

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BABYBJÖRN AB

Petitioner

v.

THE ERGO BABY CARRIER, INC.

Patent Owner

Inter Partes Review Case No. IPR2025-00110

U.S. Patent No. 11,786,055

DECLARATION OF MR. DIRK DUFFNER

TABLE OF CONTENTS

I. INTRODUCTION	3
A. BACKGROUND AND QUALIFICATIONS	4
B. MATERIALS REVIEWED.....	5
II. LEGAL FRAMEWORK	6
A. ANTICIPATION	7
B. OBVIOUSNESS.....	7
III. CLAIM CONSTRUCTION.....	9
A. NON-CONSTRUED CLAIM TERMS.....	10
B. CONSTRUED CLAIM TERMS	10
C. OPINIONS REGARDING THIGH SUPPORT ADJUSTER	10
IV. LEVEL OF A PERSON HAVING ORDINARY SKILL IN THE ART..	12
V. OPINIONS ON CHALLENGED GROUND 3	14
A. <i>GRAY FAILS TO TEACH AT LEAST ONE THIGH SUPPORT ADJUSTER COUPLED TO A FIRST THIGH SUPPORT AND A SECOND THIGH SUPPORT</i>	14
B. <i>STOMPER-ROSAM DOES NOT TEACH OR RENDER OBVIOUS THREE SETTINGS/POSITIONS DEFINED BY THE ADJUSTABLE CHILD CARRIER, PER CLAIM LIMITATIONS [1J]/[6K]/[11L]</i>	16
VI. CONCLUSION	22

I, Mr. Dirk Duffner, declare as follows:

I. INTRODUCTION

1. My name is Dirk Duffner, and I am over 21 years of age and otherwise competent to make this Declaration. I make this Declaration based on facts and matters within my own knowledge and on information provided to me by others, and, if called as a witness, I could and would competently testify to matters set forth herein.

2. I have been retained as a technical expert witness in this matter by Counsel for the Patent Owner, The Ergo Baby Carrier, Inc. (“Patent Owner”) to provide my independent opinions on certain issues requested by Counsel for Patent Owner relating to the accompanying Patent Owner Preliminary Response to the Petition for *Inter Partes* Review of U.S. Patent No. 11,786,055. I am being compensated in this matter at my customary rate of \$450/hour. My compensation in this matter is not based on the substance of my opinions or on the outcome of this matter. I have been informed that BabyBjörn AB (“Petitioner”) is the Petitioner in this matter. I note that I have no financial interest in BabyBjörn AB or in Patent Owner, and I have no other interest in the outcome of this matter.

3. I have summarized in this section my background and qualifications. I have also included a current version of my curriculum vitae as Appendix A.

A. Background and Qualifications

4. I am an independent consultant and the principal of Duffner Engineering, located at 807 Aldo Ave., Suite 101, Santa Clara, CA 95054. I received a Bachelor of Science in Mechanical Engineering from the University of California, Los Angeles in 1985. I received a Master of Science in Mechanical Engineering from Stanford University in 1998. I am a registered professional mechanical engineer (California #M27229, Nevada #ME021731, and Florida #86252). Further details are included in my curriculum vitae (Appendix A).

5. Prior to forming Duffner Engineering, I was a founder and owner of Principia Engineering Services and Managing Engineer at Exponent, Inc. (formerly Failure Analysis Associates), and a cooperative education student at the Space Systems Division of the Lockheed Missiles and Space Company, now the Lockheed Martin Company.

6. I have expertise in product design, especially as it relates to manufacturing and material selection for consumer products and their design. Materials are chosen based upon strength and stiffness to meet requirements of the external loads that are placed upon them during their normal usage and to obtain sufficient dynamic response for the desired performance of the product. My work involves assessing the sufficiency of designs for purposes of the manufacturing and material selection to achieve these characteristics.

7. Much of my practice concerns the analysis of consumer goods, their designs, and their real-world performance. I have studied a wide range of consumer products such as juvenile products including baby carriers, toys, etc. My work on baby carriers included measuring the performance of latching and locking mechanisms and analyzing the stresses withstood by the polymer structure of the carrier.

8. I am the author or co-author of 18 peer-reviewed journal articles and conference publications. I am also a named inventor on multiple U.S. and foreign patents.

