Disassembly of a Single Use Camera
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How it Works
There is a lot of thinking that had to go into developing a disposable camera, but in this section we will give a very simple explanation of how it actually works. To begin, you spin the film advance wheel which in turn spins the sprocket that is connected to the film. You turn the wheel until a click is heard and at that point the spring gets loaded and the film and counter advance. When flash is necessary, you hold down the trigger slightly until the green LED light appears signifying the capacitor being charged. Once you fully press down the arm is released in the trigger mechanism and rotates the shutter exposing film. The shutter reaches the bottom of its rotation and contacts the metal bar located at the base of the camera. That bar is connected to the circuit board and completes the circuit resulting in a discharge from the capacitor and a flash of light. Then the spring shutter brings the shutter back to its resting position and the process is completed.

Components and Subsystems

a) Lens
   - group of parts that sits on the front of camera; where light passes through in order to produce the picture

b) Shutter mechanism
   - the gears that control the advancement of the film and the shutter movement
c) Viewfinder
   - clear plastic piece in the center of the outer housing unit; used to find the desired frame for the picture

![Viewfinder Image]


d) Film transport
   - placed in the camera in such a way that it can rotate and move the film over after each picture, in order to take another

![Film Transport Image]

e) Film
   - contains thin plastic that is coated in a light sensitive emulsion in order to produce picture in the camera

![Film Image]
f) Electronic flash/Energy cell
   - includes the battery, circuit board and capacitor that power the camera and
     control the flash capabilities

g) Housing
   - holds the circuitry and smaller parts together and encases the entire camera

Disassembly Procedure

The first step in the disassembly of the camera is to remove the outer case. To do that
you must pry open the case and remove the tabs holding it together. Once the case is off the
internal components of the camera are exposed. We began by simply taking the film cannister
out as it was simply held in place by the case. After that, we must remove the battery and
discharge the capacitor by bringing a neutral object into contact with it. This will prevent any
shock from the still charged component. After this step we can remove the viewfinder and then
the trigger to take the pictures following that. We can then remove the frame counter, film
advance wheel, and film advance lock, in that order. This should lead to the sprocket becoming
dislodged and next we remove the lens holder. This part needs to be pried out of its position
with a little force. Underneath that piece is a spring that needs to be removed then the shutter held in place by the shutter spring (which we unfortunately damaged during the disassembly). After this we simply pulled the circuit board out of the base and the camera's disassembly was complete.

**Parts Breakdown** - see picture for parts

1. Viewfinder → gives user ability to see picture being taken
2. Circuit Board (& Battery) → connected to battery and provides energy for the flash
3. Frame Counter → indicates to the user how many pictures they have left
4. Camshaft → allows for parts to advance through rotation
5. Sprocket → moves the film forward when user turns advancement wheel
6. Advancement Wheel → connects to sprocket so that user can manually move film forward
7. Film Advance Lock → locks the film in place to ensure the film is only moved forward a certain amount
8. Film Canister/Film → holds the film that the pictures are captured on
9. Shutter → moves in order to let in light for lens to capture photo
10. Shutter spring → holds shutter in place (broken in disassembly)
11. Activation Button → user presses in order to activate process of taking the picture
12. Spring → gives tension needed to advance film and gears
13. Lens → captures light to take the photo
14. Lens Holder → consists of 2 parts, rotating gray disc and black base; holds lens and keeps it from moving
15. Film Transporter → aids in advances the film
Suggested Redesign

In order to reduce waste, Kodak should attempt to make their film casing smaller in size. Sadly the cartridge is usually thrown away because film cannot be reused, therefore producing more waste than necessary. To solve this problem, a smaller roll of film could be designed to be able to fit in a smaller case, thus preventing excess waste. This could also result in a less bulky, and possibly sleeker design since less space will be required to hold the cartridge.
Recycled Parts

A lot of parts in the cameras are recycled. To begin with, the film is sent back to the manufacturer to be developed and create the actual pictures. The roll which the film was on can be reused by the company in the next camera. The company can then take apart the camera and look for undamaged parts in the camera and use those parts for future cameras. However, when parts are ruined or malfunctioning, certain ones can be melted down and they molded into brand new parts for new assembly. Circuit boards also need to be recycled when optional as they are the most costly pieces to produce.

The Kodak single-use camera is made out from a number of different materials. These materials include mostly plastic, with different colors, copper, steel and silicone. The Kodak Company prides itself for creating a product that is mostly recyclable and reusable. According to Kodak, above 1.5 billion single-use cameras and similar products have been recycled and reused since 1990. It is apparent that they have the right to be proud of this this product given that up to 77% of each camera is reused or recycled to produce new cameras. This means that basically the only things that cannot be reused are the AA battery and the film itself. Internal parts that are in perfect working condition are just reused in newer cameras and everything else, such as the front and back cover are ground up and recycled to be cleaned and molded into new parts. This camera is an excellent example of a product life cycle that revolves around reducing waste and bettering our environment.

http://www.kodak.com/ek nec/PageQuerier.jhtml?pq-path=4213&pq-locale=it_US
http://gicl.cs.drexel.edu/index.php/Group_7 - Kodak Dispos able Camera