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Disassembly of a Single Use Camera

Functional Components

The functional components of a single use camera include the viewfinder, focus free lens, shutter, film, film transport, viewfinder, flash and AA energy cell,the outer and inner frames, and aluminum packaging.

- Viewfinder: Allows the user to see the frame and what is being shot.
- Focus Free Lens: Focuses light on the film so it can be developed into pictures.
- Shutter: Opens and closes to let light which makes the pictures clear.
- Film: A strip of transparent plastic film that on one side contains microscopic silver halide crystals. These crystals are light sensitive and when activated, produce a chemical change. Its produces an invisible image which can then be developed into a visible photograph.
- Film Transport: This mechanism brings a new section of film behind the lens to allow for another picture to be taken. When the outside wheel is turned, it winds the used film around a cylinder and unwinds the fresh film.
- Flash: After pressing a button on the front of the camera, a flash of light is produced as a picture is being taken. This happens after a capacitor discharges into a bulb. The light produced provides necessary light to ensure a chemical reactions occurs.
- Energy Cell: A AA battery provides power to charge the capacitor
- Inner and Outer Housing: Made out of ABS plastic, the outer shell protects the parts inside from any type of damage. Inside this outer shell, is an inner housing that allows for a place for the film to rest, and it adds extra protection for the lens and energy cell.
- Packaging: The aluminum packaging protects the film from radiation that could

How Parts and Components are Arranged

The mechanisms within the camera are mechanical and function by using springs and winding. The inside is organized into subsystems which include the circuit board, viewfinder, and winding system. These systems work together so the shot can taken at the exact time when there is enough lighting. The systems are also assembled into a compact design which allows for easy transport.

How the Camera Works:

1) Winding the outer wheel reveals a new piece of film behind the lens. It also moves the white wheel to show how many more pictures can be taken.
2) After the flash button is pressed, the battery charges the capacitor.

3) When the shutter button is pressed, the capacitor releases the stored energy into the bulb which creates a flash.
4) The light produced reflects off the images in front of the camera and causes a chemical reaction on the film.
5) The image is imprinted on the film

Reuse/ Recycling

The plastic parts go to a recycling center. Here they either get milled-up, or are put into another camera, depending on if the part is scratched, damaged, or if the part is still functional. One example of a part that is always recycled is the outer shell. They then make a new shell out of this plastic. The other parts are tested to insure they will work again in another camera. Some examples of parts that are reused provided there is no damage are the circuit board, and battery (as long as there is still a specified amount of energy still there). There is no specified number of times a part is reused prior to being recycled; it is solely based on the condition of the part and whether it can withstand another use in a camera.Each camera receives a new lens to ensure optical purity. The used lens are sold to companies as a raw material for other products.

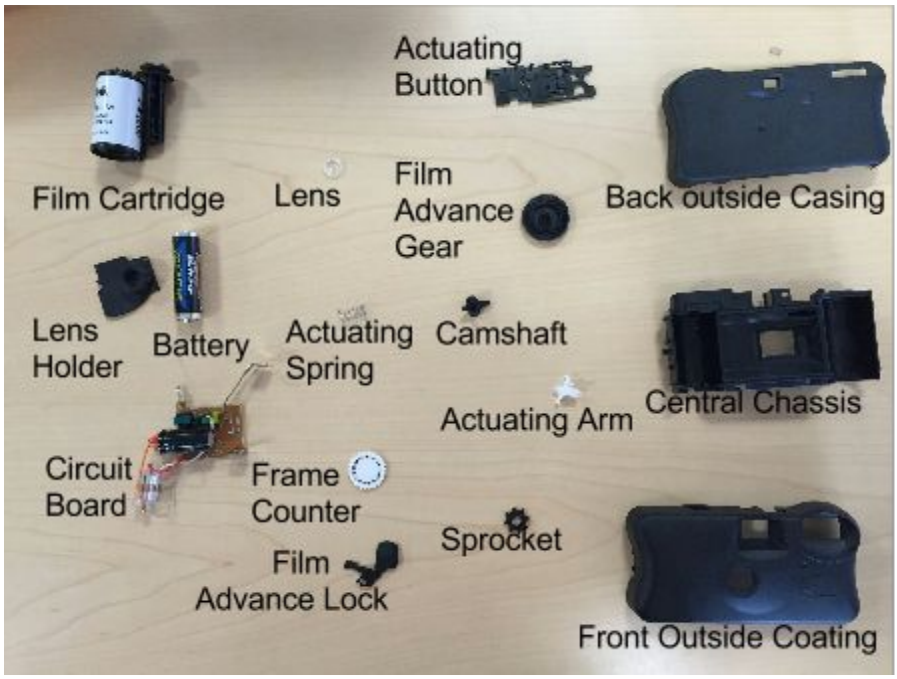
Assembly and Disassembly of a Single Use Camera

