

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AIRBUS AMERICAS, INC.
Petitioner

v.

HARPER ENGINEERING COMPANY
Patent Owner

Case IPR2022-00195
Patent No. 10,801,244

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 10,801,244
UNDER 35 U.S.C § 312 AND 37 C.F.R. § 42.104**

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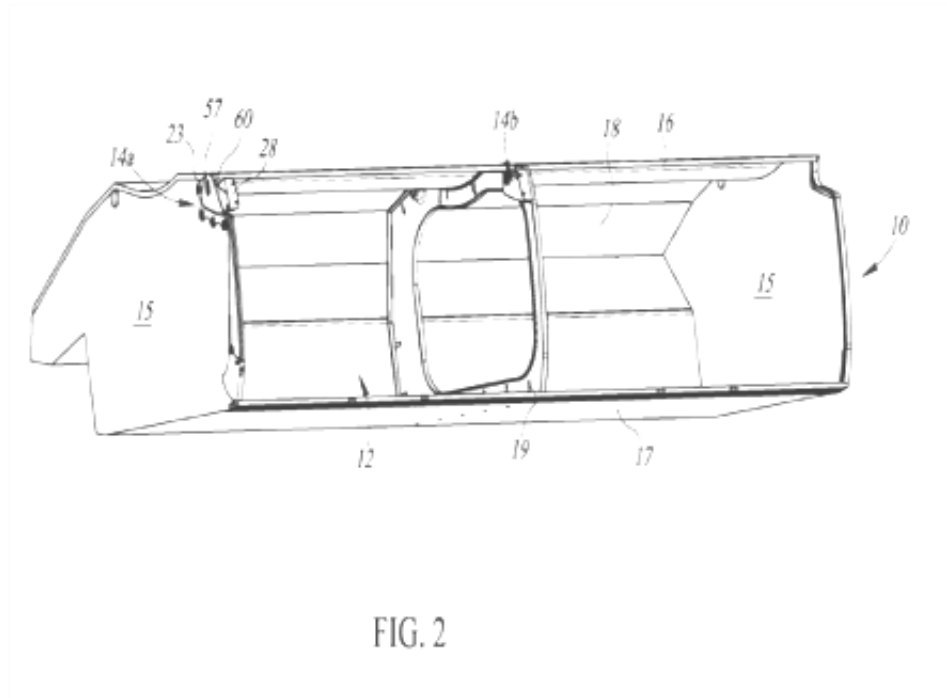
EXHIBIT LIST

No.	Short Name	Exhibit
1001	'244 Patent	U.S. Patent No. 10,801,244 to Chadwell et al.
1002	'244 File History	File History of U.S. Patent No. 10,810,244
1003	Codd Decl.	Declaration of Daniel Codd, Ph.D.
1004	Codd CV	Curriculum Vitae of Daniel Codd, Ph.D.
1005	<i>Rheaume</i>	U.S. Pat. App. Pub. No. 2020/0040633 A1 to Rheaume
1006	<i>Savian</i>	PCT Pub. No. WO 2014/127161 A1 to Savian <i>et al</i>
1007	<i>Kearsey</i>	U.S. Pat. App. Pub. No. 2013/0207529 to Kearsey et al. (incorporated by reference into <i>Savian</i>)
1008	<i>Frazier</i>	U.S. Patent No. 9,090,351 to Frazier <i>et al.</i>
1009	<i>Rheaume Prov.</i>	U.S. Provisional App. 62/436,556 to Rheaume
1010	<i>Papke</i>	PCT Pub. No. WO 2017/173431 A1 to Papke et al.
1011	<i>Savian '090</i>	U.S. Pat. App. Pub. No. 2016/0083090 A1 to Savian
1012	Inf. Con.	Plaintiff's Initial Infringement Contentions (July 30, 2021) in <i>Harper Engineering Company v. FACC Operations GmbH and Airbus Americas, Inc.</i> , Case No. 1:20-cv-00510-CG-C (S.D. Ala.)
1013	EP File History	File History for EP3655321 (Appl. No. EP18749700.3, EP counterpart to the '315 Patent)
1014	<i>Ehlers</i>	U.S. Pat. Pub. No. 2009/0194635 A1 to Ehlers

I. INTRODUCTION

Airbus Americas, Inc. (“Airbus” or “Petitioner”) respectfully requests *inter partes* review (“IPR”) of Claims 1-15 (“Challenged Claims”) of U.S. Patent No. 10,801,244 to Chadwell et al. (“the ’244 Patent”), Exhibit (“Ex.”) 1001, under 35 U.S.C. §§311-319, 37 C.F.R. §§42.1-.80 and 37 C.F.R. §§42.100-.123. The ’244 Patent is assigned to Harper Engineering Company (“Patent Owner” or “Harper”).

The ’244 Patent describes a stowage bin assembly that includes a bin bucket assembly having at least one sidewall with a notch. Ex. 1001, Abstract. A hinge assembly is received in the notch. *Id.* The hinge assembly housing has an interior surface that is flush with the interior surface of the sidewall when the housing is received in the notch. *Id.*; cl. 1. The stowage bin also includes a partition that receives a partition hinge assembly. The hinge and bin assembly is shown in at least Figure 2 of the ’244 Patent.



As described in more detail below, however, Patent Owner did not invent the claimed stowage bin or hinge assembly. In the early-to-mid 2010s—well before the earliest possible priority date of the '244 Patent—significant efforts were being undertaken to increase the storage capacity of bin buckets so that the bins could accommodate more pieces of luggage. As described below, bin hinges were already being designed integral with the bin sidewall (*e.g.*, received in a “cut out” or notch of the sidewall) in order to reduce or eliminate the hinge protrusion into the bin and maximize the amount of usable storage space well before the priority date of the '244 Patent. A person of ordinary skill in the art (“POSITA”) at the time of the alleged invention would have been motivated to reposition or integrate the door hinge into the bin sidewall to increase the bin storage capacity

and permit more pieces of luggage to be stowed in the bin. Codd Decl. ¶¶5-6. Accordingly, the Board should grant this Petition and find the Challenged Claims of the '244 Patent invalid.

II. MANDATORY NOTICES

A. Grounds for Standing (37 C.F.R. § 42.104(a))

Petitioner certifies that the '244 Patent is available for *inter partes* review and Petitioner is not barred or estopped from requesting review of the Challenged Claims on the grounds identified in this Petition.

B. Real Party-in-Interest (37 C.F.R. § 42.8(b)(1))

The real party-in-interest for Petitioner is Airbus Americas, Inc.

C. Related Matters (37 C.F.R. § 42.8(b)(2))

The following judicial or administrative matters may affect or be affected by a decision in this proceeding: *Harper Engineering Company v. FACC Operations GmbH and Airbus Americas, Inc.*, Case No. 1:20-cv-00510-CG-C (S.D. Ala.). In that action, Patent Owner has asserted the '244 Patent against Airbus. The '244 Patent shares the same specification as U.S. Patent No. 10,760,315, which has also been asserted in the above litigation against Airbus. Petitioner is concurrently filing a petition challenging that patent.

D. Lead and Backup Counsel and Service Information (37 C.F.R. § 42.8(b)(3)-(4))

The designations of counsel and address for service¹ are:

LEAD COUNSEL	BACKUP COUNSEL
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E. Fee for *Inter Partes* Review

The required fees are submitted herewith. Petitioner authorizes the Patent Office to charge Deposit Account No. 505708 for any additional fees required for this filing.

III. IDENTIFICATION OF CHALLENGE AND RELIEF REQUESTED

Petitioner challenges claims 1-15 of the '244 Patent and requests that these claims be found unpatentable in view of the following references:

1. U.S. Pat. Pub. No. 2020/0040633 A1 to Rheume, filed as PCT/IB2017/057912 on December 13, 2017, claiming the benefit of U.S. Provisional App. No. 62/436,556, filed December 20, 2016, and published on February 6, 2020 (Ex. 1005, hereinafter "*Rheume*");

¹ Petitioner consents to electronic service to QE-Airbus-

Harper@quinnemanuel.com and the email addresses listed in the table below.

2. PCT Pub. No. WO 2014/127161 A1 to Savian *et al.*, filed on February 13, 2014 and published on August 21, 2014 (Ex. 1006, hereinafter “*Savian*”), together with U.S. Pat. App. Pub. No. 2013/0207529 A1 to Kearsy *et al.*, filed on February 12, 2013 and published on August 15, 2013 (Ex. 1007, hereinafter “*Kearsy*”), which is incorporated by reference into *Savian*; and
3. U.S. Patent No. 9,090,351 to Frazier *et al.*, filed on December 18, 2013 and issued on July 28, 2015 (Ex. 1008, hereinafter “*Frazier*”).
4. U.S. Pat. Pub. No. 2009/0194635 A1 to Ehlers, filed on January 30, 2009 claiming the benefit of U.S. Provisional App. No. 61/063,029, filed on January 31, 2008, and published on August 6, 2009 (Ex. 1014, hereinafter “*Ehlers*”).

Pursuant to §§42.22(a)(1) and 42.22(b)(1)-(2), Petitioner requests cancellation of claims 1-15 of the ’244 Patent on the following grounds:

Ground 1: Claims 1-3, 8, 14, 15 are unpatentable under 35 U.S.C. §103 in view of *Rheume* and *Ehlers*.

Ground 2: Claims 4-7 are unpatentable under 35 U.S.C. §103 in view of *Rheume*, *Ehlers*, and *Savian*.

Ground 3: Claims 9-13 are unpatentable under 35 U.S.C. §103 in view of *Rheume* and *Savian*.

Ground 4: Claims 1-8, 14, and 15 are unpatentable under 35 U.S.C. §103 in view of *Savian*, *Ehlers*, and *Frazier*.

Ground 5: Claims 9-13 are unpatentable under 35 U.S.C. §103 in view of *Savian* and *Frazier*.

A. How the Claims are Unpatentable (37 C.F.R. § 42.104(b)(4))

Pursuant to 37 C.F.R. §42.104(b)(4), an explanation of how the Challenged Claims of the '244 Patent are unpatentable under the statutory grounds identified above, including the identification of where each element of the claim is found in the prior art, is provided in Section VIII, *infra*.

B. Supporting Evidence (37 C.F.R. § 42.104(b)(5))

Pursuant to 37 C.F.R. §42.104(b)(5), the exhibit numbers of the supporting evidence relied upon and the relevance of the evidence to the challenges raised, including identification of specific portions of the evidence that support the challenge, are provided herein. An Exhibit List identifying the exhibits is included. *See supra* at iii. In further support of the proposed grounds of rejection, this Petition is accompanied by the declaration of Dr. Daniel Codd, Ex. 1003 (“Codd Decl.”).

IV. OVERVIEW OF THE TECHNOLOGY

As acknowledged in the Background of the '244 Patent itself, there was a well-known desire to maximize the storage capacity of stowage bins by repositioning the hinge so as to not protrude into the bin bucket or adversely affect available storage space. Ex. 1001, 1:32-40; Codd Decl. ¶42.

A. Overhead Stowage Bins

Overhead stowage bins (sometimes called overhead stowage compartments) are storage bins that are attached to ceilings in the passenger cabins of aircraft. As

a passenger of any commercial aircraft would understand, items a passenger carries on-board an airplane can be stowed in overhead bins or under the seats. Codd Decl. ¶¶43-44.

Currently, there are at least three types of overhead stowage bins: (1) shelf bins, (2) pivot bins, and (3) translating bins. Individual bin size generally is determined by the length of the airplane, interior arrangement, carry-on baggage requirements, and the spacing of the body frames to which the bins are attached. Codd Decl. ¶¶45-46.

B. Hinges for Overhead Stowage Bins

The hinge assemblies used in connection with overhead stowage bins have always been very similar to the hinges used in other storage compartments, like vehicle trunks and doors, storage trunks, kitchen cabinets, and other pieces of furniture. Codd Decl. ¶47.

As described in more detail below, it was universally understood well before the priority date of the '244 Patent that maximizing storage capacity within an overhead stowage bins “is of utmost importance in passenger aircraft.” Savian '090, ¶[0125]; Savian, ¶[0098]. It was also well known that “[t]he hinges...reduce the available storage space within the bin, and accordingly the amount of luggage which can be stored within the bin.” Rheume, ¶[0003]. Accordingly, hinge designs that did not protrude into the available storage space were preferable in

order to maximize the bin storage volume (and consequently the number of pieces of luggage that could fit in the bin). Codd Decl. ¶48. Hinge assemblies were therefore routinely installed either on top of the bin bucket or integral with the sidewalls in order to maximize available storage space within the bin. Codd Decl. ¶49-51.

V. THE '244 PATENT

A. Overview

The '244 Patent relates to a stowage bin assembly having a bin bucket which includes at least one sidewall. Ex. 1001, Abstract. The sidewall includes a notch that receives a housing of a hinge assembly. The housing has an interior surface that is flush with the interior surface of the sidewall when the housing of the hinge assembly is received in the notch. *Id.*; Codd Decl. ¶67.

B. Prosecution History

The '244 Patent was filed on July 28, 2020 and is a continuation of U.S. Pat. App. No. 16/036,048, filed July 16, 2018, now U.S. Patent No. 10,760,315, and claims the benefit of U.S. Prov. App. No. 62/533,575, filed July 17, 2017.² Ex. 1002.07. On August 18, 2020, a Notice of Allowance was mailed. Ex.

² For the purposes of this Petition only, Petitioner has assumed the Challenged Claims are entitled to the July 17, 2017 provisional priority date, but Petitioner may take other positions in the related district court litigation.

1002.60. The application issued as U.S. Patent No. 10,810,244 on October 13, 2020. Ex. 1002.84.

C. Level of Ordinary Skill in the Art

The '244 Patent claims priority to U.S. Prov. App. No. 62/533,575, filed July 17, 2017. A POSITA at that time would have had at least a bachelor's degree in mechanical engineering, aerospace engineering industrial design, or a similar discipline, or the equivalent experience, with at least some experience in the field of aircraft interior design, aerospace engineering, or hinges for use in mobility or stationary-use storage solutions. Codd Decl. ¶¶19-24. Each of the arguments below is made from the standpoint of a POSITA in the field of the '244 Patent. Petitioner's expert, Dr. Codd, was at least a POSITA at the time of the alleged invention. *Id.*; Ex. 1004 (noting Ph.D. in mechanical engineering and design experience with Boeing 777 wide-body aircraft stowage bins prior to 2017).

VI. CONSTRUCTION OF THE CHALLENGED CLAIMS

In an *inter partes* review, claims are “construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. §42.100(b). Claims must be 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 specification and the prosecution history

pertaining to the patent. *Id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-1313 (Fed. Cir. 2015) (*en banc*); *see also* 83 Fed. Reg. 51,340.

Petitioner submits that no claim terms require construction for the resolution of this Petition.³ Codd Decl. ¶¶64-66.

VII. OVERVIEW OF THE PRIOR ART REFERENCES

As shown in the table below, each of the cited references qualifies as prior art (post-AIA) to the Challenged Claims, which are entitled to a priority date of no earlier than July 17, 2017.

Prior Art Reference	Effective Filing Date	Section(s)
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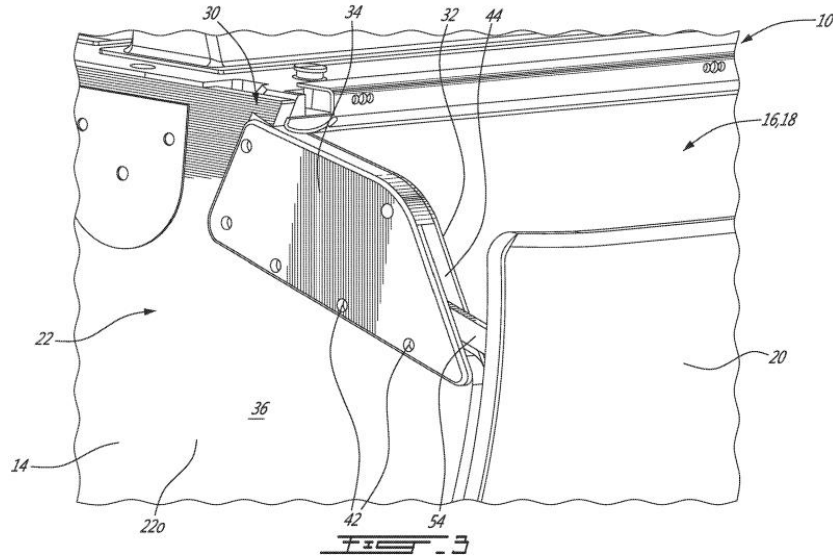
³ Petitioner reserves the right to pursue different claim constructions, including that certain claim terms are indefinite, during related proceedings including any district court litigation concerning the '244 Patent. *See Samsung Elecs. Am., Inc. v. Prisia Eng'g Corp.*, 948 F.3d 1342, 1350 (Fed. Cir. 2020) (“[T]he Board may not cancel claims for indefiniteness in an IPR proceeding.”).

<i>Rheaume</i>	December 20, 2016 ⁴	102(a)(2), 103
<i>Savian</i>	February 13, 2014	102(a)(2), 103
<i>Kearsey</i>	February 12, 2013	102(a)(2), 103
<i>Frazier</i>	December 18, 2013	102(a)(2), 103
<i>Ehlers</i>	January 30, 2009	102(a)(2), 103

A. *Rheaume*

Rheaume (Ex. 1005) relates to an improved hinge assembly for an aircraft stowage bin. *Rheaume*, Abstract. An “cut-out” is defined along the wall body of the bin. *Rheaume*, ¶¶[0037]-[0039]. Wall panels defining a housing for the hinge assembly are attached at the cut-out. A “receiving space” is defined between the wall panels for receiving a hinge arm and in some embodiments also a damper that “biases the door[] in the open position” and “can control motion through tension and compression.” *Id.*, ¶¶[0043], [0047].

⁴ The *Rheaume* provisional application (62/436,556), filed December 20, 2016, contains verbatim disclosure, including all the same figures and claims, as *Rheaume* and therefore fully supports and describes all the subject matter, including the claims, of *Rheaume*. See Ex. 1009; Codd Decl. ¶¶55-57 (including a table mapping §112 support for claim 1 of *Rheaume* to *Rheaume Prov.*). Pursuant to §102(d)(2), the effective filing date of *Rheaume* is therefore December 20, 2016.



Because “prior art hinges connected to the inner surface of the wall and protrud[ed] within the storage space,” the hinge assembly described in *Rheaume* “can thus allow for an improved storage capacity for the bin.” *Id.*, ¶¶[0056]-[0058].

The hinge and bin assembly described in *Rheaume* is “virtually indistinguishable” from the one described and claimed in the ’315 Patent. Codd Decl. ¶¶52-54.