9. In my consulting career, I have provided both deposition testimony and trial testimony.

B. Materials Reviewed

10. In reaching my opinions in this matter, I relied on the following materials:

- Petition for *Inter Partes* Review of U.S. Patent No. 11,786,055 (“Petition”);
- U.S. Patent No. 11,786,055 (“the ’055 Patent”) (Ex. 1001);
- File History for U.S. Patent No. 11,786,055 (“’979 File History”) (Ex. 1002);
- Declaration of David Smith (Ex. 1003);

- Austrian Patent Utility Model No. AT 11620U22011-02-15 to Stomper-Rosam et al. (“Stomper-Rosam”) (Ex. 1015);
- U.S. Patent Application Publication No. 2008/0190972 (“Gray”) (Ex. 1009);
- *Merriam Webster’s Collegiate Dictionary*, Tenth Edition, 1998, p. 303 (Ex. 2001);
- U.S. Patent No. 9,185,993 to Telford et al. (“Telford”) (Ex. 2006);
- U.S. Patent No. 8,561,861 to Muehlen (“Muehlen”) (Ex. 2007);
- U.S. Patent No. 9,295,341 to Sonnenberg (“Sonnenberg”) (Ex. 2008);
and
- *Ergobaby 360 – Front and Back Facing Carriers*, Web Archive, August 3, 2018,
<http://web.archive.org/web/20140803210530/http://store.ergobaby.com/baby-carrier/four-position-360?jumpTo=instructions#carrierInfo>
(Ex. 2009)

II. LEGAL FRAMEWORK

11. I am a technical expert and do not offer any legal opinions. However, I have been informed about certain legal principles regarding patentability and related matters under United States patent law, which I have applied in performing my analysis and arriving at my technical opinions in this matter.

A. Anticipation

12. Counsel has also informed me that the express or inherent disclosures of a prior art reference may anticipate the claimed invention. Specifically, if a person having ordinary skill in the art at the time of the invention would have known that the claimed subject matter is necessarily present in a prior art reference, then the prior art reference may “anticipate” the claim. In other words, if the prior art necessarily functions in accordance with or includes the claimed limitations, it anticipates. There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure at the time of invention, but only that the subject matter is, in fact, inherent in the prior art reference. Therefore, a claim is “anticipated” by the prior art if each and every limitation of the claim is found, either expressly or inherently, in a single item of prior art.

B. Obviousness

13. I understand that, in this *inter partes* review, the Petitioner has argued that certain claims of the '055 Patent are obvious. Counsel explained that a patent claim is invalid as obvious where the differences between the subject matter claimed and what was known in the prior art would have been obvious to a person of ordinary skill in the relevant field at the time the invention was made.

14. Counsel explained that an analysis of obviousness requires consideration of four factual inquiries. Counsel explained that these inquiries are:

(1) the scope and content of the prior art; (2) the differences between the prior art and the claims; (3) the level of ordinary skill in the relevant field; and (4) whether what counsel described as “secondary considerations” or “objective indicia” of non-obviousness are shown by the evidence.

15. Counsel explained that a person of ordinary skill in the relevant art is not a robot (or "automaton"), but instead a person with ordinary creativity and common sense who would apply that creativity and common sense, along with relevant background knowledge, to the problems at hand.

16. I understand that a patent may be invalid as obvious in view of a single prior art reference or multiple prior art references together, and that the background knowledge of, and common-sense inferences that would be made by, a person of ordinary skill in the art may be considered in determining whether a claim is obvious.

17. Counsel informed me that for a prior art reference to be proper for use in an obviousness analysis, the reference must be “analogous art” to the claimed invention. I have been informed that a reference is analogous art to the claimed invention if: (1) the reference is from the same field of endeavor as the claimed invention (even if it addresses a different problem); or (2) the reference is reasonably pertinent to the problem faced by the inventor (even if it is not in the same field of endeavor as the claimed invention). In order for a reference to be “reasonably pertinent” to the problem, it must logically have commended itself to an inventor's

attention in considering his problem. In determining whether a reference is reasonably pertinent, one should consider the problem faced by the inventor, as reflected either explicitly or implicitly, in the specification.

18. Counsel informed me that there need not be a specific teaching, motivation, or suggestion in the prior art to combine or modify prior art references in a particular way. For instance, the background knowledge or common sense of a person of skill could make a claim of an obvious variation on what was already known. However, there must be an articulable reason as to why a particular combination would be made or a specific reference modified.

19. I have also been informed that it is improper, in an obviousness analysis, to apply hindsight, and in particular to use the patent claims as a roadmap to assemble a collection of references or modifications to references. I understand that the proper question is what would have been obvious to a person of ordinary skill in the art without the benefit of hindsight and specifically without access to the patent at issue.

