***baid*1. Identifying Information:**

Typo

Camera Redesign Project: Kodak FunSaver

EDSGN 100 Section 10 Group 6

Submitted to: Professor Jin

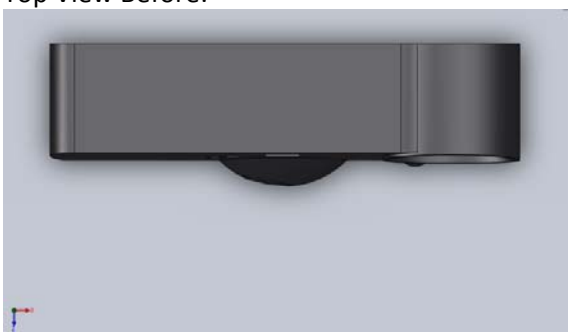
4 March 2011

2. Prototype Image or Sketches:

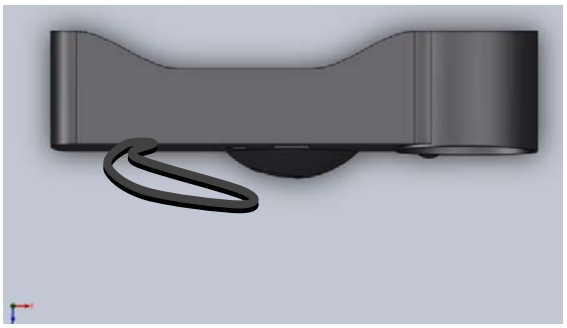
Isometric Before:

Isometric After:

Top View Before:



Top View After:



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3. Abstract:

For this camera redesign, our goal was to improve the product from the manufacturer's perspective. This inherently improved the product for the customer. The end result of the redesign reduced the amount of plastic by removing inner shell component and added a wrist strap by which to hold the camera.

4. Introduction and Mission Statement:

Introduction:

The goal of this camera redesign project was, in the end, to reduce the cost of production while improving the quality of the resulting camera. We started the process by brainstorming possible ideas as to what could and should be redesigned in the Kodak FunSaver Disposable Camera. We did background research to determine what would be valuable to the consumer, manufacturer, and servicer, and found that for its task the Kodak FunSaver performs remarkably well. Keeping the camera significantly under $10 is clearly a key attribute, we discovered. Also important was the durability, the ease of use, and possibly slightly the aesthetics.

Mission Statement:

Our product is designed for a consumer who needs a low-cost single use camera that is lightweight, durable, and still capable of taking good quality photographs.

Features:

Our redesigned product is geared toward the needs of the camera manufacturer, by integrating as many of the components together as possible and requiring fewer resources per unit.
Our design also includes improved features for the consumer, such as a smaller, slimmer design that is more portable and easier to store, as well as a wrist strap that reduces the chances of the camera being dropped and damaged or lost.

Concept Generation (see Customer Needs Analysis):
This section must be in the concept generation and selection part.

(A) Design the camera with a waterproof casing
Rejected- not feasible with plastic components
(B) Redesign the circuit to utilize a smaller battery
Rejected- smaller battery would not provide enough power and not cost-effective
(C) Redesign the film winding mechanism to make it faster
Rejected- we deemed the current design to be the best possible
(D) Change the color scheme of the camera to make it more appealing
Rejected- standard black with yellow sticker is the most suitable for a wide variety of situations
(E) Add a nylon strap to the camera
Accepted- extends the life and durability of the camera and makes it easier to carry
(F) Integrate components into each other and the front and rear shells
Accepted- makes camera thinner, requires less plastic, just as easy to manufacture and assemble

Competitors for Kodak Fun Saver Single Use Camera:
This section must be in the external research (i.e., benchmarking part).

Fujifilm Quicksnap 35mm $6.95 27 exposures, comparable quality, single use
Fujifilm Quicksnap Waterproof $8.27 27 exposures, waterproof up to 35 ft, single use
Kodak Easyshare Camera / M522 $99.95 Rechargeable batteries, high capacity memory card, 14 megapixel digital photos/video, 4x zoom, 2.7" color display
Fujifilm FinePix JX300 Camera $129.95 Rechargeable batteries, high capacity memory card, 14 megapixel digital photos/video, 5x zoom, 2.7" color display

5. Customer Needs Analysis:

We determined that the following customer needs were critical for the Kodak FunSaver. We determined this by observation of when the camera was used, who the camera was used by, and where the camera is generally sold. The following is the list of customer needs. Also listed are the weightings we assigned based on the significance of the attribute, in the opinion of group and through research.