B. *Savian*

Savian (Ex. 1006), like *Rheaume*, relates to a bin assembly “configured to receive luggage and be positioned in the interior of an aircraft.” *Savian*, Abstract.

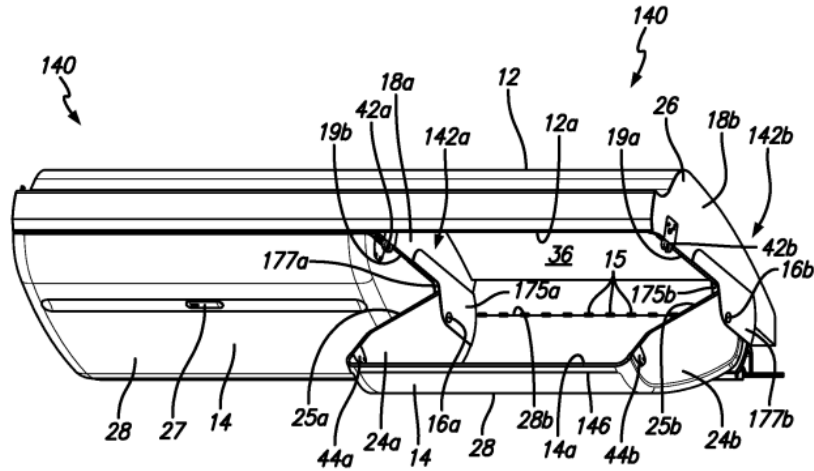


FIG. 21

The bin assembly has sidewalls and a notch in each sidewall configured to receive a pivot mechanism. The interior surface of the bin and sidewall is shown in Figure 21, while the exterior is shown in Figure 22.

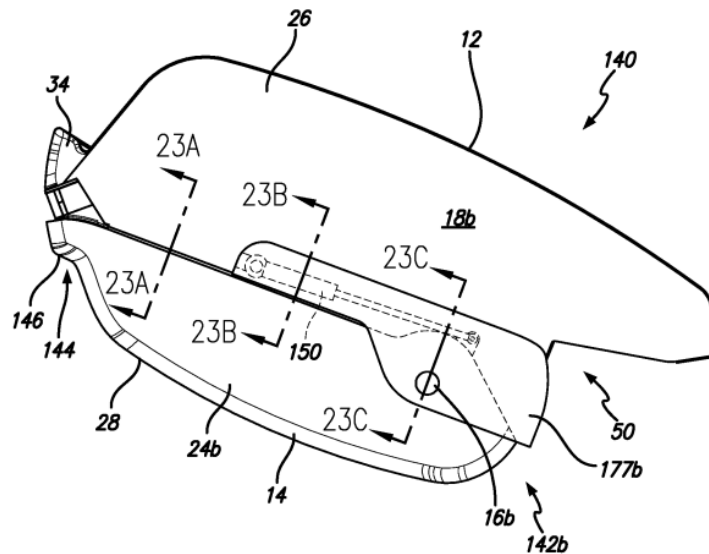


FIG. 22

A connector unit 150 can also be positioned within a the cut out. *Savian*, ¶[00123] (“[T]he connector unit 150 is positioned in a cut out 151 in the side 18b of the upper housing 26”). The connector unit pivots about pivotal connections as necessary and lengthen or contract as necessary during opening or closing of the bin. *Savian*, ¶[00124].

The hinge and bin assembly described in *Savian*, like the hinge and bin described in *Rheaume*, is “virtually indistinguishable” from the one described and claimed in the ’315 Patent. Codd Decl. ¶¶58-61.

C. *Frazier*

Frazier (Ex. 1008) also relates to an overhead stowage bin for aircraft. *Frazier*, 1:9-10. *Frazier* describes stowage bin sidewalls that include “voids” to receive a pivot receiver that engages the outer surface of a bushing. *Id.*, 4:56-5:11. This arrangement advantageously allows for “a relatively long pivot protrusion 62 to be utilized within a relatively shallow pivot receiver 68 to maximize the internal width 78 (storage volume) of each bin 44 between internal surfaces 80 and 82 of the bin end-walls 184 and 186 and maintain structural integrity of the system.” *Id.*, 5:6-11. Figure 7 shows void 78 in the sidewall used to maximize the internal volume of the bin. Codd Decl. ¶62.

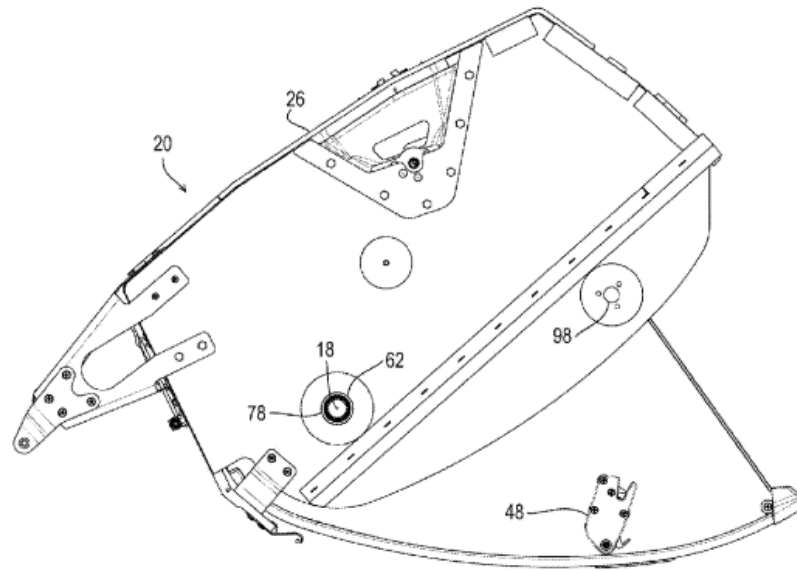


Fig. 7

D. Ehlers

Ehlers (Ex. 1014) also relates to an overhead stowage bin for aircraft. *Ehlers* describes an overhead stowage bin with multiple baggage compartments, divided by a partition. *Ehlers*, Abstract. These compartments “differ from each other in their shape and/or alignment” to allow for customization to ensure adequate bin space for passengers. *Ehlers*, Abstract. *Ehlers* describes that the partition may comprise recesses to “further optimise the use of space in the overhead bins.” *Ehlers*, ¶[0017]; Codd Decl. ¶63.

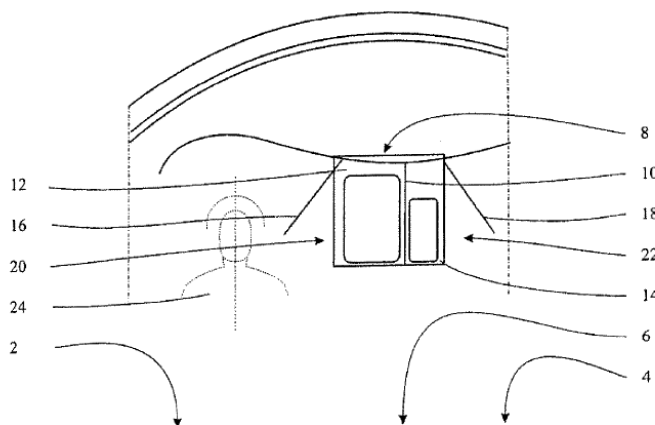


Fig. 1

VIII. DETAILED EXPLANATION OF GROUNDS FOR INVALIDITY

As explained below pursuant to 37 C.F.R. §42.104(b), the cited prior art renders anticipates or renders obvious the Challenged Claims of the '244 Patent. The cited references ***were not substantively considered*** by the Patent Office during the examination of the '244 Patent.⁵ The Challenged Claims are unpatentable based on each of the grounds presented below.

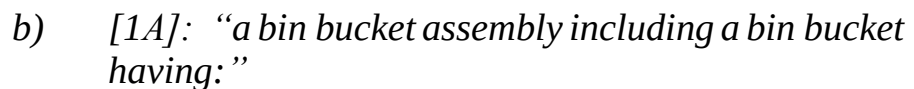
A. **Ground 1**: Claims 1-3, 8, 14, 15 are unpatentable under 35 U.S.C. §103 in view of *Rheaume* and *Ehlers*

1. **Claim 1**

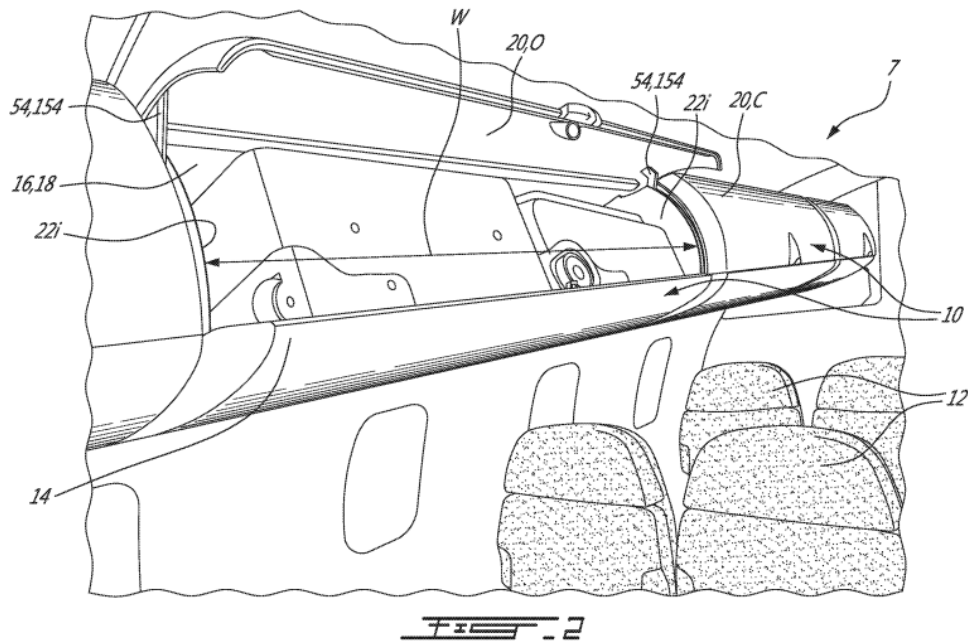
a) *Preamble*: “A stowage bin assembly comprising:”

To the extent the preamble is considered limiting, *Rheaume* discloses this limitation. Codd Decl. ¶68. *Rheaume* describes “[a] hinge assembly for receiving

⁵ See Ex. 1001, (56) (References Cited); see also *infra* §X(B).

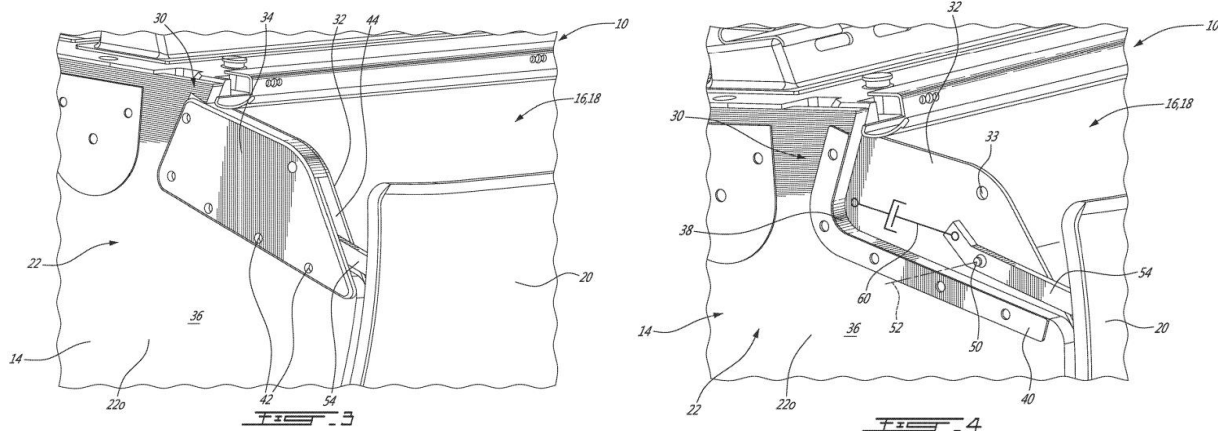


Rheume discloses this limitation. Codd Decl. ¶69. As shown in Figure 2, *Rheume* explains that “[e]ach storage bin 10 includes a bin body 14 defining a storage space 16 (for e.g. luggage) and an opening 18 for accessing the storage space 16.” *Rheume*, ¶[0034].

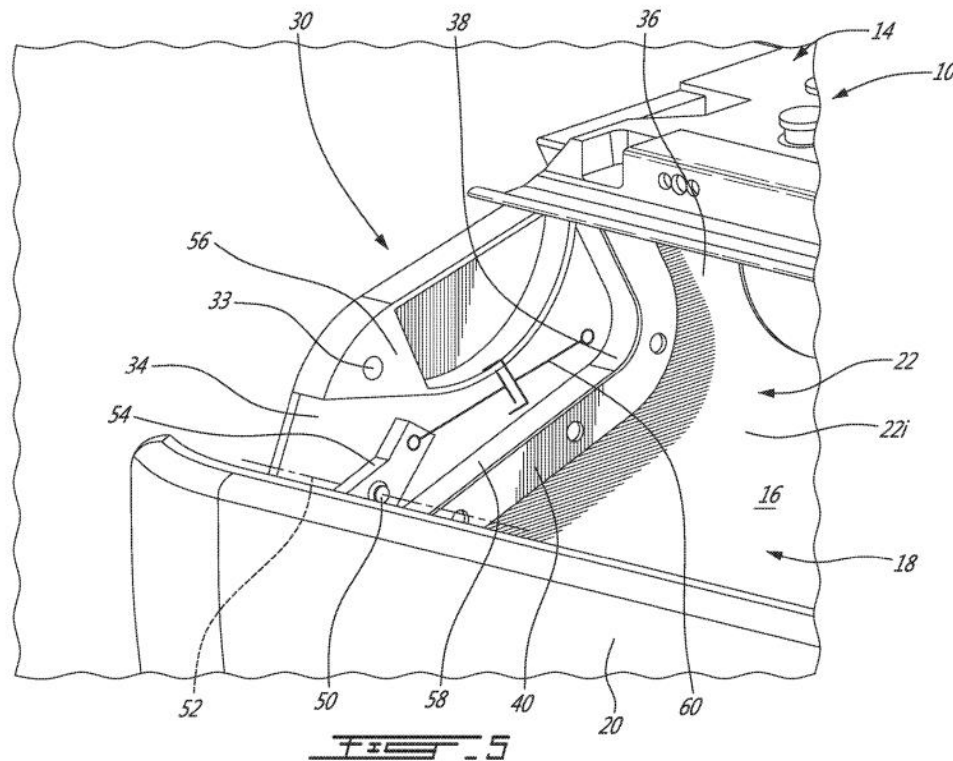


c) [1B]: “a first sidewall including a first notch and an interior surface;”

Rheaume discloses this limitation. Codd Decl. ¶¶70-71. As shown in Figure 2, *Rheaume* explains that “[e]ach storage bin 10 includes a bin body 14 defining a storage space 16 (for e.g. luggage) and an opening 18 for accessing the storage space 16.” *Rheaume*, ¶[0034]. The notch of the sidewall of the bin bucket is shown in more detail in Figures 3 and 4 as “cut-out” 38 in the sidewall 36 that receives hinge assembly 30.

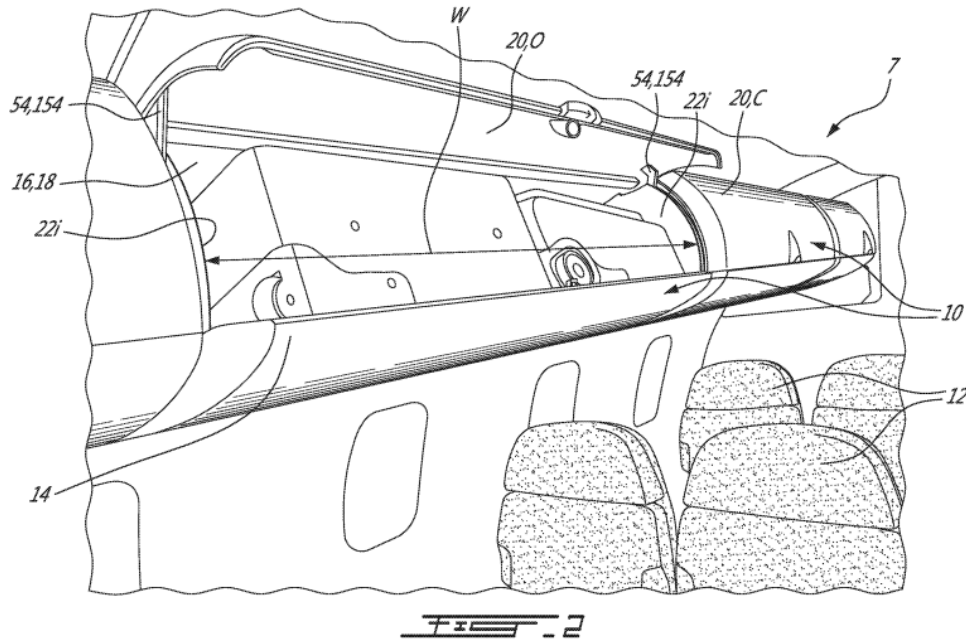


Rheume explains that “[a] cut-out 38 (FIGS. 4-5) is defined along the edge of the wall body 36. The inner wall panel 32 is detachably connected to the inner surface 22 *i* of the wall body 36 along the edge of the cut-out 38, and the outer wall panel 34 is detachably connected to the outer surface 22 *o* of the wall body 36 along the edge of the cut-out 38.” *Rheume*, ¶[0038]. The wall panels 32, 34 of the hinge housing extend from the edge of the cut-out 38 “to complete the perimeter of the opening 18 of the storage bin 10.” *Rheume*, ¶[0039]. The interior surface of the sidewall is show in Figure 5 as inner surface 22 *i* of the walls 22. *Rheume*, ¶[0035].



d) [1C]: “a second sidewall;”

Rheume discloses this limitation. Codd Decl ¶72. As described above in connection with claim [1B], *Rheume* discloses bins 10 with at least two sidewalls. For example, Figure 2 of *Rheume* shows bins 10 with “a plurality of walls 22” with “[t]he dimensions of the storage space 16...defined between the inner surface 22 *i* of the walls 22.” *Rheume*, ¶¶[0034]-[0035]. The door 20 is connected to walls 22 via the hinge assembly. *Rheume*, ¶¶[0053]-[0056] (describing a first bin wall and an “opposite” or “corresponding” bin wall).



e) [1D]: “a partition positioned between the first and second sidewalls;”

Rheaume in view of *Ehlers* discloses this limitation. Codd Decl ¶73. *Ehlers* describes “a partition for dividing the first baggage compartment from the second baggage compartment.” *Ehlers*, Abstract, ¶[0007], [0016]-[0021]. The partition may be a “fixed wall” or “variable and can easily be adapted to various load situations.” *Ehlers*, ¶[0017]. As shown in Figures 1-3, *Ehlers*’ partitions are versatile enough to “close[] off the entire overhead bin 8” so that the partitioned bins are “arranged one beside the other,” or they “can also be aligned so as to alternately open towards two opposite ends.” *Ehlers*, ¶[0018].

