The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DARIUS J. PREISLER

Appeal No. 2006-2962
Application No. 10/252,177
Technology Center 1700

Before MURRIEL E. CRAWFORD, ANITA PELLMAN GROSS, and JENNIFER D. BAHR, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

Darius J. Preisler appeals from the Final Rejection (mailed November 3, 2005) of claims 25-29, all of the claims pending in the application. This Board has jurisdiction to hear the appeal pursuant to 35 U.S.C. § 134(a).

This is the second appeal to the Board involving the instant application. The first appeal (Appeal No. 2005-0361) resulted in a decision (mailed December 23, 2004) reversing the Examiner's prior art rejections on the basis that Appellant's claims were indefinite. Appellant has since resolved the indefiniteness issues, and the Examiner has reinstated the prior art rejections. These rejections are now before us for review.

THE INVENTION

The invention relates to a method of making a unitary composite cover for a motor vehicle inflatable air bag system. Representative claim 25 reads as follows:

> 25. A method of making a unitary composite air bag cover for an inflatable air bag system, the method comprising the steps of:
>
> injecting a molten first plastic into a mold cavity of a first mold having a shape defining a body of the air bag cover, wherein the shape defining a body includes a shape defining a front panel;
>
> permitting the first plastic to cool to a temperature beneath the softening point of the first plastic such that a body having a front panel is formed;
>
> removing the body from the first mold;
>
> inserting the body into a mold cavity of a second mold having a shape defining the entire air bag cover including an outer layer having a contact surface;
>
> injecting a molten second plastic into the mold cavity of the second mold at a temperature and pressure sufficient to melt the front panel of the body and to form the outer layer;
>
> permitting the second plastic to cool to a temperature beneath the softening point of the first and second plastics such that the unitary composite air bag cover is formed, wherein a molecular concentration gradient is formed at an interface between the first and second plastics to bond the first and second plastics by diffusion at the entire contact surface of the outer layer to prevent separation of the outer layer from the front panel during use of the air bag cover; and
>
> removing the completed air bag cover from the second mold.

THE PRIOR ART

The references relied on by the Examiner as evidence of obviousness are:

Cherry	5,536,037	Jul. 16, 1996
Kikuchi	5,762,362	Jun. 09, 1998

THE REJECTIONS

Claim 25 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Cherry in view of Kikuchi.

Claims 25-29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kikuchi in view of Cherry.

Attention is directed to the main and Reply Briefs (filed December 2, 2005 and May 8, 2006) and Answer (mailed March 8, 2006) for the respective positions of Appellant and the Examiner regarding the merits of these rejections.

DISCUSSION

I. The 35 U.S.C. § 103(a) rejection of claim 25 as being unpatentable over Cherry in view of Kikuchi

Cherry discloses a motor vehicle occupant restraint apparatus 10 comprising, *inter alia*, an inflatable air bag 18, a reaction canister 16 and an inflator 22. The reaction canister houses the air bag and inflator and includes an opening 19 through which the air bag deploys when inflated.

The occupant restraint apparatus 10 also comprises a cover in the form of a deployment door 12. In a closed position, the door 12 overlies the opening in the canister and lies flush with the instrument panel 14 of the motor vehicle (see Figures 1 and 2).

The door 12 is a unitary structure composed of a relatively soft one-piece thermoplastic layer 60 and a relatively hard one-piece thermoplastic layer 70 (see col. 2, ll. 3-9). These layers provide the door with a desirable combination of external softness and internal rigidity (see col. 5, ll. 27-33). As described in more detail by Cherry,

> The deployment door 12 comprises a relatively soft first material layer 60 and a relatively hard second material layer 70. The hard second material layer 70 includes a body portion 78 (FIG. 3) which lies between the air bag 18 and the soft first material layer 60. The hard second material layer 70 includes an inner surface 74 which is presented toward and engaged by the air bag 18 when the air bag 18 is inflated. The hard second material layer 70 further includes a major side surface 77 which lies opposite the inner surface 74. The major side surface 77 is adhered to a major side surface 67 of the soft first material layer 60. The soft first material layer 60 includes (i) a first outer surface portion 62 which lies opposite the major side surface 67 and is exposed to the vehicle passenger compartment and (ii) a second outer surface portion 69 which is also exposed to the vehicle passenger compartment.
>
> The hard second material layer 70 has a [U-shaped] projecting portion 76 which extends away from the body portion 78 toward the vehicle passenger compartment. The projecting portion 76 has an outer surface 72 which is shown in the drawings as exposed to the vehicle passenger compartment. The outer surface 72 of the projecting portion 76 lies flush with the first and

