysis of many machines, machine elements, and mechanisms including, but not limited to, the ball screw mechanism, roller screw mechanism, and differential and planar mechanisms.

13. I taught courses in mechanical engineering in the general area of mechanical systems analysis and design at both the undergraduate and graduate levels. For example, I taught a course on design and dynamics of machinery, which primarily involved the design and analysis of mechanisms. At the graduate level, I developed courses in advanced mechanical design and on the design and dynamics of road vehicles, both of which taught methods of mechanism analysis. I also taught the capstone mechanical engineering senior design project course for about

20 years and have thus advised well over 100 senior design projects, virtually all of which have involved the design and analysis of mechanisms.

14. I regularly advised students on research projects in my area of expertise. In this role, I regularly served as an advisor to Ph.D. and master's degree candidates, and postdoctoral researchers. I have also advised student groups involved in the design of vehicles for various Society of Automotive Engineers' competitions.

15. I note that the term "skid steer" means that the equipment or device changes direction by propelling the opposite sides of the machine at different rates, as opposed to actively turning the wheels for example. Another term for "skid steer" is "differential steer." I have expertise on these types of devices as my initial work on differentially steered, wheeled devices started in the early 1990's when we began developing differentially steered wheeled mobile robots for use in highway maintenance tasks.

16. I have also published extensively in the field of mechanical systems design and analysis including those articles listed in EX1036.

III. LEVEL OF ORDINARY SKILL IN THE ART

17. I understand there are multiple factors relevant to determining the level of ordinary skill in the pertinent art, including (1) the levels of education and experience of persons working in the field at the time of the invention; (2) the

sophistication of the technology; (3) the types of problems encountered in the field; and (4) the prior art solutions to those problems.

18. I understand that the '386 Patent was filed April 21, 2015 and claims priority to February 20, 2015. My analysis reflects the views of a person of ordinary skill in the art ("POSITA") in the field of the '386 Patent as of February 20, 2015.

19. Here, a POSITA at the time of the claimed invention in February 2015 would have had a Bachelor of Science degree in Mechanical or Agricultural Engineering and two years of experience in the mechanical design of machines, or have had equivalent knowledge and experience. Lack of professional experience can be remedied by additional education, and vice versa. A person with less formal education but more experience, or more formal education but less experience, could have also met the relevant standard for POSITA. For purposes of this Declaration, in general, and unless otherwise noted, my statements and opinions, such as those regarding my experience and the understanding of a POSITA generally (and specifically related to the references I consulted herein), reflect the knowledge that existed in the field as of the earliest proper priority date of the '386 Patent (*i.e.*, February 2015). Unless otherwise stated, when I provide my understanding and analysis below, it is consistent with the level of a POSITA prior to the earliest alleged priority date of the '386 Patent.

20. I met the definition of a POSITA in February 2015. I also had a greater knowledge and experience than a POSITA. In my work discussed above, including as a professor, I worked with graduate students and others who had the knowledge and experience of a POSITA in February 2015, and I am able to render opinions from the perspective of a POSITA based on my knowledge and experience.

IV. RELEVANT LEGAL STANDARDS

21. I am not an attorney. In preparing and expressing my opinions and considering the subject matter of the '386 Patent, I am relying on certain basic legal principles that counsel have explained to me. These principles are discussed below.

22. I understand that prior art to the '386 Patent includes patents and printed publications in the relevant art that predate the proper priority date of the alleged invention recited in the '386 Patent.

23. I have been informed that a claimed invention is unpatentable under 35 U.S.C. § 103 if the differences between the invention and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. I have also been informed by counsel that the obviousness analysis takes into account factual inquiries including the level of ordinary skill in the art,

the scope and content of the prior art, and the differences between the prior art and the claimed subject matter.

24. I have been informed by counsel that the Supreme Court has recognized several rationales for combining references or modifying a reference to show obviousness of claimed subject matter. Some of these rationales include the following: (a) combining prior art elements according to known methods to yield predictable results; (b) simple substitution of one known element for another to obtain predictable results; (c) use of a known technique to improve a similar device (method, or product) in the same way; (d) applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; (e) choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; and (f) some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

25. I further understand that certain factors may support or rebut the obviousness of a claim. I understand that such secondary considerations include, among other things, commercial success of the patented invention, skepticism of those having ordinary skill in the art at the time of invention, unexpected results of the invention, any long-felt but unsolved need in the art that was satisfied by the

alleged invention, the failure of others to make the alleged invention, praise of the alleged invention by those having ordinary skill in the art, and copying of the alleged invention by others in the field. I understand that there must be a nexus—a connection—between any such secondary considerations and the alleged invention. I also understand that contemporaneous and independent invention by others is a secondary consideration tending to show obviousness.

26. I am not aware of any allegations by the named inventor of the '386 Patent or any assignee of the '386 Patent that any secondary considerations are relevant to my obviousness analysis of any Challenged Claim of the '386 Patent. I have briefly reviewed the allegations by the assignee of the '386 Patent of certain secondary considerations during earlier proceedings of at the U.S. Patent Office and find those allegations were directed to the obviousness of an alleged improvement of placing a four-bar mechanism disclosed on larger equipment *replacing* a two-bar mechanism disclosed on smaller equipment. This is not the framework of my obviousness analysis.

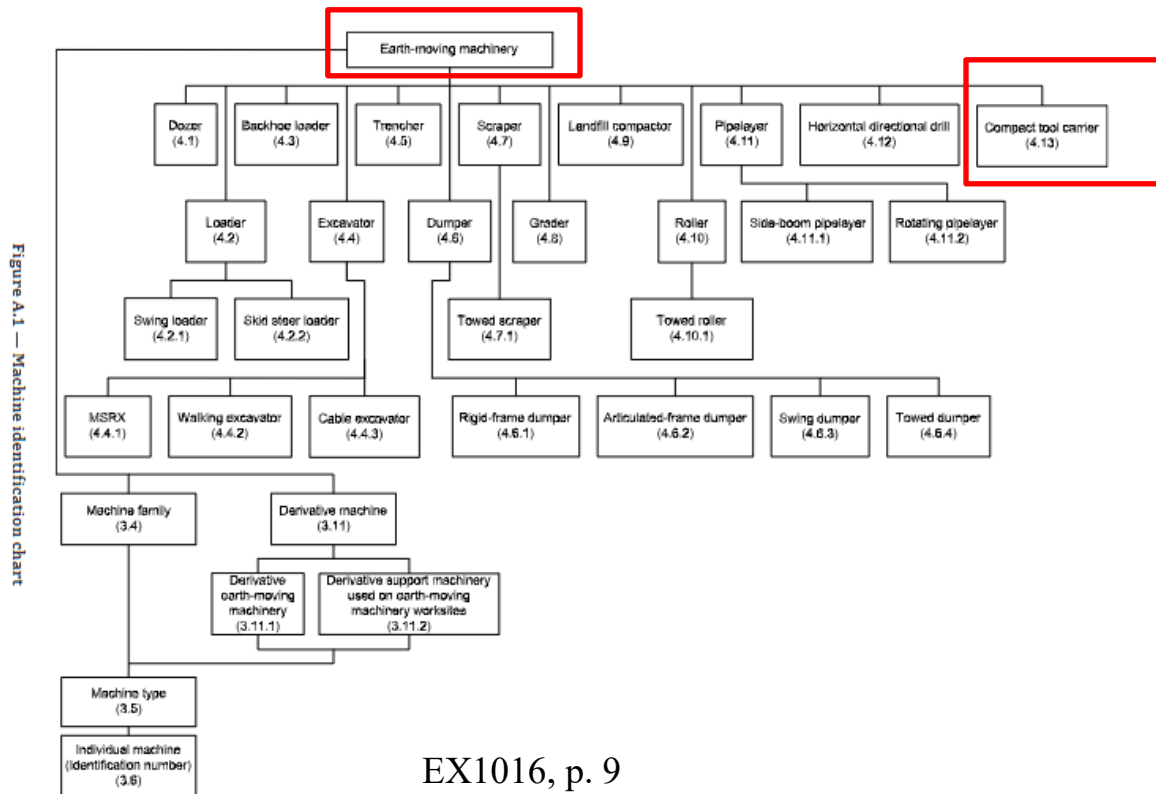
V. BACKGROUND TECHNOLOGY

27. In this section, I provide some background information relating to vehicle design including mechanisms such as different types of linkages. The concepts embodied in claims of the '386 Patent are not new as of the priority date and do not represent the combination of known elements that resulted in an

unexpected and unanticipated result.

Machinery Type

28. As explained in the summary of the patent below, the '386 Patent is directed to a "compact tool carrier." A compact tool carrier, as illustrated in the '386 Patent, may also be referred to as a compact utility loader (CUL) or a mini-skid steer. These machines are smaller (e.g., in comparison with ride-on skid steers) equipment that are suitable for tight spaces and maneuverability. Exemplary uses include construction, landscaping, and the like. International Standard Organization (ISO), a well-known, recognized source for information for a POSITA, put forth ISO 6165 standard, which defines different types of equipment and is illustrative of compact tool carriers being one of those types:



29. The standard describes the class of machinery:

4.13

compact tool carrier

self-propelled crawler or wheeled machine having an *operating mass* (3.7) of less than 1 500 kg with a rigid frame, having either a pedestrian operating position or a standing operator platform at the rear of the machine and either front-mounted interchangeable *equipment* (3.9) or lift arms with an attachment bracket capable of coupling to interchangeable, front-mounted *attachments* (3.10)

EX1016, p. 7. A POSITA would recognize the '386 Patent, like at least KR996

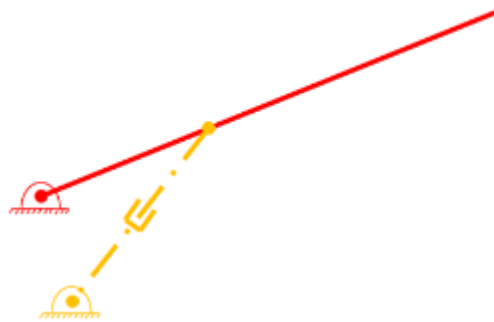
(EX1005), McIlwraith (EX1007), Bares '568 (EX1009), Bares (EX1010), Azure

(EX1013), and KR528 (EX1014) and others, are explicitly discussing this type of

machinery.¹

Loader Mechanism:

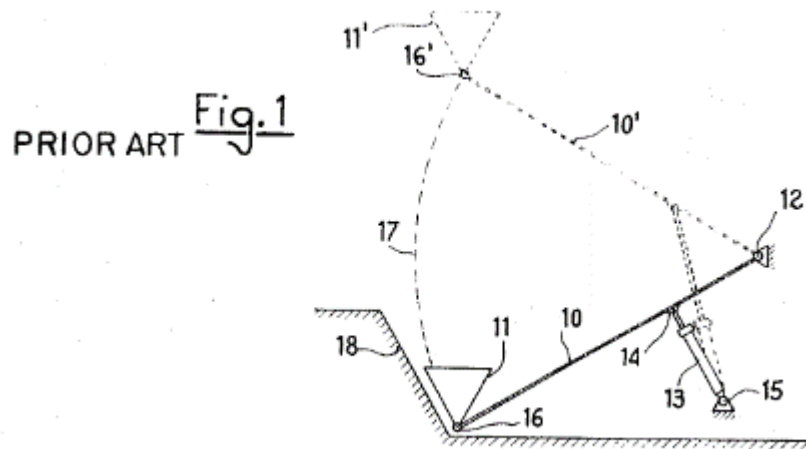
30. A loader or lift arm is attached to the carrier to provide for tools such as a bucket to perform the functionality of the equipment. One of the simplest well-known mechanisms providing motion for the loader arm is illustrated schematically below. This may also be described as a two-bar or radial lift mechanism.



31. In the context of a loader, the orange illustrates an actuator (also referred to as a cylinder or jack) driving the mechanism and the red illustrates a lift arm. Beltrami at FIG. 1 describes such a system as prior art, which illustrates a jack 13 pivotally connected at 14 to the arm 10 and at 15 to the tracked vehicle

¹ JP705 (EX1006) and Beltrami (EX1008) are not limited to any type of machinery.

body. Beltrami (EX1008), 2:41-48.



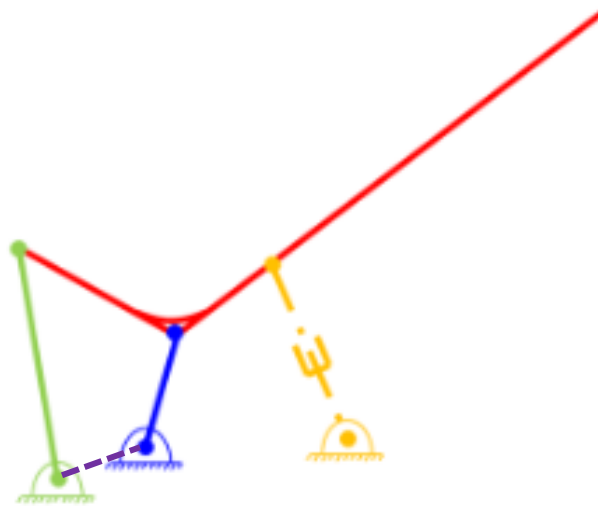
EX1008, FIG. 1

Bares '568 illustrates a similar system in its FIGS. 1, 3 with an assembly that includes an arm 24A attached at a pivot 21 to supports 22 with a cylinder 26 pivotally mounted the frame 12 and pivotally connected at pivot pins 30 to the arm 24. Bares '568 (EX1009), 2:49-2:15.

32. Another type of mechanism is a four-bar linkage, also called a four-bar mechanism or simply four-bar. Four-bars are, while slightly more complex than the two-bar mechanism, a very simple mechanism widely employed across various machines. Due to its wide use, this type of mechanism is introduced early in undergraduate mechanical engineering courses in which detailed methods of design and analysis are taught. *See, e.g.,* EX1028, Theory of Machines and

Mechanisms, Shigley, J.E. and Uicker, J.J. Jr., McGraw Hill, 1980; EX1023, Mechanisms and Mechanical Devices. One four-bar mechanism is illustrated schematically below. Such a mechanism is depicted by 3 moving bars or links (also referred to here as linkages), those illustrated in green, red and blue, and 1 stationary bar, an imaginary link shown in purple connecting the fixed pivot points. Note that the fixed pivot points would have no relative motion with the machine that supports the four-bar. The red link is typically referred to as the coupler. Based on the design of the mechanism (e.g., the lengths of the 4 links), the green and blue links may make a full rotation, referred to as a crank, or move back and forth through an angle in which they are referred to as rockers. Also, the input to the mechanism is typically a motor, which is attached to either the green or blue link, and/or an actuator, illustrated in orange, which can be connected to any of the 3 moving links. Generally, the actuator may be attached at any location on a link to drive the mechanism. Note that the actuator position is a design choice based on the working load of the mechanism and the force that the selected actuator can generate. The four-bar mechanism has a mobility equal to one, which means that it has one-degree-of-freedom and that only one input parameter (e.g., the position one of the moving links) is needed to place the mechanism in a particular position. Note that the figure below is a kinematic diagram of the mechanism for purposes of design and analysis. The pivot points connecting the adjacent links define the

links' kinematic lengths, but the actual link shapes are determined by the specific application. Thus, as illustrated, in this implementation, the red link, or coupler, is pivoted at the points attached to the green and blue links respectively and is approximately L-shaped as shown.



33. The four-bar mechanism is used for 3 different types of design cases: function generation, motion generation and path generation. For function generation, one link (e.g., either the green or blue link illustrated above) is defined as the “crank” and the other link (e.g., the other one of the green or blue link illustrated above) is defined as the “follower.” Function generation involves a prescribed relationship between the crank’s angular displacement and the follower’s angular displacement. Motion generation concerns the prescribed position and orientation of the coupler. Path generation concerns the prescribed

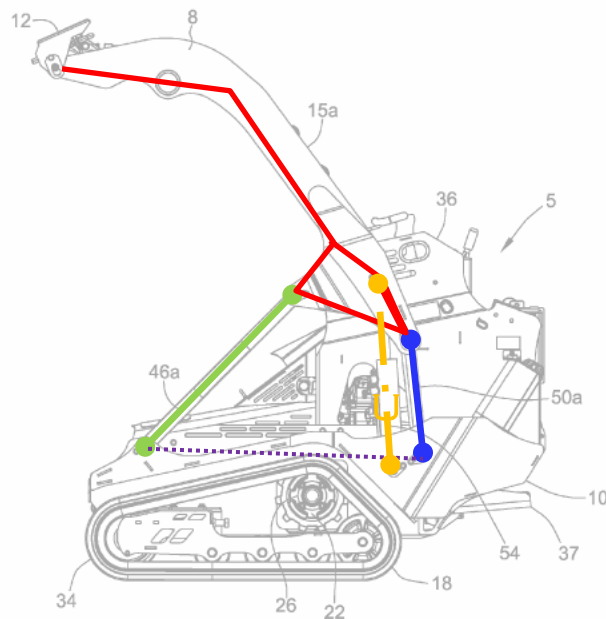
path of a point on the coupler, which is referred to as the coupler point.

34. Four-bar mechanisms are found in a tremendous number of machines—large and small. For a function generation example, the windshield wipers of an automobile are a crank-rocker type of four-bar in which a continuously rotating motor drives the crank and the follower has the wiper attached and rocks back and forth. An automobile's suspension is an example of a motion generation design in which the wheel and tire are prescribed to have a specific position and orientation through their motion relative to the vehicle's frame to maintain a generally vertical orientation and a generally constant track. The four-bar of the loader such as discussed below can be considered a path generation example as the motion is prescribed of a specific coupler point, the pivot point of the tool attachment plate. The four-bar is perhaps the most widely studied mechanism in history. The initial formal design and analysis methods date back to the 1800's and there have been hundreds of publications since the 1970's on four-bar path and function generation. *See, for example, EX1026, Linkage Coupler Curve Synthesis: A Historical Review-II. Developments after 1875, Nolle, H., Mechanism and Machine Theory, Vol. 9 pp. 325-348, 1974; EX1027, Lee, W.-T. and Russell, K., Inverse Problems in Science and Engineering, Developments in quantitative dimensional synthesis (1970–present): four-bar path and function generation, 1280-1304.*

35. When designing a mechanism such as a four-bar mechanism for an

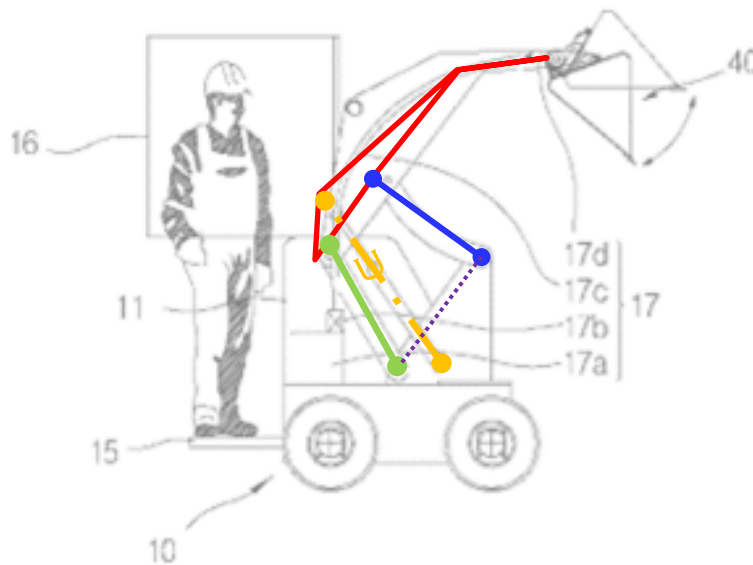
application, one may approach the design by providing known link dimensions and calculating the output motion, which is referred to as a kinematic analysis. Or conversely, in a dimensional synthesis, the link dimensions may be calculated to achieve a prescribed output motion. The link dimensions include link lengths, link positions and joint (pivot point) coordinates. *See, e.g.,* EX1024, Pareto optimal synthesis for four-bar mechanisms for path generation, 2008; EX1028, p. 4; EX1023, p. 117.

36. In the context of a loader, a four-bar mechanism is implemented by a cylinder (**orange**) driving the mechanism, a lift arm (**red**) provides a coupler, the links (**blue** and **green**) (also referred to as linkages) providing the bars (follower/crank), and the frame of the loader providing the stationary fourth bar (**purple**) extending between the links. And may be referred to as a vertical lift loader. The '386 Patent loader arm is an example of a four-bar mechanism. In this design, the actuator is connected to the coupler (lift arm). A kinematic diagram designating the four-bar mechanism is overlaid on FIG. 3:



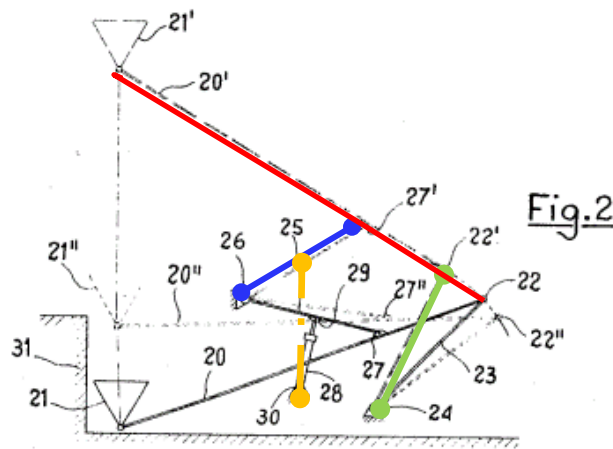
EX1001, FIG. 3
(annotated)

37. Similarly, the loader of KR996 (EX1005) is an example of a four-bar. Again, a kinematic diagram designating the four-bar is overlaid on KR996's Fig.



KR996 (EX1005), FIG. 21
(annotated)

38. Including in the context of its Fig. 2, Beltrami also illustrates a four-bar. In this case, the actuator is not directly connected to the coupler (lift arm), but is connected to one of the other links. Beltrami is an example of a Watt-style four-bar mechanism, which produces approximately straight-line motion. See, e.g., EX1025, p. 150; EX1023, p. 7.



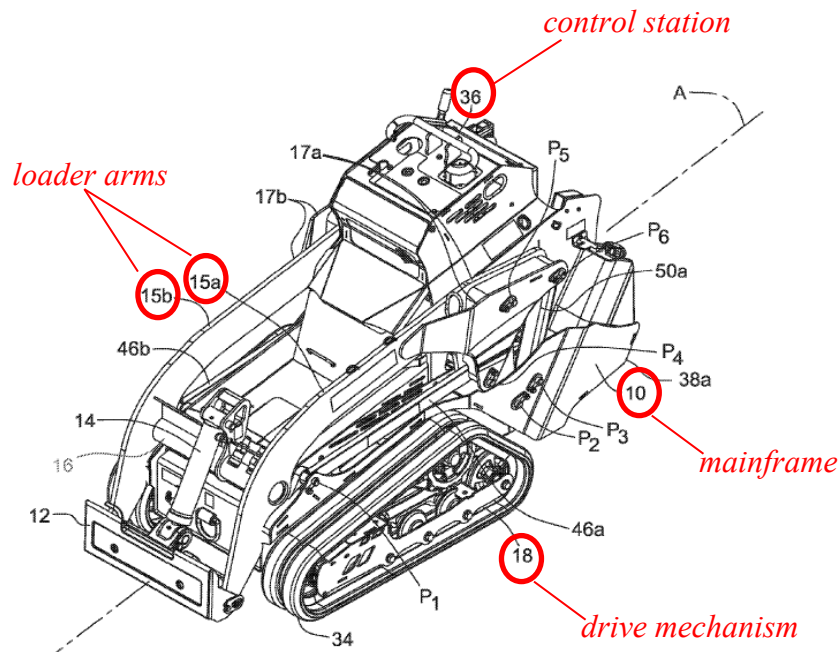
EX1008, FIG. 2

See also, Beltrami (EX1008), FIG. 3.

VI. OVERVIEW OF THE '386 PATENT

39. The '386 Patent relates to compact tool carriers having a loader (with two loader arms) designed for operation by an operator standing towards or at the rear of the carrier. '386 Patent (EX1001), 1:12-28. In its background, the '386 Patent asserts its compact tool carriers "may be distinguished from much larger conventional skid steers in which an operator is seated in the operating position." '386 Patent (EX1001), 1:32-36. A variety of interchangeable tools may be provided as front-mounted attachments such as buckets, augers, and the like. '386 Patent (EX1001), 1:28-31.

