

Homework 10: Patent Liability Analysis

Team Code Name: The Incredible HUD

Group No. 3

Team Member Completing This Homework: Marcelo Leone

E-mail Address of Team Member: mleone@purdue.edu

Evaluation:

SCORE	DESCRIPTION
10	<i>Excellent – among the best papers submitted for this assignment. Very few corrections needed for version submitted in Final Report.</i>
9	<i>Very good – all requirements aptly met. Minor additions/corrections needed for version submitted in Final Report.</i>
8	<i>Good – all requirements considered and addressed. Several noteworthy additions/corrections needed for version submitted in Final Report.</i>
7	<i>Average – all requirements basically met, but some revisions in content should be made for the version submitted in the Final Report.</i>
6	<i>Marginal – all requirements met at a nominal level. Significant revisions in content should be made for the version submitted in the Final Report.</i>
*	<i>Below the passing threshold – major revisions required to meet report requirements at a nominal level. Revise and resubmit.</i>

* Resubmissions are due within **one week** of the date of return, and will be awarded a score of “6” provided all report requirements have been met at a nominal level.

Comments:

1.0 Introduction

The Incredible HUD is a helmet-based heads up display. Somewhat similar to the displays that exist in various aircraft, the Incredible HUD will display critical telemetry information and rear view video to its user via a projection onto the visor of the helmet. In order to enable the sensation of an augmented reality the display will not only be semi-transparent, but it will be focused further than the surface of the visor itself so as to not impact the user's sight. With this technology being contained in a full-faced, motocross styled helmet, the average motorcyclist, skier/snowboarder, or even skydiver will be able to enhance their experience with this device. That being said, the notion of a heads up display is becoming common in the technology world of today and this document will analyze any potential patent liability issues that may exist with the creation of the Incredible HUD. The key functionalities that will be focused on are those affiliated with the projection/display function, the telemetry data collection function, and the both of them combined.

2.0 Results of Patent and Product Search

The first of four patents that were found that perform substantially the same function as the Incredible HUD is the US Patent # 5646784. Filed May 25, 1994, this Helmet Display System comprises of a display visor, which is located on a helmet that has means for projecting an image onto the visor via a holographic combiner. Furthermore, this anti-glare visor has optical transmission characteristics that are similar to those of a neutral density visor except for the fact that it's tuned to display only a narrow band of frequencies. Such a display system can be used in conjunction with an aircraft head-up display to showcase desirable information such as altitude, speed, etc. of the aircraft itself [1].

Basically, this patent specifically claims to have a photochromic display visor, carried by the helmet, for projecting an image within the predetermined waveband of 545nm to an eye of a wearer of the helmet by reflection from the combiner. Also, it claims to comprise of a holographic combiner, which collimates the image that is projected by relay optics located on the helmet [1]. Surprisingly, included in these claims is the notion that it is for use in combat aircraft – something the Incredible HUD is not intended for specifically.

The second patent is US # 5251333; a Helmet Mounted Display Device filed September 29, 1992. This device is an opaque displaying element that can be mounted on a helmet visor on the outside of the user's instantaneous field of view. In addition, it includes a display control circuit that is located remotely from the display element and connected by a signal transmission apparatus. In the contract this patent claims to be a display device including an opaque multi-element LCD display element mounted outside of the helmet visor in a manner that makes it retractable. Another key claim is that the display appears to the wearer as if it lies at infinity, to relinquish the need for the wearer to adjust his focus in order to see the display [2]. Compared to the previously mentioned patent, this device has more potential to have existing infringements.

The third patent that has many similarities to the Incredible HUD is US # 2002/0053101. It was filed on December 28, 2001 and is essentially a Helmet, that comprises of a helmet shell, a breathing apparatus implemented as a face mask and visor connected to the shell, an augmented reality viewer within the shell that can receive a video signal and be viewed by the user, and a power socket adaptor that can be connected to an external power source. These functionalities appear to be very equivalent to those of the design in question; however, the following key claims could definitely affect any potential for infringement. These claims are stated that the augmented reality viewer is located behind the breathing apparatus face mask, that the external video source comprises of a thermal imaging sensor, which is connected to an image interpretation circuit specifically [3].

