Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte BRIAN M. CURTIS

Appeal No. 2002-1911
Application No. 09/598,087

ON BRIEF

Before ABRAMS, NASE, and BAHR, Administrative Patent Judges.
NASE, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 to 19, which are all of the claims pending in this application.[1]

We AFFIRM-IN-PART.

[1] Claim 1 was amended subsequent to the final rejection.

BACKGROUND

The appellant's invention relates to an apparatus for measuring the weight of a seat occupant (specification, p. 1). A copy of the claims under appeal is set forth in the appendix to the appellant's brief.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Kiuchi	4,181,012	Jan. 1, 1980
Asche	5,481,078	Jan. 2, 1996
Verma et al. (Verma)	5,942,695	Aug. 24, 1999
Mehney et al. (Mehney)	6,039,344	Mar. 21, 2000

Claims 1, 3 and 11 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Verma.

Claims 1 to 3, 7 to 15 and 17 to 19 stand rejected under 35 U.S.C. § 103 as being unpatentable over Mehney in view of Kiuchi.

Claims 4 to 6 and 16 stand rejected under 35 U.S.C. § 103 as being unpatentable over Mehney in view of Kiuchi and Asche.

Claims 4 to 6 stand rejected under 35 U.S.C. § 103 as being unpatentable over Verma in view of Asche.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellant regarding the above-noted rejections, we make reference to the final rejection (Paper No. 8, mailed August 29, 2001) and the answer (Paper No. 17, mailed April 8, 2002) for the examiner's complete reasoning in support of the rejections, and to the brief (Paper No. 14, filed February 12, 2002) and reply brief (Paper No. 18, filed June 14, 2002) for the appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by the appellant and the examiner. As a consequence of our review, we make the determinations which follow.

The anticipation rejection

We sustain the rejection of claims 1, 3 and 11 under 35 U.S.C. § 102(e).

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. Inc. v. Union Oil Co., 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir.), cert. denied, 484 U.S. 827 (1987). The inquiry as to whether a reference anticipates a claim must focus on what subject matter is encompassed by the claim and what subject matter is described by the reference. As set forth by the court in Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 772, 218 USPQ 781, 789 (Fed. Cir. 1983), cert. denied, 465 U.S. 1026 (1984), it is only necessary for the claims to "'read on' something disclosed in the reference, i.e., all limitations of the claim are found in the reference, or 'fully met' by it." While all elements of the claimed invention must appear in a single reference, additional references may be used to interpret the anticipating reference and to shed light on its meaning, particularly to those skilled in the art at the relevant time. See Studiengesellschaft Kohle v. Dart Indus., Inc., 726 F.2d 724, 726-727, 220 USPQ 841, 842-843 (Fed. Cir. 1984).

Verma teaches in the abstract that (1) an existing vehicle seat design is equipped with strain gauges welded to structural seat members to sense occupant seated weight; (2) a microprocessor compensates for preload on the sensors and multiplies each signal by an empirically determined gain, and then combines the gauge outputs; (3) the combined output is low pass filtered to avoid motion induced errors; and

(4) the measured occupant seated weight is used by decision logic to decide whether to allow passenger airbag deployment.

Figures 1 and 2 of Verma show a vehicle seat 10 equipped with strain gauges according to a first embodiment of the invention. The vehicle seat 10 has a seat cushion 12 which includes a support 14 such as a seat pan or suspension at its bottom. The support 14 is attached to brackets 16, one on each side, by bolts 17. Each bracket has a front riser portion 18 and a rear riser portion 20 which engage the support 14, and an intermediate beam 22 interconnecting the riser portions. A seat back 24 is pivotally supported on the rear riser portions 20. The brackets 16, in turn are mounted by bolts 25 on tracks 26 which allows fore and aft adjustment of the seat. Support feet 28 are connected to the four corners of the tracks 26 and are bolted to the vehicle floor, not shown.[2] Strain gauges 30 are rigidly attached (as by welding) to the front and rear riser portions of the brackets 16 such that they respond to the full occupant seated weight whether transmitted only through the cushion 12 or partially through the seat back 24. In this manner the entire weight is measured and an accurate assessment of the occupant size can be determined by suitably combining the strain gauge outputs.