The camera assembly process is not very complex. First, all products are molded with ABS plastic. The already assembled circuit board is put into the camera with glue and snaps. Next, the gears that move the film around are put into the camera. After that, the lens and viewfinder are assembled, including the shutter mechanism to block out light. Then, the inner housing is put on with the film inside, being careful not to expose the film to light. Finally, the two outer shells are snapped together. The camera is put inside a cardboard box, and then a plastic bag with aluminum coating on the inside is put over the bag. This protects the camera from radiation such as x-ray, water, and sunlight.

The camera was fairly easy to take apart. First, all the packaging was taken off. The two parts of the inner and outer shell were held together by little clips on the insides. These were taken apart by applying pressure to these points with a hand tool. This opened the camera in half until the inner housing was just slid out. After this step, the filmed popped out from the inner housing and so did the viewfinder. Now, every other functional component was exposed. One part in particular, the circuit board needed extreme caution. The circuit board was grounded so no energy was left for any group members to be shocked. The lens was taken from the front, and the button was taken apart from the top, and the gears were taken apart that control the film advancing. Finally, the camera was fully taken apart.

There are springs in the camera are made out of metal, in fact they are made out of an alloy of steel. The circuit board is made up of steel, copper, and wire coverings. All of these metals conduct electricity so the flash can be used. The battery that charges all of this is made out of alkaline metals that act in a chemical reaction to charge the circuit board. The outer shell and other plastic parts are made up of ABS plastic which is rather durable.

All the pieces in the camera:



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Redesign:

Our group decided that we wanted to research the battery.In an alkaline battery, powder zinc is used as the anode, manganese dioxide is used as the cathode, and potassium hydroxide is used as electrolytes. The batteries are not available to be recycled by any regional or national recycling program. They have been manufactured free of mercury so are not hazardous wastes when discarded. Most people discard them through municipal waste programs with most of the energy still left in them. Kodak usually donates any returned batteries to charity or the photofinisher. This aspect could be improved by making customers turn in the batteries when they get their film processed. This would allow Kodak to distribute more of these batteries for reuse.