40. 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. '386 Patent (EX1001), 2:44-46. A drive mechanism 18 is attached to the mainframe 10 and may include tracks (as shown) or wheels. '386 Patent (EX1001), 3:20-30. And 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. '386 Patent (EX1001), 3:31-61.

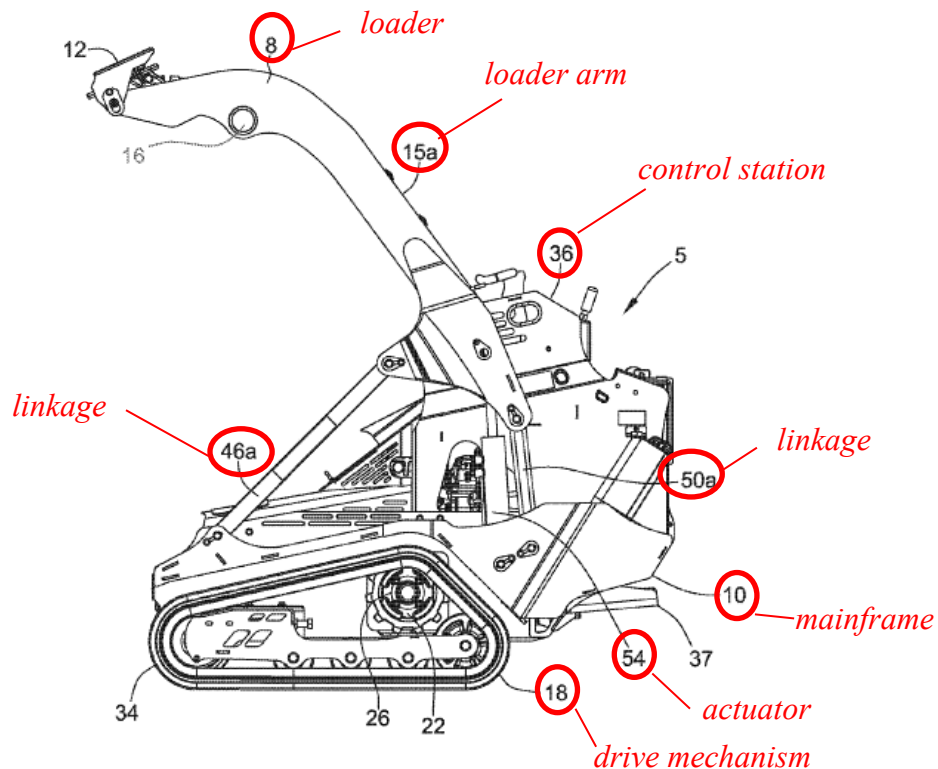


'386 Patent (EX1001), FIG. 1
(annotated)

41. 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. '386 Patent (EX1001), 4:13-16. Each loader arm is

attached to a respective side of the mainframe by a linkage 46a, an actuator 54 (e.g., a hydraulic cylinder), and a linkage 50a. '386 Patent (EX1001), 4:13-60.

FIG. 1 above 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. '386 Patent (EX1001), 2:27-30. This is a vertical lift loader as discussed above.



'386 Patent (EX1001), FIG. 3
(annotated)

VII. PROSECUTION HISTORY OF THE '386 PATENT

A. Original Prosecution

42. In response to an office action rejecting all then-pending claims, I understand the Applicant amended its claims to specify the loader configuration

(i.e., its attachment to the frame) and the operator's position in the equipment;

amended claim 14 is illustrative:

14. (Currently amended) A compact tool carrier comprising:

a loader adapted to carry a tool;

a mainframe for supporting the loader, the mainframe having a first side and a second side, each side having a top and a bottom, the first side of the mainframe having at least two pivot points relative to the loader, the loader not being directly attached to the mainframe; [[and]]

a linkage pivotally attached to the first side of the mainframe at a pivot point and pivotally attached to the loader;

an actuator pivotally attached to the first side of the mainframe at a pivot point and pivotally attached to the loader;

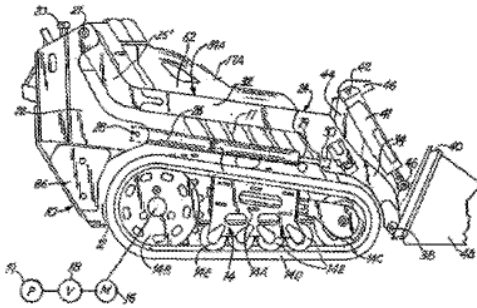
a drive mechanism comprising tracks or wheels for propelling the compact tool carrier apparatus over a supporting surface, the drive mechanism being attached to the mainframe about a rotational axis, the compact tool carrier having a bottom at which the drive mechanism contacts the supporting surface, the rotational axis and bottom of the compact tool carrier being separated by a vertical distance D1, the rotational axis and each pivot point being separated by a vertical distance, each vertical distance between the rotational axis and a pivot point being less than 1.5 times D1, and

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.

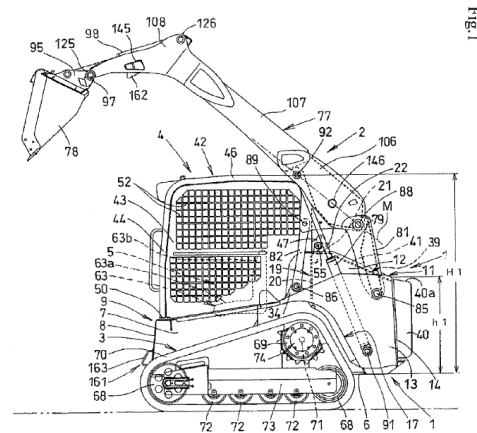
EX1002, pp. 59-60

43. A final Office action then issued rejecting all claims over a combination of Yasuda (EX1022), which illustrates the claimed loader configuration including its attachment to a mainframe (i.e., a four-bar mechanism), and Bares '568 (EX1009), which illustrates equipment having a control station for walk-behind operation (i.e., a compact utility loader). EX1002, p. 52.

Representative Yasuda and Bares '568 figures are illustrative:



EX1009, (Bares), FIG. 1



EX1022, (Yasuda), FIG. 1

44. Without contesting the teachings of each reference, I understand the Applicant argued against the **combination** asserting one would not look to combine a larger skid-steer machine with a cabin (Yasuda) and a small self-propelled vehicle (Bares '568). EX1002, pp. 43-48. After the rejection was maintained, the Applicant amended the pending claims to include an *engine bracket* to support its argument that one would not have modified as proposed in the rejection as the operator position is incompatible with the engine placement. EX1002, p. 21. After an interview, a Notice of Allowance issued. EX1002, p. 5.

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

45. The '386 Patent was subject to two reexamination proceedings.² I understand that like in the original prosecution, these proceedings turned on whether it was obvious to combine a mini compact tool carrier (mini skid-steer) having stand-behind operation and a radial lift loader, with a loader from a larger skid-steer having an operator cabin and a vertical lift loader. Each of the proceedings were requested by the same third-party, Toro. In these proceedings, Patent Owner argued that such a combination fails due to physical constraints of the smaller equipment (e.g., available space, weight of loader) vis-à-vis the size of the vertical lift loader, no reasonable expectation of success of placing vertical lift loader onto the smaller equipment, and/or secondary considerations directed to the non-obviousness of placing vertical lift loader onto the smaller equipment. The Examiner, while 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** [the Third Party Requester]...did not

² I understand that these 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.

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 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. Prosecution History Summary

46. Thus, I understand that the Patent Owner overcame claim rejections that relied upon an obviousness framework of placing a known vertical lift style loader in line with the four-bar mechanism I discuss above, onto a known compact tool carrier. I do not rely on this framework in the present petition. Therefore, I do not offer any opinion as to the veracity of the Patent Owner’s previously submitted “evidence” of such a combinations’ inoperability nor the alleged indicia of non-obviousness. I do note that the KR996 reference illustrates placing a loader onto a compact utility carrier was already known in the prior art. And as I discuss above, four-bar mechanisms were implemented in a variety of contexts including a variety

of sizes and applications long before the '386 Patent. Further, there is a predictable difference in the resulting path of the coupler point or bucket attachment when a loader is configured as radial lift (a two-bar mechanism) in comparison with such a point in a loader configured as a vertical lift (four-bar mechanism); this would have been readily recognized by a POSITA as a result of the mechanism implemented.

47. In contrast to those invalidity positions previously presented, I discuss a primary reference, KR996, that shows it was known in the art to provide, in a single embodiment, a compact tool carrier having a vertical lift loader implementing a four-bar mechanism.

VIII. EFFECTIVE PRIORITY DATE OF THE '386 PATENT

48. I have been told to assume that the '386 Patent is entitled to a priority date of February 20, 2015. I have not undertaken a priority date analysis for the purposes of this declaration.

IX. CLAIM CONSTRUCTION

49. It is my understanding that in order to properly evaluate the '386 Patent, the terms of the claims must first be interpreted. It is my understanding that for the purposes of this *inter partes* review, the claims are to be construed under the so-called *Phillips* standard, under which claim terms are given their ordinary and customary meaning as would have been understood by one of ordinary skill in the art in light of the specification and prosecution history, unless the inventor has

set forth a special meaning for a term. For the purposes of this declaration, it is my opinion that the claim terms should be given their plain and ordinary meaning.

X. IDENTIFICATION OF HOW THE CLAIMS ARE UNPATENTABLE

A. Challenged Claims

50. This declaration is directed to claims 31-49, 70-79, and 86-87 of the '386 Patent. I have made no analysis as to the patentability of claim 14. I understand claims 16 and 18 have been canceled.

B. Statutory grounds for challenges

Grounds	Claims	Basis
#1	31-36, 38-39, 41-44, 45-49, 86-87	35 U.S.C. §103 over KR996 and JP705
#2	37, 40, 70-79	35 U.S.C. § 103 over KR996, JP705, and Bares

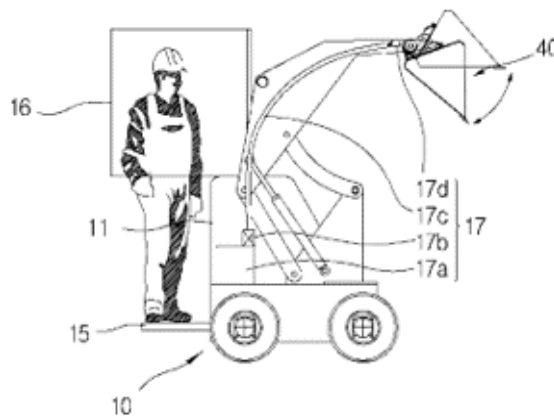
C. Ground 1

1. KR996 (EX1005)

51. KR996 is entitled “Environmentally Friendly Construction Equipment for Building Deconstruction Work.” KR996 (EX1005), (54).³ 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

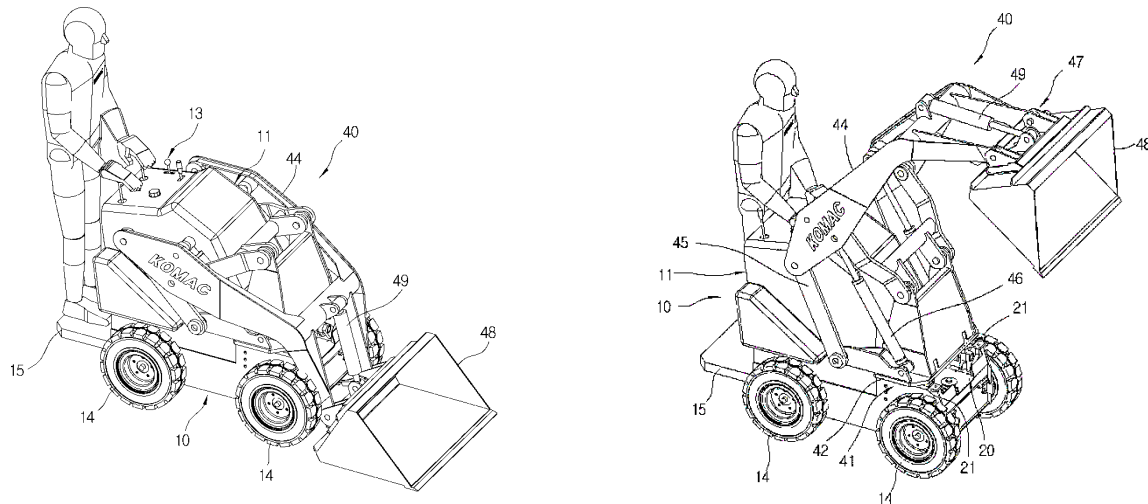
³ Citations are to the English translation of KR996. KR996 (EX1005).

maintenance, snow removal, and towing.” KR996 (EX1005), [0001]-[0002]. In particular, KR996 provides a vehicle 10 to which, interchangeably, a loader unit 40 or an arm unit 60 is attached. KR996 (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. KR996 (EX1005), [0113]-[0114].

**KR996 (EX1005), Fig. 21**

52. The vehicle 10 includes a control unit 13 for operating of the vehicle including the installed unit (here the loader unit 40) by an operator positioned on a folding safety step 15 at the rear of the vehicle. KR996 (EX1005), [0042], [0049], [0072], Figs. 8-9. The loader 40 includes a boom 44 connected to the mainframe of the vehicle by intermediary parts—a link 45, a link (unlabeled), and a boom cylinder 46. *Id.* Fig. 8 and Fig. 9 are illustrative of the loader in lowered and raised

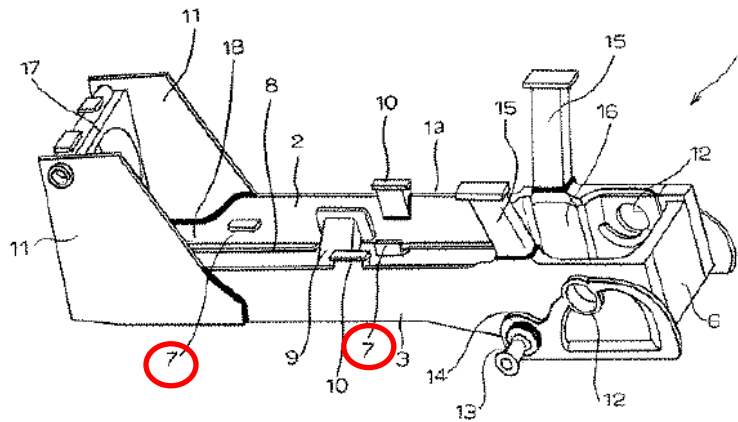
positions, respectively.



KR996 (EX1005), Fig. 8 (portion), Fig. 9

2. JP705 (EX1006)

53. 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.” JP705 (EX1006), [0001]. A main frame 1 has a pair of parallelly extending left and right side plates 2, 3. JP705 (EX1006), [0019]. “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

54. 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). KR996 (EX1005), Abstract, [0001], FIG. 21; JP705 (EX1006), Abstract, [0001], FIG. 1; '386 Patent (EX1001), 1:17-48, 2:44-3:2, FIG. 1. JP705 specifically suggests applying its teachings to an excavator, which is similarly a function of the vehicle of KR996 and the '386 Patent. JP705 (EX1006), [0017]; KR996 (EX1005), [0005]; '386 Patent (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 - securely mounting components onto a frame to effectuate the operation of a vehicle. KR996 (EX1005), Fig. 12; JP705 (EX1006),

[0006]-[0008], FIG. 1; '386 Patent (EX1001), 4:4-16, 5:52-55, FIG. 6.

55. A POSITA would have been motivated to combine the teachings of JP705 with KR996 to produce predictable and beneficial results as discussed below.

56. First, the vehicle of KR996 has an engine disposed within its frame to provide energy to propel the vehicle. A POSITA would understand that KR996's Figs. 10 and 12 illustrate a component that is a motor (engine). This is confirmed by EX1014, which is a Korean publication sharing the same inventor and affiliated company as KR996. KR528 (EX1014), FIG. 3. Moreover, certainly, power is provided to the KR996 vehicle to propel it forward. There are well-known choices to provide this power: (1) an engine with benefits of power, speed, well-established and widespread availability, (2) electric power, which needs a battery taking long to charge; (3) solar power, which is dependent upon the environment; (4) operator-powered (limited in speed and distance based on operator). KR996, with its ride-on platform, does not suggest requiring human-power, nor suggest solar or electric power. Further, a POSITA would recognize an engine is a commonly implemented power source for these types of vehicles. *See, e.g.*, ISO 6165 (EX1016), p. 7 ("self-propelled"), SAE J2752 (EX1015), p. 4 suggesting "engine" components; Azure (EX1013), [0003] "Walk-behind power machines such as wide-area lawn mowers and compact utility skid-steer loaders have been in use for some time. These

vehicles generally include a frame having an engine that not only powers drive members, but an optional implement such as a cutting deck or trencher as well.”); EX1009 (Bares ’568), 2:32-48 (“a small loader indicated generally at 10 is a walk behind powered loader ...driven by an internal combustion engine 45...”).

57. It is common practice to use a bracket to secure the engine to the mainframe of such a vehicle. There are only a few places on the mainframe to provide such as a bracket – e.g., front, back, two sides. A POSITA would have known to select a bracket extending from the sides of the mainframe as this positions the engine between the two parallel sides providing balance.

58. Second, JP705 teaches providing a mounting surface for such an engine in a substantially similar vehicle; these 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. In my experience, mounting an engine, such as in a compact utility loader, is typically done using an engine bracket. The engine bracket serves to securely attach the engine. Moreover, the engine can serve as a structural member further increasing the stiffness of the connection between the two parallel frame elements. This would be especially important in instances in which the load is not uniformly distributed to both loading arms.

59. JP705 describes a main frame that works generally with many types

of vehicles, it provides benefits that work particularly well with a compact vehicle:

The attachment parts for attaching the various attachment members fixed to a portion of the inner side surface of the frame's main body are set to the **minimum necessary size**, and in order to eliminate interference with the various on-board devices, the inner side surface of the attachment part for attaching the various attachment members and the inner side surface of the mounting parts of the frame's main body are **cut away as much as necessary**, and the attachment parts for attaching the various fastening members are fixed and integrated so that the fastening parts or the like do not protrude, thereby ensuring a continuous installation space that does not interfere with the various on-board devices. The inner width dimension of the frame's main body can be set large **without increasing the outer width**, and the **weight of the main frame can also be reduced**.

JP705 (EX1006), (57) (SOLUTION), emphasis added, reference numbers removed. As such, the mainframe of JP705 saves both size and weight, which would work particularly well with KR996's compact vehicle. A POSITA would recognize aspects of the mainframe of JP705 such as the bracket would apply to KR996 including due to a desire for lightweight component.

60. Using JP705's mounting parts 7 (*engine bracket*) extending from a frame provides a benefit of avoiding use of additional parts to secure the engine in the vehicle. JP705 (EX1006), [0008]. JP705 itself suggests providing mounting parts extending from a frame reduces the number of fastening parts (such as a bolt,

nut, collar, or the like) required. JP705 (EX1006), [0008] [0016]. And this reduction of parts allows for a reduction in component costs and weight. JP705 (EX1006), [0008]. Forming the mounting parts 7 integrally with the main frame through conventional welding processes prepares the receiving surface, advantageously a “smooth, continuous surface,” early in the manufacturing process. *See* JP705 (EX1006), [0016], [0031]. In addition to reducing the number of parts, welding the engine bracket directly to the frame eliminates additional intermediate fasteners that could loosen over time thus reducing both the security of the attachment and the corresponding structural rigidity of the system. Further, integrating the mounting parts and a frame allows for efficient loading of an engine onto the available, previously prepared, designated mounting surface it provides. JP705 (EX1006), [0013], [0018], [0022]. A POSITA would recognize these same benefits would be gained by implementing JP705’s mounting parts 7 for mounting an engine in KR996’s compact vehicle.

61. Thus, this combination is merely applying a known technique to a known device (e.g., JP705’s 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 suitable to receive the engine extending from the frame) to yield predictable results.

62. The results of combining JP705’s technique 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 and toward the rear of a frame. Modifying KR996's vehicle to provide mounting parts extending from the sides of the frame would have been a straightforward and simple matter of utilizing the engine mounting feature for its known function. JP705 describes that welding operations to form the mounting parts extending from the frame can be performed "stably [], easily, and efficiently." JP705 (EX1006), [0016]. Further, in evaluating the suggested frame of KR996 (*see* Fig. 10), a POSITA would recognize that there is available space on the KR996 frame to provide JP705's mounting parts 7 extending therefrom.

4. Claim 31

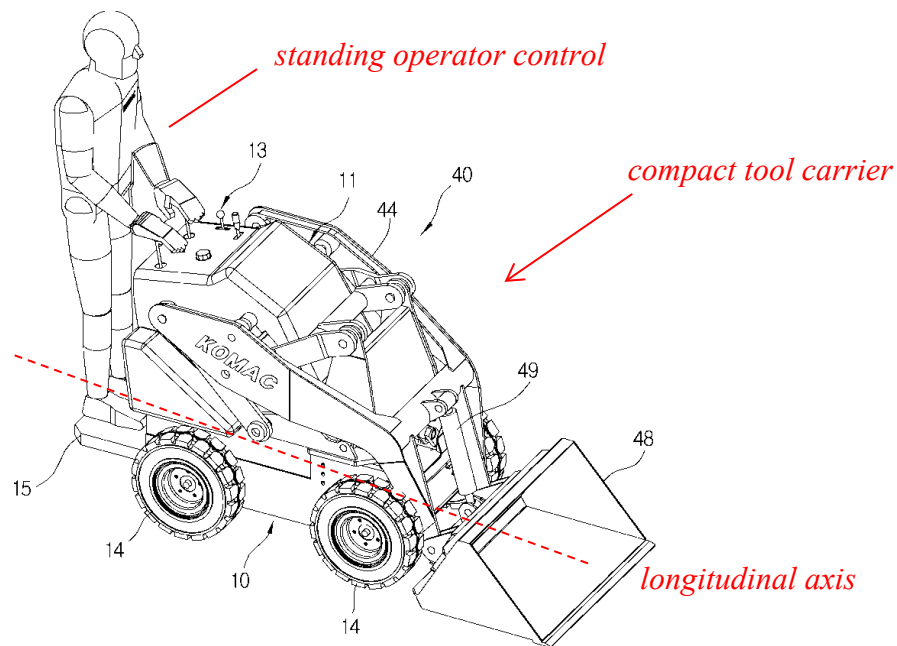
[31.0] *A compact tool carrier configured for standing or walk-behind operator control and having a longitudinal axis and a mass of less than about 1500 kg, the compact tool carrier comprising:*

63. KR996 provides this limitation.

64. As discussed above, KR996 describes a self-propelled vehicle (*a compact tool carrier*) capable of carrying interchangeable equipment for building deconstruction work providing maneuverability in small spaces having the functionality of a mini skid loader with an attachment of a bucket. EX1005, Abstract, [0001]-[0012]. The vehicle is a *compact tool carrier* as it has the same configuration as described in the '386 Patent (*see, e.g.,* Fig. 1). And a POSITA

would recognize that the KR996 vehicle also falls under the “compact tool carrier” as defined by ISO 6165 as being earth-moving machinery that is a “compact tool carrier [a] self-propelled crawler or wheeled machine ...having either a pedestrian operating position or a standing operator platform at the rear of the machine and either front-mounted interchangeable equipment (3.9) or lift arms with an attachment bracket capable of coupling to interchangeable, front-mounted attachments (3.10).” ISO 6165 (EX1016), pp. 7, 9.

65. KR996’s compact tool carrier is configured for *standing or walk-behind operator control* and has a *longitudinal axis*. KR996 at Fig. 8 is illustrative:



KR996 (EX1005), Fig. 8 (portion)
(annotated)

See also, KR996 (EX1005), [0033] (“foldable safety step is installed on the lower rear part of the vehicle, allowing the operator to board”), [0049].

66. This is the same configuration for operator control as provided in the '368 Patent. EX1001, 3:38-42 (“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.”).

67. A 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. This is because KR996 describes its functions as “building interior demolition,” “effective operations for fruit farming, gardening, and landscaping,” “suitable for narrow spaces.” KR996 (EX1005), [0002]. And the standing operator platform suggests a light-weight carrier, illustrated with a scale with respect to human.

