

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NHK SEATING OF AMERICA, INC.,
Petitioner,

v.

LEAR CORPORATION,
Patent Owner.

Case IPR2014-01101
Patent 6,631,955 B2

Before NEIL T. POWELL, MITCHELL G. WEATHERLY, and
CARL M. DeFRANCO, *Administrative Patent Judges*.

WEATHERLY, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a)

I. INTRODUCTION

A. BACKGROUND

NHK Seating of America, Inc. (“NHK”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–16 of U.S. Patent No. 6,631,955 B2 (Ex. 1001, “the ’955 patent”). NHK supported the Petition with a declaration from Richard W. Kent, PhD (Ex. 1007). Lear Corporation (“Lear”) timely filed a Preliminary Response. Paper 6 (“Prelim.

Resp.”). In its Preliminary Response, Lear indicated that it had filed a disclaimer pursuant to 35 U.S.C. § 253(a) and 37 C.F.R. § 1.321(a) for claims 1, 2, 4, 5, and 8–16, Prelim. Resp. 1 (citing Ex. 2001), which left only claims 3, 6, and 7 in the ’955 patent as candidates for *inter partes* review.

On January 5, 2015, based on the record before us at the time, we instituted an *inter partes* review of claims 3, 6, and 7, Paper 7 (“Institution Decision” or “Dec.”), on the following grounds:

References	Basis	Claims challenged
U.S. Patent No. 5,938,279 (“Schubring”) (Ex. 1003)	§ 102(b)	6
Schubring and European Patent Application No. 1,053,907 (“Kage”) (Ex. 1006)	§ 103	3 and 7
Japanese Unexamined Patent Application Publication No.: H11-34708 (“Nakano”) (Ex. 1004 with certified translation at Ex. 1005)	§ 102(b)	3 and 6
Nakano and Kage	§ 103	3 and 7

Dec. 20.

After we instituted this review, Lear filed a Patent Owner Response in opposition to the Petition (Paper 11, “Resp.”) that was supported by the declaration of David C. Viano, PhD (Ex. 2008). Lear also filed a second statutory disclaimer in which it disclaimed claim 6 of the ’955 patent. Resp. 1; Ex. 2010. Accordingly, the only claims remaining for our consideration at trial are claims 3 and 7 (“the challenged claims”). See 35 U.S.C. § 253 (disclaimer of claims considered effective as if part of original patent); 37 C.F.R. § 42.107 (Board will not institute trial on

disclaimed claims). NHK filed a Reply in support of the Petition (Paper 14, “Reply”) that was supported by an additional declaration from Dr. Kent (Ex. 1012).

Lear also filed a Motion to Strike and/or Exclude the Testimony of NHK’s Expert, Richard W. Kent. Paper 19 (“Motion” or “Motion to Exclude”). NHK opposed the Motion to Exclude. Paper 22 (“Mot. Opp.”). Lear filed a Reply in support of the Motion. Paper 24 (“Mot. Reply”). Lear did not move to amend any claim in the ’955 patent.

We heard oral argument on September 10, 2015. A transcript is entered as Paper 31 (“Tr.”).

For the reasons expressed below, we conclude that NHK has demonstrated, by a preponderance of evidence, that claims 3 and 7 are unpatentable. We also deny Lear’s Motion to Exclude.

B. RELATED MATTERS

NHK identified as a related proceeding the co-pending district court litigation of *Lear Corporation v. NHK Seating of America, Inc.*, No. 2:13-cv-12937-SJM-RSW (E.D. Mich.), filed July 5, 2013. Pet. 1.

C. THE ’955 PATENT

The ’955 patent relates to “a variable movement headrest arrangement for providing support to the head of an occupant of a vehicle upon vehicle impact.” Ex. 1001, 1:13–15. The challenged claims are directed, however, to a “method of providing head support with a movable headrest of a vehicle seat.” *Id.* at 9:36–37, 49, 53, 10:8. None of the challenged claims is independent. Rather, the challenged claims depend ultimately from claim 1, and they recite:

1. A method of providing head support with a movable headrest of a vehicle seat to a vehicle occupant head during impact of the vehicle, the method comprising:

moving the headrest toward the head of the occupant in a first manner upon impact of the vehicle; and

moving the headrest toward the head of the occupant in a second manner different from the first manner wherein the first manner in which the headrest is moved is along a first trajectory of the headrest and the second manner in which the headrest is moved is along a second trajectory of the headrest different from the first trajectory.

2. The method of claim 1 wherein the first manner in which the headrest is moved has a first forward velocity and the second manner in which the headrest is moved has a second forward velocity different from the first velocity.

3. The method of claim 2 wherein the first forward velocity is greater than the second forward velocity.

* * *

7. The method of claim 1 further comprising reducing a forward velocity of the headrest prior to contact of the headrest with the head of the occupant.

Ex. 1001, 9:36–54, 10:8–10.

The Specification describes an embodiment of the claimed seat by referring to Figures 2 and 3. We reproduce below versions of Figures 2 and 3 that are colorized to aid understanding of the seat with a headrest arrangement used to perform the methods recited in the claims.

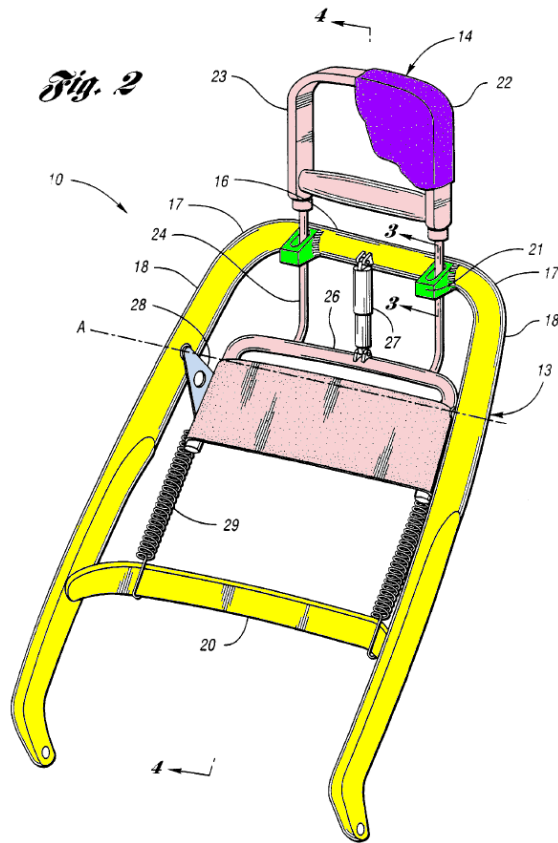


Figure 2 of the '955 patent is a perspective schematic view of headrest arrangement 14 incorporated into seatback frame 13.