The last US patent that performs a substantially similar function is # 6798392, filed on October 16, 2001. The device, a Smart Helmet, includes integrated electronics to provide safety and convenience features to the user. These features include a global locating system, an environmental interaction sensor, a mobile communication network device, a small display panel, and a microphone/speaker. The Smart Helmet is meant to be aware of the user's location and interactions with the environment, and then provide that data to the user and others for monitoring purposes. What this patent claims is that the apparatus must have an accelerometer or gyroscope, a GPS, a mobile telephone device, and a LCD dot-matrix display, all of which are positioned in the crown of the helmet in between the inner and outer protective shells. Also, the display means comprises user input means for receiving input to control the information

displayed. Other than having to actively monitor the predetermined characteristics of the user and communicating those to others, the helmet has a programmable processor controlling the devices that can also automatically call predetermined phone numbers in emergency situations [4].

3.0 Analysis of Patent Liability

After analyzing the potential liabilities described in the section above, it appears that the Incredible HUD does not literally infringe on any of those functions. In the Helmet Display System [1] the device claims to use a photochromic visor, a holographic combiner (specifically for 545nm), two relaying optical parts, and all for combat aircraft purposes. On the contrary, our design does not use either type of visor or combiner, only one relay optic part, and it is intended for variable use such as outdoor activities– not even in combat aircraft! Next, the Helmet Mounted Display Device [2] is defined by its retractable LCD display that is remotely controlled and appears to lie at infinity. In the Incredible HUD, the display technology is completely different from an LCD type display. It utilizes a projector, that doesn't retract or isn't considered movable, and will appear to be at infinity, but only through the use of a lens/mirror. Because of that huge difference in the way the display is shown, the LCD isn't comparable to the projector technology that is used. Fortunately the remote transmission of the display signals is tied with the use of the LCD type display, so that should be nullified when comparing to the design in question. Then, one can see that the Helmet [3] is different than the Incredible HUD because it has a breathing apparatus facemask, which contains the display that shows thermal imagery. Our design does not have a facemask but rather a protective visor on the outside of the helmet and the display will be connected to the top of the helmet's bill, not the inside of the visor. Also, thermal imagery is not included in what will be displayed to the user by the HUD so that is out of the question. Last, the Smart Helmet [4] utilizes a lot of the same components as in the Incredible HUD, however their functions are done in a different way. Both designs have a GPS, accelerometer, and display but there are clear differences in how they are used. For example, the GPS and accelerometer modules are not on the actual helmet in our design but are inside the helmet shells in the Smart Helmet. In addition, the display of the Smart Helmet is a dot-matrix display, and, is in the crown of the helmet – not even on any sort of visor for the user to view during use!

4.0 Action Recommended

If the analysis of the patents, identified in Section 2.0, in the previous section is indeed correct, then it is apparent that there is no immediate action that is necessary in regards to eliminating any patent infringements. However, one property of this design is that it is not entirely set in stone, as it is still being worked on as the semester continues. This leaves time for possible tweaks or small changes to the design or functions of the design to occur. If such things do happen, the potential patent infringements will have to be carefully reanalyzed before any further steps are taken. Since the design of the Incredible HUD is very closely similar to many of the mentioned patented designs, it must be kept in mind to emphasize the uniqueness and simplicity of the different integral parts such as the methods of displaying and collecting the telemetry information.

5.0 Summary

All in all, the Incredible HUD is completely novel idea created by our team. Since the beginning stages of the project phase there have been many technological findings and logical epiphanies that have granted many changes to the original design. Nevertheless, even though the idea to have a helmet based head-up display was our own, there is the possibility that others in the past could have thought to invent the same thing. Therefore there is an undeniable need to conduct research on existing patents that are substantially similar to one's own design. After identifying those patents and analyzing their potential for patent infringement by the Incredible HUD, it was concluded that there are no immediate threats of any legal discrepancies.

List of References

- [1] “Helmet Display System” 1997 [Online] Available:
<http://www.freepatentsonline.com/5646784.html> [Accessed: 11/2/2011]
- [2] “Helmet Mounted Display Device” 1993 [Online] Available:
<http://www.freepatentsonline.com/5251333.html> [Accessed: 11/1/2011]
- [3] “Helmet” 2002 [Online] Available: <http://www.freepatentsonline.com/y2002/0053101.html>
[Accessed: 11/2/2011]
- [4] “Smart Helmet” 2004 [Online] Available: <http://www.freepatentsonline.com/6798392.html>
[Accessed: 11/1/2011]