68. Further, recognized standards covering the KR996 vehicle define a weight of *less than about 1500 kg*, as recognized by the '386 Patent. EX1016, Organization for Standardization (ISO) 6165 (2012), p. 7 states compact tool carriers having an operator standing platform are less 1500 kg. EX1015, Society of Automotive Engineers (SAE), J2752 June 2010, p. 2 confirms “an operating mass of less than 1500 kg.” *See also*, '386 Patent (‘386 Patent (EX1001)) in its

Background Section (1:19-26) that states “tool-mounted machines that are capable of working in tight spaces for utility...[and are] walk-behind units of include a platform on which the operator may stand during use [] are **generally defined** [as] having **an operating mass of less than 1500 kg.**”⁴ Thus, a POSITA would recognize a benefit to keeping the weight of KR996 vehicle less than 1500 kg to comply with the relevant standards as well as provide a maneuverable vehicle.

69. Thus, KR996 teaches a *compact tool carrier* of [31.0].

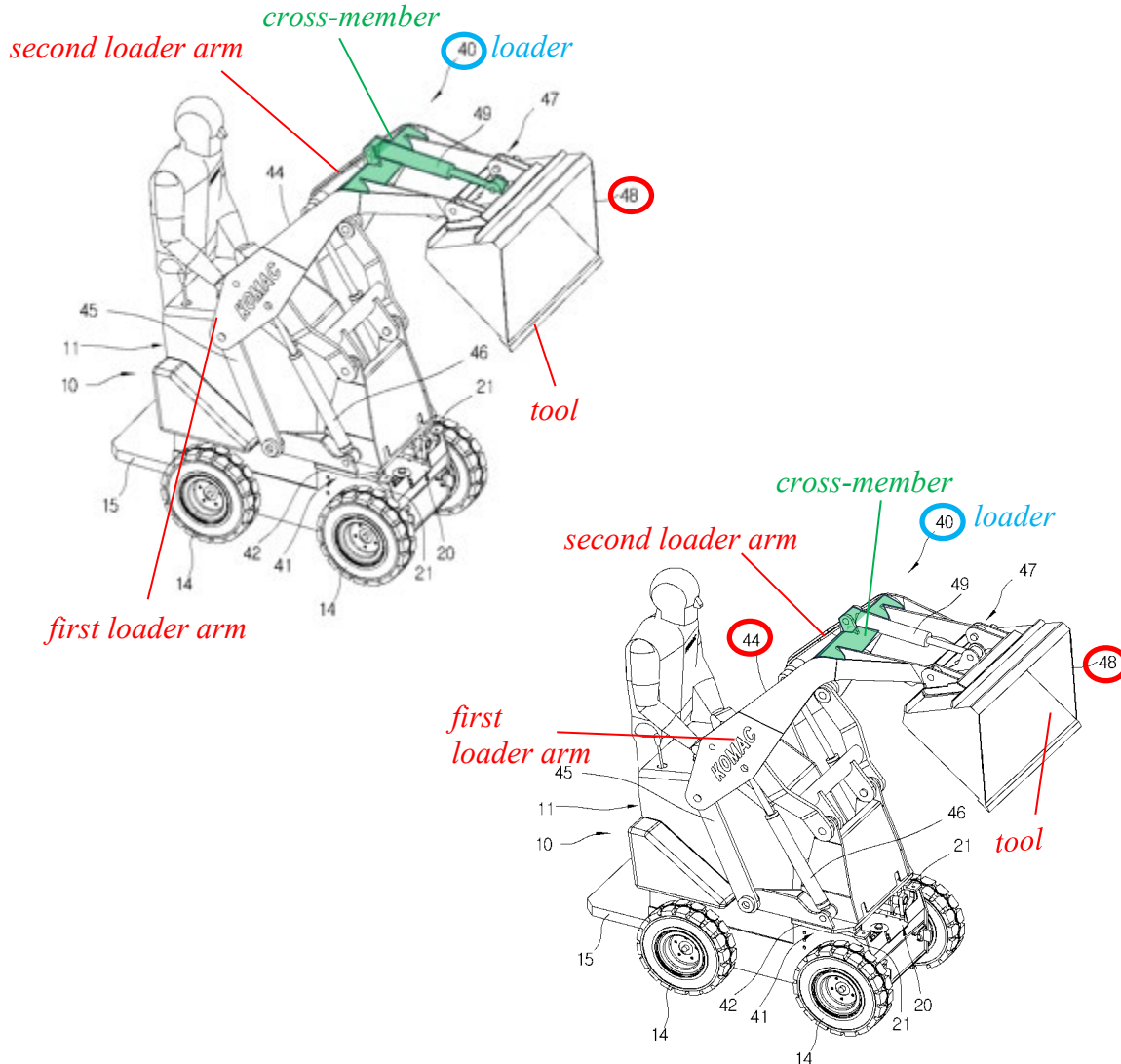
[31.1] a loader adapted to carry a tool, the loader being moveable between a down position and a vertically raised position, the loader comprising: a first loader arm; a second loader arm; and at least one cross-member that extends from the first loader arm to the second loader arm;

70. KR996 teaches this element.

71. KR996 provides *a loader* including loader unit 40, *moveable between a down position* (Fig. 8) *and a vertically raised position* (e.g., Fig. 9) and *having two booms 44 (first loader arm and second loader arm)*. EX1005, (57), [0016], [0036], [0040], [0054], [0131], Figs. 7-11. The loader unit 40 is *adapted to carry a tool*, as illustrated by a bucket 48 (*tool*) attached to the loader unit 40 and booms 44. EX1005, claim 1, [0054], [0074]-[0075], Figs. 8-9. The bucket is a “tool” just as described in the ’386 Patent. ’386 Patent (EX1001), 1:28-31 (“tools such as buckets, augers...and the like.”) Further, KR996 includes a cross-member (*at least*

⁴ All bold emphasis in quotations is added.

one cross-member) that extends from a first boom 44 to a second boom 44 (first loader arm to the second loader arm). Figs. 8-9 are illustrative:



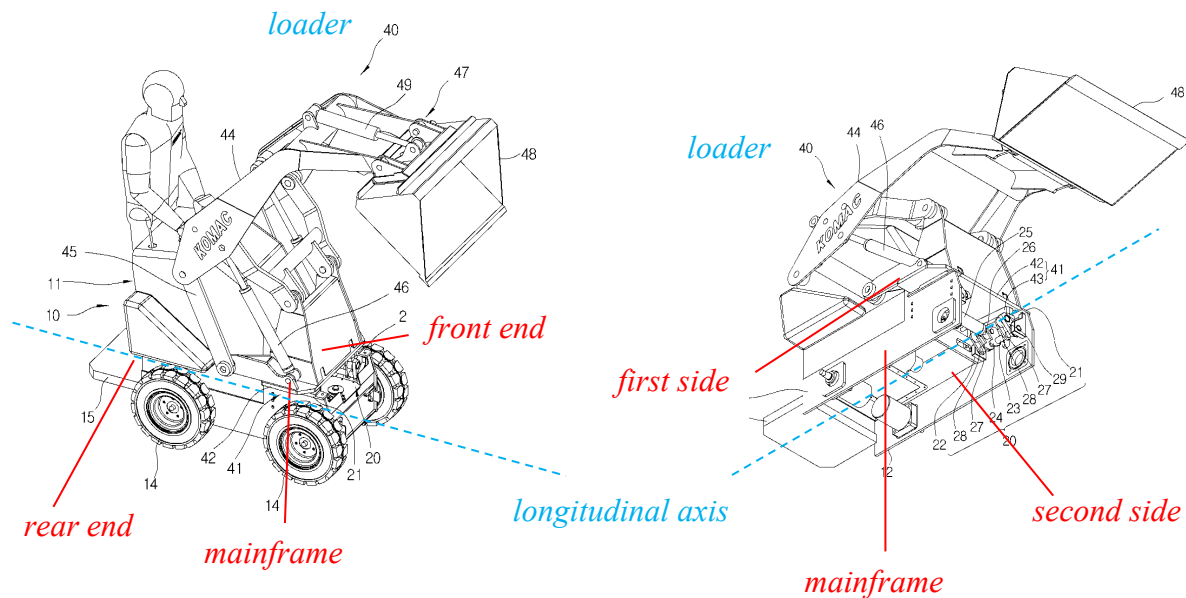
KR996 (EX1005), Fig. 8 (portion) and Fig. 9 (annotated)

72. Thus, KR996 teaches [31.1].

[31.2a] 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,

73. KR996 teaches this element.

74. The vehicle of KR996 includes a *mainframe for supporting the loader* unit 40 (*loader*) and having respective [*first/second*] *sides* and [*front/rear*] *end[s]* relative to the longitudinal axis. KR996 (EX1005), Figs. 8, 9, 10. Annotated Figs. 9 and 10 are illustrative:



KR996 (EX1005), Figs. 9, 10
(annotated)

KR996's mainframe 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. I understand the 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 specification uses the term ‘mainframe.’” EX1002_3, p. 235. KR996 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.

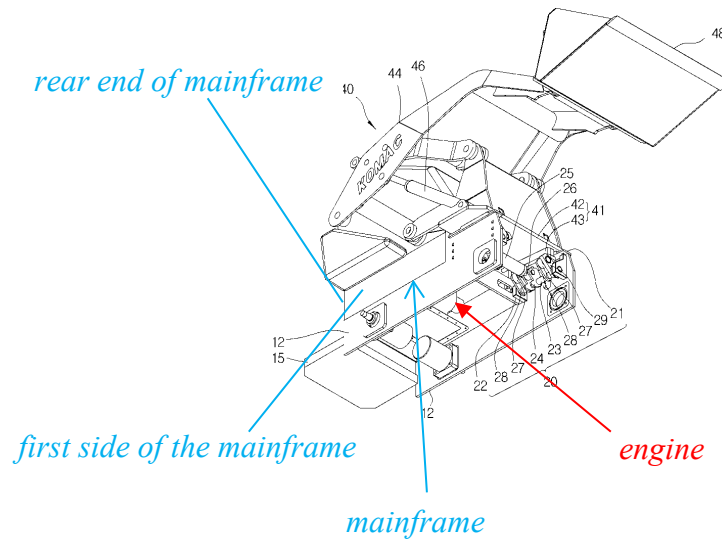
75. I note that the mainframe of the '386 Patent "mainframe 10 includes brackets...through which various pivot linkages are attached" 4:8-10. KR996 describes embodiments of its body in two portions, when in operation the mainframe of the vehicle is in one piece providing support for the loader.

76. Thus, KR996 teaches [31.2a].

[31.2b] 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,

77. KR996 in view of JP705 renders obvious this limitation.

78. KR996's vehicle includes *an engine* for propelling the vehicle. I have annotated Fig. 10 below as illustrative of the engine.



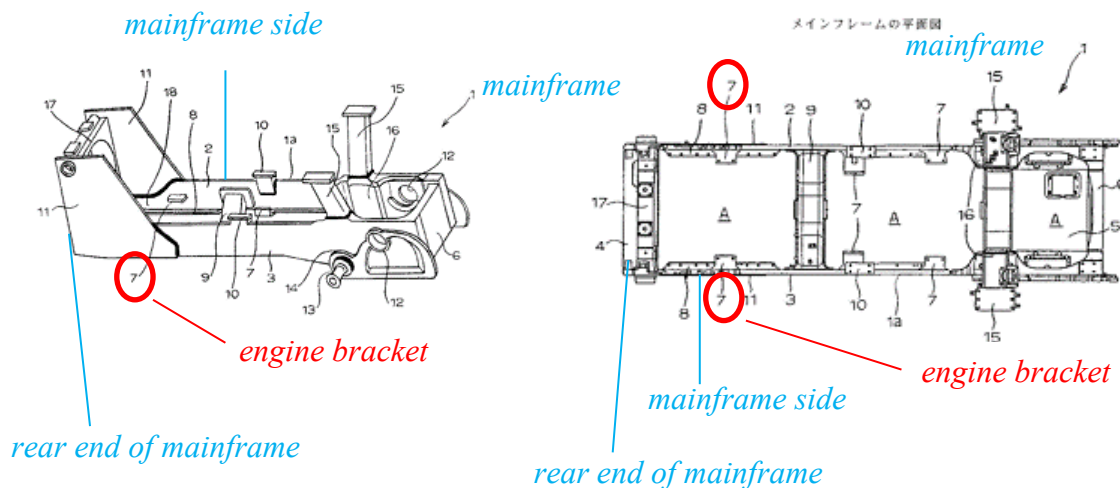
KR996 (EX1005), Fig. 10
(annotated)

See also, Fig. 12, claims 1, 2, [0002]-[0005].

79. As I discussed above, the engine and its relative location in the vehicle, as illustrated by KR996 is 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. EX1014, (54), FIG. 3.

80. It was well-known in the art that a compact carrier such as KR996 typically uses an engine bracket to support and secure the engine in place. This is a standard practice. A 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.

81. JP705 describes mounting parts 7 extending from a side of a main body 1a of a mainframe 1 to mount an engine. JP705 (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[.]” JP705 (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*. JP705 (EX1006), [0019].



EX1006, FIGS. 1 and 3

82. The mounting parts 7 (*engine bracket*) extend[] from a respective side 2[3] of the frame toward an opposing side 2[3] and are spaced from the rear end of the mainframe. JP705 (EX1006), FIGS. 1, 3. It would have been obvious to implement the mounting parts 7 (*engine bracket*) of JP705 similarly extend[ing] from the first side of the mainframe of KR996 toward the second side for mounting

the engine of KR996's vehicle. See also, mounting parts 8 of JP705. The mounting of the engine from the side would allow for engine maintenance such as oil change and such side mounting would not interfere with other engine components.

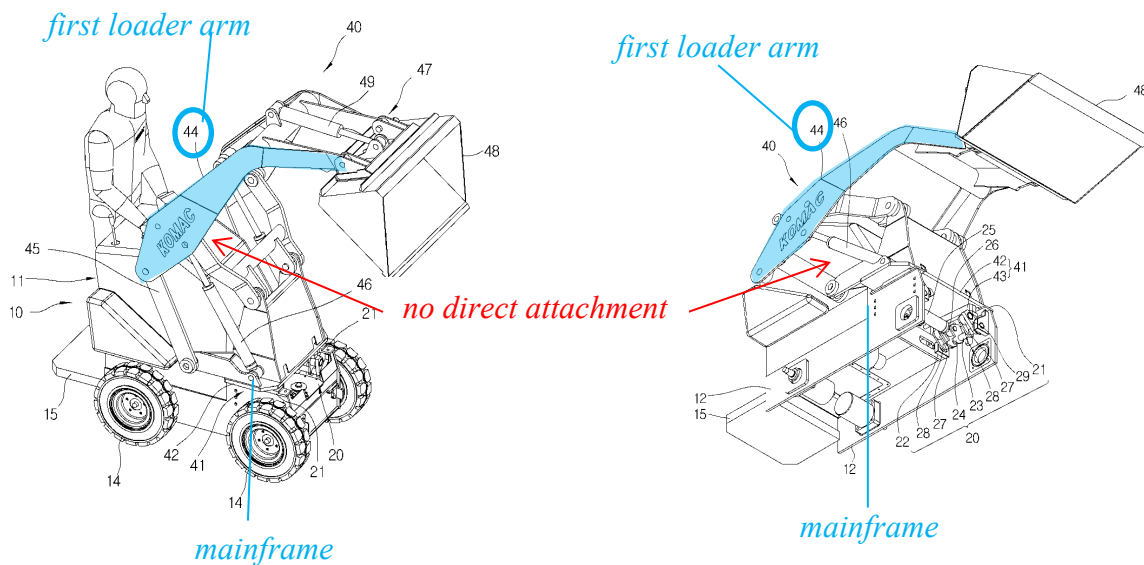
Furthermore, as discussed above (paragraph 60), the engine will serve as a member increasing the stiffness of the structure.

83. As in KR996, an engine is spaced *from the rear end of mainframe*, and the JP705 engine bracket is similarly spaced *from the rear end of a mainframe*, a POSITA would have recognized to position the mounting parts 7 (*engine bracket*) similarly *from the rear end of the mainframe* of KR996.

84. Thus, KR996 in view of JP705 renders obvious element [1.2b].
[31.2c] *the first loader arm not being directly attached to the mainframe;*

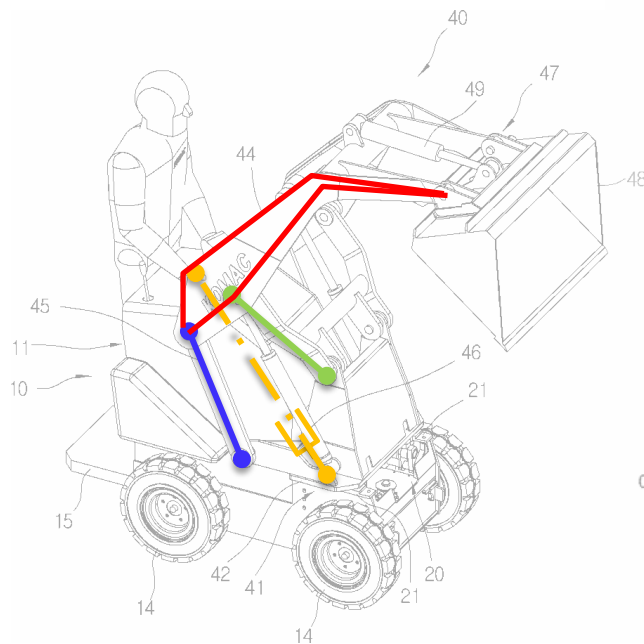
85. KR996 teaches this element.

86. KR996 provides for a loader having its boom 44 (*loader arm*) *not being directly attached to the mainframe*, rather the boom 44 is attached only by intermediary parts of the boom cylinder 46 and links 45, which are discussed in more detail in [1.3], [1.4] below.

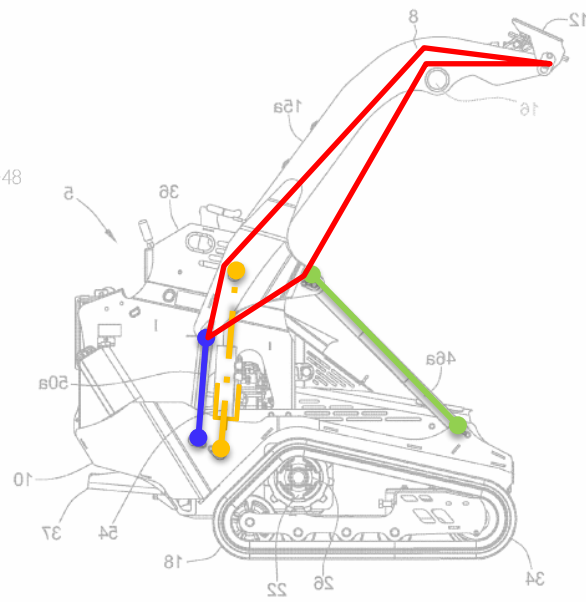


KR996 (EX1005), Figs. 9, 10
(annotated)

87. I have provided the below schematic view of the KR996 vehicle in comparison with a schematic view of the '386 Patent to illustrate they are similarly not directly attached. In particular, that each configuration is an assembly that includes a four-bar mechanism.



KR996 (EX1005), Fig. 9
(annotated)



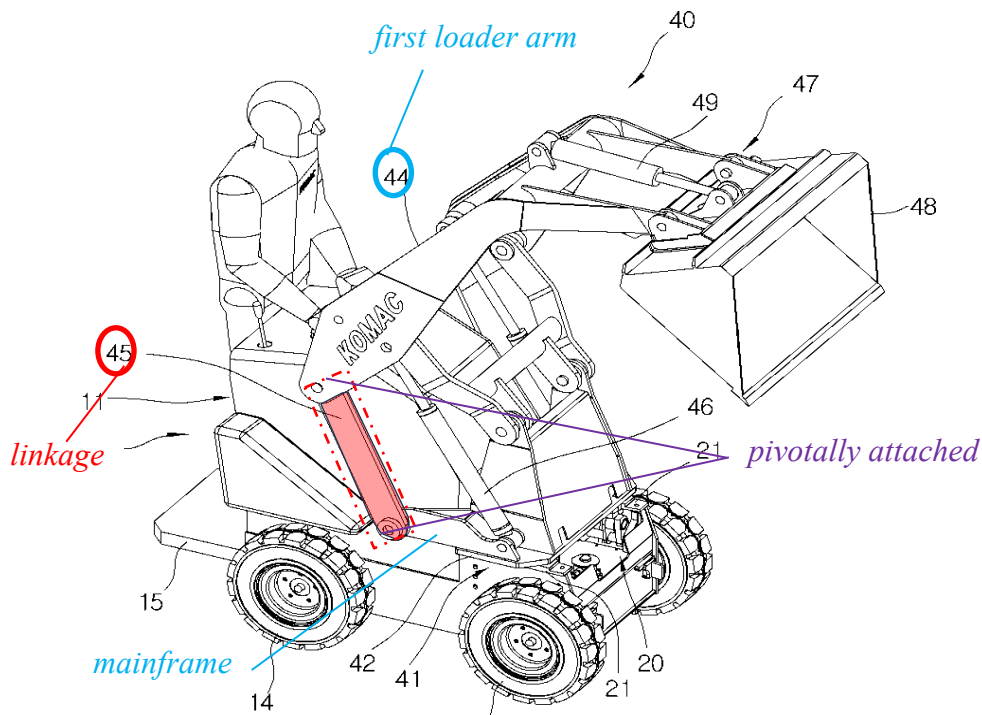
'386 Patent (EX1001), Fig. 3
(annotated)

88. Thus, [1.2c] is taught by KR996.

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

89. KR996 teaches this element.

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



KR996 (EX1005), Fig. 9
(annotated)

91. There are pivot point connections, each a point of relative rotation between the linkage 45 and each of the boom 44 and the mainframe. The pivot point between the linkage 45 and the mainframe is a fixed or anchor pivot point; the pivot point between the link 45 and the boom 44 is a moving pivot point relative to the equipment as the loader 40 raises. These pivot point connections are standard in a four-bar mechanism. *See, e.g.,* EX1023, p. 6, EX1028, p. 21. That is, as described beginning at paragraph 32, the four-bar mechanism contains two fixed pivot points and an imaginary fixed linkage between them, and the other 3 bars and 2 pivot points move relative to the fixed pivots.

92. This is also confirmed by Beltrami, which also describes a similar

mechanism for raising an arm as discussed below and discusses the connection between the linkage, which it refers to as connecting rod 23, and the mainframe as being “pivot point 24.” Beltrami (EX1008), 3:12-22; FIG. 2; 4:5-34; FIG. 3; 5:26-73.

93. This is consistent with '386 Patent's disclosure of a loader linkage (e.g., a loader linkage 46a or 50a) pivotally attached to the first side of the mainframe and pivotally attached to the loader arm. *See, e.g., '386 Patent* (EX1001), FIG. 3, 4:25-35.

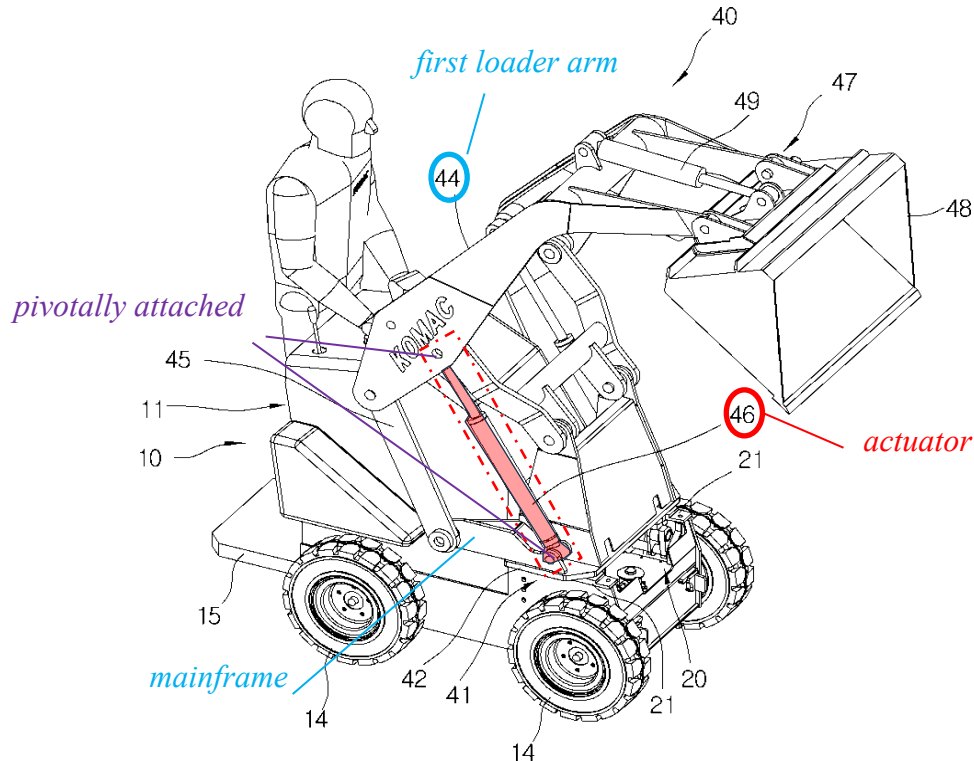
94. Thus, [31.3] is taught by KR996.