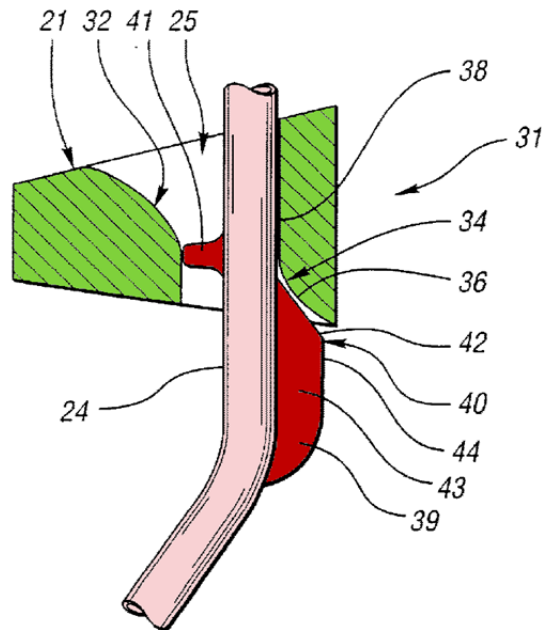


Fig. 3

Figure 3 of the '955 patent is a detailed cross section view of follower 39 and guide (unnumbered but green) with guideway 25.

Upon a rearward load being applied to impact target 26 (pink), connectors 28 (blue) pivot about axis A and impact target 26 (pink) moves rearward and upward. *Id.* at 6:46–50. Movement of impact target 26 (pink) causes headrest extensions 24 (pink) to slide upward through guideway 25 of guide members 21 (green). *Id.* at 6:50–55. Follower 39 (red) on headrest extension 24 (pink) slides along the interior walls of guideway 25 as headrest extension 24 (pink) carrying headrest 22 (purple) moves upward, which results in headrest 22 (purple) moving with first and second velocities along first and second trajectories. *Id.* at 6:42–7:10.

II. CLAIM INTERPRETATION

“A claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.” 37 C.F.R. § 42.100(b); *see also In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1278 (Fed. Cir. 2015) (“We conclude that Congress implicitly approved the broadest reasonable interpretation standard in enacting the AIA.”). When applying that standard, we interpret the claim language as it would be understood by one of ordinary skill in the art in light of the specification. *In re Suitco Surface, Inc.*, 603 F.3d 1255, 1260 (Fed. Cir. 2010). Thus, we give claim terms their ordinary and customary meaning. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007) (“The ordinary and customary meaning ‘is the meaning that the term would have to a person of ordinary skill in the art in question.’”). Only terms which are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

All claims require that the headrest move “along a first trajectory” and “along a second trajectory . . . different from the first trajectory.” Ex. 1001, 9:45–48. For purposes of instituting this trial, we found “any discontinuity in the direction of the path traveled by a headrest to be an example of a transition from a first trajectory to second trajectory. Other types of changes in trajectories may also constitute a transition from a first to a second trajectory.” Dec. 7. We also interpreted “forward velocity” as recited in claims 3 and 7 to refer to “the speed of the headrest in a direction towards the occupant or front of the vehicle.” *Id.* at 7–8. After our Institution Decision, neither party identifies any dispute regarding the meaning of any

term in the claims. *See* Resp. 10–13 (discussing preliminary interpretation of claim terms set for in our Institution Decision); *see also* Reply (not discussing interpretation of any claim term). Accordingly, for this Final Written Decision, we apply our prior preliminary interpretations of “first trajectory,” “second trajectory,” and “forward velocity.”

III. THE CHALLENGES TO PATENTABILITY

We instituted a review of the patentability of claims 3 and 7 of the ’955 patent on the grounds that one or both claims may be anticipated or obvious in light of various prior art references including: Nakano, Kage, and Schubring. Dec. 13–20.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987). The Supreme Court in *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398 (2007) reaffirmed the framework for determining obviousness as set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966). As observed by the Court in *KSR*, the factual inquiries set forth in *Graham* that are applied for establishing a background for determining obviousness under 35 U.S.C. § 103(a) are summarized as follows:

1. Determining the scope and content of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

KSR, 550 U.S. at 406. With these standards in mind, we address each challenge below.

A. THE PARTIES' POST-INSTITUTION ARGUMENTS

In our Institution Decision, we concluded that the argument and evidence adduced by NHK demonstrated a reasonable likelihood that: (1) the combination of Schubring and Kage rendered claims 3 and 7 unpatentable as obvious, Dec. 13–15; (2) Nakano anticipated claim 3, *id.* at 16–19; and (3) the combination of Nakano and Kage rendered claims 3 and 7 unpatentable as obvious, *id.* at 19. We must now determine whether NHK has established by a preponderance of the evidence that these combinations of prior art render the specified claims unpatentable.

35 U.S.C. § 316(e). In this connection, we previously instructed Lear that “any arguments for patentability not raised in the [Patent Owner Response] will be deemed waived.” Paper 8, 2–3; *see also* 37 C.F.R. § 42.23(a) (“Any material fact not specifically denied may be considered admitted.”).

Additionally, the Board’s Trial Practice Guide states that the Patent Owner Response “should identify all the involved claims that are believed to be patentable and state the basis for that belief.” Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012).

