

REQUEST FOR FILING A PROVISIONAL PATENT APPLICATION

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TITLE OF INVENTION:

A system to make curling accessible for deaf people.

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Enclosed Application Parts:

- 1 Specification (3 Pages)
- 1 Drawings (1 Page)
- Total Pages (4 including this page)

A cheque for \$130.00 US is enclosed for the filing fee.

Respectfully submitted, April 8th, 2024

Rajdeep Gill, Ph: 1-204-123-4567

I am claiming small entity status for the purpose of the filing fee.

Signature: _____

1 Provisional Patent Application

1.1 Title

A system to make curling accessible for deaf people.

1.2 Abstract

Curling is a team sport that depends heavily on real-time verbal cues. These cues help the skip communicate sweeping instructions to the team. Deaf curlers cannot hear these cues and must visually check for direction, which affects performance and focus.

This invention introduces a visual communication system to address this gap. The device allows the skip to transmit commands via a remote control to sweepers' broom-mounted receivers. These receivers display clear visual signals, enabling deaf players to receive instructions while maintaining full attention on the game.

1.3 Drawings

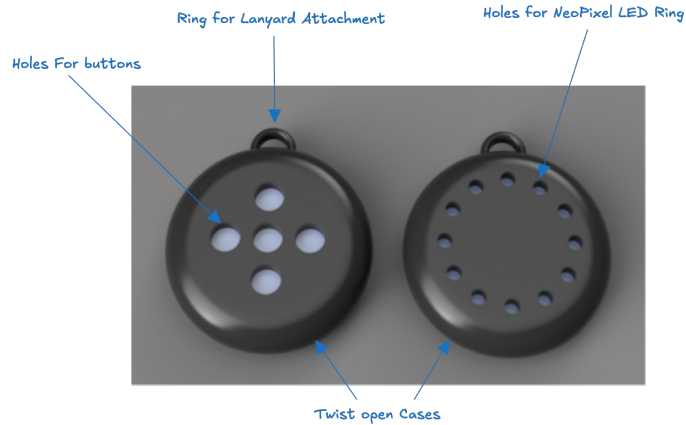


Figure 1: Skip's device (left) and sweeper's device (right). Both devices are 65mm in diameter and 25mm thick.



Figure 2: Skip's device (left) and sweeper's device (right) fully assembled

1.4 Background of the Invention

Curling is a sport that relies heavily on verbal communication between players, particularly between the skip and the sweepers. These verbal cues are essential for guiding the sweepers on when to sweep, how hard to

sweep, and how to adjust based on the rock's trajectory. Deaf curlers face a significant disadvantage, as they are unable to hear these commands and must constantly look toward the skip for direction, reducing their ability to focus on the stone.

The idea for this invention arose from recognizing this accessibility gap. The aim is to create a solution that levels the playing field, allowing deaf athletes to fully engage in the sport without communication barriers. By replacing verbal communication with a visual signaling system, the invention enables real-time, hands-free communication on the ice in a way that is both functional and discreet.

The proposed system is a wireless communication device that allows the skip to send distinct visual signals to the sweepers' devices. This helps remove the need to look back at the skip for instructions, allowing sweepers to maintain their focus on the stone and the game.

1.5 Summary of the Disclosure

According to the World Curling Federation (WCF) rules¹, section R11(c) prohibits the use of most electronic devices on the ice, except in cases of medical necessity. The relevant section reads:

R11 (c): *Teams must not use electronic communication equipment, or any device to modify the voice, during a game. With the exception of stopwatches that are limited to providing 'time' data only, the use of electronic devices during the games, which provide information to players on the athletes' field of play, are forbidden. A whistle or another signalling instrument can be used in case of medical reason and after consultation and written approval from World Curling.*

In this context, the proposed device qualifies as a signaling instrument used for medical reasons. It does not provide any extra game-related information as compared to shouting the commands. The device is solely intended to enable equitable participation for deaf athletes, in alignment with the spirit of the WCF's medical exception clause.

