

Materials and manufacturing

The product I will be analyzing and discussing will be the computer mouse. The computer mouse was first designed in 1964 by a man called Douglas Engelbart when he designed the mouse it consisted of a wooden shell, circuit board and two metal wheels that came into contact with the surface it was being used on. In 1972 Bill English developed the design that we all know today the “ball mouse” the ball replaced the wheels and was capable of monitoring movement in any direction. Approximately 8 years in the future after the development of the ball mouse the optical mouse was created eliminating the ball which often became dirty from rolling around the desktop. There is a computer mouse in almost every home around the world because to own a computer involves having a mouse to operate it the materials used to create a computer mouse are various different materials such as (ABS) plastic, metal, and rubber etc. the outer shell of the mouse is made out of an injection molded plastic called (ABS) which is a cheap and fast to use. Injection molding involves injecting hot plastic which is in a liquid form into a mold then once the plastic cools within the mold the mold is opened the cooled plastic is removed in the shape of the mold. This method is fast and easy to do and can be done on an industrial scale producing hundreds at a time at a low cost. The printed circuit board which is one of the main components in the mouse is custom made to every mouse to suit the design. The (PCB) printed circuit board is a flat resin coated sheet which consists of integrated circuits (ICs), oscillators, electrical resistors, and other components. The mouse is held together using screws and plastic clips which are located on the inside of the plastic to ensure that they are not visible and that they hold the various pieces together. The benefits of using the plastic clips mean that you don’t need to worry about welding pieces together because during the injection molding the pieces will be designed to clip together. But this also means that it will only be as strong as plastic. This is probably the reason that they used two little metal screws to ensure that the product is held together. The whole mouse consists of seven different components and five screws. The first piece of the mouse is the base which has been injection molded out of hard and thick plastic and it has been given structural support within the base. The second component is the (PCB) printed circuit board this contains the LED and the detectors which are used to calculate the movement of the mouse on the desktop surface this (PCB) is then screwed to the inside of the base using three little black screws to hold it in place. The third piece of the mouse is the ball used to scroll up and down the screen when using the mouse. This piece is made out of rubber and plastic and attached to the (PCB) directly because it needs to measure the amount of pressure used on it to allow you to scroll fast and slow. The rubber is used just to give it a nicer and smoother touch when using it. The fourth piece of the mouse is the battery connects which is a simple (PCB) with a positive and negative which allow the power from the battery’s which will later be inserted in the product to flow to the main (PCB) board to power the mouse this piece slots into the plastic base perfectly and prongs from the battery piece slide into the main (PCB) to allow the power to flow through. The next piece which covers internals of the

mouse is a hard (ABS) plastic this piece acts as a cover to hide all the insides of the mouse it clips to the base using plastic clips which were created during the injection molding process after this piece is attached one of the final pieces can be attached to the mouse which is the outer shell this piece has a smooth finish and a painted coat and has the logo of the company which created the mouse on it. This piece just simply clips to the hard (ABS) shell. The next piece of the mouse is the two screws left which screw into the underbody of the mouse which holds the whole mouse together making it stronger. The last piece of the mouse is the cover which goes over the battery's to cover them once they have been placed in the mouse to supply it with power. The future of the mouse will follow the evolution of the internet but at some point, the mouse will become extinct someday. It will most likely that candidate to replace the mouse will be a device which tracks the eyes movement of the computer user and follow with cursor motion and function signal this will be the future of the computer mouse.

1. <http://www.computinghistory.org.uk/det/613/the-history-of-the-computer-mouse/>
2. <http://www.madehow.com/Volume-5/Computer-Mouse.html>

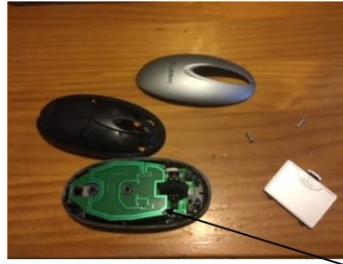
Non-permanent – assembly that allows disassembly



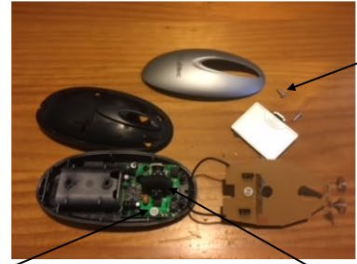
(ABS) plastic that is injection-molded



Snap Fits - joining of two parts in which mating elements possess a temporary interference during assembly, but once assembled they interlock. During assembly, one or both parts elastically deform to accommodate temporary interference.



The printed circuit board (PCB)



screws - externally threaded fastener generally assembled into a blind threaded hole

Silicone rubber wheel to allow for scrolling