Accordingly, with regard to all limitations of the claims other than those that Lear identifies in the Response as being novel over the prior art, the record now contains unrebutted arguments and evidence presented by NHK regarding the merits of the teachings of Schubring, Kage, and Nakano. We agree with and adopt NHK’s factual contentions set forth in the Petition and the Reply with regard to these limitations. We find that the preponderance of the evidence of record developed at trial supports our

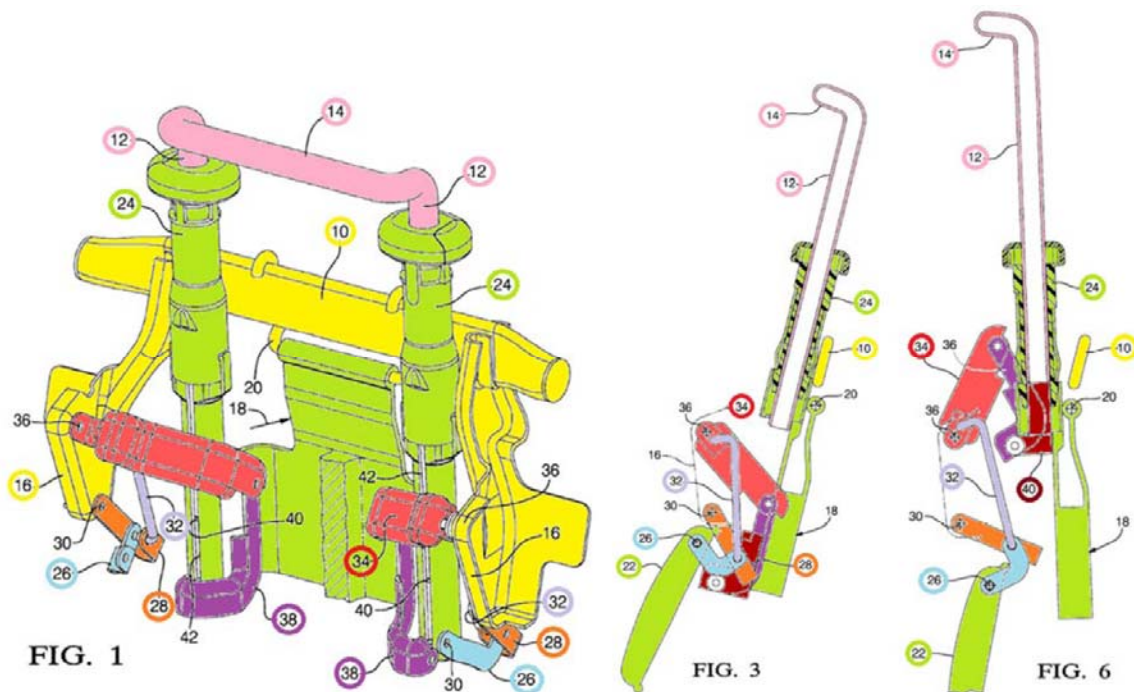
conclusion that NHK has set forth how the alleged prior art teaches or suggests the uncontested limitations of the reviewed claims. Accordingly, we do not address these uncontested limitations in our discussion below.

B. OBVIOUSNESS OF CLAIMS 3 AND 7 OVER SCHUBRING AND KAGE

We preliminarily determined that NHK had established a reasonable likelihood of showing that the combination of Schubring and Kage rendered claims 3 and 7 unpatentable as obvious. Dec. 13–15. For the reasons expressed below, NHK persuades us by a preponderance of evidence that the combination of teachings in Schubring and Kage render claims 3 and 7 unpatentable as obvious.

1. Overview of Schubring

The operation of Schubring is illustrated in the colored versions of Schubring's Figures 1, 3, and 6 (reproduced below).



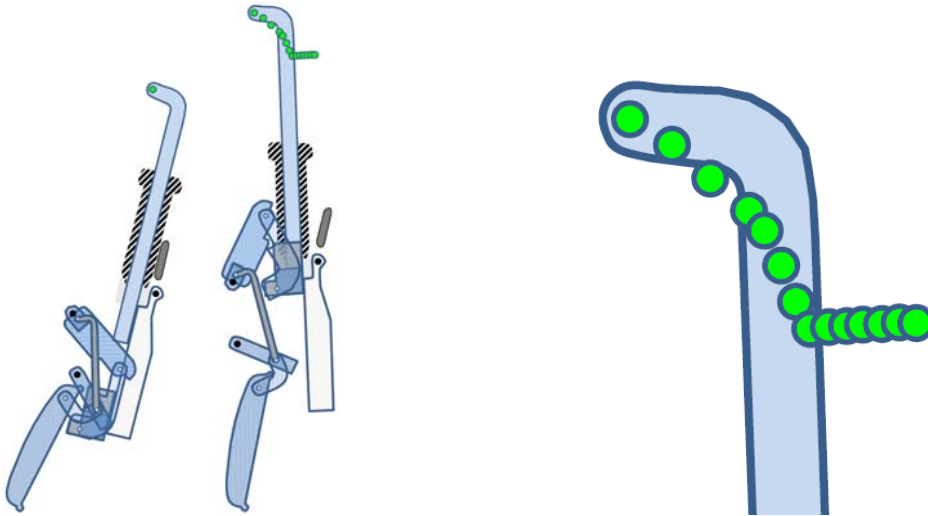
Schubring's Fig. 1 is a perspective view of a linkage for moving a headrest structure to its fully raised

Schubring's Figs. 3 and 6 are side views of the linkage with the headrest raised midway in Fig. 3 and

position in a vehicle collision. all the way up in Fig. 6.

Schubring's headrest frame (pink) includes cushion support 14 and support posts 12, which move within guide tubes 24 (green) to permit the height of the headrest to be adjusted. Ex. 1003, 3:38–51. During a rear end vehicle collision, the occupant forces impact plate 22 (green) rearward to pivot head restraint mount 18 (green) forward around pivot axis 20. *Id.* at 3:23–34. Impact plate 22 also interacts with Schubring's actuation linkage to push slider block 40 (dark red) up within guide tubes 24 and eventually contact the bottom of posts 12 and push the headrest upward. *Id.* at 2:67–3:3, 3:53–4:44, 4:59–62. This linkage includes bell cranks 26 (light blue), primary link 28 (orange), transfer link 32 (light purple), secondary link 34 (light red), and pulling links 38 (darker purple). *Id.* When the headrest frame is in the starting position shown in Figure 3 (i.e., raised midway), slider blocks 40 do not initially engage the bottom of posts 12. *Id.* Eventually, however, slider blocks 40 contact posts 12 and move the headrest to its fully raised position shown in Figure 6. *Id.* at 5:1–16. “In effect, there is complete independence between the rocking forward motion and upward raising motion of the head restraint, although both are activated by the same primary input of the swinging impact plate 22 [green].” *Id.* at 5:16–20.

Dr. Kent, NHK's expert, models the movement of cushion support 14 as shown in the graphics below from a starting position raised midway before impact (below left) to its finishing position (below center) after impact and an enlarged portion of the center graphic illustrating the path through which cushion support moved (below right). See Ex. 1007 ¶ 36 and Attachment B.