III. CLAIM CONSTRUCTION

20. Counsel has informed me that the first step in a validity analysis involves construing the claims, as necessary, to determine their scope. The construed claim language may then be compared to the prior art disclosures. Counsel has informed me that in proceedings before the USPTO the claims are generally given

their ordinary and customary meaning as understood by one of ordinary skill in the art at the time of the invention, in light of the patent specification.

A. Non-Construed Claim Terms

21. For any claim terms not construed, I have applied the meaning of the claim terms of the '055 Patent that are generally consistent with the terms' ordinary and customary meaning, as a person of ordinary skill in the art would have understood them at the time of the invention. I have been instructed to assume for purposes of this proceeding that the time of the invention is the earliest priority date of the '055 Patent, which counsel has informed me is October 30, 2015.

B. Construed Claim Terms

22. I have been instructed by counsel that *defined by* in claim limitations [1j], [6k], and [11l] is construed to have its plain and ordinary meaning, encompassing at least first, second, and third settings/positions each having a location fixed or marked on the adjustable child carrier.

C. Opinions Regarding thigh support adjuster

23. Counsel has informed me that in proceedings before the USPTO, whether a claim term that does not use the word “means” should nonetheless be construed as a means-plus-function limitation is based on whether the words of the claim are understood by persons of ordinary skill in the art to have sufficiently definite meaning as the name for structure. Counsel has informed me that a critical

part of this analysis is whether the claim term is used in common parlance or by skilled artisans to designate structure, including either a particular structure or a class of structures. Counsel has asked me to provide my opinion regarding whether the term *at least one thigh support adjuster* would have been understood by skilled persons to have sufficiently definite meaning as the name for structure. As discussed below, because *adjuster* is used in common parlance or by skilled artisans to designate a particular structure or class of structures in the baby carrier field, it is my opinion a POSITA would have understood *at least one thigh support adjuster* to have sufficiently definite meaning as the name for structure, namely, a class of adjustment mechanisms.

24. At the time of the invention, it was common for baby carriers in the art to be adjustable. *See, e.g., ErgoBaby 360 – Front and Back Facing Carriers*, 4 (describing the 360 carrier as having “button adjustments [to] let parents adapt the seat width to the baby’s size and position”); *Telford*, Abstract (describing the shape of a carrier seat “adjusts” based on the position of thigh support straps). Moreover, a class of structures was well-known to skilled persons for providing those adjustments; namely, adjustment mechanisms. *See, e.g., Muehlen*, 4:27–31 (describing **adjustment mechanisms** 108, 114 for a baby carrier including “quick-release buckles, ties, snaps, hook and loop, or any other known and/or convenient type of...adjustment mechanism”); *Sonnenberg*, 8:10–18 (describing baby carriers

containing “hardware 1010 that can **adjust** and/or connect the support sections 1002 together, such as buckles, adjustment rings, clasps, straps, snaps, buttons,” with the sections 1002 including “child support sections 1008”). A skilled artisan in the field of baby carriers would have understood the term *adjuster* to be a common parlance for this class of adjustment mechanisms, which include, e.g., hook and loop, ties, snaps, buckles, rings, clasps, zippers, and buttons. *See, e.g., Muehlen*, 4:27–31; *Sonnenberg*, 8:10–18. This is consistent with Dr. Smith’s opinion that these “components” (e.g., Velcro, rings, buckles, snaps, zippers, buttons) were well-known to a POSITA for making adjustments to various features of child carriers. Ex. 1003, ¶¶ 106–108.

25. For at least these reasons, it is my opinion a POSITA would have understood the term *adjuster* in the Challenged Claims to be a common parlance for a specific class of structures: adjustment mechanisms. Therefore, a POSITA would have understood the term *thigh support adjuster* to provide sufficiently definite meaning as the name for structure.

IV. LEVEL OF A PERSON HAVING ORDINARY SKILL IN THE ART

26. Petitioner proposes that a person having ordinary skill in the art at the time of the ’055 Patent would have:

Had at least a four-year degree in a design-based field, which may include fashion design, industrial design, mechanical engineering, or

another technical field, or equivalent experience, and familiarity working with child products and/or adjustable products.

Petition, 7.

