A9 - Legal and Regulatory Analysis

Year: 2023 Semester: Fall Team: 5 Project: Smart Air Hockey Table

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Assignment Evaluation: See the Rubric in the Brightspace Assignment

1.0 Regulatory Analysis

As the Smart Air Hockey Table (SAHT) reaches the end of its design phase and the team seeks to enter the open market, it will need to comply with electrical safety standards as it houses electrical systems underneath the table. Each compliance body will be laid out henceforth with a short discussion about what they entail.

**1.1 CE (“European Conformity”) Certification**

If the team behind the SAHT wanted to enter the European market, it would need to comply with the European Union’s CE marking [1], a certification that ensures the product meets the EU safety, health and environmental protection requirements.

Essential tests under this certification include RoHS compliance [2], which would require the enforcement of using compliant parts that do not exceed permissible limits of hazardous materials. The SAHT will also need to satisfy the EMC directive [3], this would require testing to ensure the electrical systems do not interfere with other devices and can operate reliably amidst electromagnetic disturbance.

**1.2 FCC (Federal Communications Commission) Certification**

In the United States, the FCC certification is crucial to verify that the table’s electrical systems comply with federal standards on electromagnetic interference [4]. This would mostly concentrate the microcontroller on the system, as it will be categorized as unintentional radiators, and will need to adhere to specific standards and be authorized under the Supplier’s Declaration of Conformity procedure [5].

**1.3 UL (Underwriters Laboratories) Certification**

UL Certification is a universally recognized standard that can validate the table’s electrical safety and ensure it poses no fire hazard or electrical shock risks to users [6]. Compliance can be verified through lab testing either by UL or a third-party lab approved by UL.

**1.4 Other Miscellaneous Certifications**

Since the SAHT is targeted towards households, there are certain certifications that apply to home products and appliances that may also apply. Those being the NSF Home Products and Appliance Certification [7] and the CSA Group Certification [8]; the former ensures the product’s safety and performance, while the latter offers a comprehensive evaluation and testing for safety, performance, energy efficiency, cybersecurity and functional safety.

2.0 Legal Liability Analysis

Due to the lack of patents that overlapped with SAHT on more than one facet, patents that are of international origin will also be analyzed.

2.1 Analysis of Patent 1: Registered Chinese Utility Model CN210904920U [9]

**Title:** Table top luminous air hockey table **Holder:** Guangzhou Fenheng Science And Technology Development Co Ltd
**Filing Date:** September 20, 2019

The patent describes a luminous type air hockey table that employs a light-homogenizing panel and light-emitting lamp bars to achieve a light special effect on the table surface. This may affect the smart air hockey table if it intends to implement a similar lighting feature alongside its tracking system. The mentioned patent’s focus on lighting, and light effects could potentially overlap with the smart table's feature of displaying a trail underneath the playing surface using RGB LEDs. This overlap might pose a risk of patent infringement.

2.2 Analysis of Patent 2: US Patent Application Publication US20170232307A1 [10]

**Title:** Lighted hockey puck **Holder:** Huizhou City Hefenglong Sporting Goods Co Ltd, Indian Industries Inc **Filing Date:** January 12, 2017

The patent discusses an illuminated air hockey puck. The SAHT should not infringe on the patent as it does not use LED to light up the puck in the similar manner as it was described in the publication. However, if the SAHT’s tracking system, which uses Hall Effect sensors and RGB LEDs, interacts with or lights up the game pieces in a way similar to the patent, this might also pose an infringement risk.

2.3 Analysis of Patent 3: Registered Chinese Utility Model CN210904920U [11]

**Title:** Noctilucent air game ball table **Holder:** 谢进荣 **Filing Date:** June 6, 2009

The patent discusses a noctilucent air game ball table where a special coating on the game panel interacts with an illuminant on the game ball cake to create visual effects in a dark environment. If the SAHT were to employ an additional coating that interacts with lighting to create visual effects, especially during movement of game pieces, there could be a risk of infringement.

3.0 Sources Cited:

[1] European Union. *CE marking*. Available: <https://europa.eu/youreurope/business/product-requirements/labels-markings/ce-marking/index_en.htm> (accessed Oct. 26, 2023).

[2] cemarking.net. *RoHS Directive*. Available: <https://cemarking.net/eu-ce-marking-directives/rohs-directive/> (accessed Oct. 26, 2023).

[3] cemarking.net. *EMC Directive*. Available: <https://cemarking.net/eu-ce-marking-directives/emc-directive/> (accessed Oct. 26, 2023).

[4] Federal Communications Commission. *Equipment Authorization Procedures*. Available: <https://www.fcc.gov/general/equipment-authorization-procedures> (accessed Oct. 26, 2023).

[5] National Institute of Standards and Technology. *The Use of Supplier’s Declaration of Conformity*. Available: <https://www.nist.gov/system/files/documents/standardsgov/Sdoc.pdf> (accessed Oct. 26, 2023).

[6] UL Solutions. *Certification*. Available: <https://www.ul.com/services/certification> (accessed Oct. 26, 2023).

[7] NSF. *Home Products and Appliance Certification*. Available: <https://www.nsf.org/food-beverage/food-equipment-appliances/home-products-appliances#:~:text=NSF%20certification%20protocols%20cover%20a,beverage%20containers%20NSF%20P396%2C%20servingware> (accessed Oct. 26, 2023).

[8] CSA Group. *Household Appliances*. Available: <https://europa.eu/youreurope/business/product-requirements/labels-markings/ce-marking/index_en.htm> (accessed Oct. 26, 2023).

[9] Google Patents. *Table top luminous air hockey table*. Available: <https://patents.google.com/patent/CN210904920U/en?q=(air+hockey+table)&oq=air+hockey+table> (accessed Oct. 26, 2023).

[10] Google Patents. *Lighted Hockey puck*. Available: <https://patents.google.com/patent/US20170232307A1/en?q=(~patent%2fCN210904920U)> (accessed Oct. 26, 2023).

[11] Google Patents. *Noctilucent air game ball table*. Available: <https://patents.google.com/patent/CN201445773U/en?q=(~patent%2fCN210904920U)> (accessed Oct. 26, 2023).