Dr. Kent graphically illustrates Schubring's headrest movement from starting position above left to ending position above right.

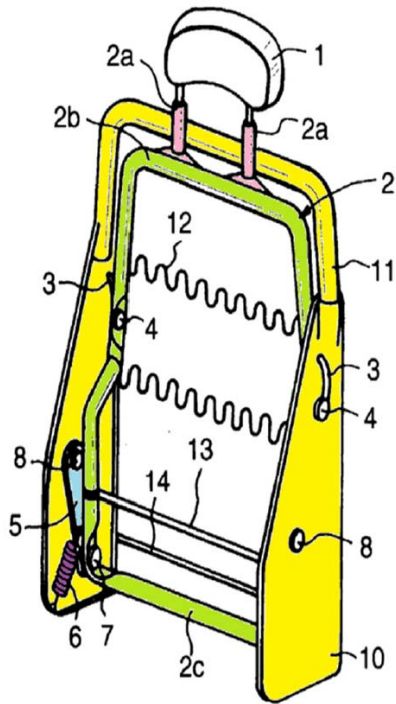
An enlarged portion of the middle graphic illustrates the total path traveled by headrest cushion 14 as it moves from its starting to its ending positions.

Dr. Viano generates his own model of the movement of Schubring's headrest from the same starting position, raised midway, that closely corresponds to to Dr. Kent's illustration. Dr. Viano also testifies that: "The motion of [Schubring's] assembly for any intermediate initial positioning of the head restraint includes two parts: pure rigid body rotation of the assembly about the main axis hanger 20 followed by combined rotation and upward rising." Ex. 2008 ¶ 111.

Lear does not dispute that Schubring describes a headrest that moves in two different manners and along two different trajectories. Tr. 66:21-22. Rather, the dispute focuses on whether the combination of teachings from Schubring and Kage render methods of claims 3 and 7 obvious.

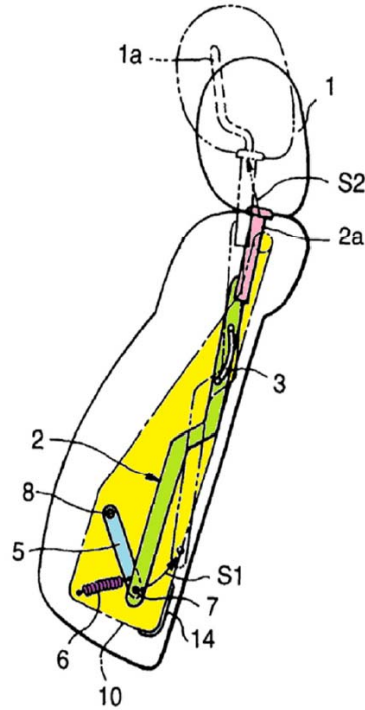
2. Overview of Kage

The operation of Kage is illustrated in the colorized versions of Kage's Figures 1 and 2 (reproduced below).



Kage Fig. 1

Kage's colorized Figure 1 depicts movable frame 2 with headrest supports 2a mounted within fixed frame 10.



Kage Fig. 2

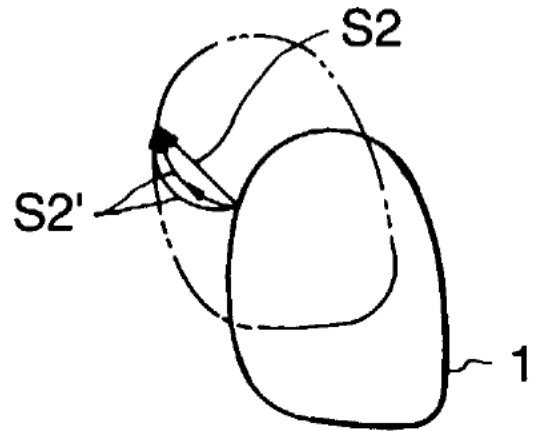
Kage's colorized Figure 2 depicts how movable frame 2 and headrest supports 2a move within fixed frame 10 upon impact.

Kage relates to a seat that “can receive a load from [a] passenger’s waist and the headrest can be quickly and stably moved forward.” Ex. 1006, 2:42–44. Kage’s seat includes stationary seat frame 10, 11, 14 (yellow) and movable seat frame 2 (green) from which headrest support guides 2a (pink) extend to support headrest 1. *Id.* at 7:21–36, 7:55–8:1. Guide shafts 4 extend from moveable frame 2 (green) and slidably engage guide holes 3. *Id.* at 7:42–50. Link members 5 (blue) are pivotally connected to movable frame 2 (green) at pivot axes 7 and to fixed frame 10 (yellow) at link shafts 8. *Id.* at 8:8–15.

When rearward force is applied to seat frame 2c (green), link members 5 (blue) pivot upward and frame 2c (green) is guided along

moving path S1. *Id.* at 8:43–48. Guide shafts 4 slide within guide holes 3 as movable frame 2 moves upward. *Id.* As a result, the headrest 1 moves along linear moving path S2, which is defined by a combination of moving path S1 and the shape of guide holes 3. *Id.* at 8:49–54.

Kage illustrates its linear path S2 in the pertinent portion of its Figure 3, which is reproduced at right, as the path through which a point on the front-facing surface of headrest 1 moves as link members 5 move along moving path S1. *Id.* at 8:39–42, 8:49–54. The pertinent portion of Kage’s Figure 3 also illustrates an alternative moving path S2’ for the same point on headrest 1, which Kage describes as follows:



[I]f the guide holes 3 are formed to have a linear shape or a shape which is convex toward the front side of the vehicle body, the headrest 1 is displaced forward with respect to the vehicle body at an early timing of its movement, and is then displaced upward, as indicated by a path S2’ in Fig. 3. *In such case, the distance between the passenger’s head and headrest can be shortened quickly at an early timing of movement of the headrest 1, and when the passenger’s head contacts the headrest in practice, the relative speed between the passenger’s head and headrest can be minimized (since the moving direction of the headrest has changed in the upward direction).*

Id. at 8:58–9:12 (emphasis added). The emphasized portion of the quotation establishes that Kage’s headrest moves differently at the beginning and end of its path S2’. Namely, Kage’s headrest moves quickly toward the occupant’s head at the beginning of path S2’ and more slowly toward the occupant’s head at the end of path S2’.