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

95. KR996 teaches this element.

96. KR996 describes a boom cylinder 46 (*an actuator*) that drives the boom 44 (*the first loader arm*). KR996 (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 (the first loader arm)*. A POSITA would recognize a boom cylinder is an actuator cylinder, or simply actuator. *See, e.g., Bares 659* (EX1010) 2:66-3:1 (“The lift arm assembly 24 is raised and lowered with extendible and retractable double acting hydraulic cylinders or actuators”). An actuator cylinder may be pneumatic, hydraulic or electric. For example, the '386 Patent describes an actuator 54 as a

“hydraulic cylinder” as in claim 7; KR996 describes a “hydraulic cylinder” ([0003]). Fig. 9 below is illustrative:



KR996 (EX1005), Fig. 9
(annotated)

97. There are pivot point connections – points of rotation within mechanical systems - between the actuator and the boom 44 and the mainframe. The pivot point between the boom cylinder 46 and the mainframe is a fixed or anchor pivot point; the pivot point between the actuator and the boom 44 is a moving pivot point relative to the mainframe as the loader 40 raises. The boom cylinder drives the movement of the boom 44.

98. This is also confirmed by Beltrami, which also describes a similar

mechanism for raising an arm as discussed below and discusses the connection between the actuator, which it refers to as, in one example, hydraulic jack 28, being “pivotally connected to the vehicle at 30.” Beltrami (EX1008), 3:16-21; FIG. 2; 4:20-25; FIG. 3; 5:25-50.

99. Thus, [31.4] is taught by KR996.

[31.5a] 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 operation,

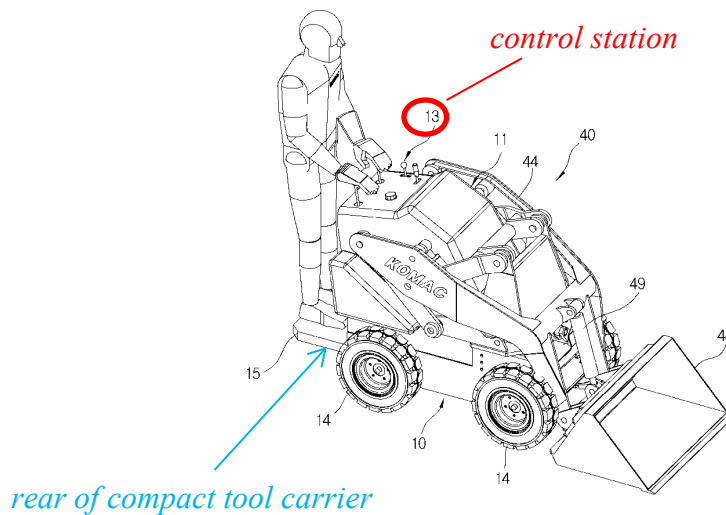
100. KR996 teaches this element.

101. KR996 describes a control unit 13 (*a control station*) having *operator controls* to “operate the equipment while the worker is on board at the rear.”

KR996 (EX1005), [0042], Figs. 1, 8-9. The control unit 13 controls moving the vehicle including *propelling the compact tool carrier forward*. The vehicle of KR996, like standard in operator controlled vehicles, uses its control unit 13 to effectuate the movement of the vehicle forward, and reverse. KR996 (EX1005), Abstract (“when the vehicle **moves forward** and separates from the front side of the vehicle when the vehicle moves backward”), [0016]-[0017], [0072]. The control station 13 also controls the *raising and lowering* of the boom 44 (*the 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)**.” KR996 (EX1005), [0072]. Operating the loader means performing its function of

raising and lowering the loader to raise and lower the tool – bucket 48. The control station 13 is mounted toward the rear of the vehicle (compact tool carrier).

Fig. 8 is illustrative:



KR996 (EX1005), Fig. 8 (portion)
(annotated)

102. As illustrated by the KR996 figures and as discussed in [1.0], the vehicle including its controls 13 (*control station*) is *adapted to allow for standing operation*. KR996 (EX1005), Figs. 8-9, [0033].

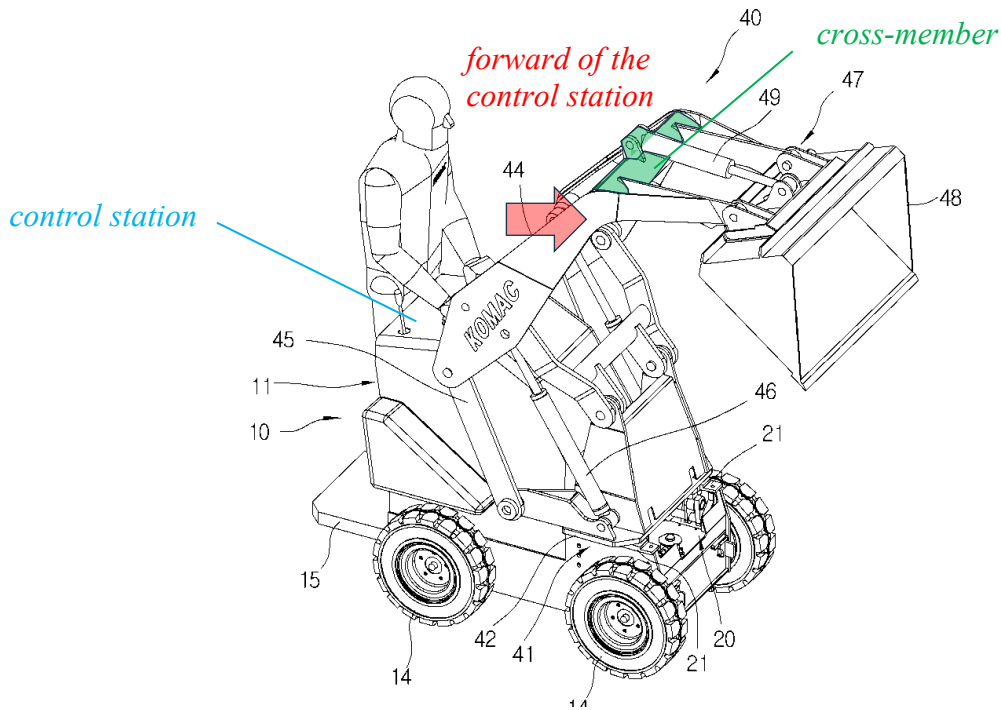
103. I note that KR996 discloses an operator platform that is described as a folding step and thus, suitable for being displaced when operating the vehicle to the extent the carrier is also to be adapted for walk-behind operation. KR996 (EX1005), claim 18 (“folding safety step”), [0033] “foldable step,” [0044]. EX1013 (Azure) confirms that a folding step for an operator platform provides both walk-behind and standing/riding platform operation of the vehicle. EX1013,

[0004]–[0006], [0008], FIG. 4.

104. Thus, [31.5a] is taught by KR996.

[31.5b] *each cross-member being disposed forward of the control station in the vertically raised position of the loader; and*

105. Here “each cross-member” is referring to the “at least one cross-member”. KR996 illustrates its cross-member is *disposed forward of* control unit 13 (control station) in the vertically raised position (Fig. 9):



KR996 (EX1005), Fig. 9
(annotated)

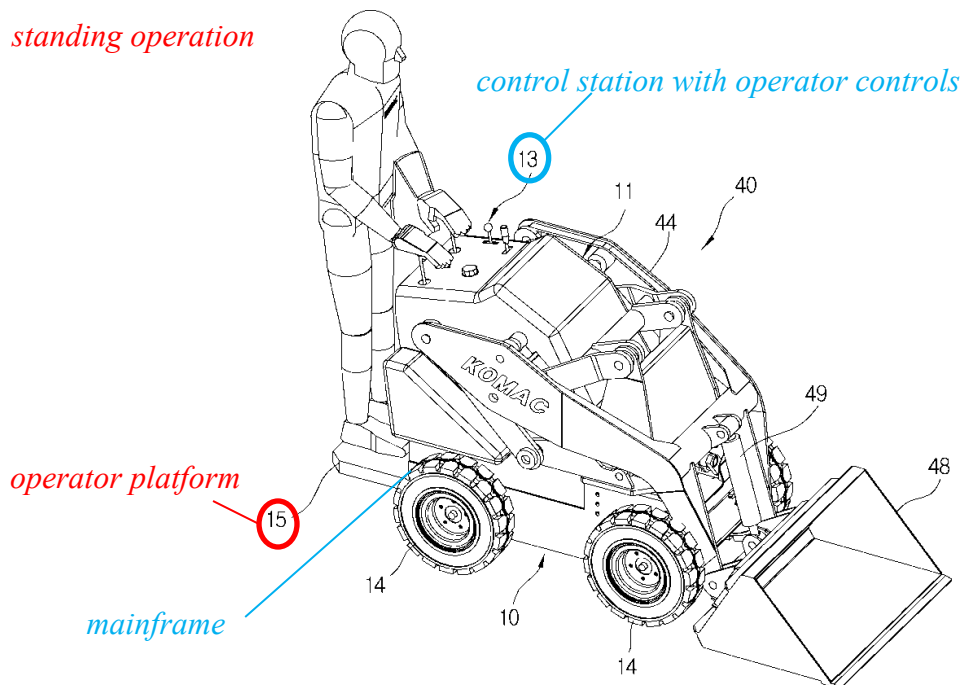
106. This naturally follows from the control unit 13 being at the rear of the carrier. Thus, [31.5b] is taught by KR996.

[31.6] *an operator platform for standing operation of the operator controls of the control station.*

107. KR996 teaches this element.

108. KR996 describes a safety step 15 (*operator platform*) for *standing operation* of the *operator controls* of the control unit 13 (*control station*). EX1005, Figs. 1-14, 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].

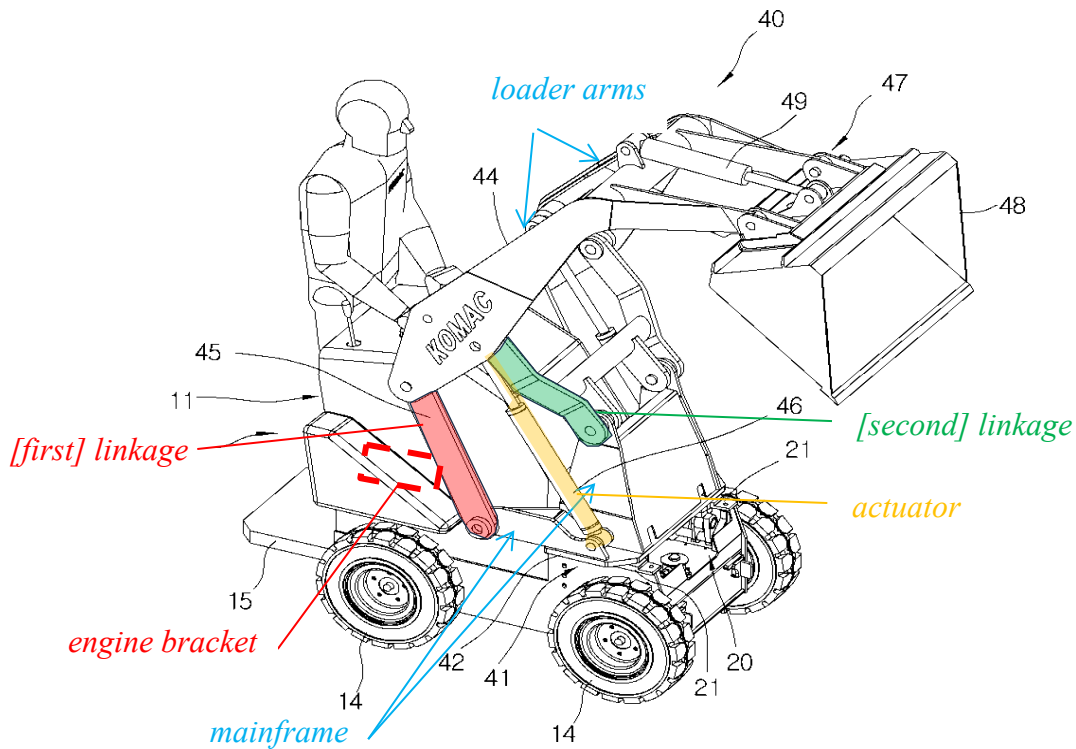
KR996’s Fig. 8 is illustrative:



KR996 (EX1005), Fig. 8 (portion)
(annotated)

109. Thus, [31.6] is taught by KR996. And claim 31 is taught by KR996 in

combination with JP705. KR996's vehicle providing stand-behind operation from a step 15 (*operator platform*), through a control unit 13 (*control station*), including its booms 44 (*first and second loader arm*) attached to its *mainframe* by link(s) 45 (*linkage*) and boom cylinder 46 (*actuator*), and is modified to include JP705's *engine bracket* in its mainframe, which renders obvious claim 31.



EX1005, Fig. 9
(annotated)

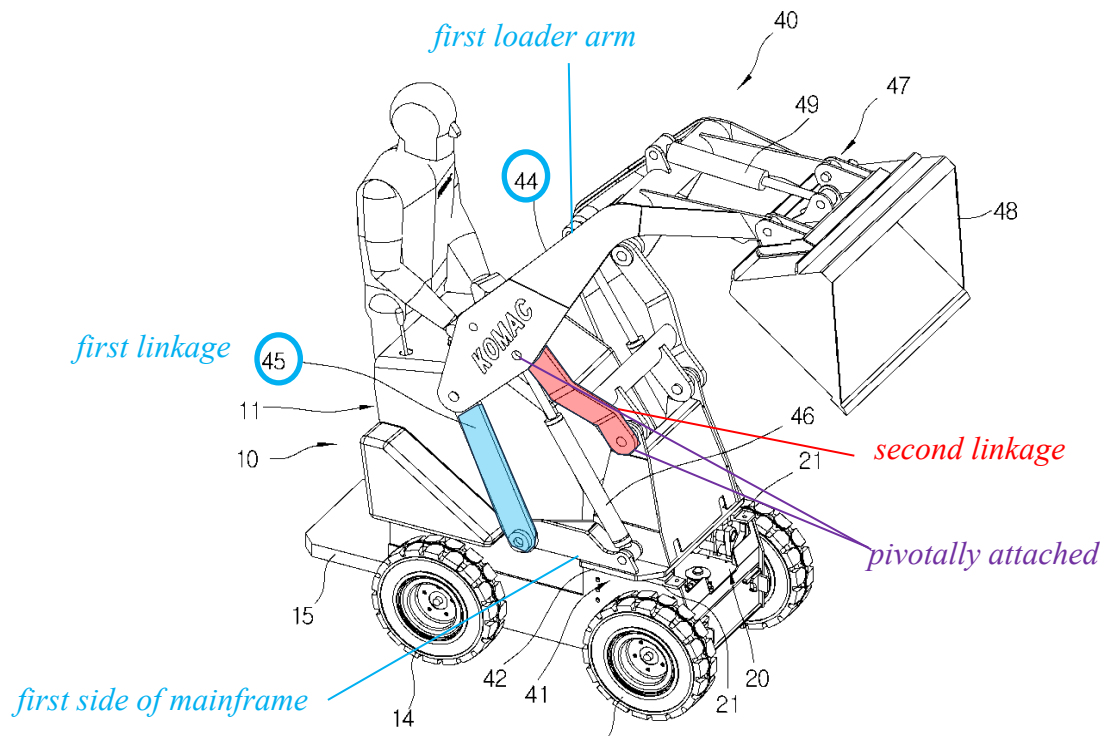
5. Claim 32

[32] *The compact tool carrier as set forth in claim 31 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 and pivotally attached to the first loader arm.*

110. KR996 and JP705 teach claim 1 as I discuss above. And this element

is also taught by KR996.

111. First, the link 45 (*linkage*) and boom cylinder 46 (*actuator*) discussed in elements [31.3], [31.4] provide a *first linkage* and an *actuator* each attached to the *first side* of the KR996 frame (*mainframe*) and boom 44 (*first loader arm*) at respective pivot points. KR996 also illustrates an additional link (unlabeled) providing a *second linkage* similarly *pivotally attached* to a *first side of the mainframe* at a pivot point and pivotally attached to the boom 44 (*first loader arm*) at a pivot point. EX1005, Figs. 8-10. *See also*, EX1005, claim 1, [0054], [0134], Figs. 1-7. KR996's Fig. 9 is illustrative:



KR996 (EX1005), Fig. 9
(annotated)

112. This second linkage provides a link of the 4-bar mechanism. There are pivot point connections, each a point of relative rotation between the linkage and each of the boom 44 and the mainframe. The pivot point between the linkage and the mainframe is a fixed or anchor pivot point; the pivot point between the link and the boom 44 is a moving pivot point relative to the equipment as the loader 40 raises. These pivot point connections are standard in a four-bar mechanism. *See, e.g.,* EX1023, p. 6, EX1028, p. 21. That is, as described beginning at paragraph 32, the four-bar mechanism contains two fixed pivot points and an imaginary fixed linkage between them, and the other 3 bars and 2 pivot points move relative to the fixed pivots.

113. This is also confirmed by Beltrami, which also describes a similar mechanism for raising an arm as discussed below and discusses the connection between the linkage, which it refers to as connecting rod 25, and the mainframe as being pivotally connected at 26 to the vehicle body and at 27 to an intermediate point of arm 20.” Beltrami (EX1008), 3:12-22; FIG. 2; 4:5-34; FIG. 3; 5:26-73.

114. Thus, claim 32 is rendered obvious by KR996 and JP705.

6. Claim 33

[33] *The compact tool carrier as set forth in claim 31 wherein the mainframe incorporates a single weldment.*

115. KR996 and JP705 teach claim 31 as I discuss above. And this element is also suggested by KR996.

116. First, as discussed above in [31.2b] and the reasons to combine JP705, it would have been obvious to provide the engine bracket of JP705, which is attached by a *weldment* to the mainframe of KR996, thus providing a mainframe that *incorporates a single weldment*.⁵

117. Further, a 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. There are numerous examples of implementing a welding technique in substantially similar compact tool carriers. Bares '659 (EX1010), 4:8-34 ("The body or frame 12, as shown, is a unitized welded body that includes side walls 90A and 90B extending in fore and aft direction.... The body 12 is fully welded together with the components..."). And implementing welding in other earth-moving vehicles known to have vertical lift mechanisms was typical. See Yasuda (EX1022) 4:50-11:25 discussing "welding."

118. A POSITA would recognize that there are known trade-offs in the engineering or design choice between a single weldment and attachment by, for

⁵ 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.

example, nuts and bolts. These factors include aesthetics (e.g., a weld can provide a smooth surface), ease of manufacturability of the component (e.g., welding is a simple, easy to apply process), positioning the surrounding components (e.g., placement of the engine in the loader apparatus), replaceability of parts, structural rigidity, reliability of the connection, and/or costs including as discussed above with reference to JP705.

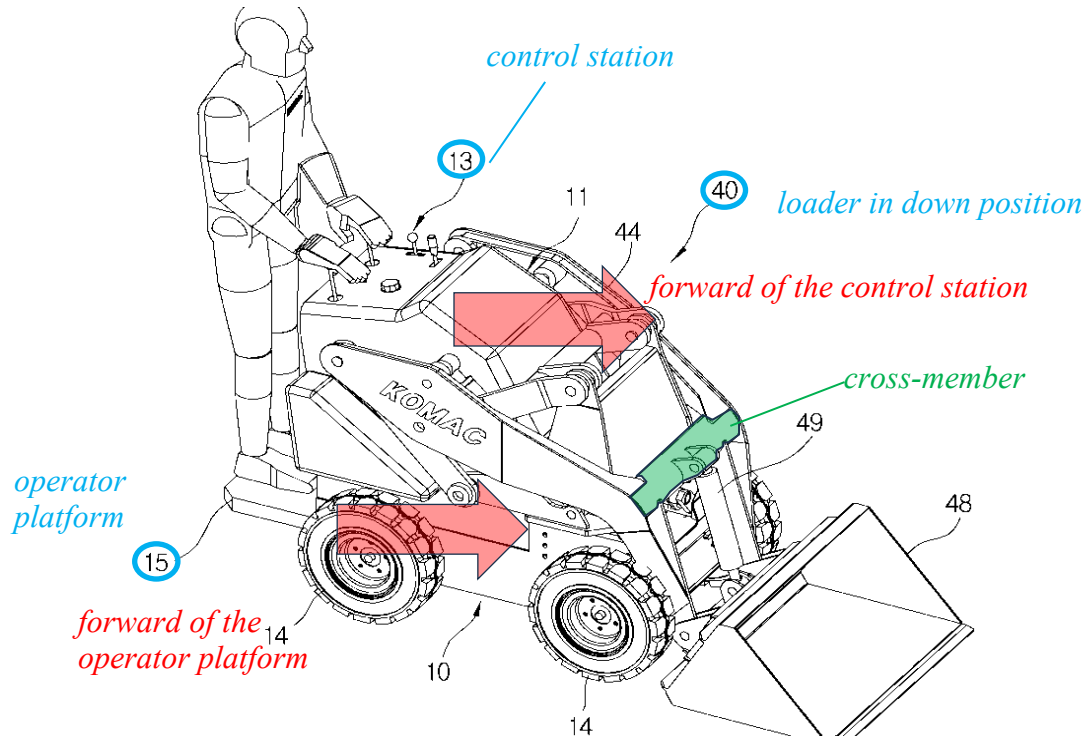
119. To the extent Patent Owner argues that certain components of the mainframe are required to be coupled by a weldment, JP705 illustrates a main frame (*mainframe*) that consists of one *single weldment*. JP705 (EX1006), [0019] (“The main frame 1 is constructed from cast steel for welding construction ...”). As discussed above, JP705 easily applies to the compact utility loader of KR996, and further it was well known in the art to have a mainframe consisting of a single weldment to provide a compact tool carrier. See, e.g., Bares 659 (EX1010), 4:8-9. 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.

120. Thus, claim 33 is obvious in light of KR996 and JP705.

7. Claim 34

[34] *The compact tool carrier as set forth in claim 31 wherein each cross-member is disposed forward of the operator platform and forward of the control station in the down position of the loader.*

121. KR996 and JP705 teach obvious claim 31 as I discuss above and KR996 also illustrates the *cross-member* is disposed forward of the safety step 15 (*operator platform*) and forward of the control unit 13 (*control station*) in the down position of the loader. KR996 (EX1005), Fig. 8.



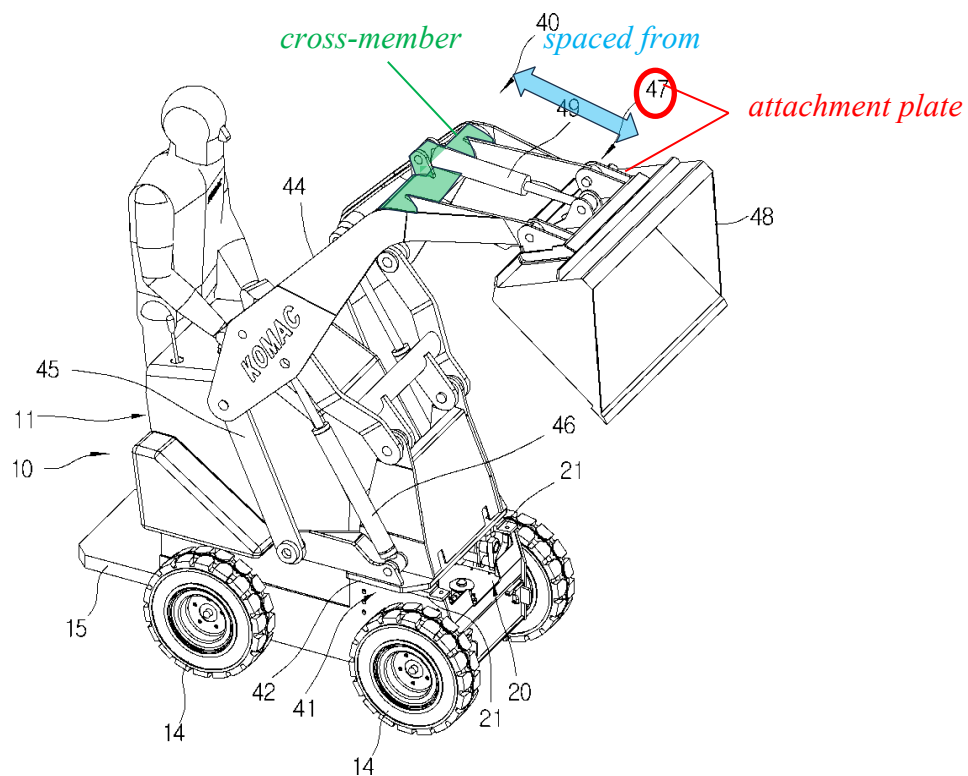
KR996 (EX1005), Fig. 8 (portion)
(annotated)

122. See also, KR996 (EX1005), claim 1, [0054], [0134], Figs. 1-7. And this configuration naturally follows from the operator position being at the rear of the carrier. Thus, claim 34 is rendered obvious by KR996 and JP705.