[2] One skilled in the art at the relevant time would know that each of Verma's tracks 26 would include a lower rail fixed to two of the support feet 28, an upper rail fixed to a bracket 16 and a plurality of bearing members which support the upper rail for longitudinal movement relative to the lower rail. See, for example, Mehney at column 2, lines 50-55.

A second embodiment of Verma's invention is shown in Figure 3 wherein the same seat structure is used and the same reference numerals apply. In this case the strain gauges 30 are applied to the four feet 28, thereby sensing all the seated weight of the occupant. This configuration, like that of Figures 1 and 2 requires four strain gauges for full implementation.

A third embodiment of Verma's invention, as shown in Figure 4, requires only two strain gauges. The seat structure is slightly altered by incorporating a thin spacer 32 at each bolt 25 to slightly separate the brackets 16 from the tracks 26. The spacers support the brackets at their extreme ends so that the vertical force imposed by the cushion support 14 on the riser portions 18 and 20 inboard of the spacers applies a moment to the beams 22 which connect the riser portions. Since the beams are thus allowed to flex slightly due to their separation from the track, strain gauges 30 on the two beams 22 will respond to the total force applied to the brackets.

Figure 5 of Verma is an isometric view, partly exploded, of a strain gauge for use in carrying out the invention. The strain gauge includes a steel substrate 38 supporting a housing 40 having a circuit connector 42 at one end. The housing contains a hybrid circuit including a Wheatstone bridge having two resistors 44 in one pair of opposite arms and two thick film piezoresistors 46 in another pair of opposite arms. Ground and

power lines are supplied to the bridge by the connector 42. Bridge output lines are coupled to a signal conditioning and amplification integrated circuit 48 which has its output connected to the connector. A cover 50 fits on the housing to protect the circuit. The steel substrate extends beyond the housing sufficiently to permit welding to a structural member of the seat. The gauge responds to a bending moment and is mounted to a seat member subject to bending due to occupant weight.

Verma's strain gauges 30 are inputs to a circuit, as shown in Figure 7, comprising a microprocessor 52 which processes the strain signals to determine whether the deployment of the passenger airbag should be inhibited, and the microprocessor output is connected to an airbag control module 54 which decides whether to deploy the driver airbag 56 and/or the passenger airbag 58.

Claim 1

Claim 1 reads as follows:

> A system for measuring a weight on a vehicle seat comprising:
> a seat element mounted to a vehicle structure;
> a seat support member for supporting a seat bottom; and
> a plurality of weight sensor assemblies mounted between said seat element and said seat support member, each of said weight sensor assemblies having a bottom surface and a top surface with a full bridge strain gage mounted on one of said top or bottom surfaces.

Claim 1 is readable on Verma as follows: A system for measuring a weight on a vehicle seat comprising (Verma discloses apparatus for determining the seated weight of a seat occupant using strain gauges on the seat structure): a seat element mounted to a vehicle structure (Verma's support feet 28 are connected to the four corners of the tracks 26 and are bolted to the vehicle floor); a seat support member for supporting a seat bottom (Verma's support 14 at the bottom of seat cushion 12); and a plurality of weight sensor assemblies mounted between said seat element and said seat support member (Verma's brackets 16 are mounted between support feet 28 and support 14), each of said weight sensor assemblies having a bottom surface and a top surface (Verma's brackets 16 have a bottom surface and a top surface) with a full bridge strain gage mounted on one of said top or bottom surfaces (Verma's full bridge strain gages 30 are mounted to the top surface of brackets 16 as shown in Figure 4).

The appellants argue (brief, p. 6) that claim 1 is not anticipated by Verma since Verma does not disclose a plurality of weight sensor assemblies mounted between a seat element and a seat support member since Verma discloses separate brackets to which the sensor assemblies are mounted. We do not agree. Verma's full bridge strain gages 30 are mounted to the top surface of brackets 16 much like the appellant's full bridge strain gages 50 are mounted to the top surface of sensor assemblies 36 as shown in Figure 4. Accordingly, it is our determination that the claimed plurality of

weight sensor assemblies are readable on Verma's brackets 16 with full bridge strain gages 30 mounted on top of the intermediate beam 22 sections of the brackets as shown in Figure 4.