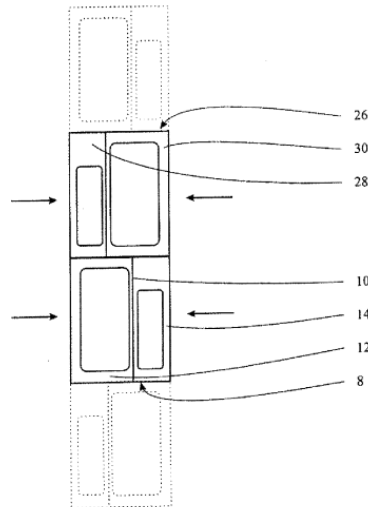


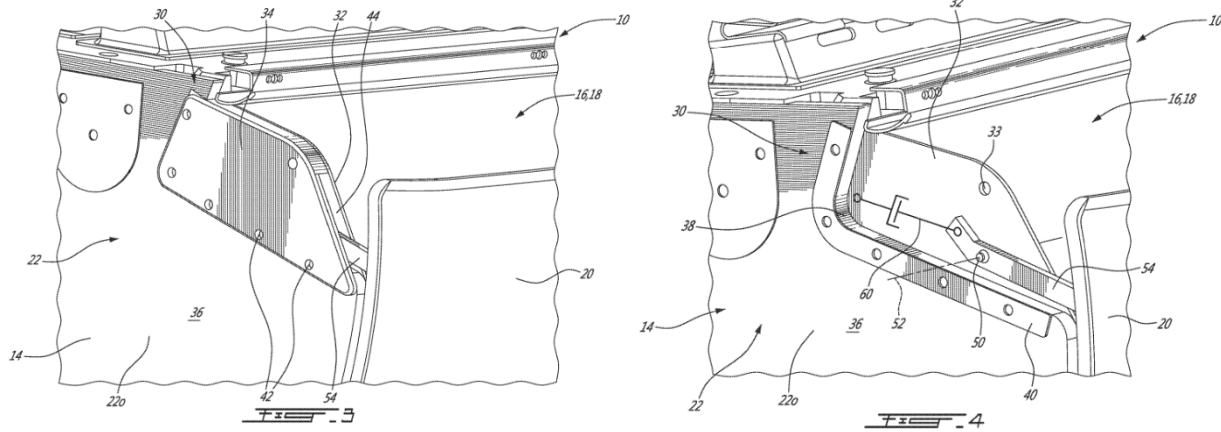
Fig. 2

It would have been obvious and achieve a predictable result to add the partition disclosed by *Ehlers* to the bin assembly of *Rheaume* so that a divider or partition was positioned between the first and second sidewalls. A POSITA would have incorporated a partition into the bin assembly of *Rheaume* without any technical difficulty and with extremely predictable results, *i.e.*, bins with increased structural stability and subdivided space to hold the luggage of different passengers. Codd Decl. ¶74. The '244 Patent itself explains that the claimed “partition” can be just another bin sidewall. *See* Ex. 1001 at 3:43-50. In addition, partitions were common design elements in storage containers and bin assemblies at the time of the invention to achieve a simple design need (*e.g.*, segregated and isolated storage space) and increase the structural stability of the container/bin (*e.g.*, rigidize and provide a path for shear, torsional, bending and impact loads to

be distributed throughout the bin's structure). *Id.* As explained by Dr. Codd, the addition of a partition to any overhead bin was "an extremely predictable solution well within the technical grasp of a POSITA," as explained in more detail below. *Id.*; see *infra* §VIII(A)(7).

- f) [1E]: "a first hinge assembly having a housing which is received in the first notch, the housing having an interior surface, the interior surface of the housing being flush with the interior surface of the first sidewall when the housing of the first hinge assembly is received in the first notch;"

Rheaume discloses this limitation. Codd Decl. ¶¶75-78. *Rheaume* describes that "hinge assembly 30 is configured for receiving the door 20 to allow movement of the door 20 between the open and closed position." *Rheaume*, ¶[0035]. The hinge assembly includes a housing made up of a receiving space and wall panels 32, 34. *Rheaume*, ¶¶[0037], [0039], [0047], Figs. 3-5. "The inner wall panel 32 is detachably connected to the inner surface 22 *i* of the wall body 36 along the edge of the cut-out 38, and the outer wall panel 34 is detachably connected to the outer surface 22 *o* of the wall body 36 along the edge of the cut-out 38." *Rheaume*, ¶[0038].

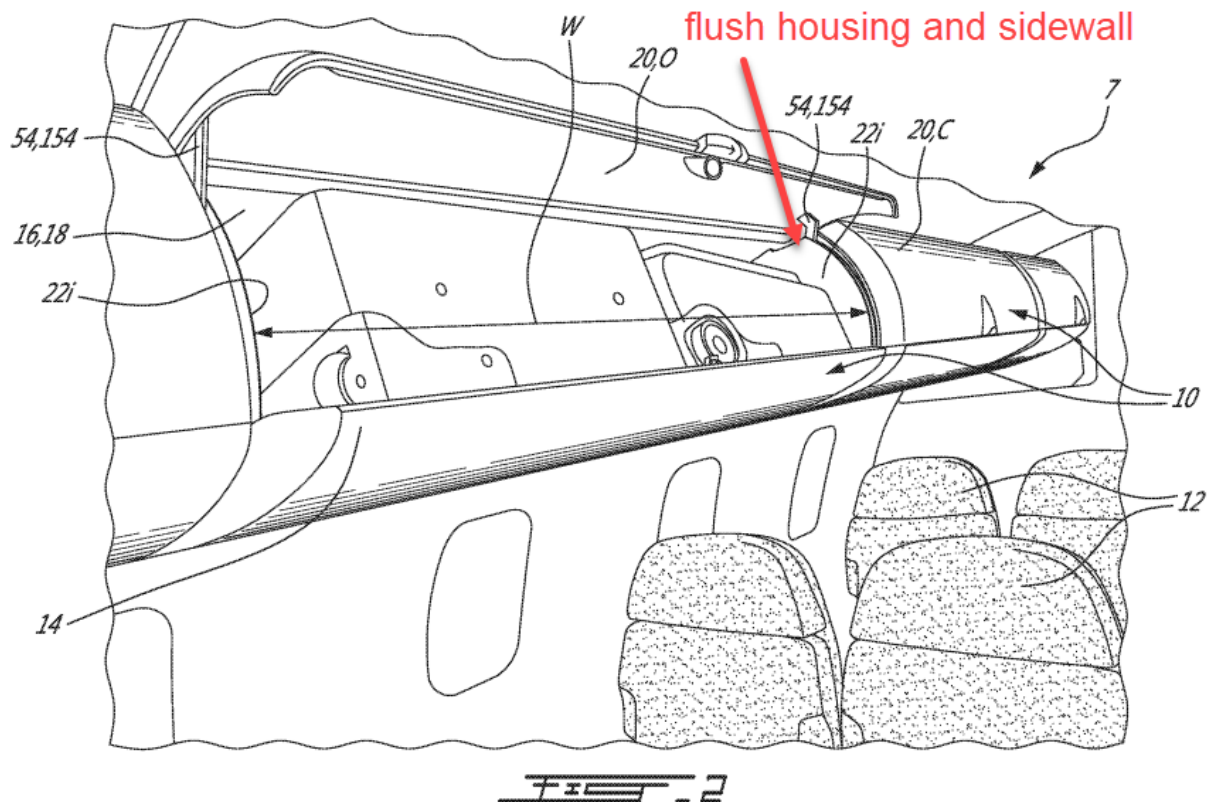


The hinge assembly and its housing can be received in the notch (cut-out) in a number of ways. First, “[s]eals 40 may optionally be provided between the wall panels 32, 34 and the respective surface 22 i, 220 of the wall body 36 along their connection.” *Rheaume*, ¶[0038]. Second, “the wall panels 32, 34 are connected to the wall body 36 by a plurality of fasteners 42 extending through the wall body 36 and the wall panels 32, 34.” *Id.* Finally, “[o]ther suitable types of connections may alternately be used, including detachable connections (i.e. connections which are detachable without causing damage to the wall body 36 and the wall panels 32, 34), and permanent connections (i.e. connections which are not detachable without causing damage to one or both of the wall body 36 and the wall panels 32, 34).” *Id.* The two wall panels forming the housing may also be detachably connected to each other using clips or fasteners, may be formed from the same or different materials as the sidewall body, or may be “an integral part of the wall body.” *Rheaume*, ¶¶[0040]-[0041].

The interior surface of the housing is flush with the interior surface of the bin sidewall when the housing of the at least one hinge assembly is received in the notch. *Rheaume* explains that “the hinge assembly 30, 130 advantageously allows for support of the door 20 without causing an obstruction in the storage space 16.” *Rheaume*, ¶[0056]. A POSITA would have understood that “there is no obstruction of storage space because the interior surface of the hinge assembly housing of *Rheaume* is flush with the sidewall.” Codd Decl. ¶77.

Rheaume describes various embodiments where the hinge housing is either substantially flush or precisely flush with the interior surface of the sidewall. *Rheaume* explains that “[t]he only protrusion of the hinge assembly 30, 130 within the storage space 16 corresponds to the thickness of the inner wall panel 32 where it is attached to the inner surface 22 *i* of the wall body 36. However, the panel thickness is a negligible dimension when compared to the width *W* of the storage space 16. Accordingly, substantially the entire width *W* of the storage space 16 remains available for storage.” *Rheaume*, ¶[0056]. In other embodiments, “an indentation may be defined in the wall body 36 at the connection with the inner wall panel 32, so that the inner surface of the inner wall panel 32 is aligned with the inner surface 22 *i* of the wall body 36. In that case, the entire width *W* of the storage space 16 remains available for storage.” *Rheaume*, ¶[0057]. As explained by Dr. Codd, the “indentation” described by

Rheume permits the inner surface of the hinge housing to be “perfectly flush” with the inner surface of the sidewall. Codd Decl. ¶78. The flush nature of the hinge housing with the interior surface of the sidewall can also be seen in Figures 2-5. A POSITA would have readily understood that this arrangement “advantageously maximizes the available bin space *W* in order to fit more luggage and eliminate any potential protrusions which may snag contents or otherwise impede loading or unloading.” *Id.*



g) [1F]: “a partition hinge assembly coupled to the partition; and”

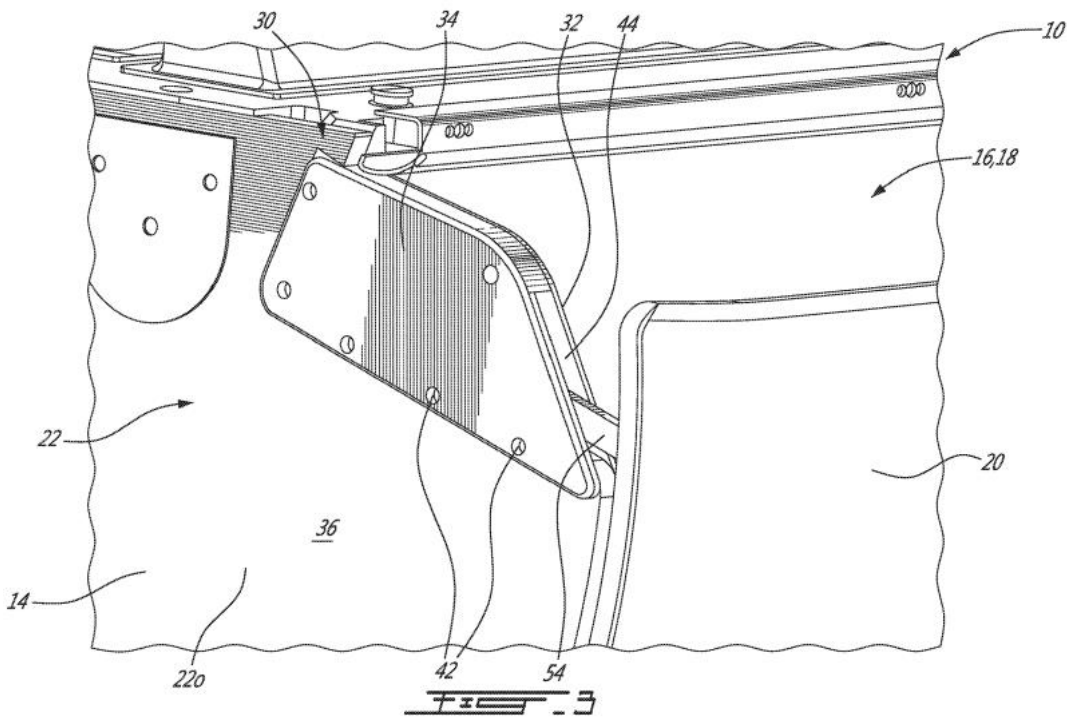
Rheaume in view of *Ehlers* discloses this limitation. Codd Decl. ¶79. *Ehlers* describes a partition, as described above in claim [1D]. *Rheaume* explains that its hinge assemblies may be received in cut-out 138 defined along one or more wall bodies of the bin. *Rheaume*, ¶¶[0048]-[0052] (“A similar hinge assembly 130 may also be provided in the opposite side wall of the bin 10.”).

Since *Rheaume* describes its hinges as received within at least two bin walls (see *Rheaume*, ¶¶[0048], [0052]), it would have been obvious to a POSITA to incorporate another intermediate hinge assembly in a partition wall, like the partition wall disclosed by *Ehlers*. Codd Decl. ¶80. The combination would achieve the predictable result of increased structural stability of the bin and an additional hinge for the bin door, which would provide greater attachment security for the bin door. *Id.* A POSITA would have incorporated the hinge assembly of *Rheaume* into the partitions of *Ehlers* without any technical difficulty and with extremely predictable results (*e.g.*, a multi-compartment hinged bin with an additional attachment point for the bin door at the partition). Codd Decl. ¶80; see *infra* §VIII(A)(7).

- h) *[1G]: “a stowage bin door pivotably coupled to the bin bucket assembly via the first hinge assembly, the stowage bin door moveable between an open position and a closed position.”*

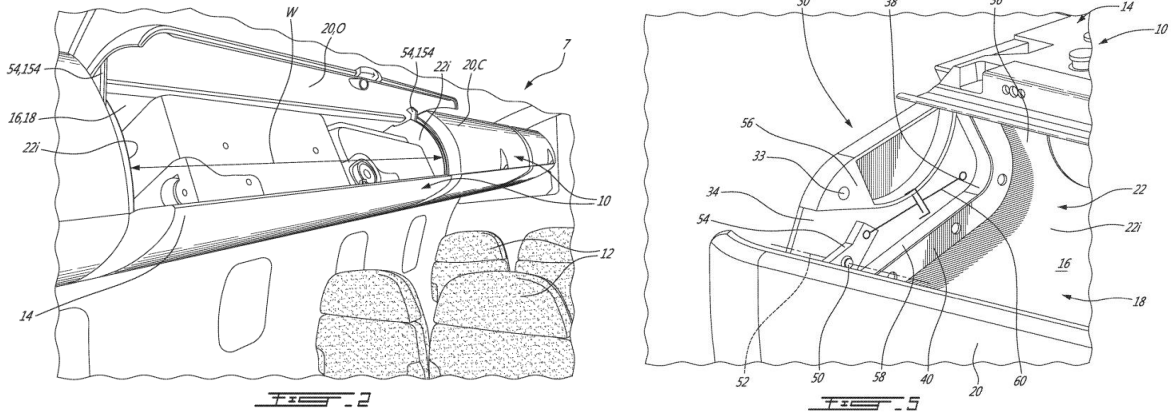
Rheume discloses this limitation. Codd Decl. ¶¶81-82. *Rheume* describes that the hinge assembly 30 “includes a pivot 50 located in the receiving space 44 defined between the wall panels 32, 34.” *Rheume*, ¶[0042]. The pivot axis 52 “extends perpendicularly to the inner and outer wall surfaces 22 *i*, 220” and can be connection to both wall panels 32, 34. *Id.* The hinge assembly 30 further includes “a hinge arm 54 having a portion located in the receiving space 44 between the wall panels 32, 34 and engaged to the pivot 50.” *Rheume*, ¶[0043]. The hinge arms pivots between an open and closed position, allowing storage bin door 20 to open and close. *Id.* “Throughout its pivoting motion, the hinge arm 54 remains within a space defined between a plane of the inner surface 22 *i* of the wall 22 and a plane of the outer surface 22 *o* of the wall 22. In other words, the hinge arm 54 pivots in plane P (FIG. 6) which is aligned with the wall 22, i.e. a plane P extending between the inner and outer surfaces 22 *i*, 220 of the wall 22 at least in proximity of the opening 18, and in a particular embodiment for the entirety of the wall 22.” *Id.* The hinge arm is connected to the stowage bin door “using any suitable type of connection.” *Rheume*, ¶[0045].

Stowage bin door 20 is shown below in Figure 3 connected to hinge arm 54.



2. Claim 2

Claim 2 recites “[t]he stowage bin assembly of claim 1 wherein the bin bucket includes an upper wall, the first notch being positioned adjacent to the upper wall.” *Rheaume* discloses this limitation. Codd Decl. ¶83. As explained above in claim 1, *Rheaume* discloses a notch or “cut-out” in the sidewall 22 and adjacent to an upper wall defining the bin body 14. The upper wall defining the top of the bin body 14 and storage space 16 can be seen in at least Figures 2 and 5.