8. Claim 35

[35] *The compact tool carrier as set forth in claim 31 further comprising an attachment plate for removably attaching a tool to the compact tool carrier, the crossmember being spaced from the attachment plate.*

123. KR996 and JP705 renders obvious claim 31 and KR996 also illustrates a bucket attachment 47 (*attachment plate*) for removably attaching bucket 48 (*tool*) to the boom 44 of the KR996 vehicle (*compact tool carrier*): “At the end of the boom (44), a bucket attachment (47) is installed, and a **bucket (48)** is **coupled to the bucket attachment (47)**[.]” KR996 (EX1005), [0054]. The *crossmember* is *spaced from* the bucket attachment 47 (*attachment plate*). Fig. 9 is illustrative:



EX1005, Fig. 9
(annotated)

124. The bucket attachment 47 is for removably attaching a bucket 48 (*tool*)

as KR996 illustrates embodiments with the bucket attached and detached. Compare KR996 at Figs. 5, 6 and Figs. 8, 9; [0040] (“bucket removed”). Further, this capability of an attachment plate was well-known in the art and is recognized as a capability of the bucket attachment such as bucket attachment 47. Bares (EX1009) at 3:16-21 discusses “lift arms curve down and pivot pins 38 are used for mounting a quick **attachment plate** 40 to the lower ends of the forward plates of conventional design. The quick attachment plate 40 is the type normally used with the BOBCAT® skid steer loaders...bucket 48 is shown in position on the attachment plate 40, and this, too, is supported on the attachment plate 40 in a known manner.”); Azure (EX1013), which illustrates an “attachment plate 132 located at the distal front ends of the loader arms 110. To ease the task of removing and installing attachments on the loader arms 110, various quick attachment systems may be used.” [0033]. A POSITA would recognize the benefit of having a removably attached tool so that the tool can be serviced and/or replaced.

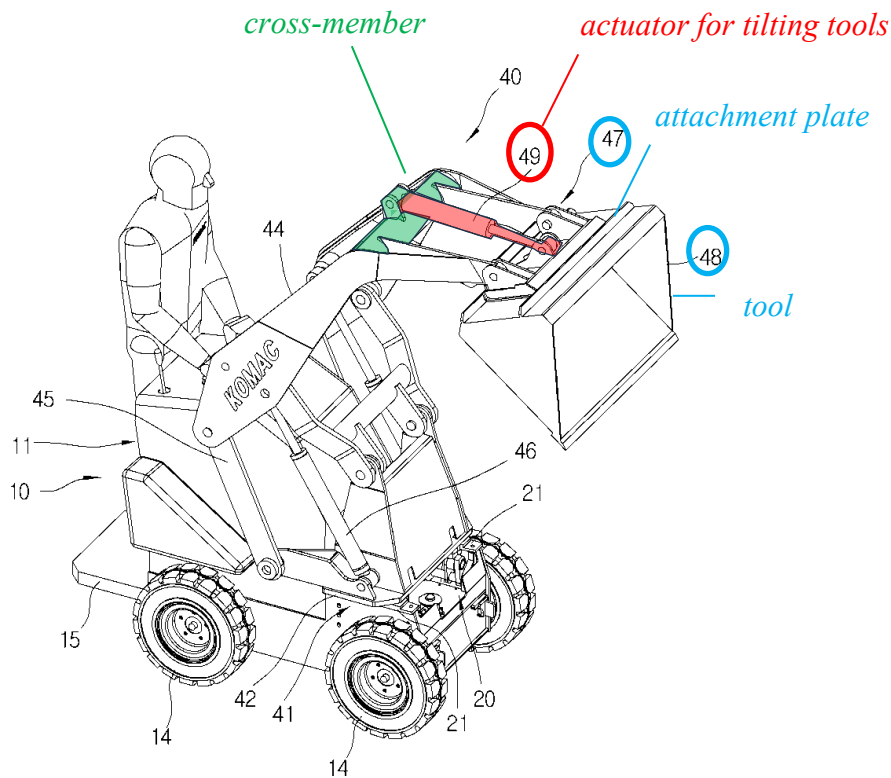
125. Thus, claim 35 is rendered obvious by KR996.

9. Claim 36

[36] *The compact tool carrier as set forth in claim 35 further comprising an actuator for tilting of tools connected to the attachment plate, the actuator being connected to the cross-member and the attachment plate.*

126. KR996 and JP705 teach claim 35 as discussed above. And KR996 teaches this element.

127. KR996 illustrates “[a] boom (44) and a bucket attachment (47) are equipped with a **bucket cylinder (49)** that **rotates the bucket (48).**” KR996 (EX1005), [0054]; *see also*, KR996 (EX1005), claim 1. KR996’s bucket cylinder 49 is an *actuator* just as the boom cylinder 46 is an actuator as I discuss above. See ’386 patent which describes the actuator as a hydraulic cylinder. ’386 Patent, 4:34. And bucket cylinder 49 (*actuator for tilting of tools*) is *connected to the cross-member* and bucket attachment 47 (*attachment plate*). KR996’s Fig. 9 is illustrative:



EX1005, Fig. 9
(annotated)

128. Thus, claim 36 is rendered obvious by KR996 and JP705.

10. Claim 38

129. Claim 38 recites substantially the same limitations as discussed above with reference to claim 31 with the differences noted and similarly is rendered obvious by KR996 in combination with JP705's engine bracket.

		See the analysis for:
38.0	<i>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:</i>	[31.0]
38.1	<i>a loader being adapted to carry a tool, the loader comprising: a first loader arm; a second loader arm; and a single cross-member that extends from the first loader arm to the second loader arm;</i>	[31.1]. The cross-member I annotated in KR996 above is a <i>single cross-member</i>
38.2a	<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>	[31.2a]

		See the analysis for:
38.2b	<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 of the mainframe,</i>	[31.2b] including JP705's mounting parts 7 (<i>engine bracket</i>) in combination with KR996's mainframe
38.2c	<i>the first loader arm not being directly attached to the mainframe;</i>	[31.2c]
38.3	<i>a linkage pivotally attached to the first side of the mainframe and pivotally attached to the first loader arm;</i>	[31.3] discussing link 45 (<i>linkage</i>) pivotally attached to the mainframe and the boom 44 (<i>first loader arm</i>)
38.4	<i>an actuator pivotally attached to the first side of the mainframe and pivotally attached to the first loader arm;</i>	[31.4] discussing boom cylinder 46 (<i>actuator</i>) pivotally attached to the mainframe and the boom 44 (<i>first loader arm</i>)
38.5	<i>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 operation; and</i>	[31.5a] discussing control unit 13 (<i>control station</i>)

		See the analysis for:
38.6	<i>an operator platform for standing operation of the operator controls of the control station.</i>	[31.6] discussing safety step 15 (<i>operator platform</i>)

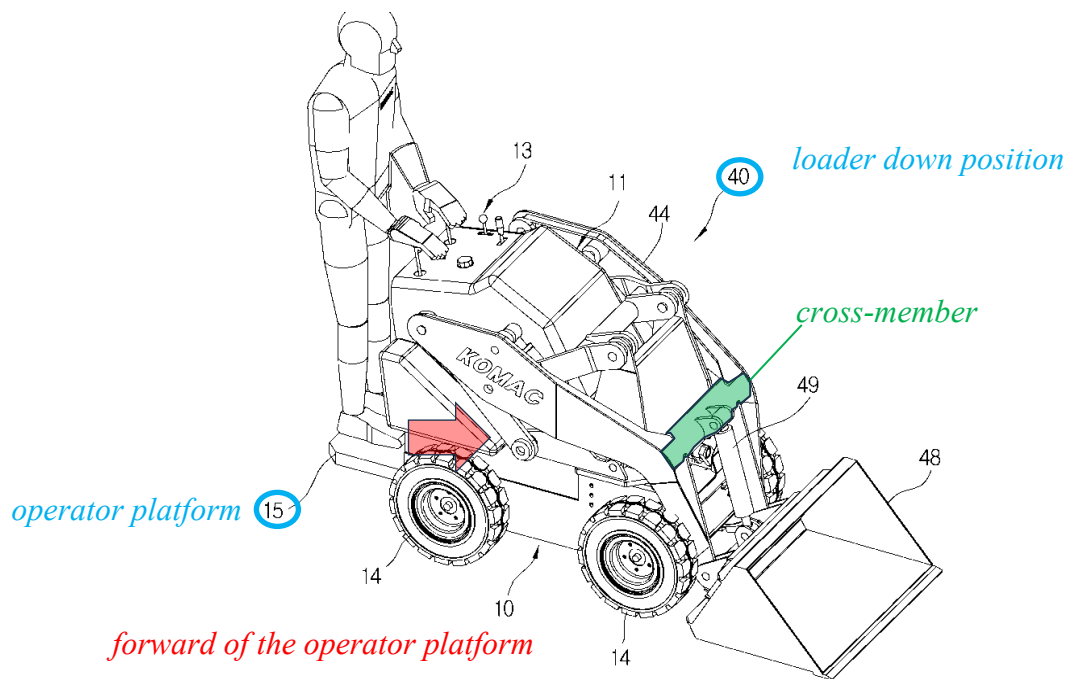
130. Thus, claim 38 is rendered obvious by KR996 in combination with JP705's *engine bracket*.

11. Claim 39

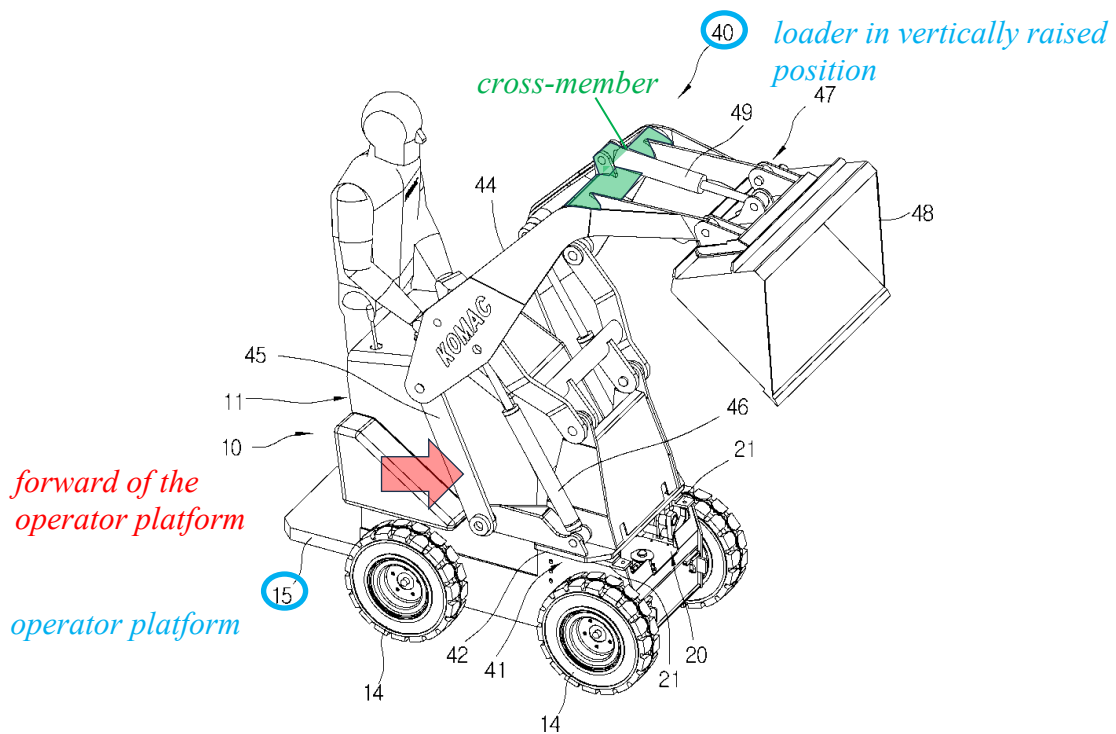
[39] *The compact tool carrier as set forth in claim 38 wherein the loader is moveable between a down position and a vertically raised position, the cross-member being disposed forward of the operator platform in the down position and the vertically raised position of the loader.*

131. KR996 and JP705 render obvious claim 38 and KR996 further teaches this element.

132. KR996's loader unit 40 (*loader*) is moveable between a *down position* (Fig. 8) and a *vertically raised position* (e.g., Fig. 9). See [31.1]. In each of these positions, KR996 illustrates the cross-member *being disposed forward of* the safety step 15 (*operator platform*). KR996's Figs. 8-9 are illustrative:



KR996 (EX1005), Fig. 8 (portion)
(annotated)



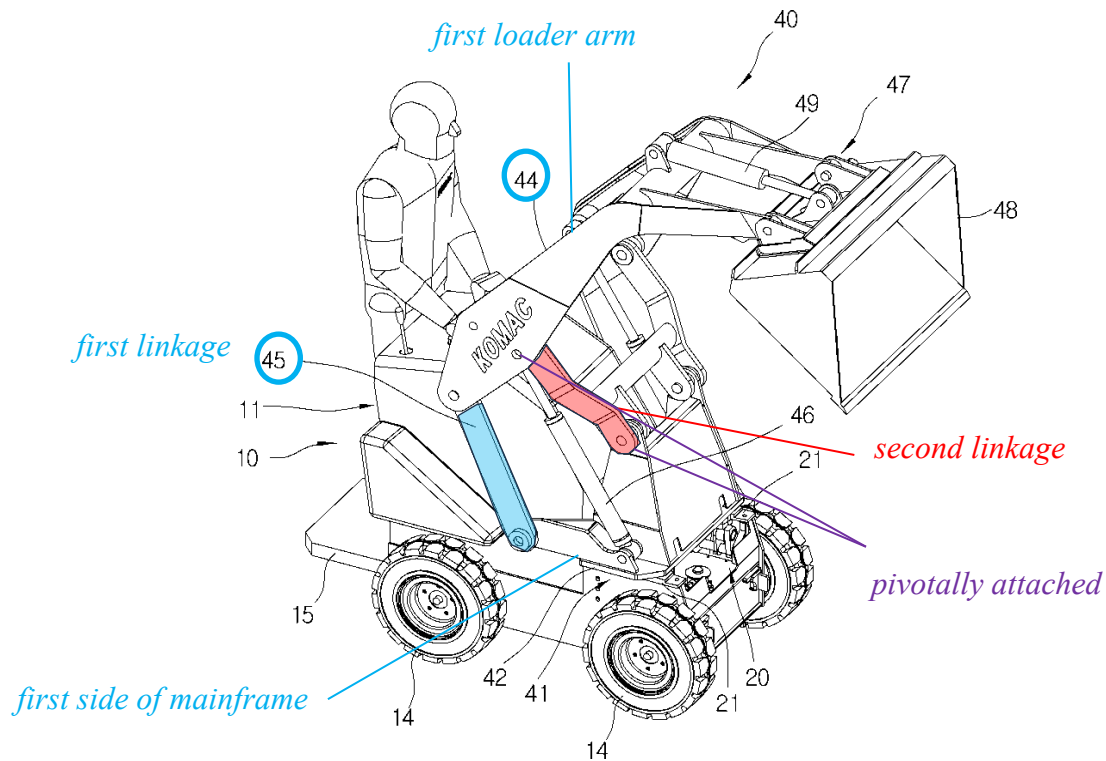
KR996 (EX1005), Fig. 9
(annotated)

133. This configuration follows from KR996 vehicle being operated by an operator positioned at the rear end of the vehicle. Thus, KR996 in view of JP705 renders obvious claim 39.

12. Claim 41

[41] *The compact tool carrier as set forth in claim 38 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 and pivotally attached to the first loader arm.*

134. KR996 and JP705 render obvious claim 38 including illustrating the link 45 of element [38.3] is a *first linkage*. And KR996 also illustrates an additional link providing a *second linkage* similarly *pivotally attached* to a *first side of the mainframe* and *pivotally attached* to the boom 44 (*first loader arm*) as discussed in claim [32]. KR996 (EX1005), Figs. 8-10, claim 1, [0054], [0134]. Fig. 9 is illustrative:



KR996 (EX1005), Fig. 9
(annotated)

135. There are pivot point connections, each a point of relative rotation between the linkage and each of the boom 44 and the mainframe. The pivot point between the linkage and the mainframe is a fixed or anchor pivot point; the pivot point between the link and the boom 44 is a moving pivot point relative to the equipment as the loader 40 raises. These pivot point connections are standard in a four-bar mechanism. *See, e.g.*, EX1023, p. 6, EX1028, p. 21. That is, as described beginning at paragraph 32, the four-bar mechanism contains two fixed pivot points and an imaginary fixed linkage between them, and the other 3 bars and 2 pivot points

move relative to the fixed pivots.

136. This is also confirmed by Beltrami, which also describes a similar mechanism for raising an arm as discussed below and discusses the connection between the linkage, which it refers to as connecting rod 23, and the mainframe as being “pivot point 24.” Beltrami (EX1008), 3:12-22; FIG. 2; FIG. 3; 5:26-73

137. This is consistent with '386 Patent's disclosure of a loader linkage (e.g., a loader linkage 46a or 50a) pivotally attached to the first side of the mainframe and pivotally attached to the loader arm. *See, e.g., '386 Patent (EX1001), FIG. 3, 4:25-35.*

138. Thus, KR996 and JP705 render obvious claim 41.

13. Claim 42

[42] *The compact tool carrier as set forth in claim 38 wherein the mainframe incorporates a single weldment.*

139. KR996 and JP705 render obvious claim 38 and it would have been obvious for the mainframe of KR996 to *incorporate[] a single weldment* for the reasons discussed in [33]. Thus, KR996 and JP705 render obvious claim 42.

14. Claim 43

[43] *The compact tool carrier as set forth in claim 38 further comprising an attachment plate for removably attaching a tool to the compact tool carrier, the crossmember being spaced from the attachment plate.*

140. KR996 and JP705 render obvious claim 38 and KR996 also illustrates

a bucket attachment 47 (*attachment plate*) for removably attaching bucket 48 (*tool*) to the boom 44 of the KR996 vehicle (*compact tool carrier*) spaced from the *crossmember* as discussed in [35]. Thus, claim 43 is rendered obvious by KR996 and JP705.

15. Claim 44

[44] *The compact tool carrier as set forth in claim 43 further comprising an actuator for tilting of tools connected to the attachment plate, the actuator being connected to the cross-member and the attachment plate.*

141. KR996 and JP705 renders obvious claim 43 and KR996 further discloses a bucket cylinder 49 (*actuator for tilting of tools*) that tilts a bucket 48 (*tool*) as discussed in [36]. Thus, claim 44 is rendered obvious by KR996 and JP705.

16. Claim 45

142. The analysis of claim 45 is substantially the same as claim 31 and claim 32, with differences noted below, and thus, claim 45 is similarly rendered obvious by the combination of KR996 and JP705's engine bracket for the reasons discussed above.

		See the analysis for:
45.0	<i>A compact tool carrier configured for standing or walk-behind operator control and having a longitudinal axis and a</i>	[31.0].

		See the analysis for:
	<i>mass of less than about 1 500 kg, the compact tool carrier comprising:</i>	
45.1	<i>a loader having an arm, the loader being adapted to carry a tool;</i>	[31.1] including loader 40 and boom 44 (<i>arm</i>) adapted to carry a bucket 48 (<i>tool</i>)
45.2a	<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>	[31.2a]
45.2b	<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 of the mainframe,</i>	[31.2b] including JP705's mounting parts 7 (<i>engine bracket</i>) that would have been obvious to combine with KR996 for the reasons above
45.2c	<i>the loader arm not being directly attached to the mainframe;</i>	[31.2c]
45.3	<i>a first linkage pivotally attached to the first side of the mainframe and pivotally attached to the loader arm at a first linkage pivot point;</i>	[31.3] discussing a link 45 which is a <i>first linkage</i> that is pivotally attached to the boom 44 (<i>loader arm</i>) at a <i>first linkage pivot point</i>
45.4	<i>a second linkage pivotally attached to the first side of the mainframe and pivotally attached to the</i>	[32] discussing link providing a <i>second linkage</i> pivotally attached to the mainframe and the

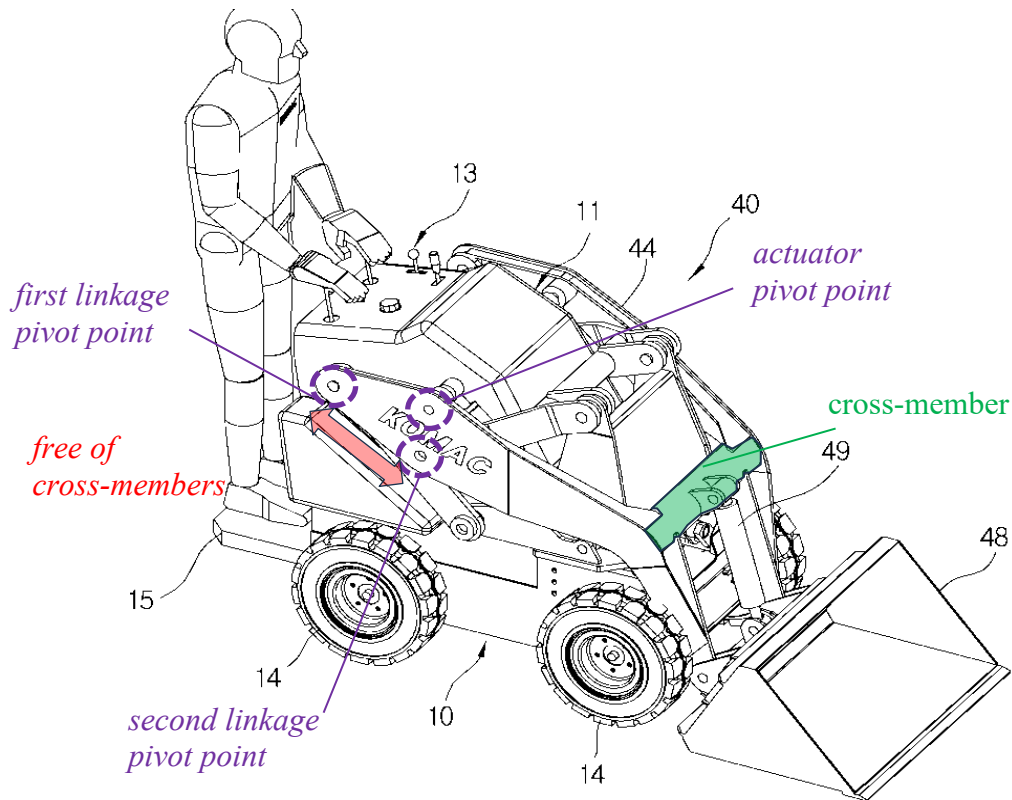
		See the analysis for:
	<i>loader arm at a second linkage pivot point,</i>	boom 44 (<i>loader arm</i>) at a <i>second linkage pivot point</i>
45.5	<i>the loader being free of cross-members between the first linkage pivot point and the second linkage pivot point;</i>	See my explanation below
45.6	<i>an actuator pivotally attached to the first side of the mainframe and pivotally attached to the loader arm at an actuator pivot point;</i>	[31.4] discussing boom cylinder 46 (<i>actuator</i>) pivotally attached to the mainframe and the boom 44 (<i>loader arm</i>) at an <i>actuator pivot point</i>
45.7	<i>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 operation⁶; and</i>	[31.5a] discussing control unit 14 (<i>control station</i>) having <i>operator controls</i> .