Durability
Low Cost
Ease of Use
Ease of Changes
Recyclability
Accessibility
Aesthetics

Analysis of Customer Needs: This table is used for concept selection so it should be in the concept selection part.

Traits	Weighting	(A)	(B)	(C)	(D)	(E)	(F)
Durability	25%	+	0	0	0	+	0
Low Cost	20%	-	-	-	0	0	+
Ease of Use	15%	0	0	+	0	+	0
Ease of Changes	10%	-	0	-	0	0	0
Recyclability	10%	0	-	0	0	0	0
Accessibility	5%	-	0	0	0	0	+
Aesthetics	5%	-	+	+	+	0	+
TOTAL	-100% to 100%	-15%	-25%	-10%	5%	40%	30%

Column heading letters reference the Mission Statement Ideas.

From this, we decided to select the two greatest column totals, and so selected ideas (E) and (F), which are to remove the inner shell to reduce plastic and to add a wrist strap to the camera.

6. External Research:

The Kodak FunSaver will be likely most used as follows:
At Ceremonies
By Children
During Travel
In Extreme Conditions

Data Sheet 1A – Product Features

Product Features	Comments
1. Packaging (including information insert)Is it easily opened?	The packaging for the single use camera is very strong and almost difficult to open. Inside the plastic bag the camera is encased in a small cardboard box that offers further protection.
2. Aesthetics (multi-color, etc.)	The camera and outer packaging are both a yellow-orange color that makes it colorful, friendly, and appealing to the eye.
3. Interface location and its easy-of-use	Shutter – center of the front face of the camera, location makes it easy to keep fingers from blocking the lens Viewfinder – top center of the front face, easy to look through and aim the camera Film Rolling Wheel – top right of rear face, easily placed to be wound with right thumb Film Counter - small space on top left of the camera, placed to be easy to view and out of the way Flash – top left of front face, placed to provide optimal lighting for the picture Flash Charging Button – left middle of front face, easy to press with finger while holding the camera Charge Indicator – top middle of rear face next to the viewfinder, easy to see and next to where you put your eye for picture taking
4. Lens location	Middle center of the front face of the camera
5. Film location	Encased in the right side of the camera, beneath the film rolling wheel
6. Film transport mechanism	Rear middle behind the lens
7. Battery location	Encased within the middle of the base
8. Flash unit location	Partially encased within the upper right corner of the front face
9. Outer Housing Design (Ergonomics)	Comfortably fits within the average consumer's hands. Mostly rectangular but with rounded edges and curved plastic to fit shape of the hands
10. Quality	Made largely of lightweight, durable plastic. Also contains durable lenses and electrical components protected by

	the outer plastic casing
11. Safety	Casing prevents user from being electrically shocked, camera cannot be swallowed unless disassembled.
12. Versatility, attachments	Can be used to take pictures in a wide variety of conditions and situations. Comes in one package without any exterior attachments.
13. Weight with batteries	Fairly lightweight (1-2 lbs) making it easy to transport and store
14. Environmental friendliness	Operates on AA batteries which can be recycled and molded plastic which is also largely recyclable.
15. Other features	Film is capable of taking 27 pictures, bright flash enables photography in dim light, attractice name “Funsaver”

Data Sheet 1B –Product Dissection Information

Part #	Part Name	Functional Description & Material	Detachment (e.g., easy, difficult, use of force, etc)
1	Paper covering	Makes the camera colorful and has instructions and warnings for the camera use	Moderately difficult to remove. Must be slowly peeled from the case
2	Back Shell	Covers the rear of the camera, providing protection and structure- ABS Plastic	Moderately difficult, removal required a screwdriver to provide leverage
3	Front Shell	Covers the front face of the camera, connects with the back shell, provides holes for camera functions, such as lens, flash, flash charger, etc.- ABS Plastic	Easy to remove after the back shell is removed. Simply peeled off
4	Inner Shell	Provides an internal frame for the camera components. Basically what everything is built around-ABS Plastic	All other components were removed from this
5	AA Battery	Provides charge to capacitor to operate the camera flash- 1.5 V Alkaline Battery of steel and various materials	Easy to remove from contact casing
6	Standard Lens	Standard non-zoom photo lens- solid transparent plastic	Difficult to remove from casing
7	Lens Frame	Holds the lens and lens cover in place- ABS Plastic	Difficult to remove
8	Shutter	Allows light to enter camera and exposure of the film- Steel	Easy to remove
9	Shutter Spring	Allows rapid movement of shutter- Copper wire	Moderately difficult since it is a very small component