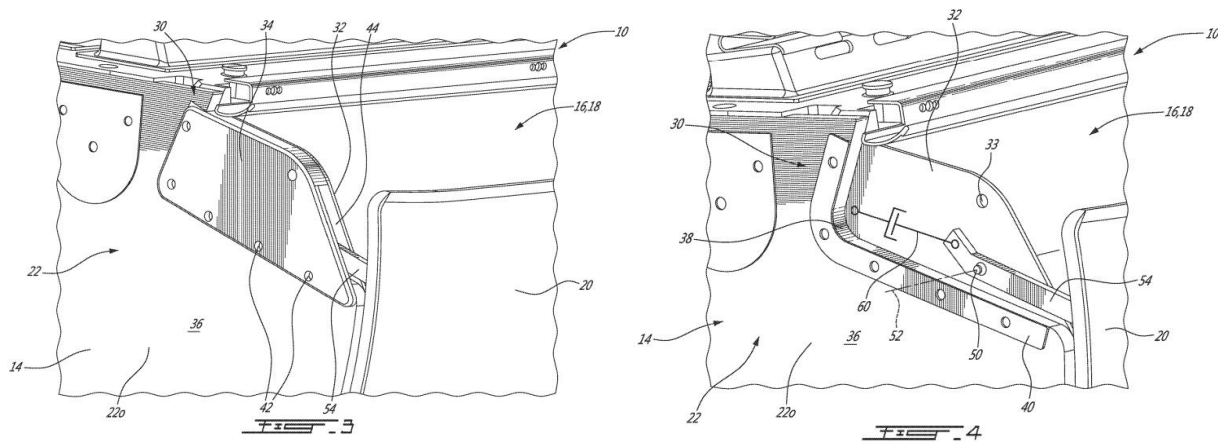
3. Claim 3

Claim 3 recites “[t]he stowage bin assembly of claim 1, further comprising: a second hinge assembly having a second housing, the second housing received in a second notch disposed in the second sidewall.” *Rheume* discloses this limitation. Codd Decl. ¶84. As discussed in claim 1, *Rheume* discloses “the storage bin 10 includes a plurality of walls 22” and each wall can receive hinge assembly 130 within cut-out 138 in that wall. *Rheume*, ¶¶[0035], [0048], [0052] (“[A] similar hinge assembly 30 is provided in the opposite side wall of the bin 10, so that the door 20 is retained by two hinge arms 54, i.e. on hinge arm 54 on each side of the door 20.”).

4. Claim 8

Claim 8 recites “[t]he stowage bin assembly of claim 1 wherein the partition includes a recess that extends through a body of the partition.” *Rheume* in view of *Ehlers* discloses this limitation. Codd Decl. ¶¶85-86. *Rheume* discloses a

recess within the walls of the bin as “cut-out” 38, 138 that receives hinge assembly 30, 130. *Rheaume*, ¶[0038], [0039], [0050]. A POSITA would have been motivated to provide these notches, or recesses, in a partition wall of the bin because a partition wall is just another type of “wall” described by *Rheaume*.⁶ Codd Decl. ¶86. In addition, the notch/recess would act as an additional attachment point for the bin door to make operation of the door more secure. *Id.*



In addition, *Ehlers* explains that “partition 10 may also comprise **recesses**, preferably situated on the ends of the overhead bins.” *Ehlers*, ¶[0017]. The recesses in the partition “may reduce the space required by a trolley in a baggage compartment 12 or 14, and may thus further optimise the use of space in the overhead bins according to the invention.” *Id.* In view of this disclosure, a POSITA would have ample motivation to include a partition with a notch/recess

⁶ The ’244 Patent itself explains that the claimed “partition” can be just another bin sidewall. See Ex. 1001 at 3:43-50.

into the bins of *Rheaume* so that the partition hinge assembly is received within the notch/recess and available storage space within the bin is optimized. Codd Decl.

¶86. The notch/recess in the partition would serve the same function as the notch/recess in the sidewall (*e.g.*, to receive a hinge assembly without protruding into the storage capacity of the bin). *Id.*; see claim [1D], [1F].

5. Claim 14

Claim 14 recites “[t]he integral overhead stowage bin assembly of claim 9, further comprising: a partition that is positioned adjacent to the sidewall, the partition including a partition notch that is sized and shaped to receive a partition hinge assembly.” *Rheaume* in view of *Ehlers* discloses this limitation for the same reasons described above in connection with claim 8. Codd Decl. ¶87. *Rheaume* already describes a notch or recess in each of the bin walls as cut-out 38, 138 sized and shaped to receive the hinge assembly 30, 130. *Rheaume*, ¶[0038], [0039], [0048], [0050], [0052]. It would have been obvious to also include the same cut-out or recess in a partition wall of the bin, as described by *Ehlers*, positioned adjacent to the sidewall for the same reasons described above. *See supra*, §VIII(A)(4).

6. Claim 15

Claim 15 recites “[t]he integral overhead stowage bin assembly of claim 14 wherein the partition includes a recess that extends through a body of the

partition.” *Rheaume* in view of *Ehlers* discloses this limitation for the same reasons described above in connection with claim 8. Codd Decl. ¶88.

7. Motivation to Combine *Rheaume* and *Ehlers*

A POSITA would have had ample motivation to combine the specific teachings of *Ehlers* described above (*i.e.*, the bin partition) with the stowage bin and hinge assembly described in *Rheaume*. Codd Decl. ¶89. First, *Rheaume* and *Ehlers* both relate to improvements in the storage capacity of overhead stowage bins in aircraft. *Rheaume*, ¶[0058] (“The hinge assembly 30, 130 can thus allow for an improved storage capacity for the bin 10.”); *Ehlers*, ¶[0004] (The invention seeks to ensure that “adequate stowage room is available for the baggage of the laterally seated passengers [because] conventional centre bins cannot provide flexible use for items of baggage of different sizes.”), ¶[0017] (The partition recesses “may reduce the space required by a trolley in a baggage compartment 12 or 14, and may thus further optimise the use of space in the overhead bins according to the invention.”). Second, a POSITA would have understood that the partition wall creating multiple compartments described in *Ehlers* “could be easily incorporated into the hinge assembly of *Rheaume* to increase structural integrity of the bin and optimize efficiency of storage space.” Codd Decl. ¶89. In other words, a POSITA would have had ample motivation to incorporate *Ehlers*’ partition into *Rheaume*’s bin assembly in view of the express

motivation within the references themselves to optimize storage space. *See Ehlers*, ¶¶[0005], [0007], [0016], [0018] (explaining the benefits of partitioned bins). Lastly, the specific features taken from *Ehlers* (*i.e.*, the recesses and partitions) are all “commonplace design elements used in storage systems generally.” Codd Decl. ¶89. According to Dr. Codd, “the use of each of these design elements in the hinge assembly of *Rheaume* would merely involve the predictable use of prior art design elements according to their established functions.” *Id.* A POSITA would have therefore had a reasonable expectation of success in adding the partitions of *Ehlers* to the bin assembly of *Rheaume*. *Id.* The combination would predictably result in “more compartmentalized storage, increased structural integrity of the bin, and an additional attachment point for the bin door at the partition.” *Id.*

B. Ground 2: Claims 4-7 are unpatentable under 35 U.S.C. §103 in view of *Rheaume*, *Ehlers*, and *Savian*

1. Claim 4

Claim 4 recites “[t]he stowage bin assembly of claim 1 wherein the first hinge assembly includes a self-opening mechanism.” *Rheaume* in view of *Savian* discloses this limitation. Codd Decl. ¶¶90-93.

Savian describes a rotary damper and/or coil spring⁷ as well as various “assist springs” that are used to assist the user in opening or closing the bin. *Savian*, ¶¶[0054], [0059], [0060], [0062], [00123]-[00130] (both damping and “spring assist” or “closing assist” provided using the same hinge assembly). The rotary damper and/or springs are types of self-opening mechanism and are “housed within the clevis assembly” (*i.e.*, within the hinge assembly). *Id.*, ¶[00115]; Codd Decl. ¶91. As shown in Figs. 22, 25A, 25B, 30-32, connecting unit 150 “is positioned in a cut out 151 in the side 18b of the upper housing 26” and “can be used for either one or both of damping the opening of the bucket 14 or assisting with the closing of the bucket 14.” *Savian*, ¶[00123].

⁷ In its Infringement Contentions, Harper cites to a spring as the claimed self-opening mechanism. Ex. 1012 at 17.

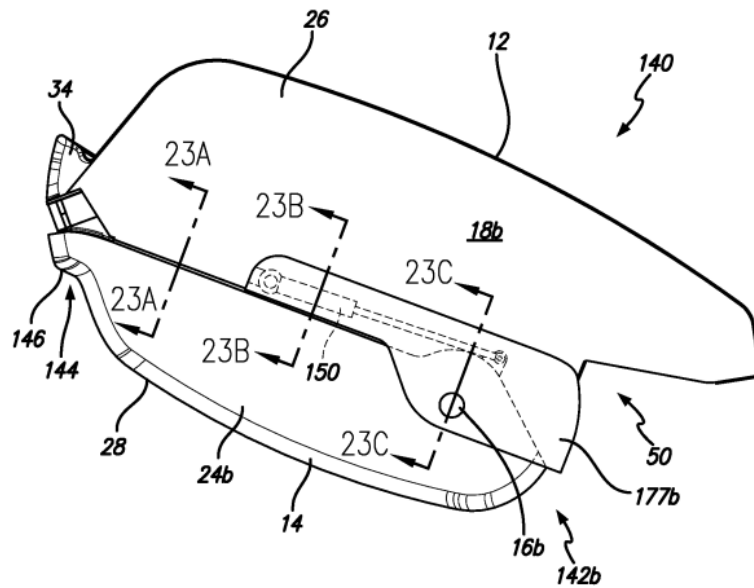


FIG. 22

Fig. 29 shows an embodiment where the self-opening mechanism (connecting unit 150) includes both spring 156 and damper 160 in order to provide both damping and spring assist during opening and closing of the bin. *Savian*, ¶[00124].

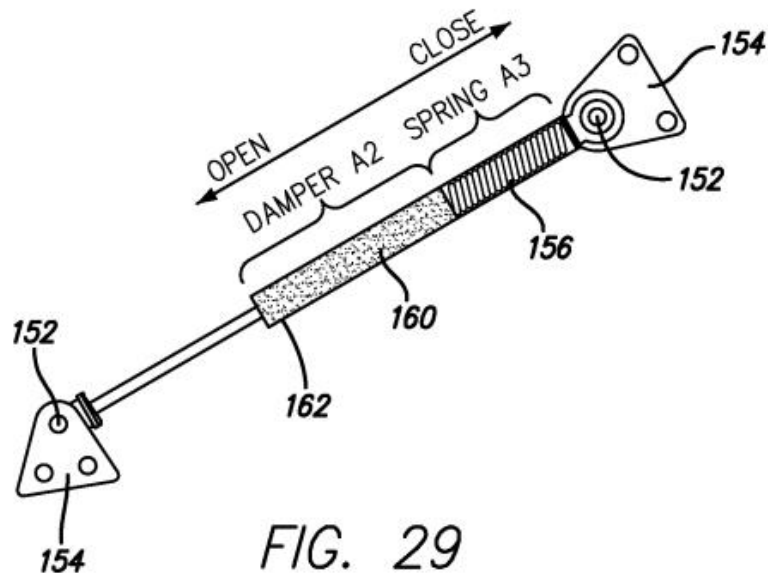


FIG. 29

It would have been obvious and achieve a predictable result to add one or more dampers (with spring assistance) in the form of connecting unit 150 disclosed by *Savian* within the hinge assembly of *Rheaume* (*e.g.*, replacing or working in cooperation with damper 60 of *Rheaume*), in order to assist the user in opening or closing the bin door of *Rheaume*. Self-opening mechanisms, such as springs and spring-assisted or gas-pressure assisted dampers, were common design elements in numerous hinge applications at the time of the invention. A POSITA would have incorporated these self-opening mechanisms into the hinge assembly of *Rheaume* without any technical difficulty and with extremely predictable results (*e.g.*, a hinge or door of a multicompartment bin that self opens after being unlatched), as discussed in more detail below. Codd Decl. ¶93; *see infra* §VIII(B)(5).

2. Claim 5

Claim 5 recites “[t]he stowage bin assembly of claim 4 wherein the self-opening mechanism includes a biasing device.” *Rheaume* in view of *Savian* discloses this limitation. Codd Decl. ¶¶94-95. As described above in connection with claim 4, *Savian* describes a rotary damper with spring assistance that also function as a rotary crank. *Savian*, ¶¶[0054], [0060], [0067] & Fig. 23D.

The rotary damper is described in more detail in *Kearsey* (Ex. 1014) (incorporated by reference into *Savian*). *Savian*, ¶¶[0067], [0089]. The rotary damper provides “more damping in the first direction (*e.g.*, opening of a pivot bin)

than in the second direction (e.g., closing of a pivot bin).”). *Kearsey*, ¶[0028]. The damping is a form of biasing that applies a force that counteracts the gravitation torque when the stowage bin door moves between the open and closed positions. The “biasing device” can include one or both of (1) the various springs used as the spring assistance with the rotary damper⁸ and (2) intermediate race 18 and/or inner race 25 with vanes 16 and damping fluid 34 that are all coupled to the rotary crank (transmission assembly 14). *Kearsey*, ¶[0026]-[0027]. In this way, the rotary damper with spring assistance provides controlled opening and closing of the bin door of *Rheume*. See *Kearsey*, ¶[0028] (describing application “to any axis that requires different damping rates in either direction (lavatory doors, **overhead stowage bin doors**...”). For the same reasons described above in connection with claim 4, a POSITA would have incorporated these self-opening mechanisms (e.g., a biasing device coupled to the rotary crank) into the hinge assembly of *Rheume* without any technical difficulty and with extremely predictable results. Codd Decl. ¶95.

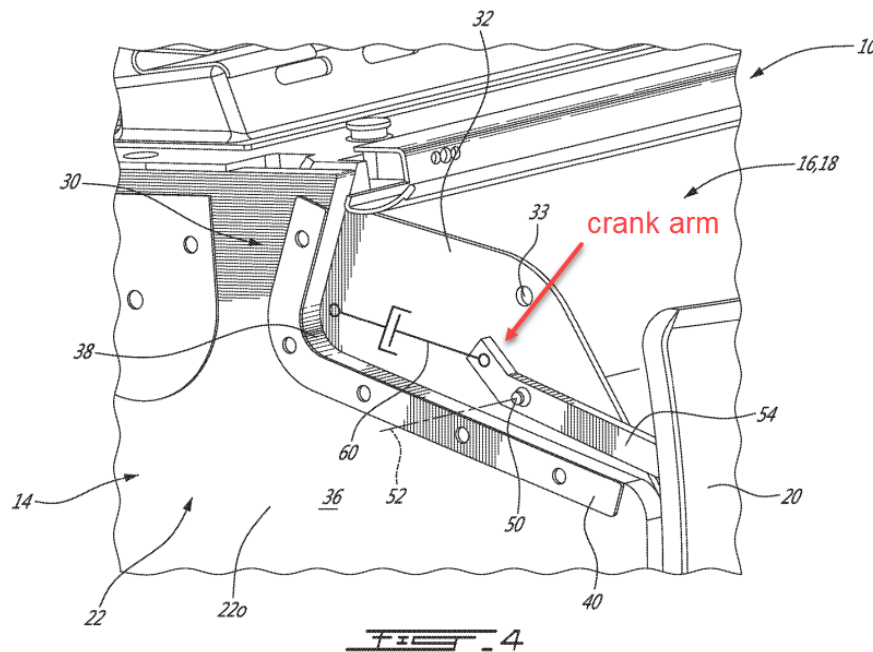
3. Claim 6

Claim 6 recites “[t]he stowage bin assembly of claim 5 wherein the self-opening mechanism further comprises: a rotary crank having a pivot pin aperture, a

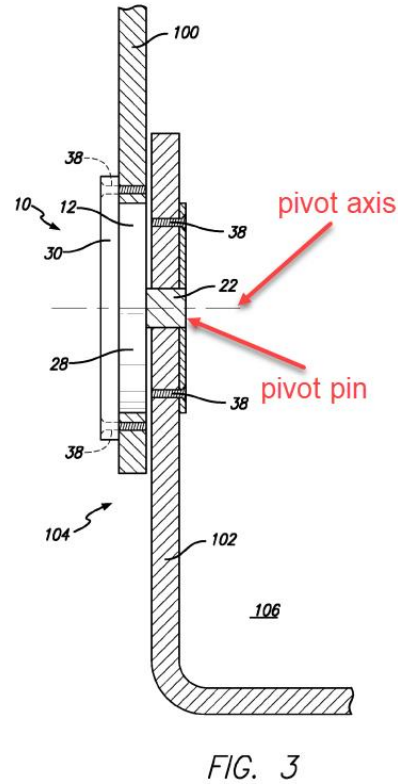
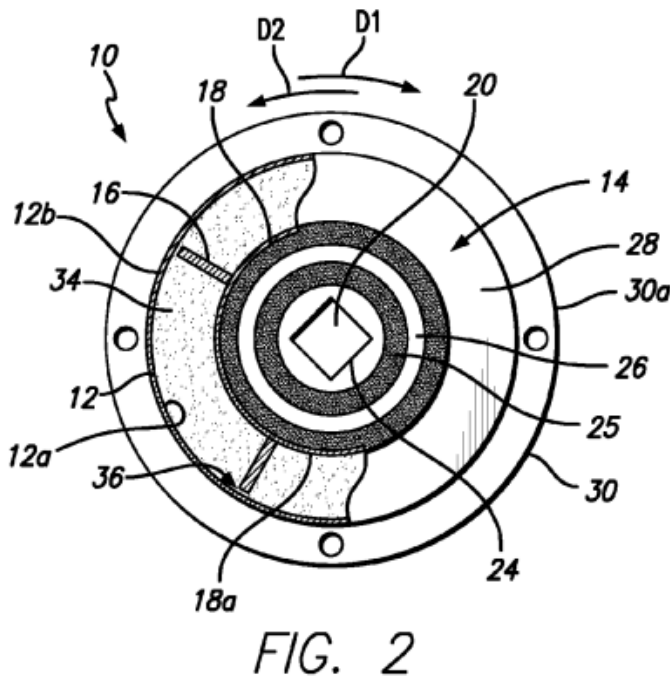
⁸ In its Infringement Contentions, Harper cites to a spring as the claimed biasing device. Ex. 1012 at 18.

center of which defines a pivot axis; and a connecting element that couples the biasing device to the rotary crank.” *Rheaume* in view of *Savian* discloses this limitation. Codd Decl. ¶¶96-100.

Figure 4 of *Rheaume* shows crank hinge arm 54 engaged to pivot 50. *Rheaume*, ¶¶[0042]-[0043]. “The hinge arm 54 has a rigid structure, and is pivotable about the pivot axis 52 to move between the open and closed positions of the door 20.” *Id.* A damper is also “pivotally connected” to the hinge arm and is also located within the hinge assembly. *Rheaume*, ¶[0047]. The hinge arm is connected to the pivot 50 and the damper 60 “to allow the damper 60 to act on the motion of the hinge arm 54 about the pivot 50.” *Id.* Crank hinge arm 54 acts as a rotary crank having a pivot pin aperture (opening in the arm to receive pivot pin 50) around pivot axis 52, as shown in Figure 4 below.