⁶ 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

		See the analysis for:
45.8	<i>an operator platform for standing operation of the operator controls of the control station.</i>	[31.6] discussing safety step 15 (<i>operator platform</i>)

143. As for element [45.5], KR996 illustrates loader unit 40 (*loader*) is *free of cross-members* between the pivot point attachments between the linkages and the boom 44 (*loader arm*). Fig. 9 is illustrative:

operation are required, KR996 supports this as I discuss above with reference to Azure (EX1013) at [31.5a]



KR996 (EX1005), Fig. 8 (portion)
(annotated)

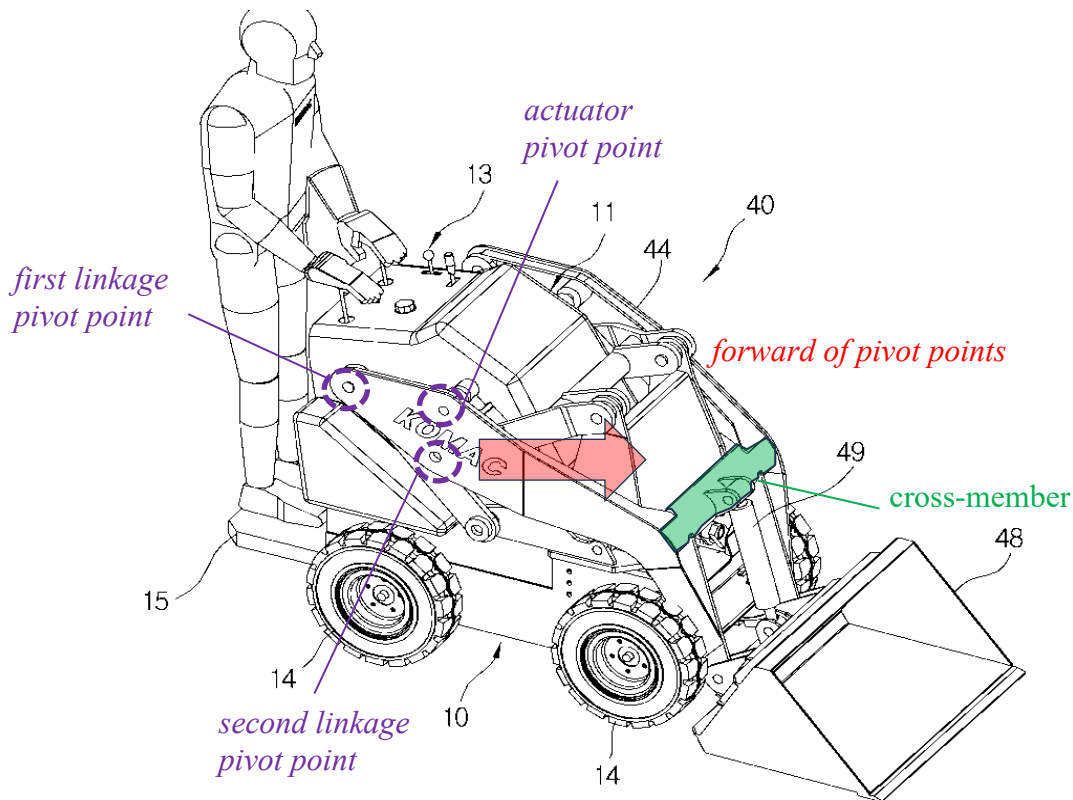
144. Thus, claim 45 is rendered obvious by KR996 and JP705.

17. Claim 46

[46] The compact tool carrier as set forth in claim 45 wherein the loader comprises: a first arm; a second arm; and a cross-member that extends from the first arm to the second arm, the cross-member being disposed forward of the first linkage pivot point, the second linkage pivot point, and the actuator pivot point.

145. KR996 and JP705 render obvious claim 45 and KR996 further teaches booms 44 (*first arm* and *second arm*) and a cross-member as I discuss in element [31.1]. Note, I am assuming that the claimed first arm and second arm are inclusive

of the arm of claim 45. Fig. 8 of KR996 as annotated below illustrates the cross-member is *forward of the first linkage pivot point, second linkage pivot point and the actuator pivot point.*



KR996 (EX1005) Fig. 8 (portion)
(annotated)

146. Thus, claim 46 is rendered obvious by KR996 and JP705.

18. Claim 47

[47] *The compact tool carrier as set forth in claim 46 further comprising an attachment plate for removably attaching a tool to the compact tool carrier, the crossmember being spaced from the attachment plate.*

147. KR996 and JP705 render obvious claim 46 and KR996 also illustrates

a bucket attachment 47 (*attachment plate*) for removably attaching bucket 48 (*tool*) to the boom 44 of the KR996 vehicle (*compact tool carrier*) as I explain in element [35] including that the bucket attachment 47 is *spaced from the crossmember*.

Thus, claim 47 is rendered obvious by KR996 and JP705.

19. Claim 48

[48] *The compact tool carrier as set forth in claim 47 further comprising an actuator for tilting of tools connected to the attachment plate, the actuator being connected to the cross-member and the attachment plate.*

148. KR996 and JP705 render obvious claim 47 and KR996 also illustrates a bucket cylinder 49 (*actuator for tilting of tools*) for tilting the bucket 48 (*tool*) that is connected to the *crossmember* and the bucket attachment 47 (*attachment plate*) as I show in element [36]. Thus, claim 48 is rendered obvious by KR996 and JP705.

20. Claim 49

[49] *The compact tool carrier as set forth in claim 45 wherein the mainframe incorporates a single weldment.*

149. Claim 45 is rendered obvious by KR996 and JP705 and it would have been obvious to provide the mainframe of KR996 *incorporat[ing] a single weldment* for the reasons I discuss in element [33]. Thus, KR996 and JP705 render obvious claim 49.

21. Claim 86

150. Claim 86 recites substantially the same limitations as discussed for

claim 31, the second linkage of claim 32, and the attachment plate of claim 35, with additional limitations also taught by KR996 and thus, is similarly rendered obvious by KR996-JP705.

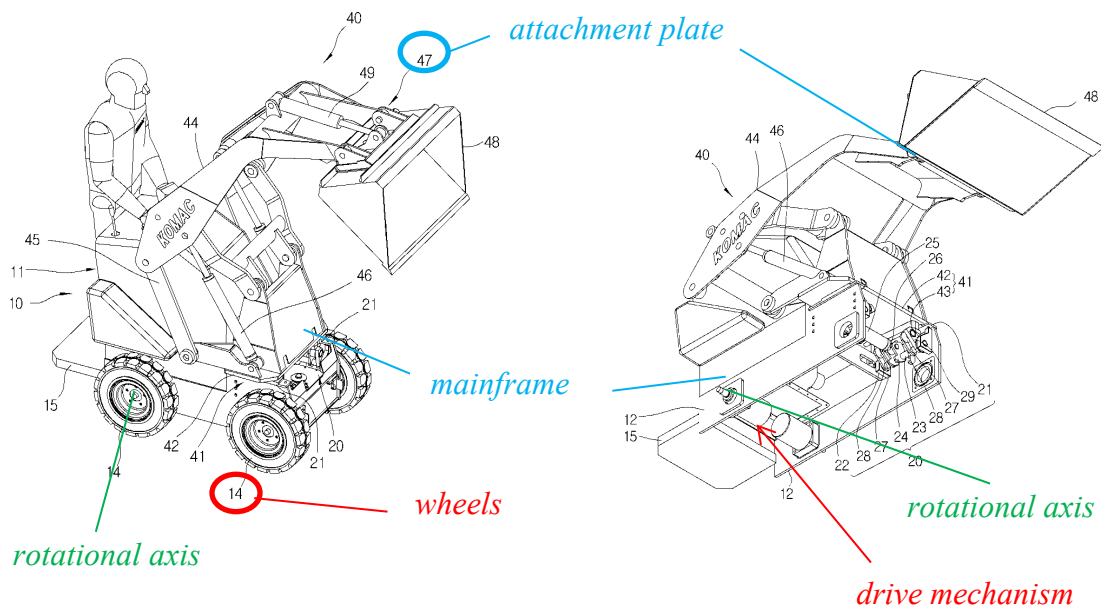
		See the analysis for:
[86.0]	<i>A compact tool carrier configured for standing or walk-behind operator control and having a longitudinal axis and a mass of less than about 1500 kg, the compact tool carrier comprising:</i>	[31.0].
[86.1]	<i>a loader having an arm, the loader being adapted to carry a tool, the loader being moveable between a down position and a vertically raised position;</i>	[31.1] discussing loader unit 40 (<i>loader</i>) having a boom 44 (<i>arm</i>)
[86.2a]	<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>	[31.2a]
[86.2b]	<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>	[31.2b] including JP705's mounting parts 7 (<i>engine bracket</i>) that would have been obvious to combine with KR996 for the reasons above

		See the analysis for:
[86.2c]	<i>the loader arm not being directly attached to the mainframe;</i>	[31.2c]
[86.3]	<i>a first linkage pivotally attached to the first side of the mainframe at a first linkage pivot point and pivotally attached to the loader arm;</i>	[31.3] discussing link 45 (<i>first linkage</i>) pivotally attached to boom 44 (<i>loader arm</i>) and pivotally attached to the first side of the KR996 mainframe at <i>a first linkage pivot point</i>
[86.4]	<i>a second linkage pivotally attached to the first side of the mainframe at a second linkage pivot point and pivotally attached to the loader arm;</i>	[32] discussing link (<i>second linkage</i>) pivotally attached to boom 44 (<i>loader arm</i>) and pivotally attached the first side of the KR996 mainframe at <i>a second linkage pivot point</i>
[86.5]	<i>an actuator pivotally attached to the first side of the mainframe at an actuator pivot point and pivotally attached to the loader arm;</i>	[31.4] discussing boom cylinder 46 (<i>an actuator</i>) pivotally attached to boom 44 (<i>loader arm</i>) and pivotally attached the first side of the KR996 mainframe at <i>an actuator pivot point</i>
[86.6]	<i>a drive mechanism comprising tracks or wheels, the drive mechanism having a rotational axis, the pivot</i>	See below

		See the analysis for:
	<i>point at which the actuator is attached to the mainframe being above the rotational axis;</i>	
[86.7]	<i>an attachment plate for removably attaching a tool to the compact tool carrier, at least a portion of the attachment plate being forward of the drive mechanism when the loader is in the vertically raised position;</i>	See element [35] discussing a bucket attachment 47 (<i>attachment plate</i>) for removably attaching a bucket 48 (<i>tool</i>) to the carrier, at least a portion of the attachment plate being forward of the drive mechanism in a vertically raised position. See KR996 (EX1005), Figs. 9 (below), 21.
[86.8]	<i>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; and</i>	[31.5a] including control unit 13 (<i>control station</i>).
[86.9]	<i>an operator platform for standing operation of the operator controls of the control station.</i>	[31.6] discussing safety step 15 (<i>operator platform</i>)

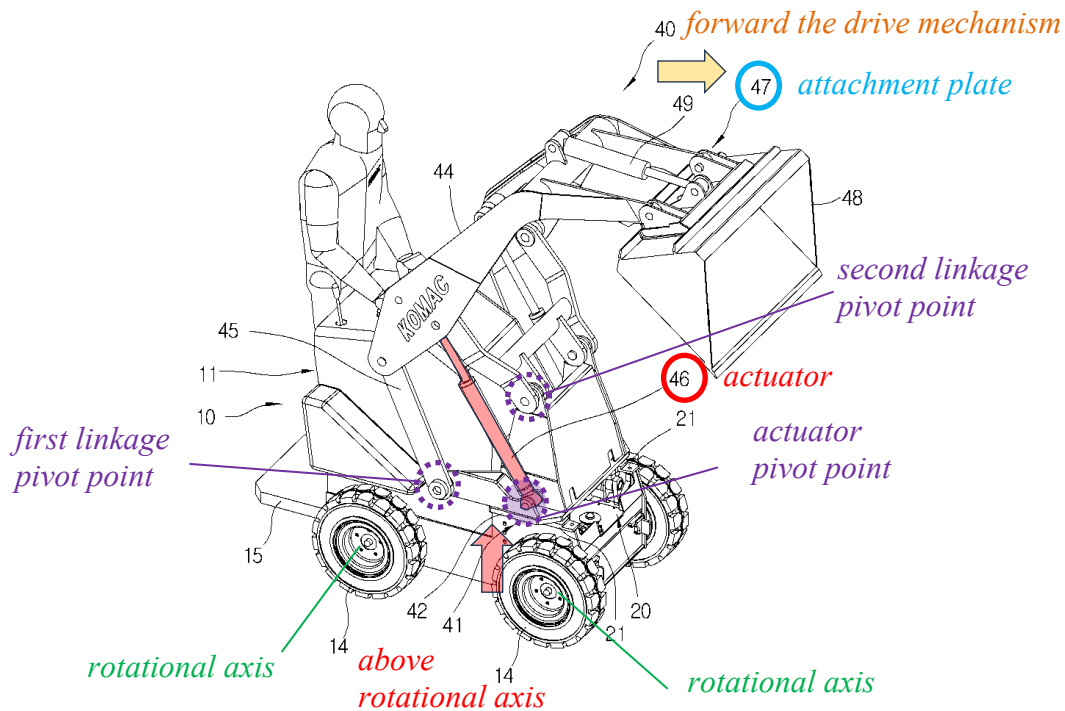
151. As to element [86.6], KR996 describes *a drive mechanism* including

“wheels (14)” (*wheels*). KR996 (EX1005), [0042], [0052], [0060], [0118], Figs. 1, 8-10. The *drive mechanism* is attached to the *mainframe* via *rotational axis* as illustrated in the figures below, just like the attachment described in the ’386 Patent. See EX1001, 1:67-2:3.



KR996 (EX1005), Figs. 9, 10
(annotated)

152. KR996 also illustrates the pivot point at which the boom cylinder 46 (*actuator*) is attached to the mainframe being *above the rotational axis* as illustrated in Fig. 9 below:



KR996 (EX1005), Fig. 9
(annotated)

Further, as in element [86.7], at least a portion of the bucket attachment 47 (*attachment plate*) is forward of the *drive mechanism*, e.g., wheels 14, when the loader is in the *vertically raised position*. See KR996 (EX1005), Fig. 9, Fig. 21. Thus, claim 86 is rendered obvious by KR996 in view of JP705.

22. Claim 87

[87] *The compact tool carrier as set forth in claim 86 wherein the mainframe incorporates a single weldment.*

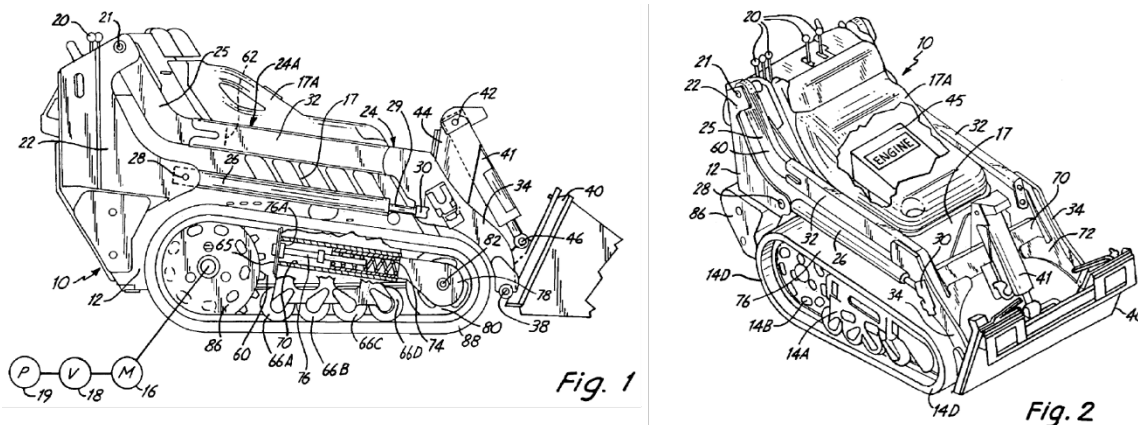
153. KR996 and JP705 render obvious claim 86 as I discuss above and it would have been obvious for the mainframe of KR996 to *incorporate[] a single*

weldment for the reasons I discuss in element [33]. Thus, claim 87 is obvious in light of KR996 and JP705.

A. Ground 2 : KR996, JP705, and Bares

1. Bares (EX1010)

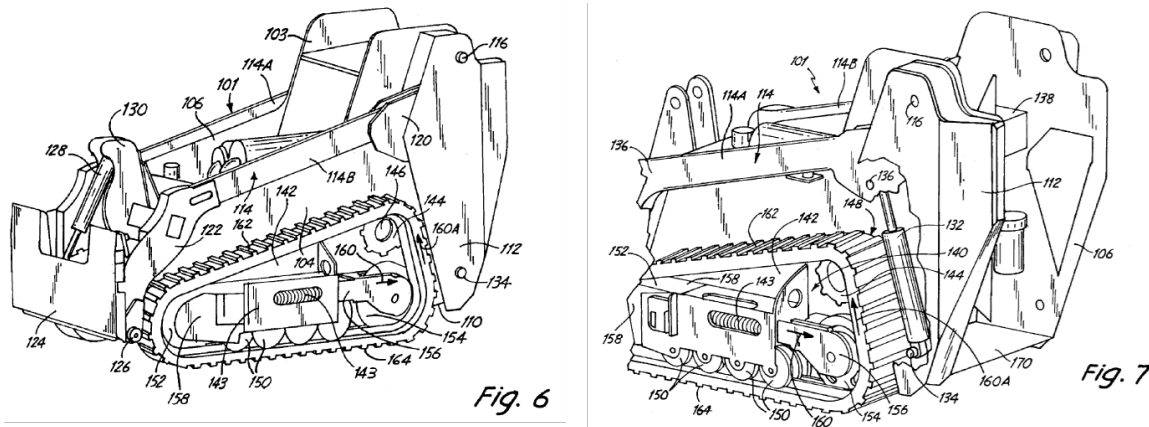
154. Bares “relates to a small...walk behind loader that is, in the form shown, track propelled.” EX1010, 1:33-35. Bares provides a first embodiment illustrated by side and perspective views in FIGS. 1-2, reproduced below. EX1010, 2:14-16.



EX1010, FIGS. 1, 2

155. A track assembly 14 is on each side of the loader for propelling the loader in a forward or reverse direction through use of drive hydraulic motors indicated generally at 16, which are operated through a pump 19 “driven by an internal combustion engine 45 mounted on the [frame] 12.” EX1010, 2:35-46. Bares also describes modified track assembly having a drive motor 146 and a drive

sprocket 144 raised above a tensioner idler wheel. EX1010, 1:59-63, 5:24-29, FIGS. 6-8.



EX1010, FIGS. 6, 7

Bares also recognizes in lieu of track assemblies, wheels are also a common configuration for this type of vehicle. EX1010, 2:1-11, 4:44-51. And Bares describes its loader can be a “walk behind unit, or can have a support platform 170 for supporting an operator.” EX1010, 5:55-57.

2. Reasons to Combine KR996 and JP705

156. The reasons to combine KR996 with JP705 (KR996-JP705) are discussed above.

3. Reasons to Combine KR996-JP705 and Bares

157. Bares, like KR996-JP705, is in the same field of endeavor as the '386 Patent, pertaining to working vehicles (*e.g.*, earth-moving equipment) and in particular, is directed to self-propelled vehicles with a stand or walk behind

operation and a loader. EX1005, Abstract, [0001], FIG. 21; EX1010, 5:55-57, FIGS. 1-8; EX1001, 1:16-31, 2:59-3:3, FIG. 1. KR996-JP705, Bares, and '386 Patent are also each reasonably pertinent to a same problem faced by the inventor regarding the need to provide compact tool carriers with a relatively low-profile, compact design. EX1005, [0008]-[0009], [0012]; EX1001, 1:28-30, 37-38; EX1010, 1:46-58.

158. POSITA would have been motivated to combine the teachings of Bares with KR996-JP705 to produce a predictable and beneficial configuration of a track assembly on the vehicle. The simple substitution of Bares' track assembly for the wheels in the KR996-JP705 vehicle would have been predictable with a reasonable expectation of success because both KR996-JP705 and Bares relate to similar vehicle types with a similar mainframe having a drive mechanism attached thereto.

159. Designing this vehicle type with a drive mechanism of either a wheeled assembly or a tracked assembly was a known alternative. See Rorabaugh (EX1032) (U.S. Patent Appl. 2010/0168933), [0011], which describes a compact tool carrier having a track or "[a]lternatively, ...a wheeled unit." Bares itself recognizes that wheel and track assemblies were known alternatives. EX1010, 2:1-2. Bares '568 (EX1009), 4:30-39 ("[t]he propulsion system for moving the loader is disclosed specifically as a track unit. However, skid steer loaders are commonly mounted on wheels...Thus the propulsion system that supports the loader for movement can be

sets of wheels mounted in place of the tracks shown.”). Industry standards for compact tool carriers also recognize these two common alternatives: “self-propelled crawler [tracked assembly] or wheeled machine.” SAE J2752 (EX1015), p. 2, ISO 6165 (EX1016), p. 5 (“self-propelled [] machine on wheels, crawlers or legs...”.) A crawler is a track assembly.

160. It was a known practice to market compact tool carriers such as KR996-JP705 and Bares to provide the buyer a choice of a wheel configuration or a track configuration. The buyer’s choice may be dependent upon the target terrain for the carrier’s use. For example, depending on the terrain, a buyer may choose a tracked assembly for example, if targeting applications with a more diverse or rocky terrain. KR996 provides for use in deconstruction work, which can provide uneven terrain and debris that its vehicle must traverse, which would benefit from a tracked configuration. The traction provided by a tracked configuration is also typically greater than the traction provided by wheeled configurations. Tracked vehicles spread their ground load over a much greater surface area than wheeled vehicles. This results in lower pressure over the ground and less likelihood of the vehicle sinking on soft surfaces such as mud. Moreover, the significantly larger contact patch (surface area in contact with the ground) allows for much higher torque transmitted to the ground without slippage, i.e., better traction. Also, by having a continuous tread, tracked vehicles have the ability to cross holes and trenches in

which wheels would sink.

161. In some desired applications for the vehicle, a POSITA would have had reason to replace the wheel configuration, which can provide higher pressure to the supporting surface of the vehicle, with a track configuration, which can provide a reduced pressure to the supporting surface. The choice to provide the tracked configuration can be driven by the surface composition and/or need to mitigate impact to said surface intended for the vehicles use. For example, track configuration, providing lower ground pressure, can be advantageous on soft surfaces.

162. A POSITA would have recognized a reasonable expectation of success in providing a tracked assembly on the KR996-JP705 vehicle as track assemblies were well known in the art and perform the same function as the wheel mounted drive mechanism illustrated in KR996-JP705. This is simple substitution of one known, equivalent element for another to obtain predictable results and performing the same function. Bares describes “[t]he drive unit can be preassembled as a unit including at least the major components, and merely bolted in place.” EX1010, 1:33-45.

4. Claim 37

[37] *The compact tool carrier as set forth in claim 31 further comprising a drive mechanism for propelling the compact tool carrier over a supporting surface, the drive mechanism having a drive sprocket, the cross-member being disposed*

forward of the drive sprocket in the vertically raised position and the down position.

163. KR996 and JP705 render obvious claim 31 as I discussed above. And I also discussed in element [86.6] that KR996 describes *a drive mechanism* including “wheels (14)” (*wheels*) for *propelling* the vehicle (*compact tool carrier*) over a *supporting surface* (e.g., ground). KR996 (EX1005), [0042], Figs. 1, 8-10; wheels (14).

164. It would have been obvious, as a simple substitution for the wheeled assembly illustrated in KR996, to provide a track assembly drive mechanism, including *a drive sprocket*, on the KR996 vehicle for the reasons I discussed above.

165. Bares illustrates track assembly (*drive mechanism*) for *propelling* a small loader vehicle. EX1010, Figs. 1, 8, 2:36-37, 3:24-32, 5:18-43. In an embodiment of Bares, each track assembly includes a frame 142, a drive sprocket 144 and wheels 150, 154 over which a track 148 (*track*) is mounted. EX1010, 5:18-42, FIGS. 6-8. Bares’ drive sprocket 144 driven by motor 146 rotates around a rotational axis, just like in the ’386 Patent. Bares explains its drive mechanism is *for propelling the loader apparatus over a supporting surface*. See EX1010, 2:37-39 (“**[ground drive] assembly []** on each side of the loader for **propelling the loader in forward** and reverse directions.”), 5:18-43 (“to power the unit and propel it over the ground.”) Bares’ drive mechanism as illustrated and on KR996’s provides these same features.