27. I do not dispute Petitioner's proposed POSITA definition.

28. As of the earliest priority date of the '055 Patent, which counsel has informed me is October 30, 2015, I was, at the least, a POSITA applying Petitioner's definition. As set forth above in the discussion of my qualifications, I had a master's degree and bachelor's degree in mechanical engineering. Additionally, I had 30 years of work experience related to product design, including juvenile products. My product design experience was mostly gained in the context of failure analysis. For example, specifically with regard to juvenile products, I studied the performance of latching and locking mechanisms on baby carriers. I also studied the performance of cabinet safety latches; those products designed to limit young children's access to the interior of cabinets which may contain hazardous materials – cleaning supplies and the like. I also investigated failures of doorknob covers. Like cabinet latches, intended to limit access through a door to small children, while allowing adults to pass. I have a diverse background in mechanical engineering and materials science analyzing and measuring stresses in car seats, testing locking mechanisms in children's strollers and in general understanding external loading, and how a product can withstand and support these loads.

V. OPINIONS ON CHALLENGED GROUND 3

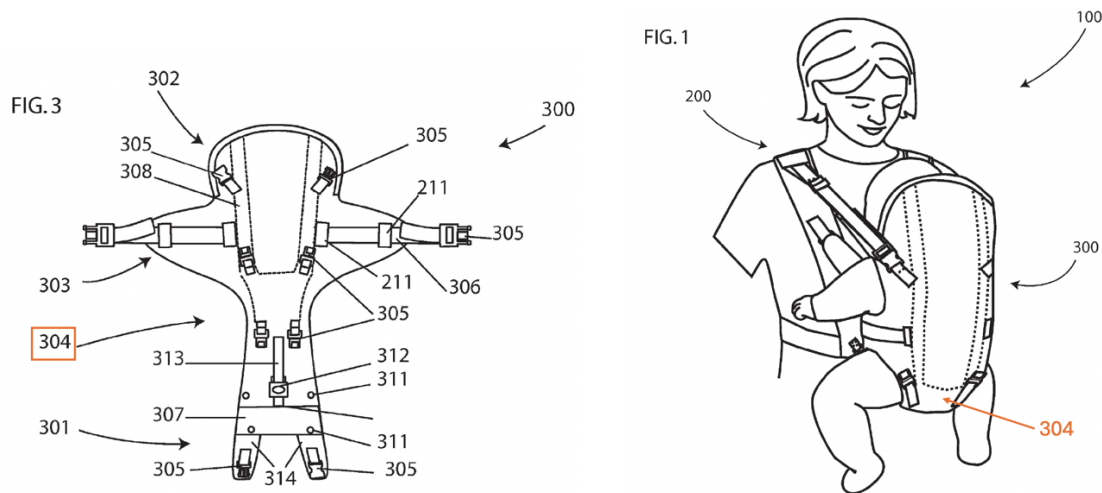
A. *Gray fails to teach at least one thigh support adjuster coupled to a first thigh support and a second thigh support*

29. Petitioner and Mr. Smith purport *Gray* teaches *at least one thigh support adjuster*; namely, *Gray*'s pull tab 402. *Petition*, 88–90; Ex. 1003, 139–140. Mr. Smith alleges *Gray*'s pull tab is a *thigh support adjuster coupled to a first thigh support and a second thigh support* because *Gray*'s drawstrings are coupled to the pull tab, and the drawstrings are thigh supports. Ex. 1003, 139. However, as discussed below, a POSITA would not have understood *Gray*'s drawstrings to support a child's legs, and thus *Gray*'s pull tab is not a *thigh support adjuster* because the pull tab is not *coupled to* thigh supports, per claim limitation [1k].

30. *Gray* discloses a baby carrier that includes an adjustable pouch system. Ex. 1009, Abstract. Specifically, *Gray* discloses an embodiment of the carrier that includes a retractable drawstring system 308 comprising retractable drawstrings 400. Ex. 1009, [0026]. The drawstrings 400 extend through channels that form a V-shaped configuration. *Id.* The drawstrings 400 attach to a back portion 302 of the carrier at one end and extend through the channels to an opening 401 where a pull tab 402 is attached “at the apex of the V-shaped” channels. *Id.* From *Gray*, a POSITA would have understood the pull tab 402 is coupled to the ends of drawstrings 400

extending through opening 401. Indeed, Mr. Smith admits the pull tab 402 “is coupled to the drawstrings 400.” Ex. 1003, 139.