In addition, *Savian* describes a “rotary damping mechanism” that includes “spring assistance over at least one direction of the rotational travel of the device.” *Savian*, ¶[0067]. Rotary dampers 17a and 17b “provide the ability to damp or control the descent or pivoting of the bucket when it pivots to the open position.” *Savian*, ¶[0089]. A POSITA would have understood that since the rotary dampers described in *Savian* include “spring assistance over at least one direction of the rotational travel of the device” (see *Savian*, ¶[0067]), the rotary dampers also must function as a rotary crank in the rotational direction of non-damping, particularly when used as damper 60 connected to crank arm 54 in the hinge assembly of *Rheume*. Codd Decl. ¶98. As shown below, the rotary damper includes a rotary crank (transmission assembly 14) that rotates inner race 24 and intermediate race 18 in the D1 or D2 direction based on the rotational movement of a pivot pin (axle shaft 22). *Kearsey*, ¶[0025], [0027]; Codd Decl. ¶98. Housing 12 and/or flange 30a is connected to the housing of the bin door while axle shaft 22 is connected to the “pivoting portion” of the overhead stowage bin. *Kearsey*, ¶¶[0025], [0027]. The crank includes a pivot pin aperture (axle opening 20), a center of which defines a pivot axis (the center of inner race 25 shown as dashed line in Fig. 3); and a pivot pin (axle shaft 22 of Fig. 3) received in the pivot pin aperture (axle opening 20).



Kearsey, ¶¶[0022]-[0027]; Figs. 2 & 3; Savian, ¶¶[00113] (“[T]he pivot axles 16a and 16b are essentially the clevis pins and the clevis is comprised of an inner plate 175 and an outer plate 177 that each include an opening 179 therein, through which the pivot axle/pin 16 extends.”).

The “biasing device” can include one or both of (1) the various springs used as the spring assistance with the rotary damper⁹ and (2) intermediate race 18 and/or inner race 25 with vanes 16 and damping fluid 34 that are all coupled to the rotary

⁹ In its Infringement Contentions, Harper cites to a spring as the claimed biasing device. Ex. 1012 at 18.

crank (transmission assembly 14). *Kearsey*, ¶¶[0026]-[0027]. In this way, the rotary damper with spring assistance provides controlled opening and closing of the bin door of *Rheaume*. See *Kearsey*, ¶[0028] (describing application “to any axis that requires different damping rates in either direction (lavatory doors, **overhead stowage bin doors**...”). A POSITA would have understood that when the damper 17a, 17b of *Savian* included spring-assistance, the connecting element (axle shaft 22) would couple the biasing device (spring) to the rotary crank/damper 17a, 17b in order to assist the rotary crank/damper to rotate. Codd Decl. ¶99; *Savian*, Fig. 29 (showing spring A3 connected to damper A2); *Kearsey*, ¶[0027] (“[T]he axle shaft 22 can include a flat surface, key or the like or can be polygonal such that rotation can be transferred from the pivoting object to the axle shaft.”).

A POSITA would have incorporated these self-opening mechanisms (*e.g.*, rotary crank and pivot pin) into the hinge assembly of *Rheaume* without any technical difficulty and with extremely predictable results (*e.g.*, a hinge or door that self opens using a crank and pin after being unlatched). Codd Decl. ¶100. In addition, rotary cranks and pivot pins were routinely used in hinge and door assemblies in countless applications at the time of the alleged invention. *Id.* A POSITA would therefore have had a reasonable expectation of success in adding a crank/pin mechanism to the hinge assembly of *Rheaume* to obtain a well-known and predictable result. *Id.*; see *infra* §VIII(B)(5).

4. Claim 7

Claim 7 recites “[t]he stowage bin assembly of claim 6 wherein the self-opening mechanism includes a connecting pin that couples the connecting element to the biasing device.” *Rheaume* in view of *Savian* discloses this limitation. Codd Decl. ¶101. As described above in connection with claim 6, a connecting pin couples the connecting element (axle shaft 22) to the biasing device (spring). *Savian*, Fig. 29 (showing spring A3 connected to damper A2), ¶[00113] (“[T]he pivot axles 16a and 16b are essentially the clevis pins and the clevis is comprised of an inner plate 175 and an outer plate 177 that each include an opening 179 therein, through which the pivot axle/pin 16 extends.”), Fig. 23D (showing biasing device (spring 172) coupled to biasing device (rotary damper 14) via a connecting pin (pivot axle 16); *Kearsey*, ¶¶[0022]-[0027]; Figs. 2 & 3.

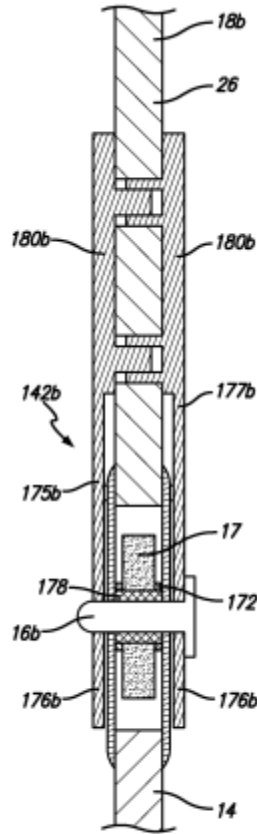


FIG. 23D

5. Motivation to Combine *Savian* with *Rheaume* and *Ehlers*

A POSITA would have had ample motivation to combine the specific teachings of *Savian* described above with the stowage bins and partitions described in *Rheaume/Ehlers*. Codd Decl. ¶102. First, *Rheaume* and *Savian* both relate to improvements in the storage capacity of overhead stowage bins in aircraft. *Rheaume*, ¶[0058] (“The hinge assembly 30, 130 can thus allow for an improved storage capacity for the bin 10.”); *Savian*, ¶[0098] (“As will be understood by those of ordinary skill in the art, storage of a maximum amount of luggage within overhead stowage bins is of utmost importance in passenger aircraft.”) Second, a

POSITA would have understood that the various self-opening mechanisms described in *Savian* “could be easily incorporated into the hinge assembly of *Rheaume* to simplify access to the overhead storage.” Codd Decl. ¶102. This is because (1) both *Rheaume* and *Savian* are directed to “highly predictable mechanical arts where components can be substituted or added with little or no technical difficulty” (*id.*) and (2) both references disclose hinge assemblies that are received into a notch or cut out of a sidewall of an overhead storage bin. *Rheaume*, ¶[0038]; *Savian*, ¶[00123]. The geometries of the bin environment are therefore similar and compatible with each other. Codd Decl. ¶102. In other words, a POSITA would have understood that components of *Savian*’s hinge assembly could be incorporated into *Rheaume*’s assembly “without difficulty, yielding a robust and predictable result.” *Id.* Third, *Rheaume*’s hinge already includes a damper that “biases the door 20 in the open position” (*Rheaume*, ¶[0047]), so the claimed self-opening mechanisms recited in claims 4-7 and taken from *Savian* would have been “completely natural, intuitive, and straightforward design elements to incorporate in *Rheaume*.” Codd Decl. ¶102. Finally, the specific features taken from *Savian* (*i.e.*, the various springs and cranks) are all “commonplace design elements used with pivoting doors and hinges generally to facilitate operation of the doors.” *Id.* According to Dr. Codd, “the use of each of these design elements in the hinge assembly of *Rheaume* would merely involve the

predictable use of prior art design elements according to their established functions.” *Id.* A POSITA would have therefore had a reasonable expectation of success in adding the springs and cranks described in *Savian* to the hinge assembly of *Rheaume*. *Id.* The combination would result in “safer and more efficient access to the overhead storage” with “less force or effort required by the user to open/close the doors.” *Id.*

C. Ground 3: Claims 9-13 are unpatentable under 35 U.S.C. §103 in view of *Rheaume* and *Savian*

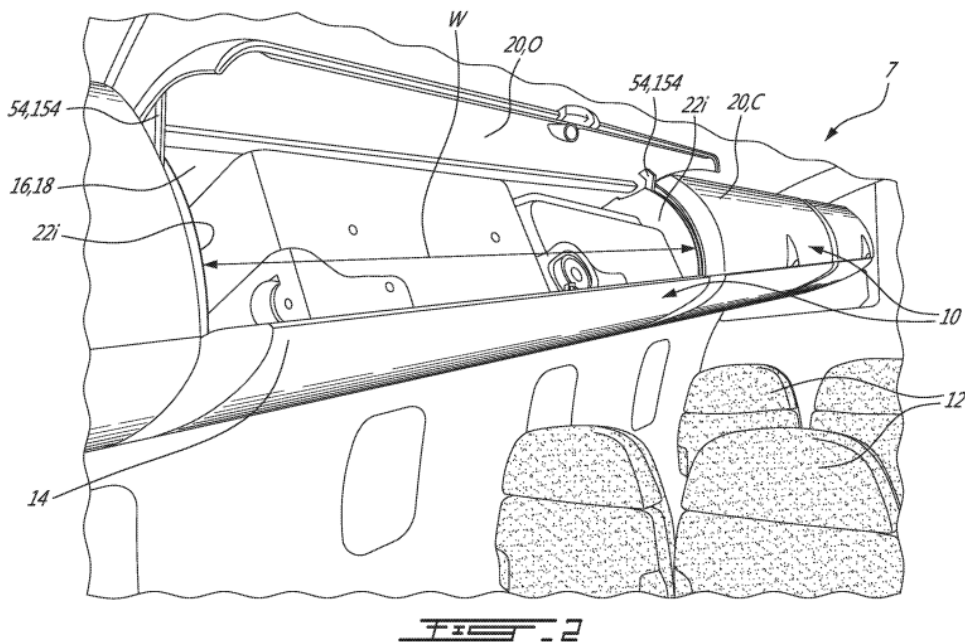
1. Claim 9

- a) *Preamble: “An integral overhead stowage bin assembly, comprising:*

Rheaume discloses this limitation, as described above in connection with claim 1 of Ground 1. *See supra*, §VIII(A)(1); Codd Decl. ¶103.

- b) *[9A]: “a bin bucket assembly including a bin bucket including:*

Rheaume discloses this limitation, as described above in connection with claim 1 of Ground 1. *See supra*, §VIII(A)(1); Codd Decl. ¶104. Stowage bin assemblies 10 are shown at least in Figure 2 of *Rheaume*, which describes “overhead bins with doors in open and closed positions.” *Rheaume*, ¶¶[0026], [0034]. As shown below, the bins include a bin bucket 10 with at least two sidewalls, an upper wall, and a rear wall.



c) [9B]: “a sidewall having an interior surface;”

Rheäume discloses this limitation, as described above in connection with claim [9A] and claim 1 of Ground 1. *See supra*, §VIII(A)(1); Codd Decl. ¶105.

d) [9C]: “an upper wall;”

Rheäume discloses this limitation, as described above in connection with claim [9A] and claim 2 of Ground 1. *See supra*, §VIII(A)(2); Codd Decl. ¶106.

e) [9D]: “a rear wall;”

Rheäume discloses this limitation, as described above in connection with claim [9A] and claim 1 of Ground 1. *See supra*, §VIII(A)(1); Codd Decl. ¶107.

- f) [9E]: “a notch extending through the sidewall, the notch positioned adjacent to the upper wall;”

Rheume discloses this limitation, as described above in connection with claims [1B] and 2 of Ground 1. See *supra*, §VIII(A)(1), (2); Codd Decl. ¶108.

- g) [9F]: “a stowage bin door pivotably coupled to the bin bucket assembly, the stowage bin door moveable between an open position and a closed position; and”

Rheume discloses this limitation, as described above in connection with claim [1G] of Ground 1. See *supra*, §VIII(A)(1); Codd Decl. ¶109.

- h) [9G]: “a hinge assembly having a housing which is received in the notch, the housing having an interior surface, the interior surface of the housing being flush with the interior surface of the sidewall when the housing of the hinge assembly is received in the notch, the hinge assembly including:”

Rheume discloses this limitation, as described above in connection with claim [1E] of Ground 1. See *supra*, §VIII(A)(1); Codd Decl. ¶110.

- i) [9H]: “a biasing device;”

Rheume in view of *Savian* discloses this limitation, as described above in connection with claim 5 of Ground 2. See *supra*, §VIII(B)(2); Codd Decl. ¶111.

- j) [9I]: “a rotary crank having a pivot pin aperture, a center of which defines a pivot axis;”

Rheume in view of *Savian* discloses this limitation, as described above in connection with claim 6 of Ground 2. See *supra*, §VIII(B)(3); Codd Decl. ¶112.

- k) [9J]: “a pivot pin received in the pivot pin aperture, the pivot pin pivotably coupling the stowage bin door to the bin bucket assembly; and”

Rheume in view of *Savian* discloses this limitation, as described above in connection with claims 6 and 7 of Ground 2. *See supra*, §VIII(B)(3), (4); Codd Decl. ¶113. The pivot pin (axle shaft 22) is inserted in the pivot pin aperture (axle opening 20), which is coupled to the stowage bin door (crank hinge arm 54 coupled to door 20).

- l) [9K]: “a connecting element that couples the biasing device to the rotary crank.”

Rheume in view of *Savian* discloses this limitation, as described above in connection with claims 6 and 7 of Ground 2. *See supra*, §VIII(B)(3), (4); Codd Decl. ¶114.

2. Claim 10

Claim 10 recites “[t]he integral overhead stowage bin assembly of claim 9, further comprising: a connecting pin that couples the connecting element to the biasing device.” *Rheume* in view of *Savian* discloses this limitation, as described above in connection with claims 6 and 7 of Ground 2. *See supra*, §VIII(B)(3), (4); Codd Decl. ¶115.

3. Claim 11

Claim 11 recites “[t]he integral overhead stowage bin assembly of claim 9, further comprising: a coupling flange that is coupled to the stowage bin door.”

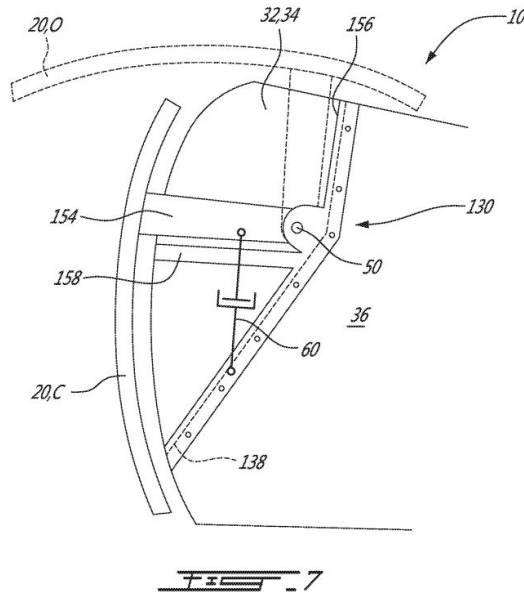
Rheaume discloses this limitation. Codd Decl. ¶116. *Rheaume* explains that “the hinge arm 54 includes a connection portion extending parallel to the door 20, having a U-shaped cross-section which defines a recess sized to receive an edge of the door 20, and the edge of the door 20 is slidably engaged in this complementary recess.” *Rheaume*, ¶[0043]. The claimed “coupling flange” corresponds to the recesses of the connection portion that engage with corresponding recesses in the door. Codd Decl. ¶116.

4. Claim 12

Claim 12 recites “[t]he integral overhead stowage bin assembly of claim 9, further comprising: a damper configured to control pivotable movement of the stowage bin door.” *Rheaume* discloses this limitation. Codd Decl. ¶117. *Rheaume* explains the “a damper 60 is pivotally connected to the hinge arm 54 and to one or both of the wall panels 32, 34, and is located in the receiving space 44 between the wall panels 32, 34.” *Rheaume*, ¶[0047]. The damper “act[s] on the motion of the hinge arm 54 about the pivot 50” by biasing the door in the open position and “provid[ing] sufficient resistance so as to counteract the weight of the door 20 and allow the door 20 to remain in the open position unless a sufficient force toward the closed position is applied to it.” *Id.*

5. Claim 13

Claim 13 recites “[t]he integral overhead stowage bin assembly of claim 9 wherein the housing of the hinge assembly includes an interior cavity that receives the biasing device, the rotary crank, and the connecting element.” *Rheume* in view of *Savian* discloses this limitation. Codd Decl. ¶¶118-119. *Rheume* explains that receiving space 44 within the housing can also receive the biasing device (damper 60) as well as hinge arm 54. *Rheume*, ¶¶[0047]-[0048]. Figure 7 of *Rheume* shows a “larger” cut-out 138 to completely enclose the hinge arm and damper.



In addition, *Savian* explains that the rotary damper/crank, biasing device (spring), and connecting element (axle shaft 22 of the rotary damper/crank) are all housed within the hinge assembly housing (clevis assembly 142a, 142b). *Savian*,

¶[00115] (“[I]n an embodiment that includes the rotary damper 17 and/or an assist spring 172 (described below), these components are also housed within the clevis assembly 142b.”).

6. Motivation to Combine *Rheaume* and *Savian*

It would have been obvious to combine *Rheaume* and *Savian* for the same reasons described above. *See supra* §VIII(B)(5); Codd Decl. ¶¶120.

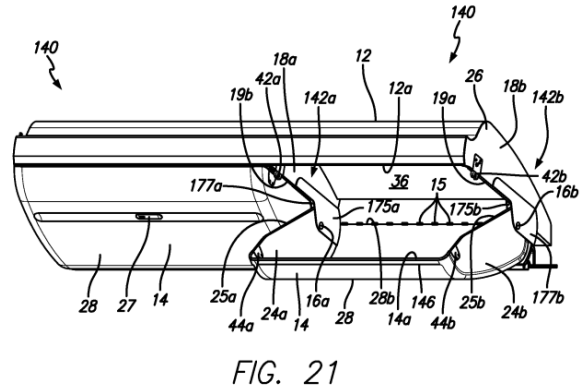
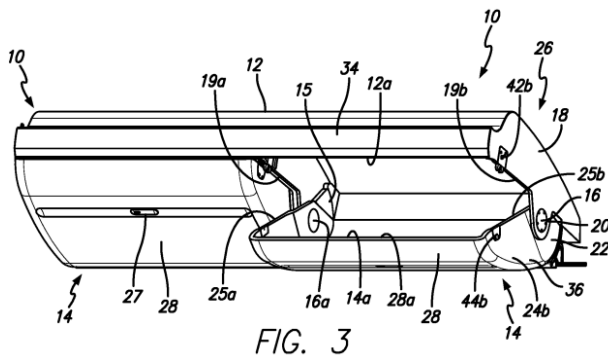
D. Ground 4: Claims 1-8, 14, and 15 are unpatentable under 35 U.S.C. §103 in view of *Savian*, *Ehlers*, and *Frazier*

1. Claim 1

*a) Preamble*¹⁰

To the extent the preamble is considered limiting, *Savian* discloses this limitation. Codd Decl. ¶121. *Savian* describes stowage bin assembly 10 in Figures 1-16 and stowage bin assembly 140 in Figures 21-34. *Savian*, ¶¶[0079]-[0079], [00108].