3. *NHK's Argument and Evidence*

NHK argues: “For the express reasons that Kage teaches, it would have been obvious to combine the Kage teachings to Schubring to slow down the final movement of the headrest (e.g., with a spring, linkage, or bumper), to avoid injuring the passenger’s head.” Pet. 28–29 (citing Ex. 1007 ¶¶ 60, 66, 97). In a portion of the cited testimony, Dr. Kent opines that:

it would have been obvious to combine the Kage teachings to Schubring to slow down the final movement of the headrest (e.g., with a mechanical linkage that modulated the relationship between the head restraint motion and the input displacement caused by the occupant loading the seat, such as that described in [Schubring] or with a bumper or spring element introduced between the head restraint mounting posts and the seat frame, which imparted a decelerating force to the head restraint as it neared its actuated position) to avoid injuring the passenger’s head.

Ex. 1007 ¶ 66. Dr. Kent cites no independent evidentiary support for this testimony. NHK provides no details about its proposed modification of Schubring beyond those expressed in the quoted portion above.

4. *Lear's Arguments*

Lear argues that the combination of Schubring and Kage proposed by NHK fails to render claims 3 and 7 obvious for three reasons. Resp. 13–29. First, Lear contends that because neither Schubring nor Kage describes a “spring, linkage, or bumper,” NHK’s proposed combination of prior art fails to support a conclusion of obviousness. *Id.* at 21–23. Second, Lear contends that a skilled artisan would not have been motivated to alter Schubring as NHK proposes. *Id.* at 24–27. Third, Lear contends that modifying Schubring as NHK proposes would impermissibly render

Schubring's headrest inoperable for its intended purpose. *Id.* at 27–29. We address each argument below.

a) NHK's Proposed Addition of a Spring, Linkage, or Bumper to Schubring

Lear contends that neither Schubring nor Kage describes “‘a spring, linkage, or bumper’ used to slow down the forward velocity of the headrest during a second trajectory.” Resp. 23. Lear argues that it is improper to find obviousness when the asserted combination of prior art fails to disclose all elements of the claimed combination. *Id.* (first citing *Motorola, Inc. v. Interdigital Tech. Corp.*, 121 F.3d 1461, 1473 (Fed. Cir. 1997) (holding that an obviousness finding fails “because no combination of prior art references for obviousness describes the four particular functions recited in the claim.”); and then citing *Upjohn Co. v. MOVA Pharm. Corp.*, 225 F.3d 1306, 1311 (Fed. Cir. 2000) (holding that substantial evidence in the record is required to support an expert’s opinion regarding the obviousness of modifying a reference and “[a]t this critical point in the determination of obviousness, there must be factual support for an expert’s conclusory opinion”)).

Rather than identifying where Schubring or Kage teaches using a spring, linkage, or bumper to slow the movement of the headrest during the second trajectory, NHK responds that any method of reducing the forward velocity of the headrest prior to contacting the head meets the requirements of claims 3 and 7. Reply 10. NHK also contends that even Dr. Viano agrees that “springs are within an engineer’s general repertoire of tools.” *Id.* (citing Ex. 1017, 23:2–5). NHK also contends that a skilled artisan is “not an automaton” and may employ well-known devices such as springs to slow the

headrest as suggested by Kage. *Id.* (citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007)).

Lear's argument is not persuasive. Lear's reliance on *Motorola* and *Upjohn* is inapposite because Lear's claims are directed to methods of providing head support with a movable headrest rather than a headrest apparatus. NHK's challenge is based on the modification of Schubring's method of moving a headrest to include Kage's suggestion to slow the forward velocity of the headrest before the headrest contacts the occupant's head. The use of any well-known hardware to achieve the combination of these steps may render the claimed method obvious. *See In re Hoyer*, 181 F.2d 228, 231 (C.C.P.A. 1950) ("where rejected claims are directed to a method or process performed by the operation of the elements of an apparatus, the question for determination is not whether the apparatus and the method or process defined by the limitations of the rejected claims differ from the apparatus and process disclosed by the reference patent, but whether the respective processes in and of themselves are patentably different"); *In re Dean*, 160 F.2d 562, 564 (C.C.P.A. 1947) (differences in apparatus cannot lend patentability to method claims). "If all the features of a rejected method claim are old, and if there is no invention in combining them in a single method or process, it is no defense that a number of references were used in rejecting the claims." *Hoyer*, 181 F.2d at 231 (citing *In re Streckert*, 167 F.2d 1010, 1011 (C.C.P.A. 1948)).

Therefore, the combination of Schubring and Kage need only to have rendered it obvious to support the head of an occupant using a headrest that initially moves quickly toward the occupant's head along a first trajectory and then slows as it moves along a second trajectory before contacting the

occupant's head. Kage indisputably describes the step of slowing the forward velocity of the headrest before supporting the occupant's head. Schubring indisputably describes the step of moving the headrest along a first trajectory and then a second trajectory. NHK persuades us that a spring was a well-known apparatus at the time of the invention that a skilled artisan could have used to slow the movement of Schubring's headrest before it contacts the occupant's head.

b) Motivation to Combine Teachings from Kage and Schubring

Lear argues that a skilled artisan would not have wanted to add "a spring, linkage, or bumper" to Schubring's system because it would slow down the actuation of Schubring's system. Resp. 24–27. Lear contends that because slowing the actuation of Schubring's system would change the principle of operation of Schubring's system, activating the headrest as quickly as possible, a skilled artisan would not have been motivated to slow the forward velocity of Schubring's headrest. *Id.* at 25–26.

NHK responds that Lear fails to establish why the use of a spring to slow Schubring's headrest just before impact would necessarily prevent Schubring's headrest from achieving its intended supportive position early enough to provide effective support. Reply 12–13 (citing Ex. 1012 ¶ 16). We also note that Kage slows its headrest before the headrest contacts the occupant's head but successfully moves the headrest into position early enough to support the occupant's head. NHK persuades us that a skilled artisan would have considered hardware such as a spring, a modification to Schubring's linkage, or a bumper were well-known mechanisms for slowing a headrest as it approaches contact with the occupant's head in accordance with Kage's express suggestion to do so.

c) Whether Modifying Schubring Impermissibly Renders It Inoperable for Its Intended Purpose

Lear argues that slowing Schubring's headrest before it contacts the occupant's head would prevent Schubring's mechanism from achieving its intended purpose, moving the headrest to a "consistent final raised position." Resp. 27–29. We accept Lear's contention that Schubring's "intended purpose" is to move its headrest to a consistent final raised position. Nevertheless, Lear's argument is unpersuasive. NHK points out persuasively that using a spring in Lear's system between the head restraint mounting posts and the seat frame would not prevent Lear's headrest from achieving its final height, i.e., the "consistent final raised position." Reply 12–13 (citing Ex. 1012 ¶ 16; Ex. 1017, 22:2–17).