31. However, drawstrings 400 are not thigh support[s]. *Gray* also discloses the carrier comprises seat portions 304. Ex. 1009, [0024]. When viewing Figures 1 and 3, a POSITA would have understood, *at best*, the seat portion 304 of the carrier supports portions of the legs of the child:



Ex. 1009, FIGs. 3 (left) and 1 (right) (annotated to show the seat portion 304 (orange)).

32. Similarly, a POSITA would have understood the fabric at the seat portion in the embodiment of Figure 4 to support portions of the child’s legs, not the drawstrings 400. Ex. 1009, FIG. 4. Drawstrings 400 are thin strings and thus cannot support the child’s legs alone. This is consistent with Petitioner’s position that the “drawstrings of *Gray*” are “coupled to the first thigh support and the second thigh support,” and accordingly are not thigh supports themselves. *Petition*, 89. Rather,

Gray indicates, if anything, the fabric of the seat portion supports the child. Ex. 1009, [0024], FIGs. 1, 3. Because the pull tab 402 does not couple or attach to the fabric of the seat portion, but rather only couples to the drawstrings, *Gray*'s pull tab 402 is not an *at least one thigh support adjuster coupled to the first thigh support and the second thigh support*:

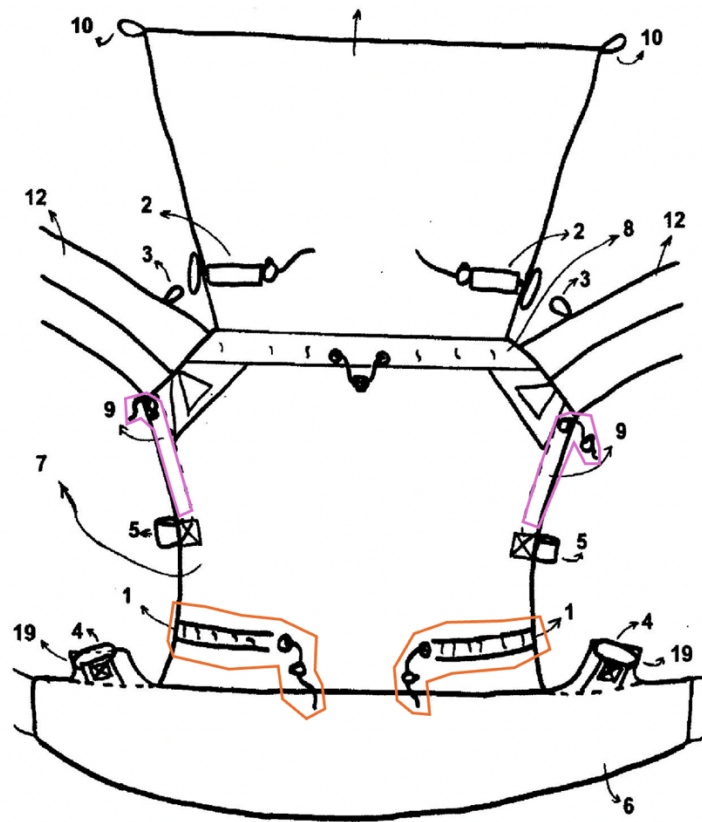
33. For the above reasons, *Gray* does not teach or suggest a *thigh support adjuster*, because *Gray*'s pull tab is not *coupled to the first thigh support and the second thigh support*.

B. *Stomper-Rosam* does not teach or render obvious three settings/positions defined by the adjustable child carrier, per claim limitations [1j]/[6k]/[11l]

34. As discussed above, the language ...*defined by* of claim limitations [1j]/[6k]/[11l] is construed to have its plain and ordinary meaning, encompassing each first, second, and third setting/position having a location fixed or marked on the adjustable child carrier. *See* Section III.B. *Stomper-Rosam* fails to teach, suggest, or render obvious [1j]/[6k]/[11l] under this construction. Namely, *Stomper-Rosam* does not include three settings/positions *defined by the adjustable child carrier*.

35. *Stomper-Rosam* discloses a baby carrier that includes a “continuously adjustable bridge and back reduction (1)” and “a drawstring system (9) in the upper area of the curved back panel (7).” Ex. 1015, (57). The bridge reduction 1 contains two drawstrings located on the left and right of the lower part of the back panel 7.

Ex. 1015, [0028], [0017]. When the drawstrings of reduction 1 are tightened, the width is reduced and the back panel 7 height is shortened. Ex. 1015, [0017]–[0018], [0029]–[0030]. The drawstrings 9 in the upper part of back panel 7 also include two drawstrings attached on the left and right side, and provide “lateral support for the child” when tightened. Ex. 1015, [0031], [0019]. FIG. 1 below illustrates both reduction 1 and drawstrings 9 on the carrier:



Ex. 1015, FIG. 1 (annotated to show drawstrings 9 (pink) and reduction 1 (orange)).