¹⁰ A recitation of the full claim language has been omitted in this ground, but can be found in the analysis for Grounds 1-3, *supra*.



b) [1A-1B]

Savian discloses these limitations. Codd Decl. ¶¶122-125. Bucket 14 and upper housing 26 is shown in at least Figures 3 and 21, above. *Savian*, ¶[0079]. “The bucket 14 and upper housing 26 cooperate to define a bin interior 36.” *Id.* The embodiment shown in Figures 1-16 includes pivot 16a in the sidewall 18a of bucket 14. *Id.* As shown in more detail in Figure 5, the pivot 16a is inserted into an opening 32a (*i.e.*, a notch) in the sidewall of the bin bucket. *Savian*, ¶[0087]. The sidewall 18a has an interior surface as shown in at least Figures 3 and 5 that defines the “bin interior” 36. *Savian*, ¶¶[0079]-[0080].

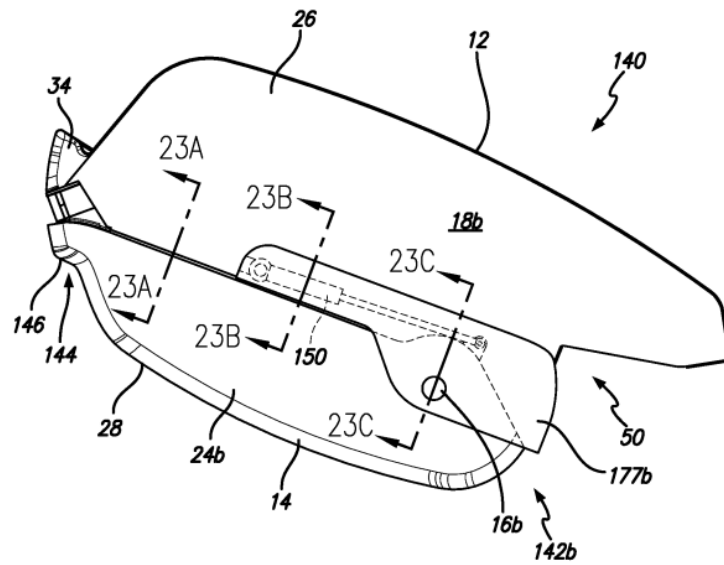


FIG. 22

As shown in more detail in Figures 25A and 25B, a connector unit 150 can be positioned within a “cut out” 151 (*i.e.*, a notch) of the sidewall. *Savian*, ¶[00123] (“[T]he connector unit 150 is positioned in a cut out 151 in the side 18b of the upper housing 26”).

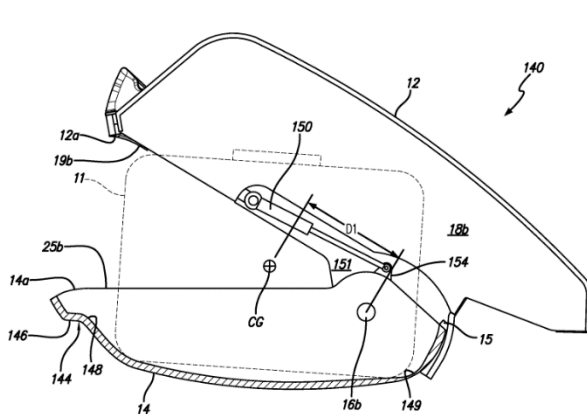


FIG. 25A

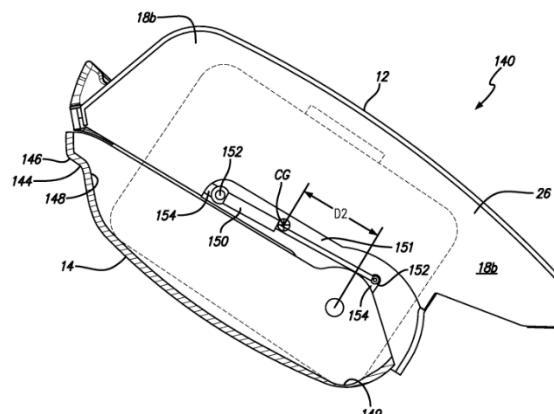


FIG. 25B

Figures 31-34 show another arrangement of the same embodiment with the cut out 151 (*i.e.*, the notch) in the sidewall 18b of the upper housing 26 of the bin bucket assembly 140 along with the connecting unit 150. The interior surface of the sidewall is shown in Figure 34.

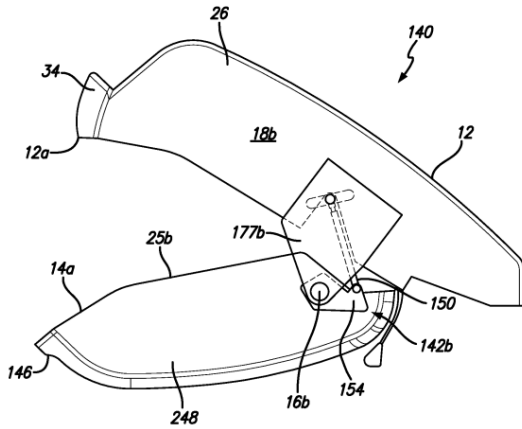


FIG. 32

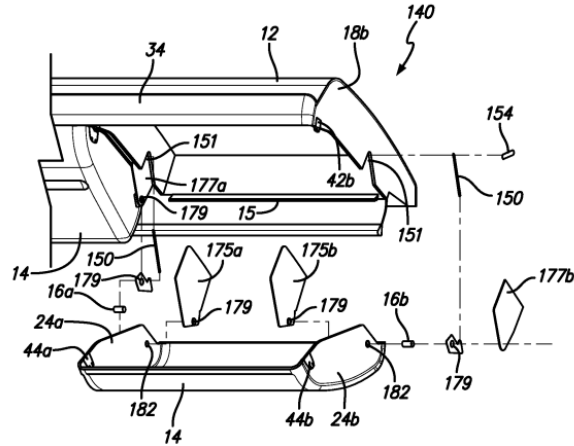


FIG. 34

c) [1C]

Savian discloses this limitation. Codd Decl ¶126. As shown in the figures above, the bin bucket assembly includes at least two sidewalls 18a, 18b. See *supra*, §VIII(D)(1)(a), (b).

d) [1D]

Savian in view of *Ehlers* discloses this limitation. Codd Decl ¶¶127-128. *Ehlers* describes “a partition for dividing the first baggage compartment from the second baggage compartment.” *Ehlers*, Abstract, ¶¶[0007], [0016]-[0021]. The partition may be a “fixed wall” or “variable and can easily be adapted to various load situations.” *Ehlers*, ¶[0017]. As shown in Figures 1-3, *Ehlers*’ partitions are

versatile enough to “close[] off the entire overhead bin 8” so that the partitioned bins are “arranged one beside the other,” or they “can also be aligned so as to alternately open towards two opposite ends.” *Ehlers*, ¶[0018].

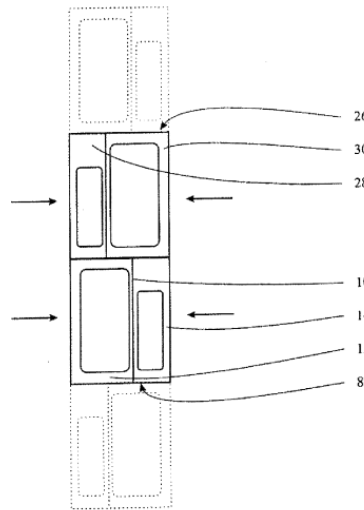


Fig. 2

It would have been obvious and achieve a predictable result to combine the partition disclosed by *Ehlers* within the bin assembly of *Savian* so that a partition was positioned between the first and second sidewalls. A POSITA would have incorporated a partition into the bin assembly of *Savian* without any technical difficulty and with extremely predictable results, *i.e.*, bins with increased structural stability and subdivided space to hold the luggage of different passengers. Codd Decl. ¶128. In addition, partitions were common design elements in overhead stowage bin assemblies at the time of the invention to achieve a simple design need (*e.g.*, segregated storage space). *Id.* The addition of a partition to any overhead

bin was an extremely predictable solution well within the technical grasp of a POSITA. *Id.*

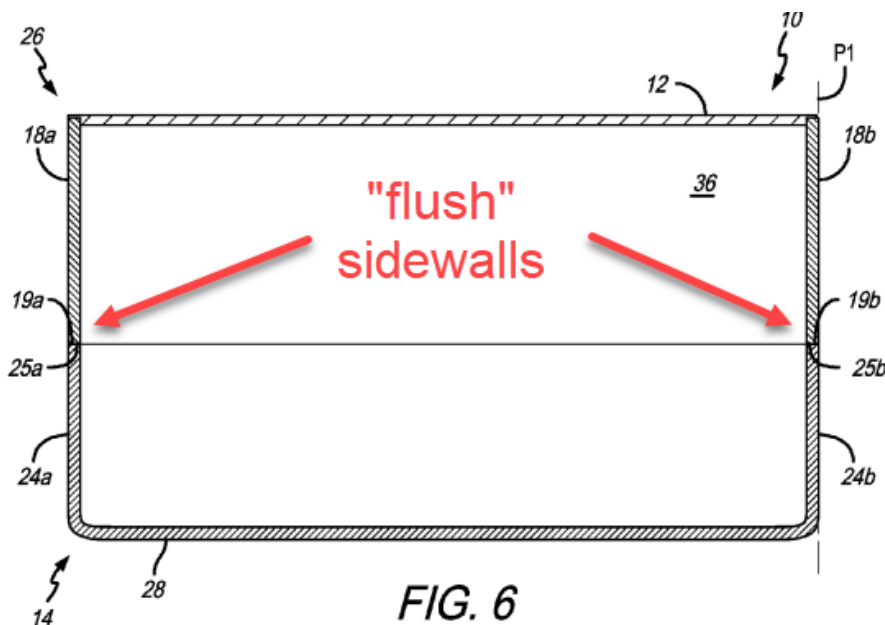
e) [1E]

Savian in view of *Frazier* discloses this limitation. Codd Decl. ¶¶129-137. Each of the embodiments described above shows a hinge assembly 16a, 16b (and optionally connecting unit 150 for the embodiments shown in Figures 21-34) having plates 175, 177 covering the hinge assembly. The claimed housing corresponds to the hinge assembly together with one or both of plates 175, 177. The hinge assembly housing is received in the cut out 151 (*i.e.*, the notch). *Savian*, ¶[00113]-[00114]. In certain embodiments, clevis assemblies 142a, 142b also “house” the pivot mechanisms (*i.e.*, the hinges) and also constitute a hinge assembly housing that is received in the cut out 151 (*i.e.*, the notch in the sidewall). *Savian*, ¶[00112] (“first and second side panels 18a and 18b include first and second clevis assemblies 142a and 142b that house first and second pivot mechanisms 16a and 16b together with other components”).

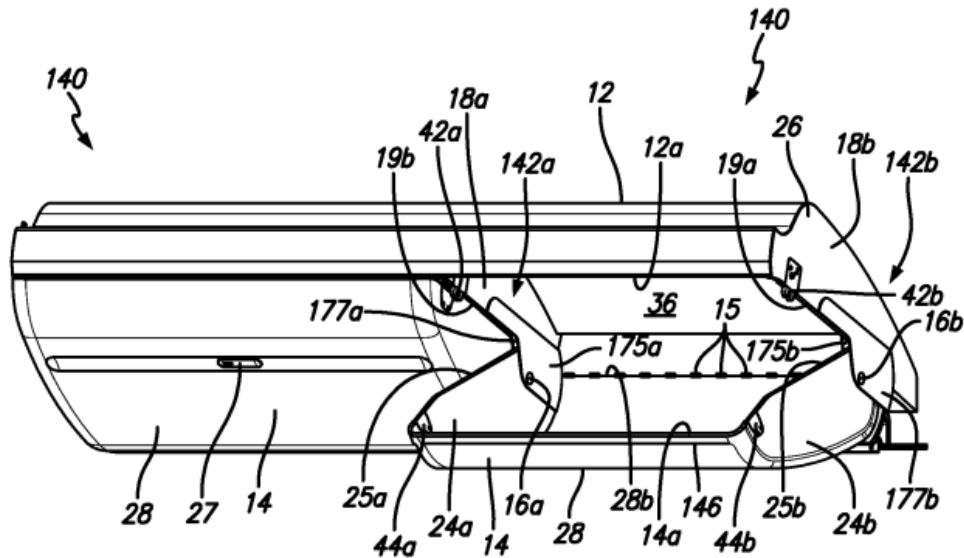
The interior surface of the hinge assembly housing is flush with the interior surface of the sidewall.¹¹ Codd Decl. ¶130. For the embodiments shown in

¹¹ See also *infra* §X(B) for the EPO Examining Division’s opinion that virtually identical disclosure from *Savian* ’090 shows a hinge assembly housing that is flush with the interior surface of the bin bucket sidewall.

Figures 1-16, Figure 6 shows the housing flush with the sidewall. *Savian* explains that “the first side panel 18a, first ear 20a and the first side 24a of the bucket 14 (other than the first indented portion 22a) all are positioned in a generally common plane P1 (see FIG. 6). Likewise, the second side panel 18b, second ear 20b and the second side 24b of the bucket 14 (other than the second indented portion 22b) all are positioned in a generally common plane. In another embodiment, the first and second ears 20a and 20b can be part of the bucket 14 and the first and second indented portions 22a and 22b can be defined in the first and second side panels 18a and 18b.” *Savian*, ¶[0085]. A POSITA would have understood that *Savian* describes embodiments where the hinge assembly housing is in fact flush with the interior surface of the bin sidewall. Codd Decl. ¶130.



Regarding the clevis embodiments, *Savian* explains that the clevis assemblies 142a, 142b (*i.e.*, the hinge housings) “**are integral with the upper housing 26**” or can be “**integral with the bucket 14** or can be attached/secured to the bucket and the pivot axles can extend through the upper housing.” *Savian*, ¶[00114]. In addition, the clevis assemblies 142a, 142b (*i.e.*, the hinge housings) (and the inner and outer plates 175 and 177 thereof) “can **each be a unitary structure** or they can be a plurality of plates that together form the clevis assembly.” *Id.* A clevis assembly that is “integral” with the upper housing of the bucket (or forms a “unitary structure”) means the housing is part of the bucket and therefore is flush with the interior surface of the sidewall (because it makes up part of the sidewall and must be flush with the sidewall because it is part of the sidewall). Codd Decl. ¶131. The flush nature of the sidewall can be seen in at least Figure 21 where the interior surface of assemblies 142a, 142b are flush with the sidewall 18a, 18b. *Id.*



In the embodiment shown in Figure 23D, the interior surface of clevis assemblies 142a, 142b (*e.g.*, the interior surface of upper arms 180a, 180b) is also flush with the sidewall 18a, 18b—particularly when not considering inner plate 177 (*i.e.*, the cover plate). Codd Decl. ¶132.

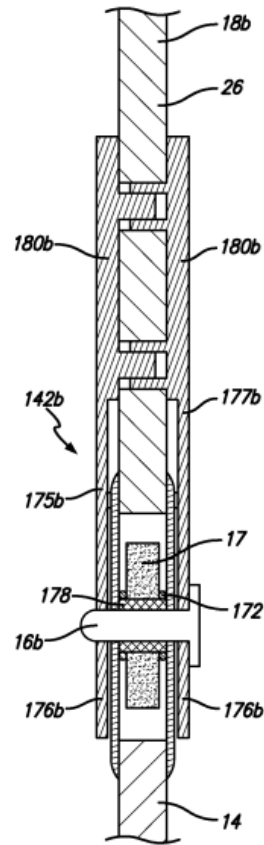


FIG. 23D

This interpretation of identical disclosure in *Savian '090* was confirmed by the EPO Examining Division in the counterpart EP application:

The novelty objection raised against claim 1 was discussed based on document D1.

The Representative of the applicant argued that the invention was constructionally different from document D1 (figure 6 of the invention compared to figures 23a-23d of document D1).

The Examiner counter-argued that the bin assembly of document D1 would fall within the scope of the claim (flush is interpreted as two elements being on the same plane, as disclosed by figures 23a-23d).

A discussion followed on the way forward but no text was agreed on.

Ex. 1014 at 21; Codd Decl. ¶134.

To the extent *Savian* is determined not to disclose an interior surface of a hinge assembly housing flush with the interior surface of the bin sidewall, *Frazier*—which is also directed overhead stowage bins in aircraft—describes that stowage bin sidewalls may include “voids” 78 (*i.e.*, notches) that receive a pivot receiver (*i.e.*, hinge assembly) to engage the outer surface of a busing, as shown in Figure 5. *Frazier*, 4:56-5:11. This arrangement advantageously allows for “a relatively long pivot protrusion 62 to be utilized within a relatively shallow pivot receiver 68 to maximize the internal width 78 (storage volume) of each bin 44 between internal surfaces 80 and 82 of the bin end-walls 184 and 186 and maintain structural integrity of the system.” *Id.*, 5:6-11. When incorporating these “voids” into *Savian*’s cut outs, the interior surface of the hinge housing is therefore flush with the sidewall because pivot receiver would be inserted entirely into the void resulting in no protrusion into the bin space. Codd Decl. ¶135.

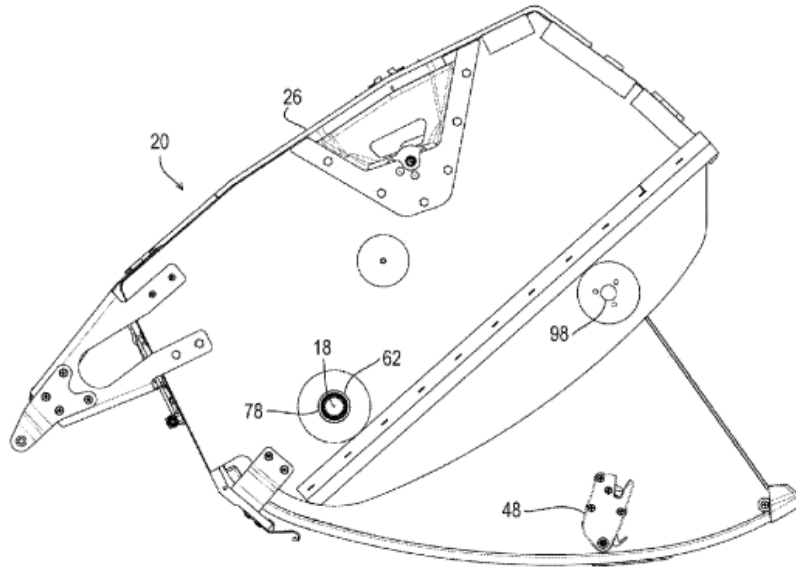


Fig. 7

The void (*i.e.*, notch) 104 in the sidewall may also be larger in some embodiments to receive pivot 108 and lift assist mechanism 106, as show in Figure 9. *Frazier*, 6:13-34. This larger void can be used to receive *Savian's* entire connecting unit 150, resulting in a hinge assembly that is flush with the sidewall of the bin. Codd Decl. ¶136.