5. *Conclusion*

For the reasons described above, NHK has persuaded us by a preponderance of evidence that a skilled artisan would have combined the teachings of Schubring and Kage as suggested by NHK. As stated in part III.A above, we also are persuaded that NHK has established by a preponderance of evidence that the combination of Schubring and Kage describes all elements of claims 3 and 7. Accordingly, we conclude that NHK has established by a preponderance of evidence that the combination of Schubring and Kage renders claims 3 and 7 unpatentable under 35 U.S.C. § 103.

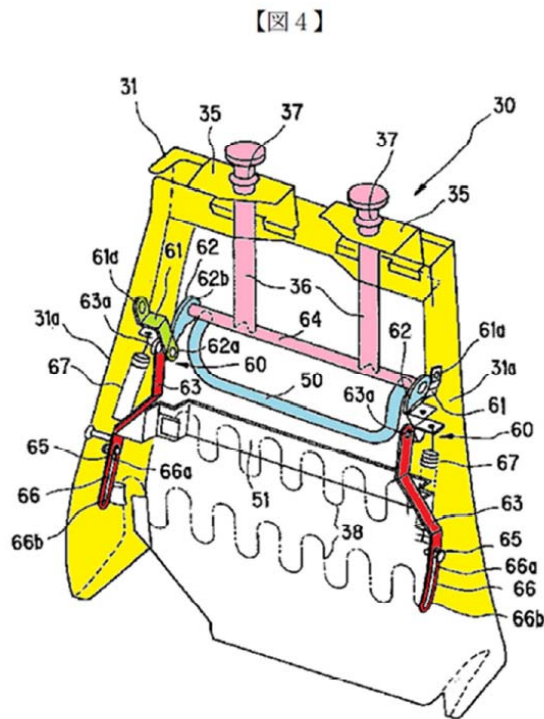
C. ANTICIPATION OF CLAIM 3 BY NAKANO

We preliminarily determined that NHK had established a reasonable likelihood of showing that Nakano anticipates claim 3. Dec. 16–19. For the

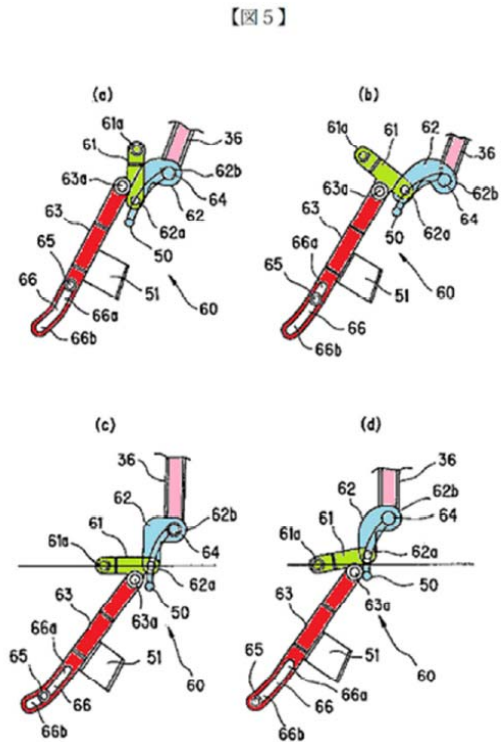
reasons stated below, we conclude that NHK has failed to establish by a preponderance of evidence that Nakano anticipates claim 3.

1. Overview of Nakano

The operation of Nakano is illustrated in the colorized versions of Nakano's Figure 4 (reproduced below left) and Figures 5(a)–(d) (reproduced below right).



Nakano's Fig. 4 is a perspective view of a linkage for actuating a head restraint during a collision.



Nakano's Figs. 5(a)–(d) are schematic illustrations of Nakano's linkage in the design position (Fig. 5(a)), the actuated position (Fig. 5 (d)), and intermediate positions (Figs. 5(b) and 5(c)).

Nakano's linkage includes frame 31 (yellow), first link arm 61 (green), second link arm 62 (blue), third link arm 63 (red), load receiving member 50 (blue), and head rest holder brackets 36 (pink). Ex. 1005 ¶¶ 16–20. During impact, load bearing members 50, 51 receive load and transfer that load through link arms 61, 62, 63 to raise head rest 40 (*id.*, Fig. 6) to an

actuated position. *Id.* ¶ 19. Under normal conditions, coil spring 67 biases first link arm 61 (green) clockwise as seen in Figures 5(a)–(d) so that the linkage is held in the design position. *Id.* ¶¶ 23, 25, Figs. 4, 5(a). During impact, forces extend coil spring 67 and move the linkage to an actuated position in which first link arm 61 and second link arm 62 rotate counterclockwise and third link arm 63 rotates clockwise and slides upward. *Id.* ¶¶ 25–29. The sliding of third link arm 63 is constrained and guided by pin 65, which projects from side portion 31a of frame 31 and engages guide hole 66 in third link arm 63. *Id.* ¶ 22. The head rest holder brackets 36 (pink) are supported within and slide through brackets 35 (yellow), which are attached to frame 31 (yellow), as the linkage moves the headrest from the design to the actuated position. *Id.* ¶ 17, Figs. 2, 6.

Nakano describes the way in which its linkage moves the headrest as follows:

[A]s shown in Fig. 5 (b), . . . the coordinated operation of the first, second and third link arms 61, 62, 63 raises the holder bracket 36 fastened to the joint bar 64 between the second link arms 62, 62, *lifting up the head rest 40.*

* * *

Subsequently, as shown in Fig. 5 (d), the third link arm 63, 63 is moved by the lower load-bearing member 51, and in particular, guide pin 65 slides through the arc-shaped portion 66b of guide hole 66, causing the third link arm 63, 63 to rise along this arc-shaped trajectory, accompanying which the first link arm 61, 61 rotates counterclockwise in the drawing and the second link arm 62, 62 operates in coordination, *lifting the holder bracket 36 fastened to the second link arm 62, 62 and the head rest 40 obliquely forward*, carrying it to a position where it is close to the passenger's head, thereby ensuring that support is provided to the head.