36. *Stomper-Rosam* does not disclose or suggest any settings/positions of the drawstrings 9 or reduction 1 that have fixed or marked locations on the carrier, let alone three settings/positions. *See, generally*, Ex. 1015. Accordingly, *Stomper-*

Rosam does not teach or suggest three *setting[s]/position[s]* in relation to drawstrings 9 or reduction 1 that each has a fixed or marked location on the carrier, per [1j]/[6k]/[11m].

37. *Stomper-Rosam* discloses “reduction 1 allows for stepless adjustment of the seat bridge, which can be set between approximately 42 cm and 22 cm in length.” Ex. 1015, [0029]. This disclosure would have indicated to a POSITA that no steps are delineated on the carrier. Thus, a POSITA would have understood no specific positions to be fixed or marked on the carrier in order to provide such stepless adjustment.

38. Mr. Smith states “[a]djustment of the bar reduction 1 defines at least 3 settings: a fully loose setting, a fully tightened setting, and at least one setting between fully loose and fully tightened (i.e., **“a first setting, a second setting, and a third setting”**).” (emphasis not added). Ex. 1003, 137. However, the fully loose, fully tightened, and between settings are not locations fixed or marked on the carrier. Instead, Mr. Smith arbitrarily created three hypothetical settings that the drawstrings for reduction 1 could be set to. But Mr. Smith’s hypothetical settings still do not have locations fixed or marked on the carrier disclosed in *Stomper-Rosam*. Thus, even if *Stomper-Rosam* provided support for fully loose, fully tightened, and a between setting (which *Stomper-Rosam* does not), nothing in *Stomper-Rosam* suggests these settings would each have fixed or marked locations on the carrier.

While Mr. Smith cites *Stomper-Rosam*'s disclosure at [0030] that reduction 1 can be used to "further adjust[] the size for smaller children[,]," this at best only suggests a single adjustment (for a smaller child), yet, still does not teach or suggest such a "smaller child" adjustment having a location fixed or marked on the carrier. Ex. 1003, 137; Ex. 1015, [0030]. Indeed, *Stomper-Rosam*'s reliance on stepless adjustments to ensure the "seat bridge lies exactly between the knees of smaller children" indicates, if anything, that the size of the child dictates the orientation of the drawstrings, not the carrier itself. *Stomper-Rosam*, [0029], Abstract ("The carrying device according to the invention is adjustable to the respective developmental stage and size of a baby or toddler....").

39. Petitioner and Mr. Smith also rely on *Stomper-Rosam*'s teaching that either reduction 1 or drawstrings 9 may be "other fastening systems, such as straps with ladder locks, hook-and-loop fasteners, or snaps...." *Petition*, 86; Ex. 1003, 137; Ex. 1015, [0017], [0019], [0031] (describing that, for drawstrings 9, "a fastening system using snap buckles, hooks, buttons, or hook-and-loop fasteners could be used" alternatively). However, that other fasteners "could be used" in the place of drawstrings on reduction 1 or drawstrings 9 still does not teach, suggest, or render obvious three settings/positions at all, let alone three settings/positions that are *defined by* the carrier. *Id.* *Stomper-Rosam* does not associate any number of settings/positions with the use of other fastener systems. *Id.* Rather, a POSITA

would have understood this disclosure as suggesting only that alternative adjustments could be used instead of drawstrings. Accordingly, *Stomper-Rosam* does not render obvious [1j]/[6k]/[111].

40. Thus, because *Stomper-Rosam* does not teach, suggest, or render obvious three settings/positions each having a location fixed or marked on the carrier, a POSITA would not have understood *Stomper-Rosam* alone to teach, suggest, or render obvious [1j]/[6k]/[111] when construed to have its plain and ordinary meaning.

41. Alternatively, even without construing *defined by* to have its plain and ordinary meaning of fixing or marking the locations, *Stomper-Rosam* still fails to teach or suggest three settings/positions *defined by* the carrier because *Stomper-Rosam* does not disclose or suggest any settings/positions of the reduction 1 or drawstrings 9 on the carrier. Even the “smaller child” setting is still not defined by *Stomper-Rosam* as to what it would look like when applied on the carrier. Rather, as explained above, *Stomper-Rosam*’s disclosure of stepless adjustment to ensure the “seat bridge lies exactly between the knees of smaller children” indicates, if anything, that the size of the child dictates the orientation of the drawstrings, not the carrier itself. *Stomper-Rosam*, [0029], Abstract (“The carrying device according to the invention is adjustable to the respective developmental stage and size of a baby

or toddler....”). Thus, Stomper-Rosam fails to teach or suggest three settings/positions *defined by the adjustable child carrier*.

