

Joystick housing

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Abstract:

A joystick includes a handle, a base shaft having opposite upper and lower ends, and a rectangular housing. The rectangular housing has an upper opening. The handle is mounted on the upper end of the base shaft.

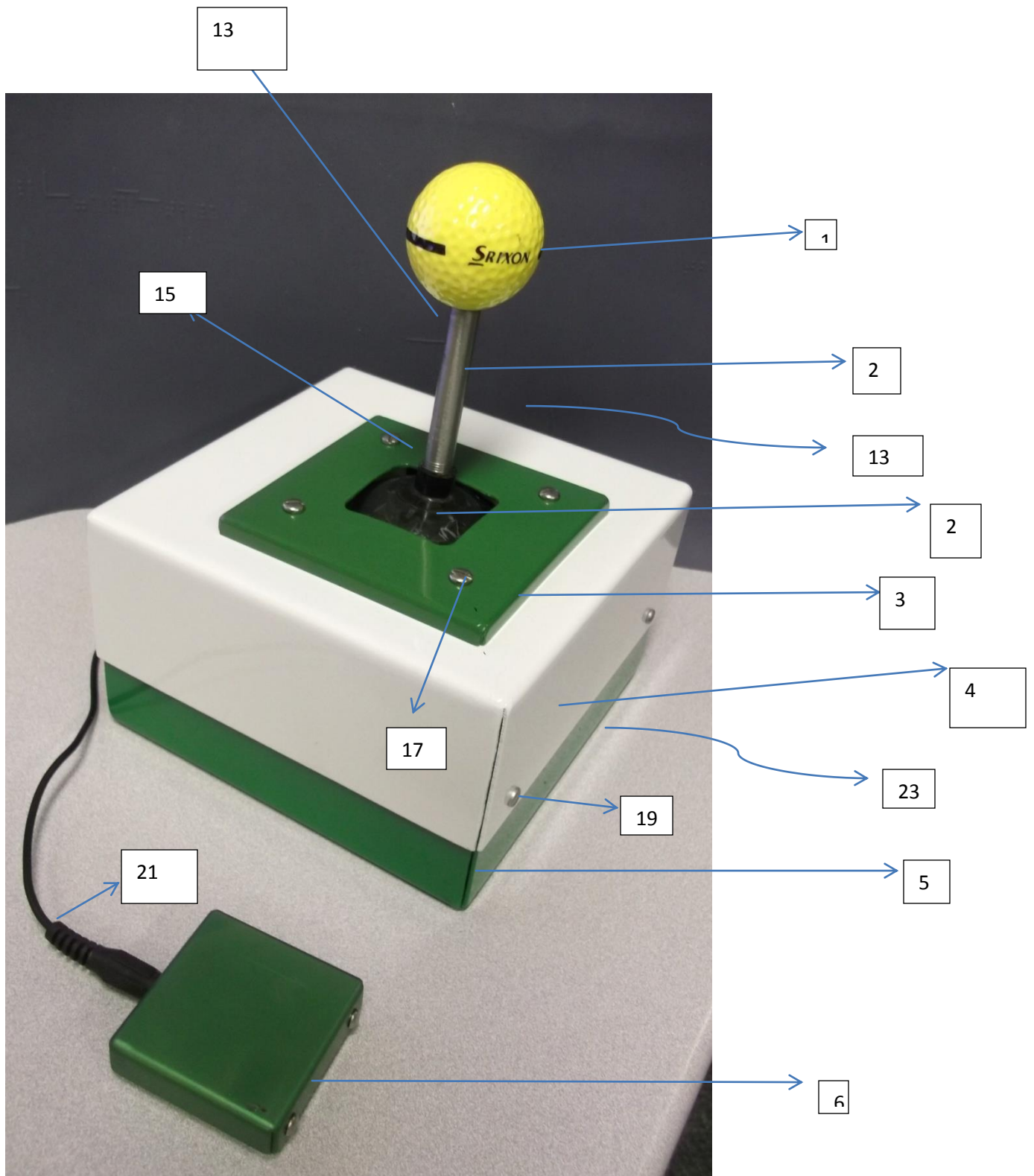


Figure 1

Background:

The present invention relates to the field of joystick and housing of a joystick controller, and more particularly, to a joystick controller most suitably useable with accessible voting devices.

Voting machines that can scan documents are known in the prior art. Also known in the prior art is a device that monitors the voter's actions while filling out a ballot. EP publication 2106604 discloses an apparatus that monitors and analyzes a voter's hand motions while filling out a traditional paper ballot, and generates electronic data corresponding to the votes.

United States patent 5,675,359 to Anderson for a Joystick Controller is used translate operator manipulations to electrical control signals. At least a direction of motion is controlled with this joystick.

Typical applications are found in industrial equipment and construction equipment where a joystick can provide one hand operation of direction and speed in order to free the operators other hand for controlling other aspects of a machine. Other typical applications for joysticks are in wheelchairs, jetways, etc...

It is desirable that a joystick includes a mechanical structure for receiving the operator manipulation, and means for translating the operator input into control signals which are accurate and cannot be abused or damaged by such operator inputs.

SUMMARY:

The joystick housing and mounting bracket of the present invention includes rectangular shape housing. The joystick according to the present invention includes a handle, and a base having opposite upper and lower ends. The handle includes a shaft, which has a first opposite end and a second opposite end. The handle also has a ball for shifting purposes. The ball is located on the opposite end of the shaft. The opposite end of the shaft is connected to the base. A first opposite end of the handle is connected to the ball and a second opposite end of the handle is connected to an upper end of the base.