For the reasons set forth above, the decision of the examiner to reject claim 1 under 35 U.S.C. § 102(e) is affirmed.

Claim 3

The appellant has grouped claims 1 and 3 as standing or falling together.[3] Thereby, in accordance with 37 CFR § 1.192(c)(7), claim 3 falls with claim 1. Thus, it follows that the decision of the examiner to reject claim 3 under 35 U.S.C. § 102(e) is also affirmed.

Claim 11

Claim 11 reads as follows:

> A system for measuring the weight of an occupant seated on a vehicle seat comprising:
> a seat riser mounted to a vehicle structure;
> a seat frame member for supporting a seat bottom;
> a plurality of weight sensors each having a first end mounted to said seat riser and a second end mounted to said seat frame with a central bendable portion extending between said first and second ends;

[3] See page 5 of the appellant's brief.

> a strain gage assembly mounted only on either a top or bottom surface of each of said weight sensors for generating a weight signal in response to measuring deflection of said central bendable portion;
>
> a central processor for determining seat occupant weight based on said weight signals; and
>
> an airbag control module in communication with said processor wherein deployment force of an airbag is controlled by said control module based on seat occupant weight.

Claim 11 is readable on Verma as follows: A system for measuring the weight of an occupant seated on a vehicle seat (Verma discloses apparatus for determining the seated weight of a seat occupant using strain gauges on the seat structure) comprising: a seat riser mounted to a vehicle structure (Verma's support feet 28 and tracks 26 are bolted to the vehicle floor); a seat frame member for supporting a seat bottom (Verma's support 14 at the bottom of seat cushion 12); a plurality of weight sensors each having a first end mounted to said seat riser and a second end mounted to said seat frame with a central bendable portion extending between said first and second ends (Verma's brackets 16 have a first end mounted to the track 26 and a second end mounted to the support 14 with intermediate beam 22 (i.e., a central bendable portion) extending between the first and second ends); a strain gage assembly mounted only on either a top or bottom surface of each of said weight sensors for generating a weight signal in response to measuring deflection of said central bendable portion (Verma's full bridge strain gages 30 are mounted to the top surfaces of the intermediate beams 22 of brackets 16 as shown in Figure 4 for generating a weight signal in response to

measuring deflection of the intermediate beams 22); a central processor for determining seat occupant weight based on said weight signals (Verma's microprocessor 52); and an airbag control module in communication with said processor wherein deployment force of an airbag is controlled by said control module based on seat occupant weight (Verma's airbag control module 54).

The appellants argue (brief, pp. 6-7; reply brief, pp. 2-3) that claim 11 is not anticipated by Verma since Verma does not disclose each weight sensor having a first end mounted to a seat riser and a second end mounted to a seat frame with a central bendable portion extending between the first and second ends and wherein a strain gage assembly is mounted only on either a top or bottom surface of each of the weight sensors. We do not agree. As pointed out in our discussion above relative to claim 1, Verma's strain gages 30 are mounted to the top surface of brackets 16 much like the appellant's strain gages 50 are mounted to the top surface of sensor assemblies 36 as shown in Figure 4. Accordingly, it is our determination that the claimed plurality of weight sensors with a strain gage assembly mounted on each weight sensor are readable on Verma's brackets 16 with full bridge strain gages 30 mounted on top of the intermediate beam 22 sections of the brackets as shown in Figure 4.

For the reasons set forth above, the decision of the examiner to reject claim 11 under 35 U.S.C. § 102(e) is affirmed.

The obviousness rejection of claims 1 to 3, 7 to 15 and 17 to 19

We will not sustain the rejection of claims 1 to 3, 7 to 15 and 17 to 19 under 35 U.S.C. § 103 as being unpatentable over Mehney in view of Kiuchi.

In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. See In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). A prima facie case of obviousness is established by presenting evidence that would have led one of ordinary skill in the art to combine the relevant teachings of the references to arrive at the claimed invention. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988) and In re Lintner, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972). When it is necessary to select elements of various teachings in order to form the claimed invention, we ascertain whether there is any suggestion or motivation in the prior art to make the selection made by the appellants. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. The extent to which such suggestion must be explicit in, or may be fairly inferred from, the references, is decided

on the facts of each case, in light of the prior art and its relationship to the appellants' invention. As in all determinations under 35 U.S.C. § 103, the decision maker must bring judgment to bear. It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the appellant's structure as a template and selecting elements from references to fill the gaps. The references themselves must provide some teaching whereby the appellant's combination would have been obvious. In re Gorman, 933 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991) (citations omitted). That is, something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. See In re Beattie, 974 F.2d 1309, 1312, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992); Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co., 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984).