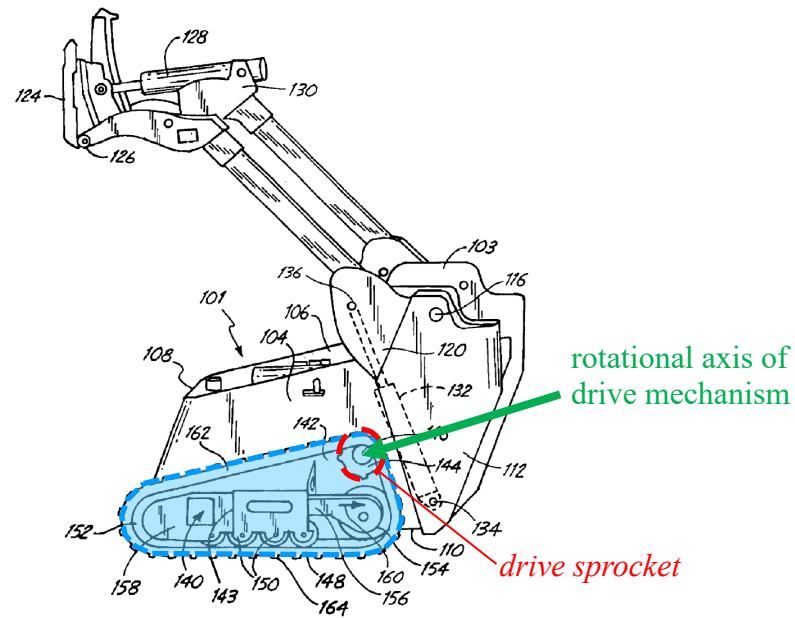


Fig. 8

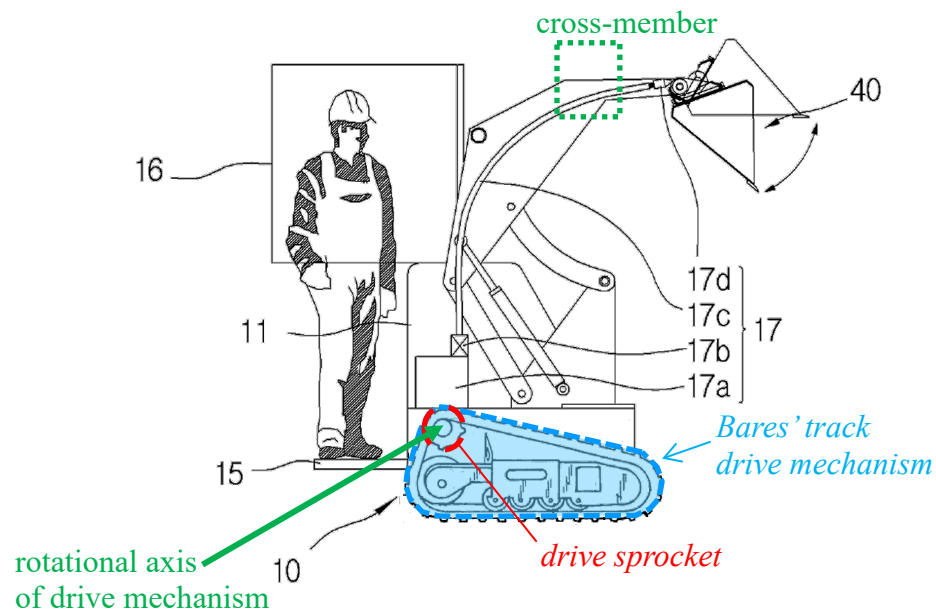
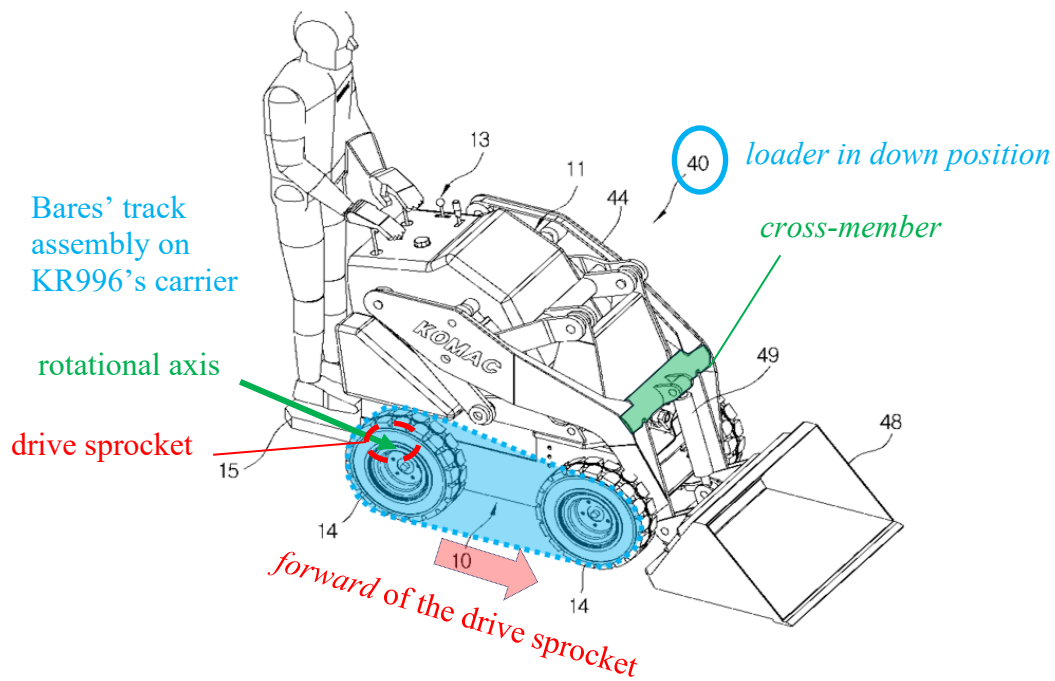
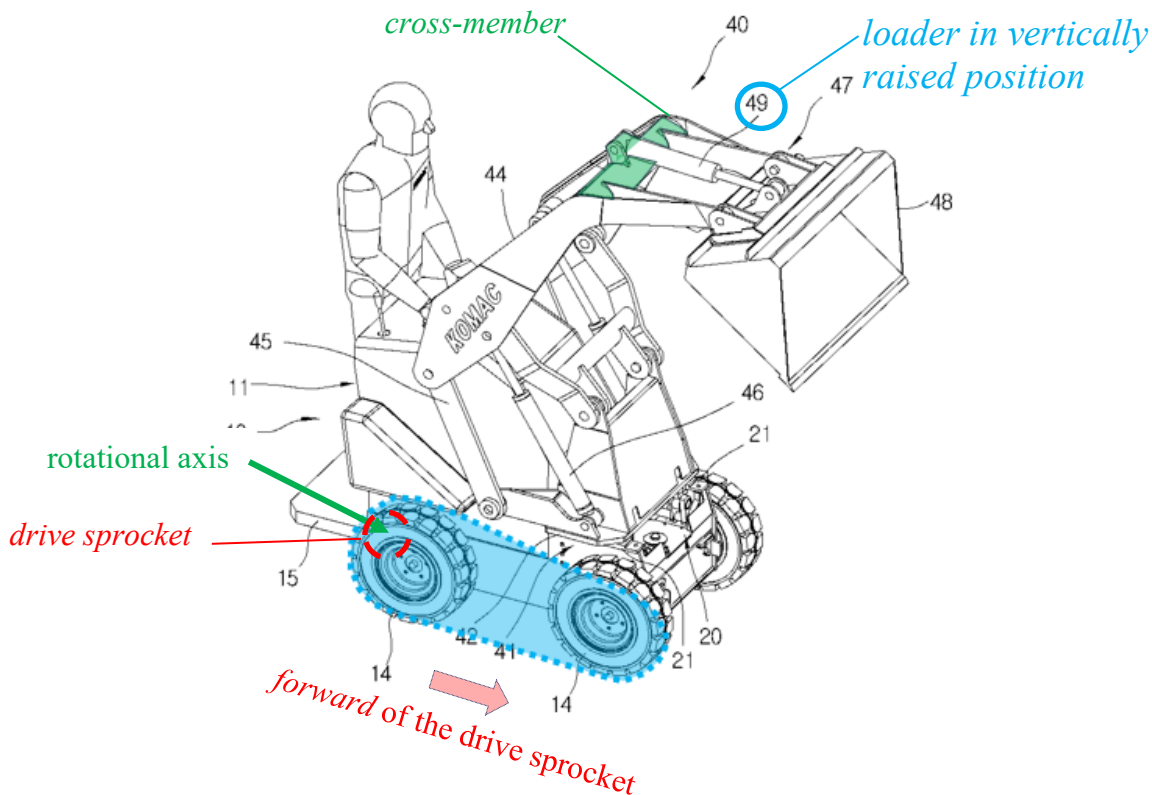
EX1010, FIG. 8
(annotated)FIGURE A
KR996's Fig. 21 (annotated)
and modified with Bares' FIG. 8 track assembly

Figure A is based on Figure 21 of KR996, with how a POSITA would understand Bares' track assembly, taken from Bares' FIG. 8, would be applied to the vehicle. (The illustration of the tracked assembly of Bares' FIG. 8 is flipped and lead lines/labels removed substituted for KR996's Fig. 21's wheel assembly.)

166. Providing the drive mechanism of KR996-JP705 vehicle with the track assembly taught by Bares, the predictably resulting KR996-JP705-Bares vehicle has *the cross-member being disposed forward of the drive sprocket in the vertically raised position and the down position* of the loader. This is because the cross-member is *disposed forward of the* rotational axis of the rear of the drive mechanism of KR996 *in the vertically raised position and the down position* of the loader and thus, the cross-member is similarly forward of the rotational axis of the drive mechanism provided by the *drive sprocket* in the track assembly in KR996-JP705-Bares.



**EX1005, Fig. 8 (portion) (annotated)
and with Bares' track assembly**



**EX1005, Fig. 9 (annotated)
and with Bares' track assembly**

167. Bares also illustrates its loader arm has a cross-member 70 between two loader arms that is *forward of the drive sprocket* and its rotational axis. See Bares (EX1010), FIGS. 6-8. Thus, claim 37 is rendered obvious by KR996, JP705 and Bares.

5. Claim 40

[40] *The compact tool carrier as set forth in claim 38 wherein the loader is moveable between a down position and a vertically raised position, the compact tool carrier further comprising a drive mechanism for propelling the compact tool carrier over a supporting surface, the drive mechanism having a drive sprocket, the cross-member being disposed forward of the drive sprocket in the down position and the vertically raised position of the loader.*

168. Claim 38 is rendered obvious by KR996 and JP705 and KR996 further describes its loader unit 40 (*loader*) is *moveable between a down position* (Fig. 8) and a *vertically raised position* (e.g., Fig. 9) as I described in element [31.1]. And it would have been obvious to provide Bares' track assembly (*drive mechanism*) including its drive sprocket 144 (*drive sprocket*) as discussed above in [37] illustrating the *cross-member being disposed forward of the drive sprocket* in each position. See KR996, Figs. 8-9, Bares, FIGS. 6-8.

169. Thus claim 40 is rendered obvious KR996, JP705, and Bares.

6. Claim 70

170. Claim 70 recites substantially the same limitations as discussed above with reference to claims 31 and 32, which are taught by KR996 in combination with the engine bracket of JP705, and includes a drive mechanism having a drive sprocket and track, which is taught by Bares as in [37].

		See the analysis for:
[70.0]	<i>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:</i>	[31.0]

		See the analysis for:
[70.1]	<i>a loader having an arm, the loader being adapted to carry a tool;</i>	[31.1] discussing loader 40 (<i>loader</i>) and boom 44 (<i>arm</i>) adapted to carry a bucket 48 (<i>tool</i>)
[70.2a]	<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>	[31.2a]
[70.2b]	<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>	[31.2b] including JP705's mounting parts 7 (<i>engine bracket</i>) that would have been obvious to combine with KR996 for the reasons above
[70.2c]	<i>the loader arm not being directly attached to the mainframe;</i>	[31.2c]
[70.3]	<i>a linkage pivotally attached to the first side of the mainframe at a linkage pivot point and pivotally attached to the loader arm;</i>	[32] discussing link (<i>linkage</i>) pivotally attached to the mainframe at a <i>linkage pivot</i>

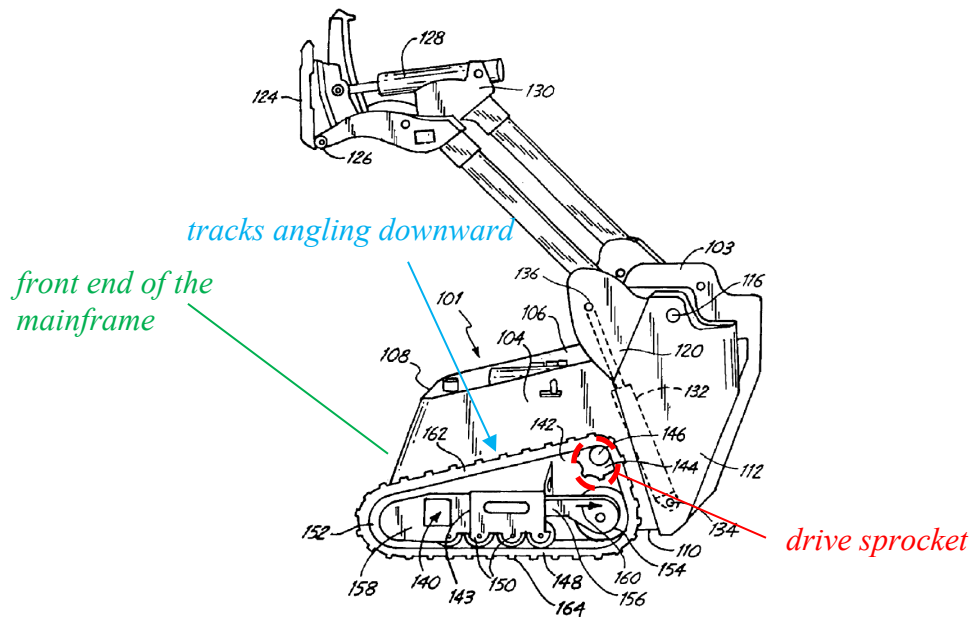
		See the analysis for:
		<i>point</i> and attached to the boom 44 (<i>loader arm</i>) ⁷
[70.4]	<i>an actuator pivotally attached to the first side of the mainframe at an actuator pivot point and pivotally attached to the loader arm;</i>	[31.4] discussing boom cylinder 46 (<i>actuator</i>) pivotally attached to the mainframe at <i>an actuator pivot point</i> and pivotally attached to the boom 44 (<i>loader arm</i>)
[70.5a]	<i>a drive mechanism comprising a drive sprocket and tracks for propelling the compact tool carrier over a supporting surface,</i>	[37] discussing the track assembly (<i>drive mechanism</i>) of Bares having a drive sprocket 14B (<i>drive sprocket</i>) and track 14D (<i>tracks</i>) that would have been obvious to combine with KR996
[70.5b]	<i>at least a portion of the tracks angling downward from the drive sprocket toward the front end of the mainframe, the linkage pivot point being disposed above the portion of the tracks that angles</i>	See my discussion below

⁷ Due to dependent claim further limitations I discuss below, here the forward linkage of KR996 is referred to as the *linkage*.

		See the analysis for:
	<i>downward from the drive sprocket toward the front end of the mainframe; and</i>	
[70.6]	<i>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.</i>	[31.5a] including control unit 13 (<i>control station</i>)

171. As for [70.5b], Bares' track drive mechanism provides for *at least portion of the tracks 148 (tracks) are angling downward from the drive sprocket 144 (drive sprocket) towards the front end of the mainframe* as shown by its illustrations. See EX1010, FIGS. 6-8. Bares describes "[t]he track 148 has an **inclined upper reach or portion 162**, and the flat ground support portion 164 that provides the support for movement over the ground." EX1010, 5:52-54. This is a standard shape of a tracked assembly in which the drive sprocket is not one of the drive wheels. This also allows for more variability in design choice for the size and number of drive wheels and size of drive sprocket based on the anticipated vehicle use and the engine/motor properties. See Valere (EX1033), U.S. Patent No. 2009/0116943, [0030], FIG. 1; EX1015, p. 11; EX1035, FIG. 1, 3:21-47. A

POSITA would understand the same configuration to be provided when incorporating Bares' track assembly on KR996 and in doing so the *linkage pivot point is disposed above the portion of the tracks that angles downward.*



EX1008, FIG. 1
(annotated)

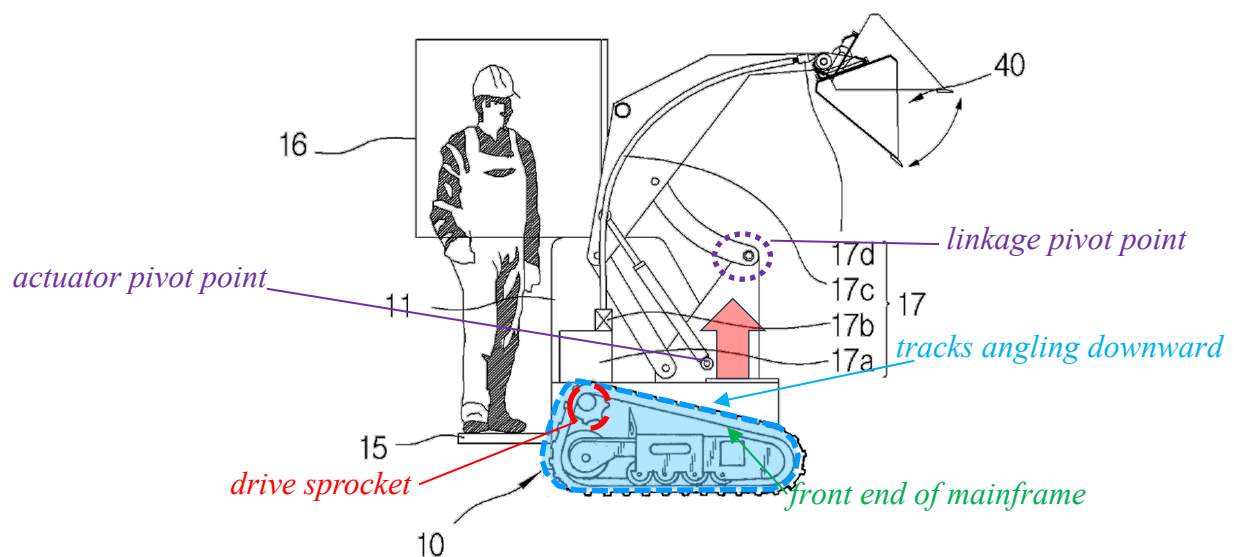


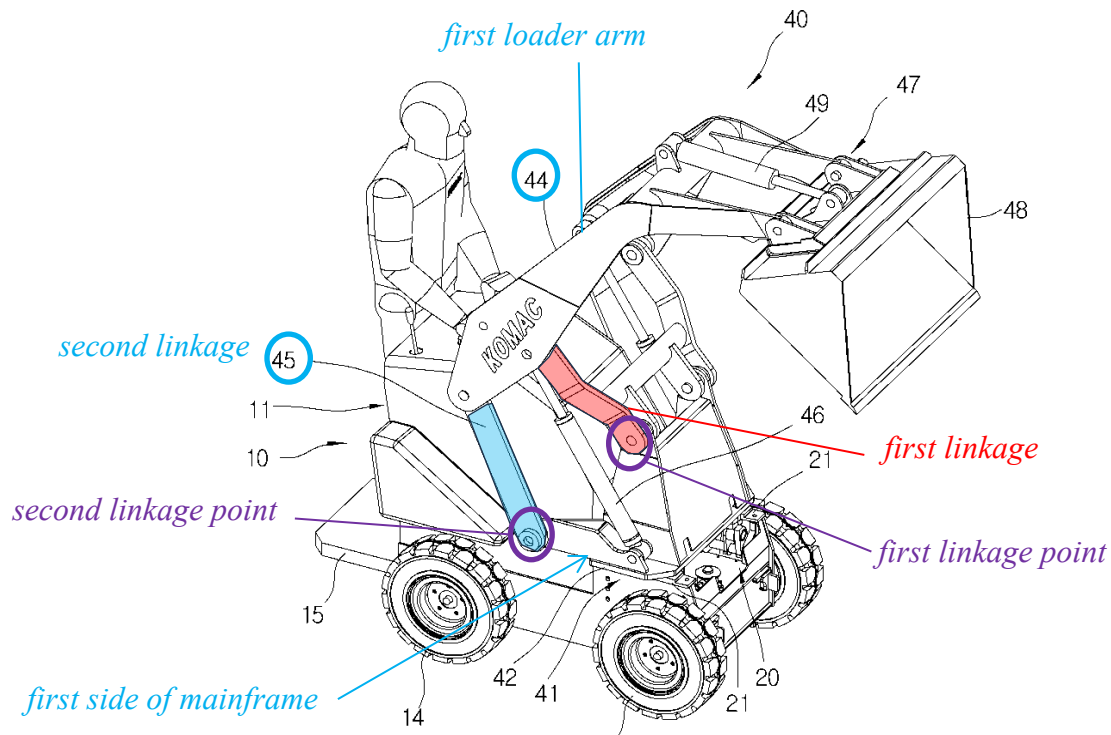
FIGURE A
KR996's Fig. 21 (annotated)
and modified with Bares' FIG. 8 track assembly

172. Thus, claim 70 is rendered obvious over KR996, JP705, and Bares.

7. Claim 71

[71] *The compact tool carrier as set forth in claim 70 wherein the linkage is a first linkage and the linkage pivot point is a first linkage pivot point, the compact tool carrier further comprising a second linkage pivotally attached to the first side of the mainframe at a second linkage pivot point and pivotally attached to the loader arm, the first linkage being forward of the second linkage.*

173. KR996, JP705, and Bares render obvious claim 70 and KR996 further illustrates the link (*linkage* at [70.3], that of the forward link in KR996) is a *first linkage* and includes another link 45 (*second linkage*) also pivotally attached to the first side of the mainframe at a *second linkage pivot point* and pivotally attached to boom 44 (*loader arm*) as I discuss in element [31.3]. Annotated Fig. 9 is illustrative:



KR996 (EX1005), Fig. 9
(annotated)

174. The link (*first linkage*), red above, is *forward of* the link 45 (*second linkage*), blue above.

175. Thus, claim 71 is obvious in light of KR996, JP705, and Bares.

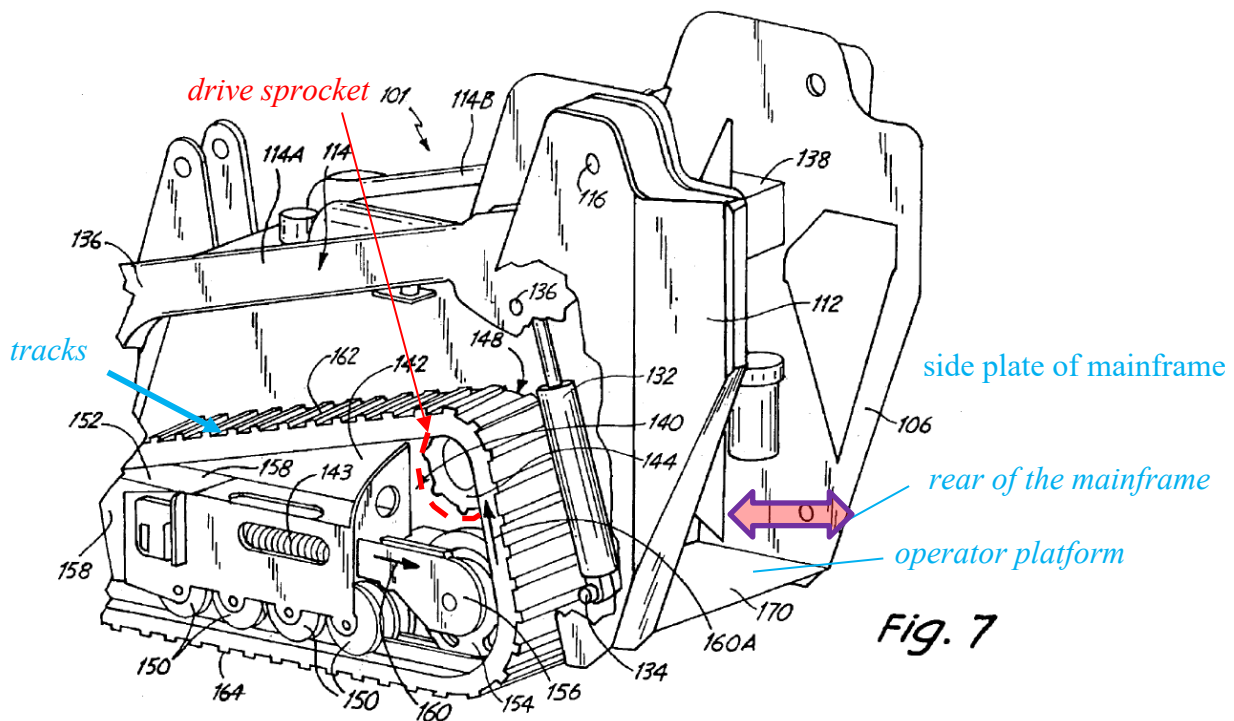
8. Claim 72

[72] The compact tool carrier as set forth in claim 70 further comprising an operator platform for standing operation of the operator controls of the control station, the operator platform extending from the mainframe, at least a portion of the operator platform being forward of the rear end of the mainframe.