> second outer surface portions 62, 69 of the soft first material layer 60, as shown in FIG. 3. The outer surface 72 could, if desired, be painted or coated or otherwise decorated, as desired, to be compatible with the vehicle interior. An interconnecting surface 75 of the hard second material layer 70 extends between the outer surface 72 and the inner surface 74 [col. 3, ll. 1-28].

The interconnecting surface 75 on the hard material layer 70 adjoins an interconnecting surface 65 on an interconnecting portion 66 of the soft material layer 60 (see Figure 3). The surfaces 65 and 75 are in continuous adhered contact along the U-shape of the projecting portion 76 (see col. 4, ll. 11-19). This joint defines a U-shaped break line 30 bounding a flap portion 86 in the door 12.

With regard to the method of making the door, Cherry teaches that:

> To manufacture the deployment door 12, the hard second material layer 70 is molded first. The layer 70 is molded by directing thermoplastic material which is used to make the hard second material layer 70 into a first injection mold. The resulting single piece of molded thermoplastic material forms the hard second material layer 70. The hard second material layer 70 is then placed into a second injection mold with the inner surface 74 engaging one surface portion of the second injection mold and the outer surface 72 engaging another surface portion of the second injection mold. The thermoplastic material which is used to make the soft first material layer 60 is then directed at a relatively high temperature into the second injection mold. This thermoplastic material flows around the single piece of molded thermoplastic material which forms the hard second material layer 70.

> As the thermoplastic material which is used to make the soft first material layer 60 flows around the hard second material layer 70, some of the thermoplastic material at the projecting portion 76 of the hard second material layer 70 melts and chemically bonds with the thermoplastic material used to make the soft first material layer 60. As the materials cool, a physical bond is formed between the interconnecting portion 66 and the projecting portion 76 to hold the hard second material layer 70 and the soft first material layer 60 together. The area contact between the interconnecting surfaces 65, 75 defines a break line 30 that extends in a U-shape horizontally across the deployment door 12 and vertically along opposite sides of the deployment door adjacent the outer surface 72 of the hard second material layer 70. The break line 30 extends in a U-shape along the juncture of the interconnecting surface 65 of the soft first material layer 60 and the interconnecting surface 75 of the hard second material layer 70 [col. 4, l. 39, through col. 5, l. 5].

In the event of a collision, the air bag 18 inflates and presses against the inner surface 74 of the hard material layer 70. This causes the interconnecting surfaces 65 and 75 to separate from one another along the U-shaped break line 30 (see col. 5, ll. 6-14). Continued inflation of the air bag pivots the flap portion 86 bounded by the tear line to an open position (see Figure 4) permitting the bag to deploy into the passenger compartment of the vehicle (see col. 5, ll. 15-26).

According to the Examiner (Answer 3-4), the air bag door/cover manufacturing method disclosed by Cherry teaches or would have suggested all of the limitations in appealed claim 25 except for the one requiring that the first plastic be permitted to cool to a temperature beneath its softening point before removal of the air bag cover body from the first mold. To overcome this perceived deficiency in Cherry, the Examiner turns to Kikuchi.

Like Cherry, Kikuchi discloses a unitary composite air bag cover and method of making same. In general, the cover 21 consists of a core layer 23 of hard resin and a skin layer 22 of soft resin. The disposition of the soft skin layer on opposite sides of the hard core layer in the area of a hinge line prevents hazardous separation of the layers and shattering of the core layer upon deployment of the air bag (see, for example, col. 1, ll. 41-63; col. 3, ll. 58-63; col. 4, ll. 11-13; col. 5, ll. 23-28; col. 7, ll. 60-67; and col. 8, ll. 32-42).