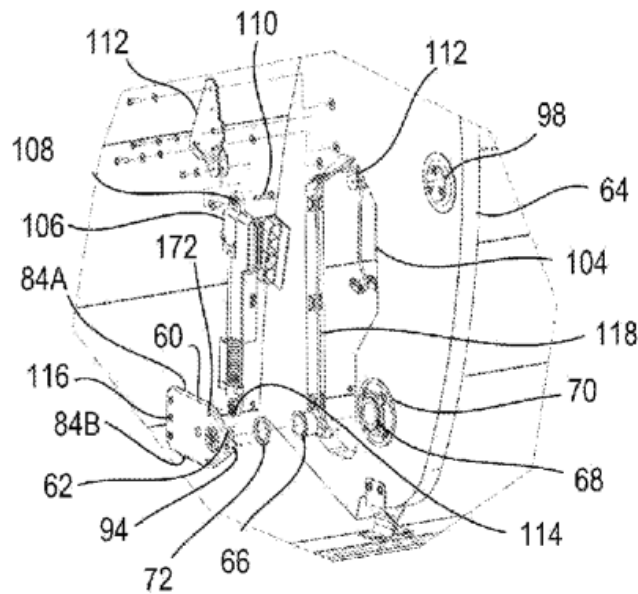


Fig. 9

“This arrangement of components again reducing space requirements in order to maximize the width 78 of the interior of the bin 44 between interior surfaces of the bin walls 74.” A POSITA would understand that the hinge assembly housing was flush with the sidewall in order to “maximize” the internal width of the bin. Codd Decl. ¶137.

f) [1F]

Savian in view of *Ehlers* discloses this limitation. Codd Decl. ¶¶138-139. *Ehlers* describes a partition, as described above in claim [1D]. *Savian* explains that its hinge assemblies are received in both sidewalls ¶[001126] (“It will be appreciated that connecting units 150 are provided on both sides of the bucket.”).

Since *Savian* describes its hinges as received within at least two bin walls (see *Savian*, ¶¶[00126]), it would have been obvious to a POSITA to add another hinge assembly to the partition wall, like the partition wall disclosed by *Ehlers*. Codd Decl. ¶138. The combination would achieve the predictable result of increased structural stability of the bin and an additional hinge for the bin door, which would provide greater attachment security for the bin door. *Id.* A POSITA would have incorporated the hinge assembly of *Savian* into the partitions of *Ehlers* without any technical difficulty and with extremely predictable results (*e.g.*, a multi-compartment hinged bin with an additional attachment point for the bin door at the partition). Codd Decl. ¶139; see *infra* §VIII(D)(11).

g) [1G]

Savian discloses this limitation. Codd Decl. ¶¶140-141. A stowage bin door 14 (see Figure 24) pivotably couples to the bin bucket assembly 12 via the at least one hinge assemble 16a, 16b, the stowage bin door 14 moveable between an open position (see Figure 25A) and a closed position (see Figure 25B).

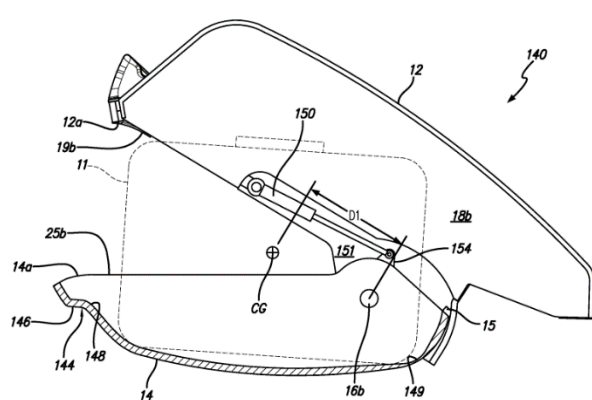


FIG. 25A

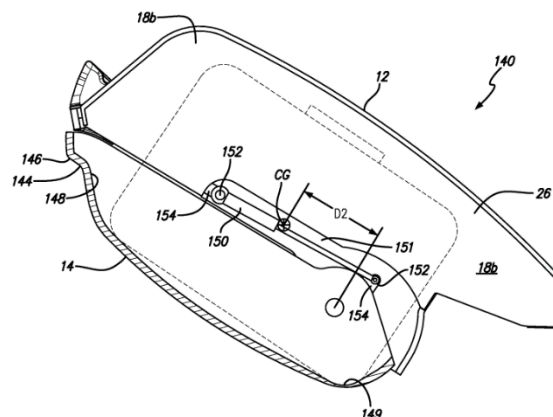


FIG. 25B

See also *id.*, ¶[00101] (“[A]ssembly 58 can be used with other types of pivot bins or an overhead stowage bin that is fixed but includes a **pivotal door**.”). Although *Savian* primarily describes pivot bins, the pivoting bin bucket 14 is a type of stowage bin door¹² that opens down instead of up. Codd Decl. ¶141.

2. Claim 2

Savian discloses this limitation. Codd Decl. ¶142. *Savian* describes upper housing 26 as the upper wall. The hinge assembly 140 is received within the cut out 151, which is adjacent to upper housing 26, as described above. *Savian*, ¶[00123] (“[T]he pivot bin assembly 140 includes a connector unit 150 that is connected at one end to the bucket 14 and at the other end to the upper housing 26

¹² The EP Examining Division agrees with the interpretation that bucket 14 can constitute the claimed bin door, while the upper housing 26 forms part of the claimed bin bucket. Ex. 1013 at 14-15, 25-26.

(preferably, one of the side walls 18)... [T]he connector unit 150 is positioned in a cut out 151 in the side 18b of the upper housing 26.”); *see supra*, §VIII(D)(1).

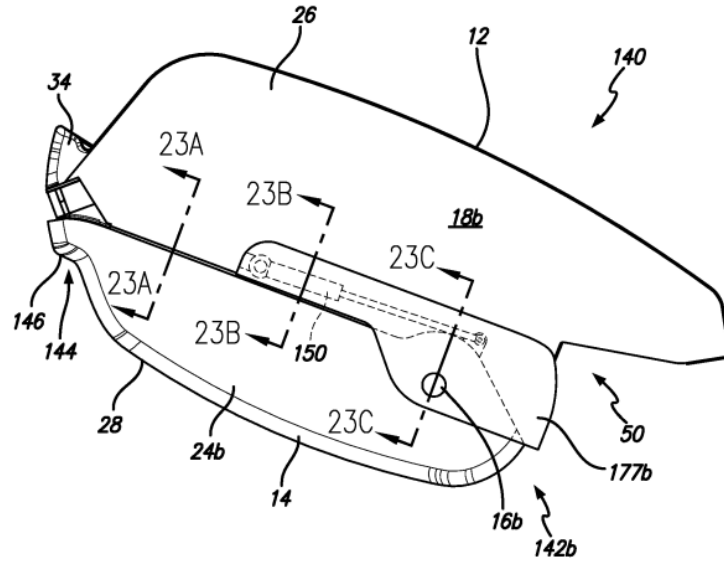


FIG. 22

3. Claim 3

Savian discloses this limitation. Codd Decl. ¶143. *Savian* discloses “first and second side panels” with each of the “two sides [having] a pivot mechanism and associated components” including latch assemblies. *Savian* ¶[0079], [0090] (“[The] first and second latch assemblies 40a and 40b [are] operatively associated with the first and second side panels 18a and 18b and the first and second sides 24a and 24b of the bucket 14.”). Figure 21 of *Savian* also shows two sidewalls 18a,

18b with hinge assemblies 142a, 142b inserted into notches (cut outs) within the sidewalls. *Savian*, ¶[00114].

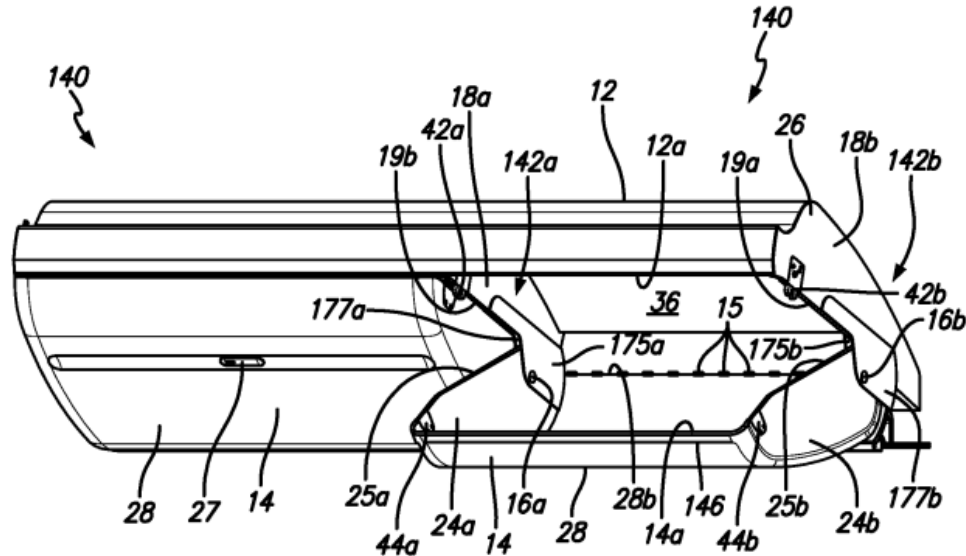


FIG. 21

4. Claim 4

Savian and *Frazier* each disclose this limitation. Codd Decl. ¶144. As described above in connection with claim 4 of Ground 2, *Savian* discloses a rotary damper with spring assistance (*e.g.*, a coil spring)¹³ (self-opening mechanism) as well as various other “assist springs” that are used to assist the user in opening and closing the bin. See *supra*, §VIII(B)(1); *Savian*, ¶¶[0054], [0059], [0060], [0062],

¹³ In its Infringement Contentions, Harper cites to a spring as the claimed self-opening mechanism. Ex. 1012 at 17.

[00128]-[00129]. The rotary damper and assist springs are “also housed within the clevis assembly” (hinge assembly). *Savian*, ¶[00115]. *Frazier* also discloses “lift assist mechanism 106” (self-opening mechanism) within the housing that is received in the void. *Frazier*, 6:12-46 & Fig. 9.

5. Claim 5

Savian discloses this limitation, as described above in connection with claim 5 of Ground 2. *See supra*, §VIII(B)(2); Codd Decl. ¶145.

6. Claim 6

Savian discloses this limitation, as described above in connection with claim 6 of Ground 2. *See supra*, §VIII(B)(3); Codd Decl. ¶146.

7. Claim 7

Savian discloses this limitation, as described above in connection with claim 7 of Ground 2. *See supra*, §VIII(B)(4); Codd Decl. ¶147.

8. Claim 8

Savian in view of *Ehlers* discloses this limitation. Codd Decl. ¶148-149. *Savian* describes recesses/notches in the form of cut outs 151 in which connector units 150 are received. *Savian*, ¶[0123]. *See supra*, §VIII(D)(1)(e). A POSITA would have been motivated to provide these notches, or recesses, in a partition wall of the bin because a partition wall is just another type of “wall” described by *Savian*. Codd Decl. ¶148. In addition, the notch/recess would act as an additional attachment point for the bin door to make operation of the door more secure. *Id.*

In addition, *Ehlers* explains that “partition 10 may also comprise **recesses**, preferably situated on the ends of the overhead bins.” *Ehlers*, ¶[0017]. The recesses in the partition “may reduce the space required by a trolley in a baggage compartment 12 or 14, and may thus further optimise the use of space in the overhead bins according to the invention.” *Id.* A POSITA therefore would have ample motivation to include a partition with a notch/recess into the bins of *Savian* so that the partition hinge assembly is received within the notch/recess. Codd Decl. ¶149. The notch/recess in the partition would serve the same function as the notch/recess in the sidewall (*e.g.*, to receive a hinge assembly without protruding into the storage capacity of the bin). *Id.*; *see* claim [1D], [1F].

9. Claim 14

Savian in view of *Ehlers* discloses this limitation. Codd Decl. ¶150. *Savian* discloses a notch or recess sized and shaped for receiving a hinge assembly. *See infra*, §VIII(D)(8). It would have been obvious to also include the same notch or recess in a partition wall of the bin, as described by *Ehlers*, positioned adjacent to the sidewall for the same reasons described above in connection with claim [1F] and 8. *Ehlers* explains that its partitions can be located in any convenient location, including adjacent to the sidewall, and include recesses to optimize storage space. *See infra*, §VIII(D)(1)(d), (f). It would have therefore been obvious to add a partition wall to the bins of *Savian* and incorporate one of *Savian*’s hinge

assemblies into that new partition wall, for the same reasons described above in connection with claim [1D] and [1F]. Codd Decl. ¶150.

10. Claim 15

Savian discloses this limitation for the same reasons described above in connection with claim 8. Codd Decl. ¶151.

11. Motivation to Combine *Savian*, *Ehlers*, and *Frazier*

The only feature taken from *Frazier* and combined with the *Savian/Ehlers* combination is the “void” in the sidewall to receive a pivot receiver, resulting in an interior surface of the hinge housing that is flush with the interior surface of the bin sidewall. The only feature taken from *Ehlers* and combined with *Savian* is the partition wall, and it would have been obvious to add partition walls into *Savian*’s bins for at least the same reasons described above with respect to *Rheaume*. See *supra* §VIII(A)(7).

A POSITA would have had ample motivation to incorporate these features into *Savian*. Codd Decl. ¶¶152-153. First, *Savian*, *Ehlers*, and *Frazier* all relate to overhead stowage bins for aircraft. A POSITA would have understood that simple design elements—like the “voids” in the sidewall for receiving a pivot receiver described by *Frazier* or the partition described by *Ehlers*—would have worked on any pivot bin, including the ones described by *Savian*. *Id.* Second, *Savian*, *Ehlers*, and *Frazier* express a desire to maximize the storage capacity of the bin. *Ehlers*,

¶[0004] (The invention seeks to ensure that “adequate stowage room is available for the baggage of the laterally seated passengers [because] conventional centre bins cannot provide flexible use for items of baggage of different sizes.”), ¶[0017] (The partition recesses “may reduce the space required by a trolley in a baggage compartment 12 or 14, and may thus further optimise the use of space in the overhead bins according to the invention.”); *Frazier*, 5:6-11 (explaining that voids serve “to maximize the internal width 78 (storage volume) of each bin 44 between internal surfaces 80 and 82 of the bin end-walls 184 and 186 and maintain structural integrity of the system.” As explained by Dr. Codd, “[a] POSITA would have immediately recognized that these benefits (both increased storage capacity and increased structural integrity) would have applied equally to *Savian*’s pivot bins.” Codd Decl. ¶153. This is particularly true in view of *Savian*’s express motivation to maximize storage capacity. *Savian*, ¶[0098] (“As will be understood by those of ordinary skill in the art, storage of a maximum amount of luggage within overhead stowage bins is of **utmost importance in passenger aircraft**.”). “A POSITA would therefore have looked for ways to increase storage capacity of *Savian*’s bins by recessing the bin pivot mechanism as far as possible so as to maximize available bin capacity” or by maximizing the configuration of the bin interiors to achieve efficient use of space. Codd Decl. ¶153. As further explained by Dr. Codd, “[i]ntroducing ‘voids’ (*e.g.*, recesses or cut-outs) into the sidewall

and a partition wall would be a simple and obvious way to achieve this result. The combination of *Frazier's* voids and *Ehlers'* partition into *Savian's* pivot bins would have been a highly intuitive variation yielding an extremely predictable result, *i.e.*, “maximiz[ed] stowage bin capacity along the length of the aircraft,” “more compartmentalized storage, increased structural integrity of the bin, and an additional attachment point for the bin door.” Codd Decl. ¶153. Finally, the addition of a partition wall and voids in the sidewalls of *Savian's* bins would have been “within the technical grasp of a POSITA as a mere workshop improvement.” *Id.* A POSITA, therefore, would have had a reasonable expectation of success in making the combination. *Id.*

E. Ground 5: Claims 9-13 are unpatentable under 35 U.S.C. §103 in view of *Savian* and *Frazier*

1. Claim 9

a) [Preamble]

Savian discloses this limitation, as described above in connection with claim 1 of Ground 4. *See supra*, §VIII(D)(1); Codd Decl. ¶154.

b) [9A]

Savian discloses this limitation, as described above in connection with claim 1 of Ground 4. *See supra*, §VIII(D)(1); Codd Decl. ¶155. Bin assembly 10 includes bucket 14 and upper housing 26 is shown in at least Figures 3 and 21, as described above. *Savian*, ¶¶[0079]-[0079], [00108]. “The bucket 14 and upper

f) [9E]

Savian discloses this limitation, as described above in connection with claim [1B] and 2 of Ground 4. *See supra*, §VIII(D)(1); Codd Decl. ¶159.

g) [9F]

Savian discloses this limitation, as described above in connection with claim [1G] of Ground 4. *See supra*, §VIII(D)(1); Codd Decl. ¶160.

h) [9G]

Savian in view of *Frazier* discloses this limitation, as described above in connection with claim [1E] of Ground 4. *See supra*, §VIII(D)(1); Codd Decl. ¶161.

i) [9H]

Savian discloses this limitation, as described above in connection with claim 5 of Ground 4. *See supra*, §VIII(D)(1); Codd Decl. ¶162.

j) [9I]

Savian discloses this limitation, as described above in connection with claims 6 and 7 of Ground 4. *See supra*, §VIII(D)(6), (7); Codd Decl. ¶163.

k) [9J]

Savian discloses this limitation, as described above in connection with claims 6 and 7 of Ground 4. *See supra*, §VIII(D)(6), (7); Codd Decl. ¶164. The pivot pin (axle shaft 22) is inserted in the pivot pin aperture (axle opening 20), which is coupled to the stowage bin door (bucket 14). *Savian*, Fig. 23D.

l) [9K]

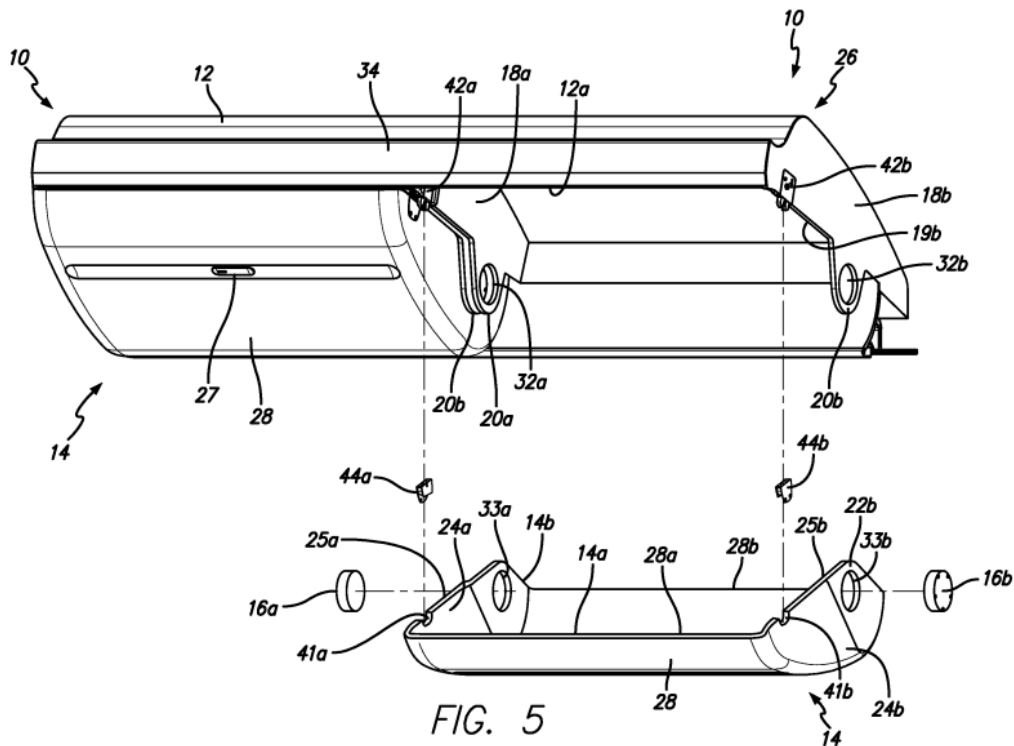
Savian discloses this limitation, as described above in connection with claims 6 and 7 of Ground 4. *See supra*, §VIII(D)(6), (7); Codd Decl. ¶165.