Id. ¶¶ 26, 29 (emphasis added).

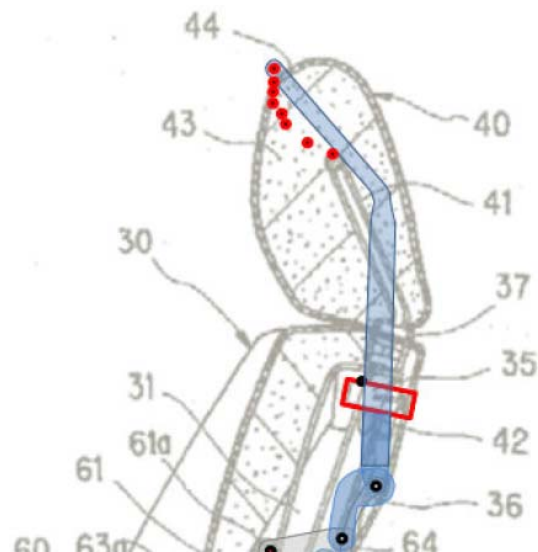
2. *NHK's Reliance on Kinematic Models of Nakano's Headrest*

NHK proffers Dr. Kent's testimony based upon his kinematic modeling of the movement of Nakano's headrest as evidence of how Nakano's headrest moves. Pet. 38–41 (citing Ex. 1007 ¶ 81). Dr. Kent based his kinematic model of Nakano's headrest upon Nakano's illustrations. Ex. 1007 ¶ 81. NHK also relies upon Dr. Viano's kinematic model of the movement of Nakano's headrest and his "admission" that Nakano "necessarily" reduces the forward velocity of the headrest. Reply 20 (citing Ex. 1017, 21:17–22:1; Ex. 1020). Dr. Viano's kinematic model of Nakano's headrest is also derived from an analysis of Nakano's illustrations. Ex. 2008 ¶ 134.

Drs. Kent and Viano use kinematic modeling techniques to reach similar conclusions about the path through which Nakano's headrest moves. The figures reproduced below illustrate those conclusions with the output of Dr. Viano's model shown on the left and the output of Dr. Kent's second model shown on the right.



The figure above is a portion of an illustration of the path (shown as a



The figure above is a portion of an illustration of the path (shown as a

red line) through which a point on Nakano's headrest moves as determined by Dr. Viano.

series of red dots) through which a point on Nakano's headrest moves as determined by Dr. Kent.

Dr. Kent's second model differs significantly from his first model of Nakano because, when generating his first model, he did not consider bracket 35 as constraining the movement of post 36. Ex. 1012 ¶ 18. The variability in the results among all three kinematic models undermines the reliability of the technique the experts used to determine the precise path through which Nakano's headrest moves. Dr. Kent testifies that others, including Dr. Viano, often use graphical representations of linkages as input for creating reliable kinematic models. *Id.* ¶¶ 9–13.

Lear argues, however, that we cannot rely on kinematic models because the accuracy of those models depend upon using drawings that are to scale, which NHK fails to establish. Resp. 9 (citing *Nystrom v. TREX Co.*, 424 F.3d 1136, 1148–49 (Fed. Cir. 2005) (holding that because “patent drawings do not define the precise proportions of the elements” the district court erred in determining invalidity based on “models made from [such] drawings.”); *In re Olson*, 212 F.2d 590, 592 (C.C.P.A. 1954) (“drawings which accompany an application for a patent are merely illustrative of the principles embodied in the alleged invention”)). Under *Nystrom*, we may not rely on evidence based solely upon patent illustrations to establish precise proportions of a disclosed structure. The proponent of the modeling must establish that the reference containing the illustrations provides at least some indication that the illustrations are to scale. *Nystrom*, 424 F.3d at 1149.

Just as in *Nystrom*, NHK attempts to transform static images that are not established as being drawn to scale into a model that reveals undisclosed details about the illustrated structure. NHK goes even farther than the

Nystrom defendant, however, because NHK uses Nakano's static images to generate a dynamic model of Nakano's headrest to derive the path through which the headrest moves. Accordingly, under *Nystrom*, NHK fails to persuade us that we can rely upon any of the modeling performed by either expert as persuasive evidence of the path through which Nakano's headrest would move.

3. *Nakano's Express Description of the Forward Velocity of Its Headrest*

Lear persuasively argues that Nakano's express description of the movement of its headrest is insufficient to establish whether the first forward velocity of the headrest is greater than the second forward velocity.

Resp. 37–39. As explained above, Nakano describes first “lifting up the head rest,” Ex. 1005 ¶ 26, and subsequently lifting the headrest “‘obliquely forward’ . . . to a position where it is close to the passenger's head,” *id.* ¶ 29. Nakano's description thus implies, if anything, that the forward velocity of the headrest increases rather than decreases as Nakano's headrest moves along its path.

4. *Conclusion*

Based on our review of the evidence of record, NHK fails to persuade us that Nakano describes a headrest that moves with a first forward velocity along a first trajectory that is greater than a second forward velocity along a second trajectory as required in claim 3. Accordingly, we are not persuaded that Nakano anticipates claim 3.

D. OBVIOUSNESS OF CLAIMS 3 AND 7 OVER NAKANO AND KAGE

We preliminarily determined that NHK had established a reasonable likelihood of showing that the combination of Nakano and Kage rendered

claims 3 and 7 unpatentable as obvious. Dec. 19. For the reasons expressed below, NHK persuades us by a preponderance of evidence that the combination of teachings in Nakano and Kage render claims 3 and 7 unpatentable as obvious.

1. NHK's Argument and Evidence

NHK contends that the combination of Nakano and Kage renders claims 3 and 7 obvious and sets forth the evidence from Nakano and Kage to support its contentions in detailed claim charts. Pet. 46–48. NHK relies upon Nakano as teaching all requirements recited in claim 1 and Kage as teaching all requirements further recited in claims 3 and 7. *Id.* Kage expressly describes one embodiment of its system in which the headrest initially moves quickly toward the passenger's head and then slows down as it approaches contact with the passenger's head. Ex. 1006, 9:5–9:12. NHK argues: “For the express reasons that Kage teaches, it would have been obvious to combine the Kage teachings to Nakano to slow down the final movement of the headrest to avoid injuring the passenger's head.” Pet. 46 (citing Ex. 1007 ¶ 97). In the cited testimony, Dr. Kent opines that:

it would have been obvious to combine the Kage teachings to Nakano to slow down the final movement of [Nakano's] headrest (e.g., with a mechanical linkage that modulated the relationship between the head restraint motion and the input displacement caused by the occupant loading the seat, such as that described in Kage or with a bumper or spring element introduced between the head restraint mounting posts and the seat frame, which imparted a decelerating force to the head restraint as it neared its actuated position) to avoid injuring the passenger's head.