Of particular interest is the method by which Kikuchi makes the unitary composite cover 21:

> Still another feature of the present invention is that a method of molding the air bag cover takes a first step in which a pair of molds are clamped and thereafter molten hard resin for a core layer is injected into a cavity of one of the molds and is cooled and hardened to form the core layer, and a second step in which after opening the molds, a core die component (male die) of the one mold is moved and brought into contact with a cavity die component (female die) of the other mold and thereafter molten soft resin for a skin layer is injected into a space between the core layer formed on the core die component and the cavity die component in order to form the skin layer [col. 2, ll. 25-37; also see col. 5, l. 29, through col. 7, l. 13].

This method produces a cover wherein the hard core layer and soft skin layer are adhered or bonded together to define an integrally formed structure (see col. 2, ll. 43-47; col. 4, ll. 63-65; col. 5, ll. 52-57; col. 6, ll. 40-41; and col. 8, ll. 33-35).

As indicated above, the Examiner is of the view that Cherry lacks response to the limitation in claim 25 requiring that the first plastic be permitted to cool to a temperature beneath its softening point before removal of the air bag cover body from the first mold. Relying on Kikuchi to cure this alleged shortcoming, the Examiner submits that it would have been obvious "to incorporate the step of cooling [and hardening] of Kikuchi et al into the process of Cherry in order to ensure that the body of Cherry is not damaged during the step of removing" (Answer 4).

The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of a primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

Aside from a *pro forma* argument that the applied combination of Cherry and Kikuchi stems from impermissible hindsight (Br. 7-8), Appellant does not specifically dispute the particular modification of Cherry in view of Kikuchi advanced by the Examiner. The requisite suggestion or motivation for this modification springs from Kikuchi's teaching that the resin of the hard core layer 23 is "cooled and hardened" (col. 2, l. 30) before transfer from a first mold set to a second mold set. Cherry discloses a comparable method of making an air bag cover, and one of ordinary skill in the art would have readily appreciated that the cooling and hardening step taught by Kikuchi would greatly facilitate the task of successfully transferring Cherry's hard layer 70 from the first mold to the second mold. Indeed, Cherry's description of the manner in which the hard layer 70 is formed in the first mold and then placed in the second mold (see col. 4, ll. 39-48) arguably by itself teaches or would have suggested the cooling limitation in question.

The crux of Appellant's position that the subject rejection is unsound instead focuses on a different limitation in claim 25. More particularly, Appellant contends (Br. 4-7; Reply 2-4) that the combined teachings of Cherry and Kikuchi would not have suggested a method meeting the limitation requiring

> a molecular concentration gradient . . . formed at an interface between the first and second plastics to bond the first and second plastics by diffusion at the entire contact surface of the outer layer to prevent separation of the outer layer from the front panel during use of the air bag cover.

The Examiner essentially relies on Cherry as being suggestive of this feature. Although Cherry does not expressly describe a molecular concentration gradient of the sort claimed, the failure to do so is not dispositive. In this regard, it is well settled that in analyzing the disclosure of a reference it is proper to take into account not only the specific teachings contained in the reference but also the inferences that one skilled in the art would reasonably be expected to draw therefrom. *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968).

Cherry teaches that when the thermoplastic material used to make the soft layer 60 is injected into the second mold and flows around the previously formed hard layer 70, some of the thermoplastic material at the projecting portion 76 of the hard layer 70 melts and chemically bonds with the soft thermoplastic material (see col. 4, ll. 55-60). Cherry also teaches that as the melted thermoplastic materials cool, a physical bond is formed between the interconnecting portion 66 of the soft layer and the projecting portion 76 of the hard layer to hold these layers together (col. 4, ll. 60-64).