Furthermore, the attachment of the device to the broom is also allowed as currently timers are allowed and are often attached to the broom. Although according to C3 (d), the broom must be prequalified by the WCF and shall not be exchanged during the game. Our invention does not require sweepers to swap brooms as each sweeper would have their own device and is therefore compliant with this rule.

C3 (d): *Each player must declare an approved sweeping device at the start of a game, and only that player can use that device for sweeping during the game.*

1.6 Brief Description of the Drawings

The drawings depict two similar shaped devices, one for the skip, with its 5 buttons, and one for the sweepers, with its LED ring. Both devices have a similar form factor to a stopwatch, which is a common tool in curling. The devices both have a hook to attach to a lanyard, or alternatively, a belt clip. The sweeper's device is intended to be attached to the broom, ensuring it is always in the line of sight of the sweepers. However, this is not a requirement and the device can be used in any position that is comfortable for the user.

The 5 distinct buttons on the skip's device are designed to be easily identifiable by location and color. Each button corresponds to a specific command, which is transmitted wirelessly to the sweeper's device.

The LED ring on the sweeper's device is designed to be easily visible in bright lighting conditions, ensuring that the sweepers can receive commands without needing to look back at the skip. The LED ring displays one of five distinct visual patterns, each clearly mapped to one of the commands. These patterns are designed to be easily recognizable during gameplay, even in bright lighting conditions. The devices are both 65mm in diameter and 25mm thick.

1.7 Detailed Description of the Invention

The system consists of two primary components:

¹<https://worldcurling.org/wp-content/uploads/2024/08/Rules-2024.pdf>

- A remote control operated by the skip, worn on a lanyard around the neck
- A receiver unit attached to the sweepers' broom, shaped similarly to a stopwatch. Intended to be attached on the broom ensuring it is always in the line of sight of the sweepers.

Both devices are powered by rechargeable batteries and utilize the ESP32 microcontroller for control. Communication between the devices is handled using ESP-NOW, a low-power, low-latency wireless protocol ideal for short-range communication.

The skip's remote control features five buttons, each corresponding to a unique command. These commands are transmitted wirelessly to the sweepers' device.

On the receiver, an LED ring displays one of five distinct visual patterns, each clearly mapped to one of the commands. These patterns are designed to be easily recognizable during gameplay, even in bright lighting conditions. The device is also lightweight, ensuring it does not interfere with sweeping technique or performance.

The unit's form factor is intentionally similar to a stopwatch, a familiar and widely accepted tool in curling, minimizing visual distraction for players and spectators. Its appearance and function are both unobtrusive and in line with standard curling equipment, ensuring it does not disrupt the aesthetics or flow of the game.

The wireless communication is designed to be power efficient. Commands are only sent in periodic intervals, and when the skip is not sending commands for a certain period of time, both devices enter a lower-power state. This ensures that the devices can last through an entire game without needing to be recharged. Both devices have removable batteries or they can be charged using a USB. The devices twist apart to allow for easy battery replacement.

Lastly, Figure 3 depict the five commands and their corresponding LED patterns. The stop pattern can be seen in the fully assembled device in Figure 2.

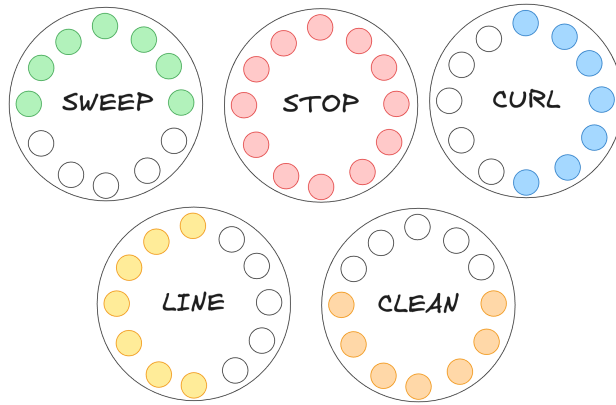


Figure 3: Commands and their corresponding LED patterns

1.8 Claims

Only one claim is made in this application:

A visual communication system that allows a curling skip to send distinct non-verbal signals to sweepers through wireless transmission to broom-mounted visual display devices.