In this rejection (final rejection, pp. 4-5), the examiner (1) set forth the pertinent teachings of Mehney and Kiuchi; (2) ascertained[4] that Mehney fails to disclose "a full bridge strain gage assembly only on a top or bottom and a groove formed opposite the sensor;" and (3) concluded that it would have been obvious to one of ordinary skill in

[4] After the scope and content of the prior art are determined, the differences between the prior art and the claims at issue are to be ascertained. Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

the art at the time the invention was made to modify Mehney based on the teachings of Kiuchi to arrive at the claimed invention.

The appellant in the brief (pp. 7-8) and reply brief (pp. 3-4) set forth his rationale as to why one skilled in the art would not have modified Mehney based on the teachings of Kiuchi to arrive at the claimed invention. We agree.

Mehney specifically teaches providing first and second strain gauges 81 and 82 mounted on an upper surface 90 of the flexible portion 68 of mounting member 20 and third and fourth strain gauges 83 and 84 mounted on a lower surface 92 of the flexible portion 68 at locations directly beneath the first and second strain gauges 81 and 82. Thus, when a vehicle occupant sits on seat 12, the flexible portions 68 of the mounting members 20 bend into S-shaped configurations causing the first and fourth strain gauges 81 and 84 to be placed in compression and the second and third strain gauges 82 and 83 to be simultaneously placed in tension.

We have reviewed the teachings of Kiuchi directed to the use of strain gages on a cantilever beam and find no suggestion or motivation therein for an artisan to have modified Mehney to arrive at the claimed invention. The mere fact that the prior art could be modified in the manner suggested by the examiner does not make such a

modification obvious unless the prior art suggested the desirability of the modification. See In re Gordon, 773 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). In this case, the applied prior art does not suggest the desirability of the modification.

For the reasons set forth above, the decision of the examiner to reject claims 1 to 3, 7 to 15 and 17 to 19 under 35 U.S.C. § 103 as being unpatentable over Mehney in view of Kiuchi is reversed.

The obviousness rejection of claims 4 to 6 and 16

We have also reviewed the reference to Asche additionally applied in the rejection of claims 4 to 6 and 16 but find nothing therein which makes up for the deficiencies of Mehney and Kiuchi discussed above regarding claims 1 to 3, 7 to 15 and 17 to 19. Accordingly, we cannot sustain the examiner's rejection of appealed claims 4 to 6 and 16 under 35 U.S.C. § 103 as being unpatentable over Mehney in view of Kiuchi and Asche.

The obviousness rejection of claims 4 to 6

We will not sustain the rejection of claims 4 to 6 under 35 U.S.C. § 103 as being unpatentable over Verma in view of Asche.

In this rejection (final rejection, p. 6), the examiner (1) set forth the pertinent teachings of Verma and Asche; (2) ascertained that Verma fails to disclose "the seat support member being a seat track member fixed to the riser;" and (3) concluded that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Verma based on the teachings of Asche to arrive at the claimed invention.

The appellant in the brief (pp. 8-10) and reply brief (pp. 5 and 7) set forth his rationale as to why one skilled in the art would not have modified Verma based on the teachings of Asche to arrive at the claimed invention. We agree. We have reviewed the teachings of Asche directed to the use of a presence sensor on an operator's seat on equipment such as a skid steer loader and find no suggestion or motivation therein for an artisan to have modified Verma to arrive at the claimed invention.

For the reasons set forth above, the decision of the examiner to reject claims 4 to 6 under 35 U.S.C. § 103 as being unpatentable over Verma in view of Asche is reversed.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1, 3 and 11 under 35 U.S.C. § 102(e) is affirmed and the decision of the examiner to reject claims 1 to 19 under 35 U.S.C. § 103 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

NEAL E. ABRAMS Administrative Patent Judge	)
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