VI. CONCLUSION

42. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: February 21, 2025

By:  _____

Duffner Engineering

Duffner Engineering
807 Aldo Avenue, Suite 101
Santa Clara, CA 95054
(650) 704-8166
dduffner@duffnerengineering.com
www.duffnerengineering.com



Dirk H. Duffner, P.E., Mechanical Engineer **Failure Analysis / Materials Science / Metallurgy**

Professional Profile

Mr. Duffner specializes in the practice of failure analysis. He has a background in mechanical engineering, materials science, and metallurgy. He focuses on determining the root cause of failures in a wide variety of products, including machinery, vehicles, pressure vessels, medical devices, consumer products, building materials, and communications equipment. He conducts construction defect investigations of mechanical systems including plumbing and heating, ventilating, and air conditioning installations. His specific areas of interest are fatigue, fracture, and corrosion of various materials, including metals, plastics, and fiber composites.

Mr. Duffner conducts failure analysis investigations and accident reconstructions. He determines product failure modes, whether related to design, manufacturing, or service. He performs environmental, structural, and/or mechanical tests in conjunction with computer-based analyses, such as finite element modeling, to determine the cause of failure. Much of Mr. Duffner's experience is with the design and development of customized experiments involving experimental stress analysis and modal (vibration) analysis.

Mr. Duffner was a founder and owner of Principia Engineering Services, Managing Engineer at Exponent, Inc. (formerly Failure Analysis Associates), and a cooperative education student at the Space Systems Division of the Lockheed Missiles and Space Company, now Lockheed Martin Company.

Education and Credentials

M.S., Mechanical Engineering, Stanford University, 1998

B.S., Mechanical Engineering, University of California, Los Angeles, 1985

Registered Professional Engineer, California #M27229, Nevada #ME021731, Florida #86252

Awards

The Rental Equipment Register Innovative Product Award Material Handling Category Winner 2008, Super Jawz Grabbing Tool

The James F. Lincoln Arc Welding Foundation Merit Award for the Advancement of Arc Welded Design, Engineering, and Fabrication, 1999

Chancellor's Scholarship, University of California, Los Angeles, 1980

Operating Engineers' Scholarship, 1980

Memberships and Affiliations

American Society of Mechanical Engineers

Society of Automotive Engineers

American Society for Composites

Society for the Advancement of Material and Process Engineering

ASM International

American Society for Testing and Materials - Committee C27 on Precast Concrete Products

National Fire Protection Association

Institute of Electrical and Electronics Engineers

Society for Experimental Mechanics

Continuing Education

"How to Perform Elevator Inspections Using ASME A17.2, Guide for Inspection of Elevators, Escalators, and Moving Walks," ASME Continuing Education Institute, 2007, 2.25 CEU, 24 hours

Publications

“Lake Mead Low Lift Pump Riser Failure Analysis,” Proceedings of the IMAC-XXVIII Conference on Structural Dynamics, Society for Experimental Mechanics, February 1-4, 2010, Jacksonville, Florida

“Buckling of Cylindrical, Thin Wall, Trailer Truck Tanks, and ASME Section XII,” Proceedings of PVP2009 2009 ASME Pressure Vessel & Piping Division Conference, July 26-30, 2009, Prague, Czech Republic (with Guido G. Karcher, P.E., et al.)

“Ball Mill Maintenance,” International Cement Review, Tradeship Publications Ltd., Surrey, United Kingdom, May 2008 (with D. Grewal)

“Torsion Fatigue Failure of Bus Drive Shafts,” Journal of Failure Analysis and Prevention, ASM International, Materials Park, Ohio, December 2006

“Evaporator Tube Fracture Results in Ammonia Leak,” The Air Conditioning, Heating, and Refrigeration News, Business News Publishing Company, Troy, Michigan, January 23, 2006

“Remediation of High Vibration Levels in a Large-Scale Induced Draft Fan Installation,” Concrete Monthly, Vol. 3, No. 7, Publications and Communications, Inc., Austin, Texas, July 2005 (with S. Hopkins and A. Strong)

“Air Conditioner Failure Investigation – Intergranular Cracking in a Pure Copper Condenser Tube,” Journal of Failure Analysis and Prevention, ASM International, Materials Park, Ohio, February 2005

“Digester Dome Collapse at the Spokane Advanced Wastewater Treatment Plant,” www.spokanecity.org/services/documents, Spokane, Washington, December 2004 (with P. Moncarz et al.)