10	View Finder Lens/Pictures Remaining Window	Small transparent plastic lens that allows the user to see what they are taking a picture of and cover for the pictures remaining wheel	Easy to remove
11	View Finder Lens Brace/ Shutter Button	Securely holds the view finder lens within the camera case and the button the user presses to take a picture- ABS Plastic	Easy to remove
12	Film Advancing Wheel	toothed wheel that the user rotates with his/her thumb to advance the film- ABS Plastic	Easily slips off
13	Pictures Remaining Wheel	Small toothed wheel that shows the user how many pictures are remaining- ABS Plastic	Easy to remove
14	Film Advancing Gear	Small wheel with large teeth that fit into the holes in the film to guide the film along- ABS Plastic	Easy to remove
15	Winding Cam	Aids in proper winding of film- ABS Plastic	Moderately difficult
16	Shutter Arm	Small plastic arm that allows the camera shutter to move- ABS Plastic	Easy to remove
17	Shutter Arm Spring	Small, wound spring that allows the quick movement of the shutter arm- Steel Wire	Moderately difficult to remove, very small component
18	Advance Arm	Restricts film to advancing one frame at a time- ABS Plastic	Easy to remove
19	Flash Circuit Board	Small electrical circuit board that coordinates the flash bulb and capacitor- Silicon, solder, and various metal s and plastics	Moderately easy to remove
20	Flash Unit	Bulb, wire, and casing that creates a bright flash to enable photography in low-light conditions	Connected to Flash Circuit Board
21	Capacitor	Metal and plastic capacitor that builds up a charge to make the flash	Soldered to the Flash Circuit Board
22	Film Spindle	The film is stored wound around the spindle when it is placed in the camera- ABS Plastic	Easy to remove
23	KODAK 800 Speed Film- 27 exposures	When exposed to light, images are stored on the film enclosed within the case- various materials	Easy to remove

Data Sheet 1C – Market Presence

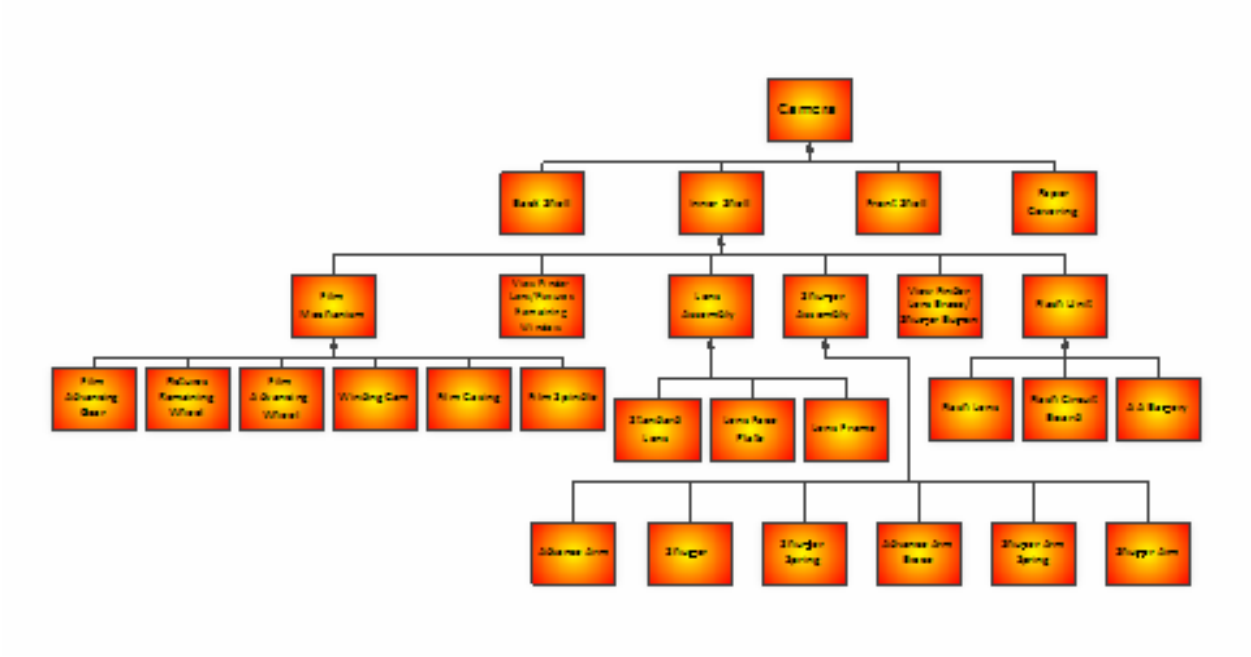
Cost (Be prepared to record multiple values and sources)	Continental Supply: $5.53 The Value Bay: $7.23 Cali_seller_2011: $14.99 J&R: $6.99 Ace Hardware: $11.41 BSD Supply: $5.50
How long has the product been in the market?	The very first camera was first described in detail by da Vinci in the 15th century. The first photograph was taken in 1826 by a Frenchman named Joseph Niepce, and the exposure took 8 hours. The first single use camera is claimed to have been created by A. D. Weir in 1949 and sold for $1.25. We can say then that the product has been on the market for just over 60 years.
Target population	Our target population will be the same as the people we considered the main customers: small children, those with a need for a camera that is waterproof, the need for a camera that doesn't matter if it gets destroyed, and for parties or other special events.
Versions of the product (Previous versions of the product)	The original single use camera, called the Photo-Pac, took 8 photographs and was approximately the size of a brick. Slightly smaller models were introduced in the 1980s by companies such as Kodak, though they still used the much larger 110 mm film. These models were improved with the addition of more photos per film and the use of 35 mm film (making the camera smaller still), and have since been improved with the addition of the flash, waterproof casing, and better lenses.
What are improvements between versions of the product?	(see previous)
How is it sold (TV infomercial, drugstores, etc.)	Most sales of single use cameras come from drugstores and grocery stores. Other larger supply stores such as WalMart and Kmart and entertainment locations such as theme parks also carry this product.
Patented Features (Please include patent dates).	5576781: Patent for the disposable camera as a whole, 5-16-944297017: Patent for automatic exposure time, simplifying camera use, 10-27-814522196: Waterproof camera casing designed for surgery, 6-11-854766451: Improvement of film casing in the camera, 8-23-884967214: Lens converter for cost-effective wider angle photography, 10-30- 90