As correctly pointed out by Appellant, these disclosures by Cherry refer only to the interface between the hard layer projecting portion 76 and the soft layer interconnecting portion 66 (Br. 5). Cherry gives no indication, however, that the melting and bonding described therein are limited to this portion of the composite door/cover. Appellant has not cogently explained or demonstrated, and it is not apparent, why the melting and bonding would be so limited. The injection temperature and pressure of the soft plastic material necessary to produce the disclosed melting and bonding seemingly would also exist along the full extent of contact between the hard layer 70 and the soft layer 60. The full extent of contact would, of course, encompass the major side surface 77 on the body portion 78 of the hard layer 70 and the major side surface 67 on the soft layer 60. The body portion 78 and major side surface 67 correspond respectively to the "front panel" and "contact surface" recited in claim 25. The apparent melting and bonding therebetween would seem to be the only reasonable explanation inferable from Cherry for the disclosed adherence between the major side surfaces 67 and 77 (col. 3, ll. 7-11).

Furthermore, Cherry's disclosure of the process of creating the chemical/physical bond between the hard and soft layers is essentially similar to the description of the bond forming process set forth in Appellant's specification (see the paragraph bridging pp. 5 and 6). Both methods involve the steps of injecting a melted soft plastic material into a mold cavity at a temperature and pressure sufficient to melt a surface layer of a formed hard plastic part and then permitting the melted plastics to cool to beneath their softening points. The injection temperature and pressure present during the molding of Cherry's soft layer would certainly produce at least some intermixing of the injected soft material and the melted hard material. Appellant has failed to explain or demonstrate, and it is not evident, why the resulting chemical/physical bond would not embody a diffusion bond exhibiting a molecular concentration gradient as broadly recited in claim 25. It also goes without saying that Cherry would have suggested using compatible hard and soft thermoplastic materials (see col. 4, ll. 20-38) suitable for effecting the melting and bonding described therein.

Appellant also has failed to persuasively support the argument (see, for example, Br. 6) that the applied prior art would not have suggested a bond that prevents separation of Cherry's outer layer (soft layer 60) from the front panel (body portion 78) of the body (hard layer 70) upon deployment of the air bag. Figure 4 of the Cherry reference illustrates the door/cover 12 after deployment of the air bag and shows no such separation. Moreover, Kikuchi establishes that separation between the hard and soft layers of similarly constructed air bag covers was a problem known in the art. This knowledge would have provided the artisan with ample motivation or suggestion to choose the parameters of Cherry's door/cover and injection molding process so as to avoid the separation problem.

Appellant's related observation that the bond between Cherry's hard and soft layers separates along the tear line 30 (see, for example, Br. 6) is of no moment. As evidenced by Cherry's Figure 3, the joint defined by the tear line 30 would be subject to separation forces far different in kind and degree than those that might tend to separate the outer layer (soft layer 60) from the front panel (body portion 78) of the body (hard layer 70).

Thus, the combined teachings of Cherry and Kikuchi, and the inferences that can be fairly drawn therefrom, would have suggested a method of making a unitary composite air bag cover responsive to the argued molecular concentration gradient and diffusion bond limitation in claim 25.

Based on the totality of evidence and argument before us, the combination of Cherry in view of Kikuchi proffered by the Examiner justifies a conclusion that the differences between the subject matter recited in claim 25 and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.

Accordingly, we shall sustain the standing 35 U.S.C. § 103(a) rejection of claim 25 as being unpatentable over Cherry in view of Kikuchi.

II. The 35 U.S.C. § 103(a) rejection of claims 25-29 as being unpatentable over Kikuchi in view of Cherry

For purposes of arguing this rejection on appeal, Appellant relies solely on the arguments in the briefs addressing the rejection of claim 25 as being unpatentable over Cherry in view of Kikuchi (Br. 8). As explained above, such arguments are not persuasive.

Therefore, we shall sustain the standing 35 U.S.C. § 103(a) rejection of claim 25, and claims 26-29 which depend therefrom, as being unpatentable over Kikuchi in view of Cherry.

SUMMARY

The decision of the Examiner to reject claims 25-29 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a). *See* 37 CFR § 1.136(a)(1)(iv).

AFFIRMED

MURRIEL E. CRAWFORD Administrative Patent Judge	)	
ANITA PELLMAN GROSS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JENNIFER D. BAHR Administrative Patent Judge	)	

Appeal No. 2006-2962
Application No. 10/252,177

BROOKS KUSHMAN P.C.
1000 TOWN CENTER
TWENTY-SECOND FLOOR
SOUTHFIELD, MI 48075