176. KR996-JP705-Bares renders obvious claim 70 and as I discuss in [31.6], KR996 also provides a safety step 15 (*operator platform*) on which an operator stands for *standing operation of the operator controls* of control unit 13 and

that *extend[s] from the mainframe*. EX1005, Figs. 1, 7-10, 21, [0033], [0049].

177. In light of Bares, it would have been obvious for *at least a portion of the safety step 15 (operator platform)* to be *forward of the rear end of the mainframe* in KR996-JP705. Like KR996, Bares similarly describes a step at the rear of a compact loader on which the operator stands during operation, “platform 170.” EX1010, 5:55-57, FIG. 7. Bares illustrates a portion of a mainframe—side plates 104, 106—extends such that platform 170 is at least partially within a pocket defined by the extension of the frame and thus, *forward of the rear end of the mainframe*. FIG. 7 of Bares is illustrative:



EX1010, Fig. 7
(annotated)

178. Extending the mainframe as taught by Bares to KR996-JP705’s frame

provides *least a portion of the step 15 (operator platform) is forward of the rear end of the mainframe* as the mainframe extension forms a pocket providing a barrier of protection for the operator when on safety step 15. Extension of a frame of a carrier adjacent to an operator platform was a well-known configuration, easy to implement. See, e.g., McIlwraith (EX1007) FIGs. 2, 3; McIlwraith illustrates a portion of its mainframe – side plates 11, 12 – extend such that the tread plate 14 is at least partially within a pocket defined by the extension of the frame and thus, is *forward of the rear of the mainframe*.

179. POSITA would have been motivated, and found it easy, to combine the extended frame of Bares with KR996-JP705 to produce a predictable and beneficial configuration of a barrier adjacent the operator's environment on the safety step. POSITA would have recognized a benefit in Bares' configuration as it provides operator protection suggested by industry standards. For example, ISO 3457 (EX1017) standard is directed to guards for earth-moving machinery such as KR996 and Bares. ISO 3457 would have suggested to a POSITA to provide Bares' extension of the mainframe to provide a barrier between the KR996's operator and drive mechanism or loader, 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 desired. ISO 3457 (EX1017), p. 1. By providing the extension of the frame of Bares to that of KR996,

a barrier is provided between an operator and the equipment (e.g., drive mechanism and/or loader) avoiding contact with the drive mechanism/loader 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.

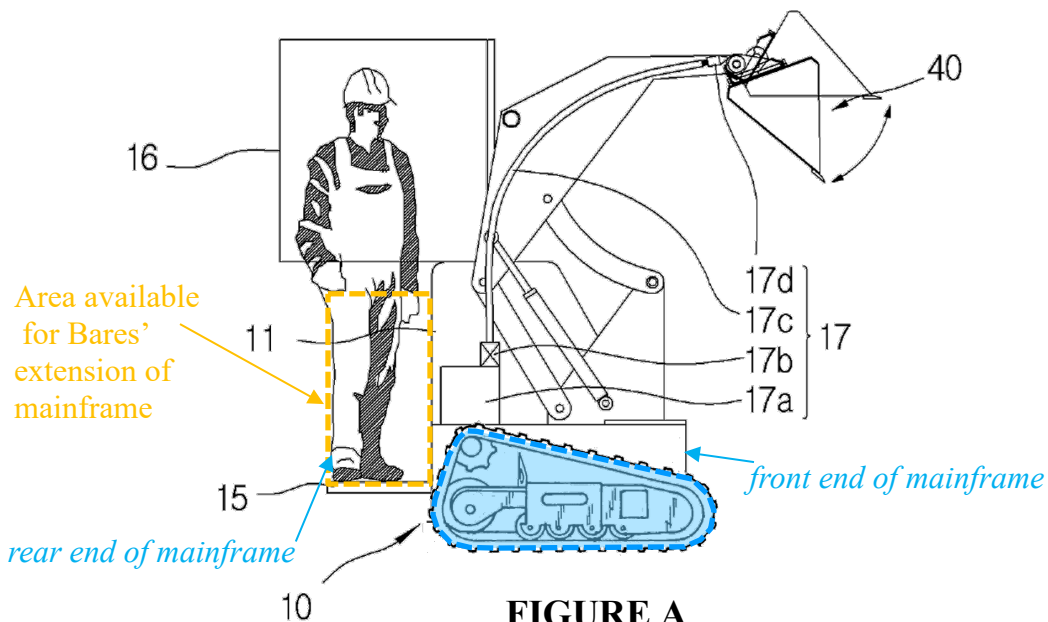


FIGURE A
KR996's Fig. 21 (annotated)
and modified with Bares' FIG. 8 track assembly

180. Thus, KR996-JP705 in view of Bares renders obvious claim 72.

9. Claim 73

[73] *The compact tool carrier as set forth in claim 70 wherein the mainframe incorporates a single weldment.*

181. KR996, JP705, and Bares render obvious claim 70 as I discuss above

and it would have been obvious for the mainframe of KR996 to *incorporate[] a single weldment* for the reasons I discuss in claim [33]. Thus, KR996, JP705, and Bares render obvious claim 73.

10. Claim 74

182. Claim 74 recites substantially the same limitations as discussed above with reference to claims 31 and 32 (second linkage), which are taught by KR996 in combination with the engine bracket of JP705, and includes a limitation as drive mechanism having a drive sprocket and tracks, and thus, is similarly rendered obvious by KR996 in view of JP705 and in combination with the drive mechanism of Bares.

		See the analysis for:
[74.0]	<i>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:</i>	[31.0]
[74.1]	<i>a loader having an arm, the loader being adapted to carry a tool;</i>	[31.1] including loader 40 (<i>loader</i>) having boom 44 (<i>arm</i>) adapted to carry bucket 48 (<i>tool</i>)
[74.2a]	<i>a mainframe for supporting the loader, the mainframe</i>	[31.2a]

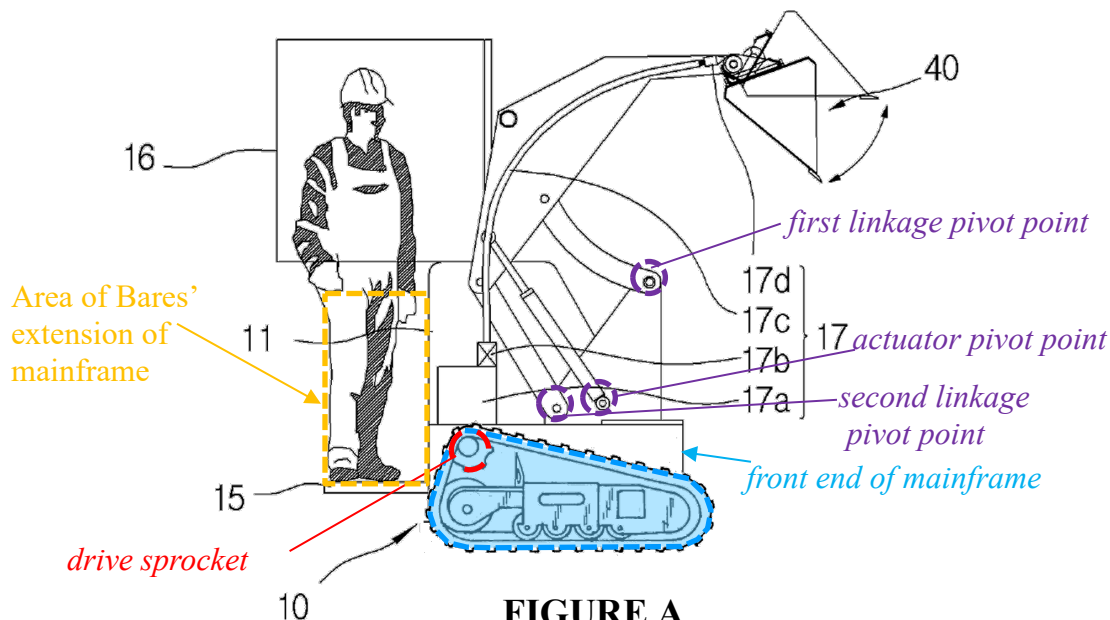
		See the analysis for:
	<i>having a first side and a second side, and having a front end and a rear end relative to the longitudinal axis,</i>	
[74.2b]	<i>the mainframe comprising an engine bracket that extends from the first side toward the second side for mounting an engine to the mainframe, the engine bracket being spaced from the rear end of the mainframe,</i>	[31.2b] including JP705's mounting parts 7 (<i>engine bracket</i>) that would have been obvious to combine with KR996 for the reasons above
[74.2c]	<i>the loader arm not being directly attached to the mainframe;</i>	[31.2c]
[74.3]	<i>a first linkage pivotally attached to the first side of the mainframe at a first linkage pivot point and pivotally attached to the loader arm;</i>	[32] discussing link of KI996 which provides <i>a first linkage</i> and pivotally attached to the boom 44 (<i>loader arm</i>) and the mainframe <i>a first linkage pivot point</i>
[74.4]	<i>a second linkage pivotally attached to the first side of the mainframe at an [sic] second linkage pivot point and pivotally attached to the loader arm;</i>	[31.3] discussing a link 45 which is a <i>second linkage</i> that is pivotally attached to the boom 44 (<i>loader arm</i>) and to the first side of the mainframe <i>at a second linkage pivot point</i>

		See the analysis for:
[74.5]	<i>an actuator pivotally attached to the first side of the mainframe at an actuator pivot point and pivotally attached to the loader arm;</i>	[31.4] discussing boom cylinder 46 (<i>actuator</i>) pivotally attached to the mainframe at an actuator pivot point and pivotally attached to the boom 44 (<i>loader arm</i>)
[74.6a]	<i>a drive mechanism comprising a drive sprocket and tracks for propelling the compact tool carrier over a supporting surface,</i>	[37] including Bares' track assembly (<i>drive mechanism</i>) having a drive sprocket 144 (<i>drive sprocket</i>) and tracks 148 (<i>tracks</i>) that would have been obvious to combine with KR996
[74.6b]	<i>the tracks being spaced from the rear end of the mainframe,</i>	[72] including Bares' frame extension forming a pocket in combination with KR996's mainframe
[74.6c]	<i>at least a portion of the tracks angling downward from the drive sprocket toward the front end of the mainframe,</i>	[70.5b] including Bares' tracks 148 angling downward
[74.7]	<i>a control station having operator controls for propelling the compact tool carrier forward and for raising and lowering the loader, the control station</i>	[31.5a] including control unit 13 (<i>control station</i>)

		See the analysis for:
	<i>being mounted toward the rear of the compact tool carrier and adapted to allow for standing or walk-behind operation; and</i>	
[74.8]	<i>an operator platform for standing operation of the operator controls of the control station.</i>	[31.6] including safety step 15 (<i>operator platform</i>)

183. As discussed in elements [37], [70.5b], and the reasons to combine Bares and KR996-JP704, it would have been obvious to provide Bares' drive mechanism comprising a tracked assembly having tracks 148 (*tracks*) that *angl[e]* downward, and drive sprocket 144 (*drive sprocket*) replacing the wheels 14 of KR996. Bares also teaches its tracks being *spaced from the rear end of the mainframe*, which would have been obvious to implement in KR996 to move a hazard further from the operator on the safety step 15.

184. Regarding, [74.6d], the KR996 vehicle having Bares' tracked assembly provides for each of the pivot point attachments between the links (*linkages*) and boom cylinder 46 (*actuator*) are (1) *disposed above at least part of the portion of Bares' tracks 148 (tracks) that angle[] downward from drive sprocket 144 (drive sprocket) toward the front end of the KR996 mainframe as shown below.*



10 **FIGURE A**
KR996's Fig. 21 (annotated)
and modified with Bares' FIG. 8 track assembly

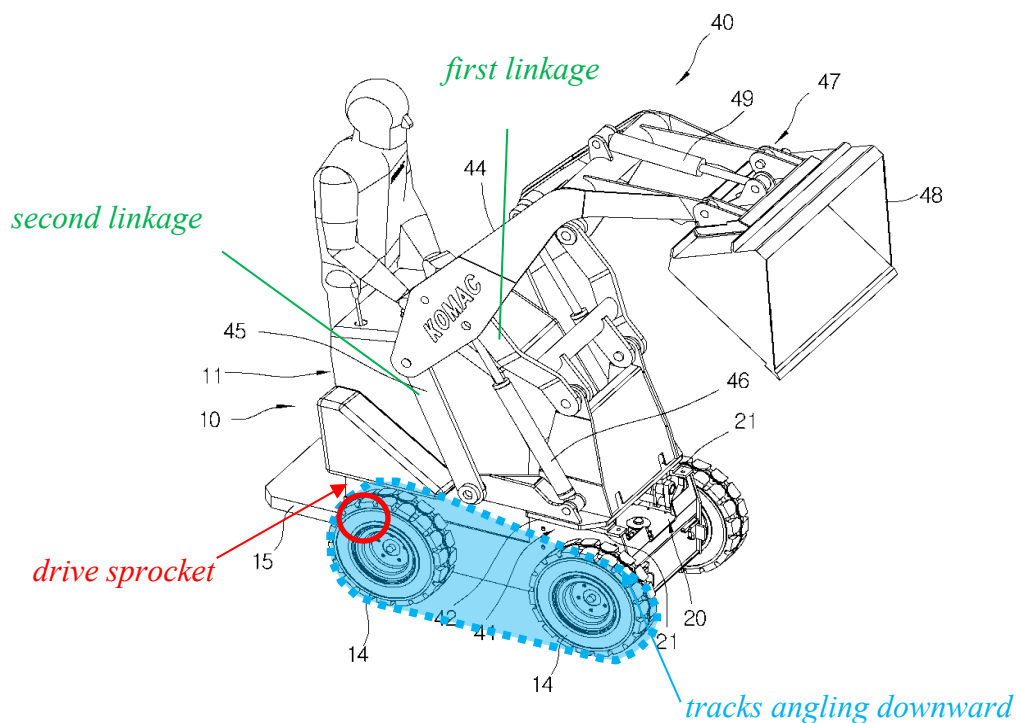
185. To the extent that the Patent Owner argues that KR996 insufficiently illustrates the drive mechanism *spaced a distance* from the end of the mainframe, it was a known feature extend the mainframe to provide a barrier between the operator and the track as shown in Bares.

186. Thus, claim 74 is rendered obvious by KR996 in view of JP705's engine bracket and Bares' tracked assembly drive mechanism.

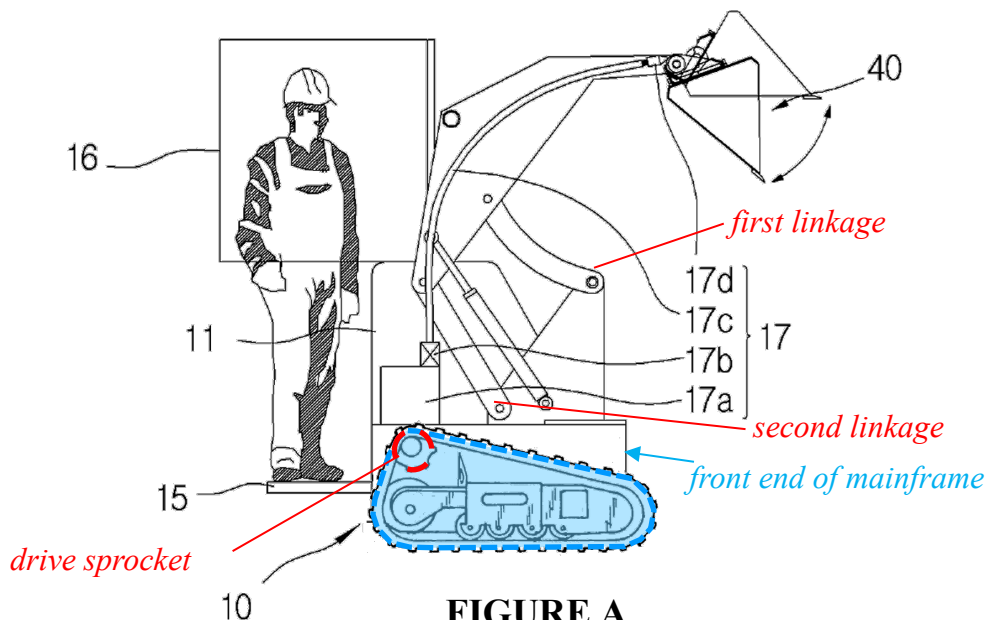
11. Claim 75

[75] The compact tool carrier as set forth in claim 74 wherein the first linkage is forward of the second linkage, the first linkage being disposed above the portion of the tracks that angles downward from the drive sprocket toward the front end of the mainframe.

187. Claim 74 is rendered obvious by KR996, JP705 and Bares as I discuss above. And as annotated in claim 74 above, the link (*first linkage*) is *forward of* the link 45 (*second linkage*) and is disposed over *the portion of the tracks 148 of Bares (tracks) that angles downward from the drive sprocket 144 (drive sprocket)* shown in Bares' Figs. 6-8, to the front end of the mainframe of KR996.



KR996 (EX1005), Fig. 9
(annotated)



10 **FIGURE A**
KR996's Fig. 21 (annotated)
and modified with Bares' FIG. 8 track assembly

188. Thus, claim 75 is obvious in light of KR996, JP705, and Bares.

12. Claim 76

[76] The compact tool carrier as set forth in claim 74 wherein the operator platform extends from the mainframe, at least a portion of the operator platform being forward of the rear end of the mainframe.

189. KR996-JP705-Bares render obvious claim 74 and as I discuss in [72] it would have been obvious for Bares' extension of the mainframe to be applied such that *at least a portion* of the safety step 15 (*operator platform*) is *forward of the rear end of the mainframe*. Thus, claim 76 is rendered obvious by KR996-JP705-Bares.

13. Claim 77

[77] *The compact tool carrier as set forth in claim 74 wherein the mainframe incorporates a single weldment.*

190. KR996, JP705, and Bares renders obvious claim 74 and it would have been obvious for the mainframe of KR996 to *incorporate[] a single weldment* for the reasons discussed in [33]. Thus, KR996-JP705-Bares renders obvious claim 77.

23. Claim 78

191. Claim 78 recites substantially the same limitations as discussed above with reference to claim 31 with the addition of the drive mechanism elements and extension of mainframe taught by Bares as discussed in [34] and [72], respectively.

		See the analysis of
[78.0]	<i>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:</i>	[31.0]
[78.1]	<i>a loader having an arm, the loader being adapted to carry a tool;</i>	[31.1] including loader unit 40 (loader) having a boom 44 (arm) adapted to carry a bucket 48 (tool)
[78.2a]	<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>	[31.2a]

		See the analysis of
[78.2b]	<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>	[31.2b] including JP705's mounting parts 7 (<i>engine bracket</i>) in combination with KR996's mainframe
[78.2c]	<i>the loader arm not being directly attached to the mainframe;</i>	[31.2c]
[78.3]	<i>a linkage pivotally attached to the first side of the mainframe at a linkage pivot point and pivotally attached to the loader arm;</i>	[31.3] including link 45 (<i>linkage</i>) is pivotally attached at a linkage pivot point with the mainframe and pivotally attached to the boom 44 (<i>loader arm</i>)
[78.4]	<i>an actuator pivotally attached to the first side of the mainframe at an actuator pivot point and pivotally attached to the loader arm;</i>	[31.4] including boom cylinder 46 (<i>actuator</i>) is pivotally attached at an actuator pivot point with the mainframe and pivotally attached to the boom 44 (<i>loader arm</i>)
[78.5]	<i>a drive mechanism comprising a drive sprocket and tracks for propelling the compact tool carrier over a supporting surface, the tracks being spaced from the rear end of the mainframe; and</i>	[37] including Bares' drive mechanism including a drive sprocket 144 and tracks 148 as a simple

		See the analysis of
		substitution for KR996's wheels 14, see also, [72] for rear end of the mainframe
[78.6]	<i>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; and</i>	[31.5a] including control unit 13 (control station)
[78.7a]	<i>an operator platform for standing operation of the operator controls of the control station that extends from the mainframe,</i>	[31.6] including safety step 15 (operator platform)
[78.7b]	<i>at least a portion of the operator platform being forward of the rear end of the mainframe</i>	[72] including Bares' teaching of extending the rear end of the mainframe adjacent the safety step 15 (operator platform) to provide the operator platform forward of the rear end of the mainframe

Thus, KR996's compact loader carrier in combination with JP705's engine bracket, Bares' tracked assembly and formation of a pocket adjacent the operator platform renders obvious claim 78.

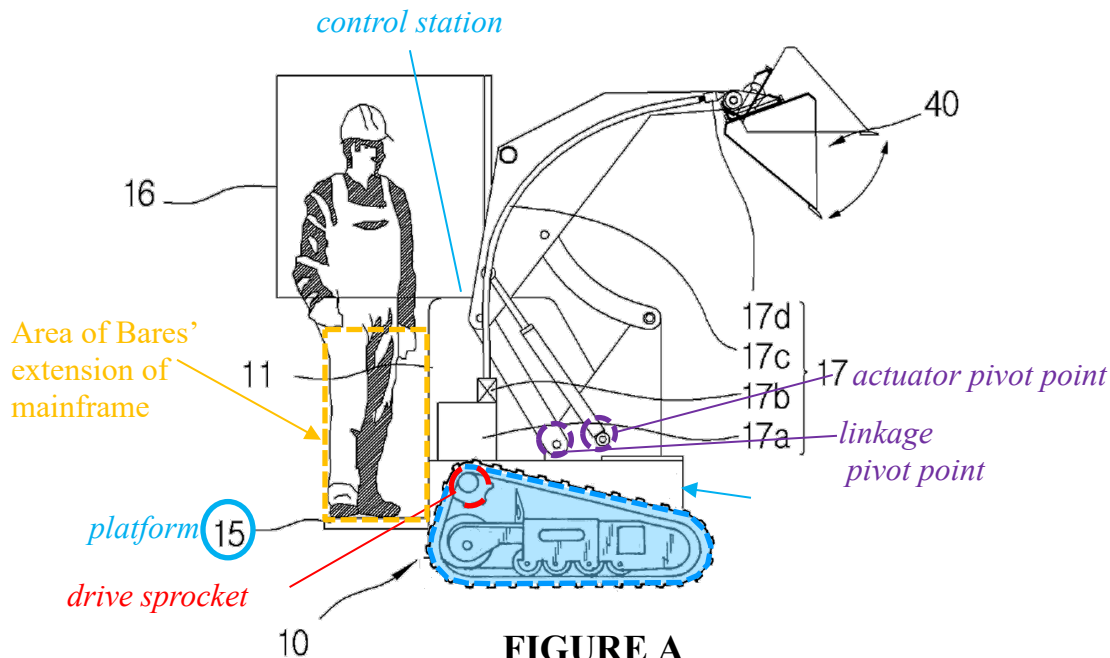


FIGURE A
KR996's Fig. 21 (annotated)
and modified with Bares' FIG. 8 track assembly

24. Claim 79

[79] *The compact tool carrier as set forth in claim 78 wherein the mainframe incorporates a single weldment.*

192. Claim 78 is rendered obvious by KR996, JP705, and Bares and it would have been obvious to provide the mainframe of KR996 as *incorporating a single weldment* for the reasons discussed in claim [33]. Thus, claim 79 is rendered obvious by KR996, JP705, and Bares.

XI. CONCLUSION

This declaration and my opinions herein are made to the best of my knowledge and understanding, and based on the material available to me, at the time of signing this declaration. I declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 or Title 18 of the United States Code.

Date: 11/13/24

A handwritten signature in cursive script, reading "Steven A. Velinsky", positioned above a horizontal line.

Steven Alan Velinsky