2. Claim 10

Savian discloses this limitation, as described above in connection with claims 6 and 7 of Ground 4. *See supra*, §VIII(D)(6), (7); Codd Decl. ¶166.

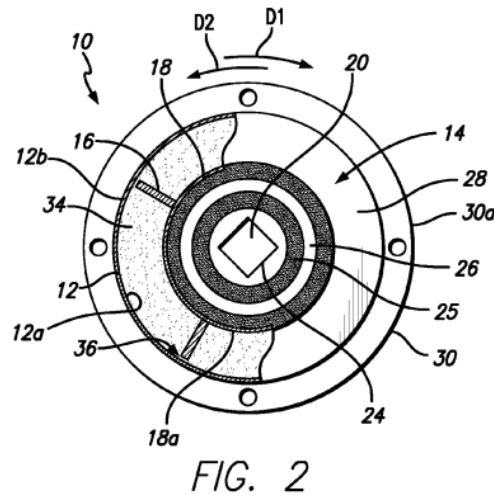
3. Claim 11

Savian discloses this limitation. Codd Decl. ¶167. “[A] portion of the first pivot mechanism 16a can be positioned in corresponding openings 32a and 33a in the first ear 20a and first side 24a, respectively, and a portion of the second pivot mechanism 16b can be positioned in corresponding openings 32b and 33b in the second ear 20b and second side 24b, respectively.” *Savian*, ¶[0087], Figs. 5-6 and 7B-7C. Openings 32a and 33a (slots) are disposed in the ears (coupling flanges) of the housing, the coupling flange fixedly coupleable to the stowage bin door (bucket 14), as shown in more detail below in Figure 5.



4. Claim 12

Savian discloses this limitation. Codd Decl. ¶168. The pivot mechanisms “include first and second rotary dampers associated therewith” that “damp the bucket when it pivots to the open position.” *Savian*, ¶[0054]. The damper is positioned in the housing (clevis assembly 142). *Savian*, ¶¶[0088]-[0089], [00115] (“[I]n an embodiment that includes the rotary damper 17 and/or an assist spring 172 (described below), these components are also housed within the clevis assembly 142b”); Fig. 23D. As shown below, the rotary damper is sized and shaped to control a rate of pivotable movement of the door.



Kearsey, ¶¶[0022]-[0028] (rotary damping mechanism 10 applied to bin doors); Figs. 2 & 3.

5. Claim 13

Savian discloses this limitation. Codd Decl. ¶169. The hinge assembly housing (clevis assembly 142) “houses” the pivot mechanisms 16a, 16b. *Savian*, ¶¶[00112]-[00115]. Clevis assembly 142 can also “house” the entirety of connecting unit 150, which includes the biasing device (spring 172), rotary crank (rotary damper 17), and the connecting pin/element (pivot axle 16 and/or bushing 178). *Id.*, ¶[00115] (rotary damper 17 and assist spring 172 housed within the clevis assembly). The interior cavity of the housing (clevis assembly) that receives these components can be seen in Figure 23D, below.

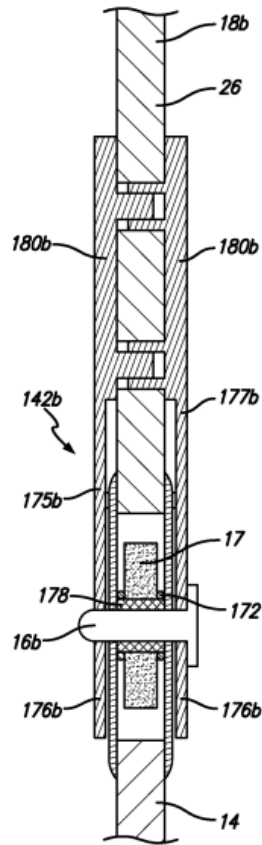


FIG. 23D

6. Motivation to Combine *Savian* and *Frazier*

The only feature taken from *Frazier* and combined with *Savian* is the “void” in the sidewall to receive a pivot receiver, resulting in an interior surface of the hinge housing that is flush with the interior surface of the bin sidewall. A POSITA would have had ample motivation to incorporate this feature from *Frazier* into *Savian*. Codd Decl. ¶170. First, both *Savian* and *Frazier* relate to remarkably similar pivot-type overhead stowage bins for aircraft. A POSITA would have understood that simple design elements—like the “voids” in the sidewall for receiving a pivot receiver described by *Frazier*—would have worked on any pivot

bin, including the ones described by *Savian*. *Id.* Second, both *Savian* and *Frazier* express a desire to maximize the storage capacity of the bin. *Frazier* explains that voids are used “to maximize the internal width 78 (storage volume) of each bin 44 between internal surfaces 80 and 82 of the bin end-walls 184 and 186 and maintain structural integrity of the system.” *Frazier*, 5:6-11. As explained by Dr. Codd, “[a] POSITA would have immediately recognized that these benefits (both increased storage capacity and increased structural integrity) would have applied equally to *Savian*’s pivot bins.” Codd Decl. ¶170. This is particularly true in view of *Savian*’s express motivation to maximize storage capacity. *Savian*, ¶[0098] (“As will be understood by those of ordinary skill in the art, storage of a maximum amount of luggage within overhead stowage bins is of **utmost importance in passenger aircraft**.”). “A POSITA would therefore have looked for ways to increase storage capacity of *Savian*’s bins by recessing the bin pivot mechanism as far as possible so as to maximize available bin capacity.” Codd Decl. ¶170. As further explained by Dr. Codd, “[i]ntroducing ‘voids’ (*e.g.*, recesses or cut-outs) into the sidewall would be a simple and obvious way to achieve this result. The combination of *Frazier*’s voids into *Savian*’s pivot bins would have been a highly intuitive variation yielding an extremely predictable result, *i.e.*, maximizing stowage bin capacity along the length of the aircraft.” *Id.* Finally, the addition of voids in the sidewalls of *Savian*’s bins would have been “within the technical grasp

of a POSITA as a mere workshop improvement.” *Id.* A POSITA, therefore, would have had a reasonable expectation of success in making the combination. *Id.*

IX. SECONDARY CONSIDERATIONS

Patent Owner has not identified any evidence of secondary considerations, and Petitioner is not aware of any such evidence. Petitioner reserves the right to present rebuttal evidence if and when the Patent Owner presents such evidence.

Indeed, as evidenced by the numerous prior art references described above, there was significant effort to design hinges for overhead storage bins that would maximize the storage capacity and usability of the bins. Codd Decl. ¶171. This strongly suggests that several others independently invented the hinge technology described and claimed in the ’244 Patent (including Bombardier, the assignee of *Rheume* and Safran/C&D Zodiac, the assignee of *Savian*) over a relatively short period of time when faced with a similar technical problem. *Id.* This observation reinforces the obviousness of the Challenged Claims.

X. DISCRETION UNDER §314(A) AND §325(D) IS NOT WARRANTED

A. Discretion Under 35 U.S.C. §314(a)

The considerations set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) favor institution in this case.

(a) *Overlap of Issues* – Patent Owner has only asserted claims 1-6, 8-9, 11, and 15 of the ’244 Patent in litigation, while all patent claims have been challenged

in this Petition. In addition, trial is likely to proceed on only a small subset of the claims challenged here (especially in view of the **26 claims** currently asserted across two patents in the underlying litigation). Moreover, to avoid any duplication of efforts between the district court and the Board, if the Board institutes trial on this Petition, Petitioner hereby stipulates to cease asserting in the co-pending litigation any prior art ground raised in this Petition as well as any ground that Petitioner reasonably could have raised. This factor therefore “weighs **strongly** in favor of not exercising discretion to deny institution.” See *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (Dec. 1, 2020) (precedential as to § II.A).

(b) *Possibility of Stay* – While a stay will be appropriate upon institution of the IPR, this factor is neutral since a motion to stay has not yet been filed. See *Intel Corp. v. VLSI Tech. LLC*, IPR2020-00158, Paper 16, at 7 (PTAB May 20, 2020); *Fintiv*, Paper 15 at 12.

(c) *Schedules* – This factor is neutral currently and may ultimately counsel in favor of institution. While the currently-scheduled trial date (in February 2023) precedes the expected FWD (no later than May 2023) by three months, many factors may result in a postponement of trial until after the FWD. Specifically, the litigation may require overseas discovery including depositions of witnesses in Germany (for Airbus) and Austria (for FACC). The backlog of cases due to

COVID-19, quarantine restrictions in some states, and travel restrictions to/from Germany and Austria (where key witnesses reside) will complicate discovery, and make trial postponement highly probable. Accordingly, Petitioner submits that these factors, rendering the trial date uncertain, favor institution. *See Sand Revolution II, LLC v. Continental Intermodal Group Trucking LLC*, IPR2019-01393, Paper 24, at 8-9 (granting rehearing of denial despite five-month gap between trial date and FWD because of continuing uncertainty).

(d) *Investment in Parallel Proceeding* – This factor strongly favors institution because the co-pending litigation is in early stages, and this Petition was filed less than two months after Petitioner served its invalidity contentions and before any claim construction briefing or any substantive orders or rulings. Moreover, the court in the parallel proceeding has ordered phased discovery, and phase one (pre-*Markman*) discovery has not yet completed, meaning very little discovery and no depositions have taken place. *See Fintiv*, Paper 11 at 9–10 (Denial is favored “if, at the time of the institution decision, the district court has issued substantive orders related to the patent at issue . . .”).

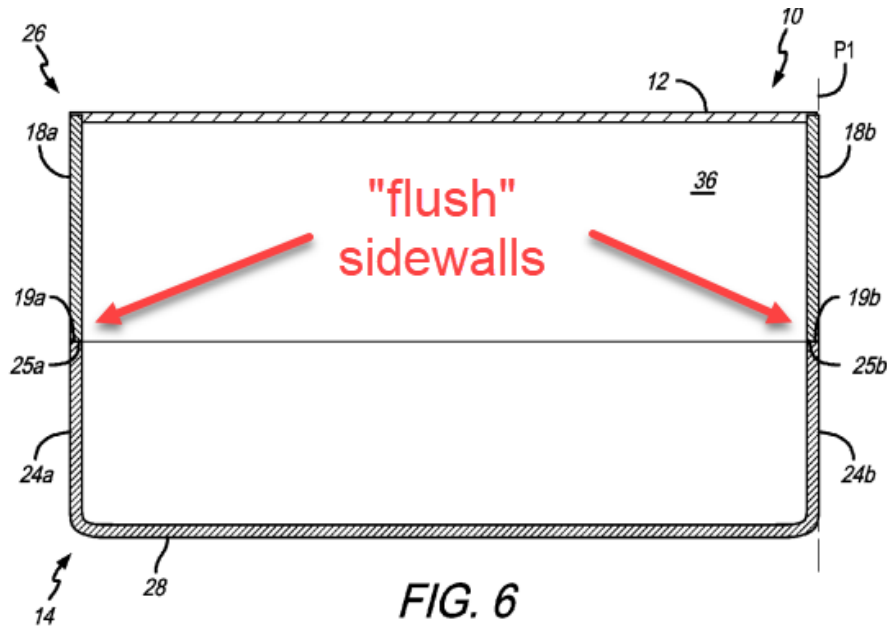
(e) *Overlap of Parties* – Petitioner is a defendant in the litigation, which is true of many Petitioners in IPR proceedings, and is consistent with one purpose of IPRs as a process available to defendants faced with infringement allegations. This factor should not be a basis for denying institution.

(f) *Other Circumstances* – This factor strongly favors institution. As described above, the combination of references presented here were not considered during prosecution and plainly disclose all elements of the Challenged Claims. Both primary references—*Rheaume* and *Savian*—are “virtually indistinguishable” from the claimed hinge designs (see Codd Decl. ¶¶52-54, 58-61), and Petition’s invalidity arguments are compelling. Thus, the merits of Petitioner’s argument support institution.

B. Discretion Under 35 U.S.C. §325(d)

The Office should also not exercise its discretion under §325(d). The prior art combinations presented in this Petition were not substantively considered by the Office previously. Neither primary reference, *Rheaume* or *Savian*, appears on the face of the Challenged Patent as a reference cited. Although other patents to *Savian* were cited, the particular *Savian* reference here—PCT Pub. No. WO 2014/127161 A1 to *Savian et al.*, filed on February 13, 2014 and published on August 21, 2014—was not previously considered. In addition, *Savian* is being combined in a §103 combination with *Ehlers* and *Frazier* (neither previously considered) particularly for *Frazier*’s teaching of “voids” (or recesses) within the bin sidewall that permit a pivot receiver to be completely inserted, creating a “flush” hinge within (or integral to) the sidewall of the stowage bin. During prosecution, the applicant distinguished the *Savian* reference cited in the file

history—U.S. Pat. Pub. No. 2016/0083090 (“Savian ’090”)—because of its alleged lack of flush hinges. *See supra* §V(B). Because neither Savian ’090 nor *Savian* was ever considered in combination with *Ehlers* or *Frazier*, the Office has not previously considered this new argument. Moreover, the Examiner clearly erred by focusing on too narrow of an interpretation of Savian ’090. Both Savian ’090 and *Savian* explain that the clevis assemblies (hinge housings) can be “integral” with the housing or bucket or “a unitary structure.” Savian ’090, ¶[0141]; *Savian*, ¶[00114]. A clevis assembly that is “integral” with the upper housing and/or bucket (or forms a “unitary structure”) means the clevis is part of the housing/bucket and therefore is flush with the interior surface of the housing/bucket (because it makes up part of the housing/bucket). Codd Decl. ¶112. In addition, both references explain that the side panels 18, ears 20, and sides 24 of the bucket “all are **positioned in a generally common plane PI.**” Savian ’090, ¶[0112]; *Savian*, ¶[0085]. A POSITA reading this disclosure would have understood that Savian ’090 describes embodiments where the hinge assembly housing is in fact flush with the interior surface of the bin sidewall. Codd Decl. ¶129. By failing to consider these portions of Savian ’090—along with Figure 6, which shows the interior surface of the bin with a flush sidewall and hinge assembly in a “common plane”—the Examiner erred. *Id.*



Savian '090, Fig. 6; *Savian*, Fig. 6 (annotated to show flush sidewalls).

In addition, the Examining Division in related EP 3655321 (EP 18749700.3)—which included virtually identical claim language¹⁴—**maintained the rejection of all claims** over Savian '090. *See generally* Ex. 1014. Even after a telephonic interview with the EP Examiner, the Examiner concluded that “the bin assembly of document D1 [Savian '090] would fall within the scope of the claim (flush is interpreted as two elements

¹⁴ The EP application claims included the phrase “substantially flush” whereas the claims of the '244 Patent were amended to remove the word “substantially.” Nevertheless, the EP Examiner found that D1 disclosed “flush” sidewalls because the two elements were “on the same plane, as disclosed by figures 23a-23d [of Savian '090]).” Ex. 1013.021.

being on the same plane, as disclosed by figures 23a-23d).” Ex. 1014.021.

In view of the foregoing, Petitioner submits that the U.S. Examiner clearly erred in allowing the claims of the ’244 Patent over the Savian ’090 reference. For these reasons, the Board should therefore not exercise its discretion to deny institution of this Petition.

XI. CONCLUSION

Petitioner has established a reasonable likelihood that the Challenged Claims are unpatentable. Petitioner therefore respectfully requests that *inter partes* review of the ’244 Patent be granted.

Respectfully submitted,

Date: November 12, 2021

/s/ *Brian E. Mack*

Brian Mack (Reg. No. 57189)

CERTIFICATION UNDER 37 C.F.R. § 42.24

Under the provisions of 37 C.F.R. § 42.24, the undersigned hereby certifies that the word count for the foregoing Petition for *inter partes* review (excluding the table of contents, table of authorities, mandatory notices, certificate of service or word count, and appendix of exhibits or claim listing) totals 13,991 words, which is less than the 14,000 words allowed under 37 C.F.R. § 42.24(a)(i).

Date: November 12, 2021

/s/ Brian E. Mack

Brian Mack (Reg. No. 57189)

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e), 42.105(a), the undersigned hereby certifies service on the Patent Owner of a copy of this Petition and its respective exhibits at the official correspondence address for the attorney of record for the '244 Patent as shown in USPTO PAIR via EXPRESS MAIL:

SEED INTELLECTUAL PROPERTY LAW GROUP LLP
C/O SYED ABEDI
701 FIFTH AVE
SUITE 5400
SEATTLE WA 98104

Date: November 12, 2021

/s/ Brian E. Mack

Brian Mack (Reg. No. 57189)