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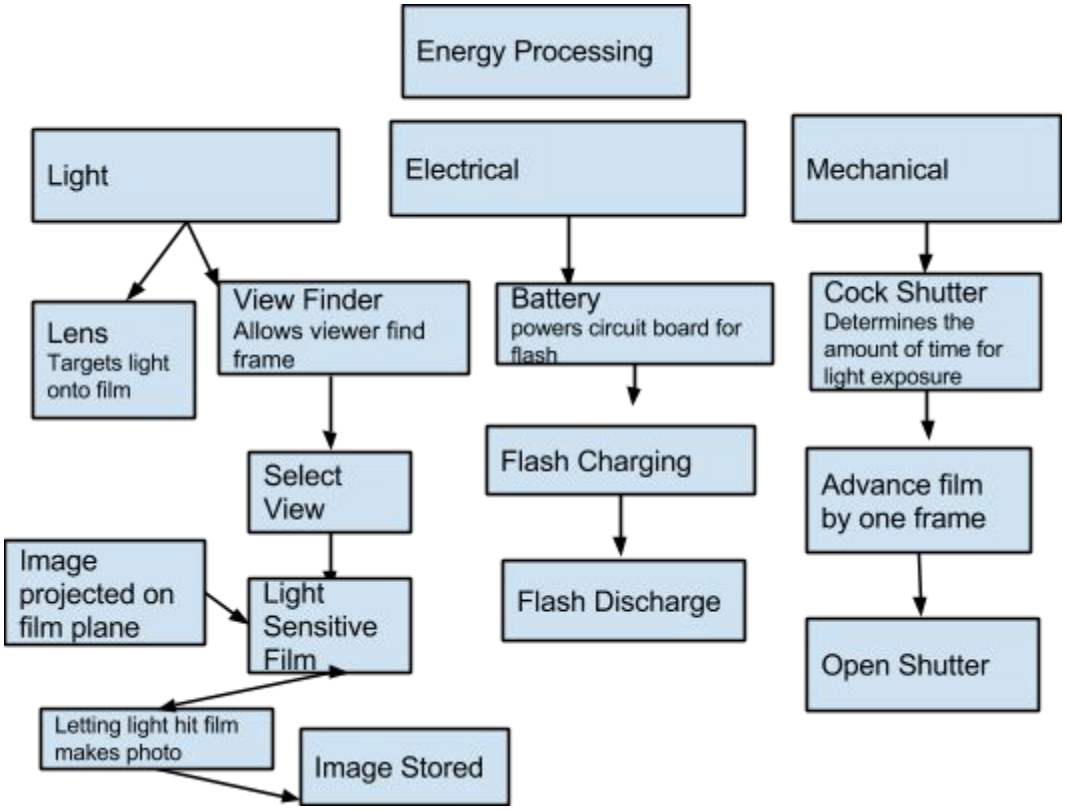
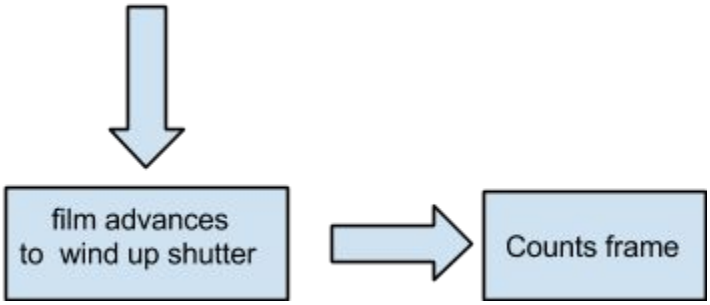


Material Processing



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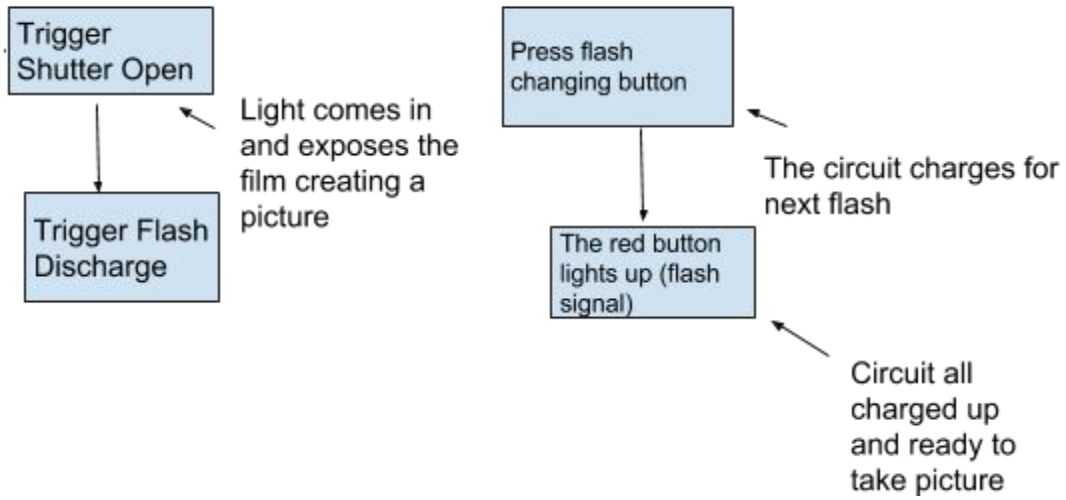
Signal Processing



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