It is not intending that the illustrated sphere or ball shape of the handle to be limiting. The rectangular shape of the joystick housing should not have limiting features, either. Other three dimensional bodies will work for both the base and the handle.

BRIEF DESCRIPTION OF THE DRAWINGS:

Figure 1 is a perspective view of the joystick and joystick housing.

DETAILED DESCRIPTION:

In Figure 1, the joystick according to the present invention has a handle 2. The handle 13 includes a shaft 2. The shaft 2 has an upper portion 13 and a lower portion 15. The handle 13 includes a controller 1. In this embodiment, the handle 13 is a sphere. In another example, the handle 13 could be a half-sphere, cylinder, etc... The lower portion 15 of the shaft 2 is connected to a surface 9. Surface 9 is a three-dimensional surface and is rotatable 360 degrees. That is, the handle 13 can be moved in at least two directional axis.

The base 23 has an upper end 4 and a lower end 7. The upper end 4 and lower end 7 come together to form a rectangular shape housing. The upper end 4 connects with a platform 3. The platform 3 has an opening 10 for the surface 9 to be shown. The platform 3 forms with upper end 4 of the base 23. In one example, the platform 3 is connected with upper end 4 of base 23 with a connector 17. In this example, the connector is a bolt. In another example, the connector could be a screw.

The upper end 4 and lower end 7 of the base 23 are connected by a connector 19. In this example, the connector is a screw. In another example, the connector could be a plate.

The base 23 has a opening (not shown) for connection of ports. In this example, the port 21 is a connector to be used with a switch 6. This allows an individual with special motor skill needs to be able to comfortably and effectively select an option.

Our team bought the Microsoft Sidewinder Force Feedback Pro for our project:



It has the force feedback system we wanted in our joystick. We did testing and programming and it worked pretty well. However, we wanted a different type of housing for the structure. We found the housing to be too weak for the joystick, so we decided to build our own. The end product is Figure 1.

What we did was we took the handle of the joystick completely off. We instead inserted a metal rod as the handle. At the end of the metal shaft was a golf ball. We did this so that the joystick handle would have more support and not easily breakable. Stephen Blosser, our sponsor, stated that over the years he found that individuals with dexterity limitations were more friendly towards something shaped like golf ball - it was much easier for them to grasp. We decided to take heed to this advice and use a golf ball for our joystick as well.

The metal shaft was put where the handle was placed on the joystick housing (surface 9). We kept the surface 9 in place. Surface 9 was an original manufacturer part of the joystick. Surface 9 allows the handle to move easily around in a 360 degree manner. Surface 9 is very smooth, and the handle really just seems to glide across to wherever one may want to move in. We did not customize surface 9.

The base 23 of the joystick was completely redesigned as well. We wanted a metal base for the joystick base. Some individuals are very strong, and may plastic may easily crack or break under strain or stress. We created a metal box. The box has an upper end 4 and a lower end 7. These were just sheets of metal that bent under intensive heat. The metal folds in a manner that looks like half a box. We connected the upper end 4 and the lower end 7 by screws that easily screw into both of the ends. This ensures that the ends will not fall apart.

An opening was cut into the upper end 4 of the base 23. This was so that the surface 9 may have more area to move around. We calculated the opening in a way that minimizes the opening, but yet maximizes the space for the joystick to move around. The opening was cut and then the joystick was put into the upper end 4.

Initially, the opening was cut in the center. Where anticipation failed was that the once all of the parts of the internal circuitry was wired and connected in the lower end 7, the joystick shaft 13 was not centered. The joystick still fit in the center opening, but with a lot of limitations. A metal cover 3 was then placed on top of the upper end 4 of the base 23. This is to ensure that the surface 9 is protected, and that only what needs to be shown can be shown through the opening.

The joystick base 23 also has a few port openings. One is for USB connectivity. Another port opening is one for the selector 6. How the individual will be selecting a vote in the ballot is through the selector 6. The selector 6 is essentially a clicker. The user only has to click the clicker and it will select the selection on the screen. The cable 21 connects the port opening to the selector 6. The selector 6 also had an exterior housing of metal made for it. The selector 6 is also made from sheet metal formed into a box. It is connected by screws as well. We wanted our selector 6 to be also made from metal for the same reason as the base - for a more secure and stable housing. The selector 6 has a clicking functionally and the clicking can actually be heard from an individual. This is something that was also important - so that the user can not only feel the clicking, but is also able to hear when they make a selection.

The joystick base 23 has a knob on the side (not shown). The knob on the side is for the force feedback option. The knob dials the force feedback up and down. This is so that the force feedback has a control. For example, for individuals sensitive to touch, the dial will be turned down. The force feedback joystick will gently vibrate when force feedback is needed. For individuals who do not experience a strong sense of touch, the force feedback dial will be turned up and the force feedback can violently shake in the individuals hand.

Once everything was configured and tailored to our liking, the joystick was then painted. We had a team vote and the team unanimously chose Michigan State University colors. We decided to alternate between a green and white color. Some decals and stickers will be added to the housing for a more aesthetically pleasing effect. We will also be switching the yellow golf ball on top of the handle for a Michigan State University color friendly golf ball.