Ex. 1007 ¶ 97. Dr. Kent cites no independent evidentiary support for this testimony.

2. *Lear's Arguments*

Lear argues that the combination of Nakano and Kage fails to describe elements of claims 3 and 7 for two reasons. First, Lear argues that Nakano fails to describe movement of the headrest along different first and second trajectories and that NHK does not explain how Kage meets this requirement. Resp. 40. Second, Lear argues that a skilled artisan would not have found it obvious to modify Nakano based on Kage in the manner described by NHK. *Id.* at 41–44. We address each argument below.

a) Nakano's Alleged Description of Two Different Trajectories

Claims 3 and 7 recite, via independent claim 1, that “the first manner in which the headrest is moved is along a first trajectory of the headrest and the second manner in which the headrest is moved is along a second trajectory of the headrest different from the first trajectory.” Ex. 1001, 9:43–48. Thus, claims 3 and 7 require that the headrest move along two different trajectories. To meet this requirement, NHK relies upon the shape of the path of Nakano's headrest as generated by any one of the three kinematic models developed by Drs. Kent or Viano. Pet. 40 (citing Ex. 1007 ¶¶ 81–82); Reply 17–19 (citing Ex. 1012 ¶¶ 36, 37, 50; Ex. 1018). As explained above, we do not rely upon any kinematic modeling of Nakano's headrest as revealing how its headrest moves. Accordingly, we are not persuaded by NHK's argument that such kinematic modeling demonstrates that Nakano's headrest moves along two different trajectories.

NHK also relies upon the inability to “differentiate” the mathematical relationship that Dr. Viano derived which allegedly defines the path of Nakano's headrest. Reply 16–17. However, NHK also criticizes the validity of Dr. Viano's mathematical model as being “fundamentally flawed”

because, among other reasons, Dr. Viano excluded links from Nakano's linkage for moving the headrest before deriving the equations that purportedly define the movement of the headrest. Reply 2–3; Ex. 1012 ¶¶ 19–24. Given the disputed accuracy of Dr. Viano's mathematical model, we are not persuaded that it is a reliable indicator of the manner in which Nakano's headrest moves. Accordingly, we are not persuaded by NHK's argument that Dr. Viano's mathematical modeling demonstrates that Nakano's headrest moves along two different trajectories.

NHK also relies upon Nakano's express description of how its headrest moves as meeting the requirement that the headrest move along two different trajectories. Reply 13–14. NHK argues that “Nakano teaches first ‘lifting up the head rest 40’ (Ex. 1005 at [0026]) and then ‘[s]ubsequently’ moving it ‘obliquely forward.’ Ex. 1005 at [0029].” Reply 13. NHK contends that a skilled artisan would “recognize that this motion contains two independent trajectories” and relies upon Dr. Kent's testimony as support for its contention. *Id.* at 14 (citing Ex. 1012 ¶¶ 38–40). The cited testimony from Dr. Kent does not support NHK's contention. Rather, it addresses Dr. Kent's analysis of whether guide pin 65 and guide hole 66 influence the motion of Nakano's headrest. Ex. 1012 ¶¶ 38–40. Nevertheless, we are persuaded that Nakano's express description of the movement of its headrest as being first lifted and then lifted obliquely forward constitutes movement of the headrest along two different trajectories.

Lear's arguments otherwise rely upon alleged deficiencies in Dr. Kent's modeling of Nakano's headrest, Resp. 32–35, or rely upon Dr. Viano's mathematical model, *id.* at 35–37. As explained above, we

determine that none of the models of the movement of Nakano's headrest is sufficiently reliable to establish the path through which Nakano's headrest moves. Lear never explains why Nakano's express description of moving the headrest "upward" and then "obliquely forward" does not constitute a type of movement along two different trajectories. For these reasons, we are persuaded that Nakano describes movement along two different trajectories as required in claims 3 and 7.

b) Alleged Flaws in NHK's Combination of Nakano and Kage

In arguing that a skilled artisan would not combine teachings from Nakano and Kage, Lear repeats its arguments against the combination of Schubring and Kage. For the reasons expressed in part III.B.4 above, we are not persuaded by Lear's arguments.

3. Conclusion

For the reasons described above, NHK persuades us by a preponderance of evidence that Nakano describes a headrest that moves in a first manner and a second manner. As stated in part III.A above, we also are persuaded that NHK has established by a preponderance of evidence that the combination of Nakano and Kage describes all other elements of claims 3 and 7. Accordingly, we conclude that NHK has established by a preponderance of evidence that the combination of Nakano and Kage renders claims 3 and 7 unpatentable under 35 U.S.C. § 103.

IV. LEAR'S MOTION TO EXCLUDE

We have reviewed Lear's Motion to Exclude, NHK's Opposition to the Motion, and Lear's Reply in support of the Motion. Based on our review, we deny the Motion in all respects for one or both of the following reasons: (1) the Motion is moot because it seeks to exclude evidence not

considered or relied upon in rendering this Decision or (2) the Motion addresses issues more appropriate to determining the weight ascribed to the evidence rather than the admissibility of evidence. In rendering this Decision, we determine and ascribe the appropriate weight to all proffered evidence and, when appropriate, comment upon the weight ascribed.

V. CONCLUSION

For the reasons expressed above, we determine that NHK has shown by a preponderance of the evidence that:

(1) the combination of Schubring and Kage renders claims 3 and 7 of the '955 patent unpatentable as obvious and

(2) the combination of Nakano and Kage renders claims 3 and 7 of the '955 patent unpatentable as obvious.

We also determine that NHK has failed to establish by a preponderance of evidence that Nakano anticipates claim 3.

VI. ORDER

For the reasons given, it is:

ORDERED that claims 3 and 7 of the '955 patent are held *unpatentable*;

FURTHER ORDERED that Lear's Motion to Exclude is *denied*; and

FURTHER ORDERED that because this is a Final Written Decision, parties to the proceeding seeking judicial review of the Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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