“Case Study: When a Firefighter’s Filament-Wound SCBA Explodes,” Composites Fabrication, Composites Fabricators Association, Arlington, Virginia, September 2003 (with R. Frankle)

“Case Study: Tests Tell Story of Fan’s Vibrations,” Facilities Engineering Journal, Association for Facilities Engineering, Cincinnati, Ohio, July/August 2003 (with S. Hopkins)

“Strength Reduction in Screw Fasteners Resulting from Outdoor Exposure,” Practical Failure Analysis, ASM International, Materials Park, Ohio, June 2003 (with B. Pound et al.)

“A Heat Pump Failure Investigation,” The Air Conditioning, Heating, and Refrigeration News, Business News Publishing Company, Troy, Michigan, May 19, 2003

“Component Damage from Printed Circuit Board Loading,” Proceedings, IPC Printed Circuits Expo 2002, IPC, Long Beach, California, March 2002 (with A. Wagner et al.)

“Long-Term Strain-Corrosion Behavior in RPM Sewer Pipes,” 14th Symposium on Composite Materials: Testing and Design, American Society for Testing and Materials (ASTM), ASTM STP 1436, Pittsburgh, Pennsylvania, March 2002 (with S. Hopkins)

“Composite Pressure Vessel Design Optimization,” Advancing Affordable Materials Technology, International Society for the Advancement of Material and Process Engineering (SAMPE) Technical Conference Series, Volume 33, November 2001 (with B. McGoran)

“The Case of the Recurring Condenser Leak,” The Air Conditioning, Heating, and Refrigeration News, Business News Publishing Company, Troy, Michigan, January 29, 2001

“Mechanical Properties of Aged RPM Piping,” Proceedings, Advanced Composites ‘93, International Conference on Advanced Composite Materials, The Minerals, Metals and Materials Society, Wollongong, Australia, February 1993 (with S. Hopkins et al.)

“Strain Corrosion Cracking in RPM Sewer Piping,” Proceedings Advanced Composites ‘93, International Conference on Advanced Composite Materials, The Minerals, Metals and Materials Society, Wollongong, Australia, February 1993 (with S. Hopkins et al.)

Presentations and Invited Lectures

“Scientific Tools to Resolve Fire and Explosion Losses,” Wildland Fire Litigation Conference, Monterey, California, April 24, 2016

“Disaster in the Courtroom – the Role of Failure Analysis in Litigation,” Vela Insurance Services Litigation Workshop, Omaha, Nebraska, November 14, 2013

“Design Objectives of Orthopedic Prostheses; Fatigue,” Orthopedic Biomechanics, ME C176, BIOE C119, University of California, Berkeley Departments of Mechanical Engineering and Bioengineering, November 2, 2006

“Residual Stress in Weld Clad Pipe,” 2004 Society for Experimental Mechanics, SEM X International Congress and Exposition on Experimental and Applied Mechanics, Costa Mesa, California, June 7–10, 2004 (with Y. Potdar)

“Implementing the Maintenance Excellence Program—Failure Analysis Investigations,”
Vezer’s Precision Industrial Constructors of California, Inc. 9th Annual Summer
Conference, Training Seminar, Claremont, California, August 2002 (with S. Hopkins)

“Personal Medical Instruments,” Stanford Design Experience, Mechanical Engineering
Department, Stanford University, Stanford, California, June 1998 (with R. Lathrop et al.)

Patents

“Front-wheel-drive vehicle having a chassis that folds to create a protective, carry-on
casing,” US 8646801 B2, February 11, 2014, MDM Productivity, Inc.

“Compact, carry-on bicycles having a shared drive-and-steering space,” US 8480113 B2,
July 9, 2013, MDM Productivity, Inc.

“Folding vehicle having a chassis that functions as a protective, carry-on casing,” US
8459678 B2, June 11, 2013, MDM Productivity, LLC

“Drive-and-chassis mechanisms used in the design of compact, carry-on vehicles,” US
8348294 B1, January 8, 2013, MDM Productivity, LLC