Camera Dissection:

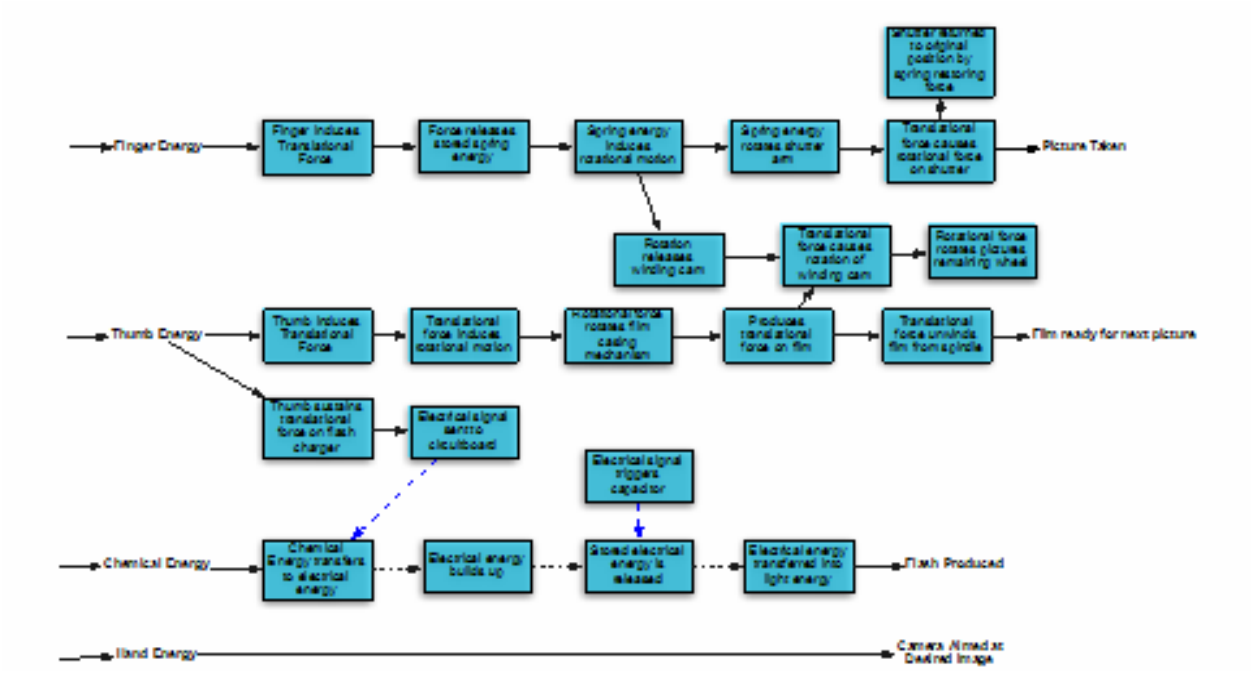
Label it please.

All the figures or diagrams shown below are not easy to read. Also, add some explanation for each chart or diagram.

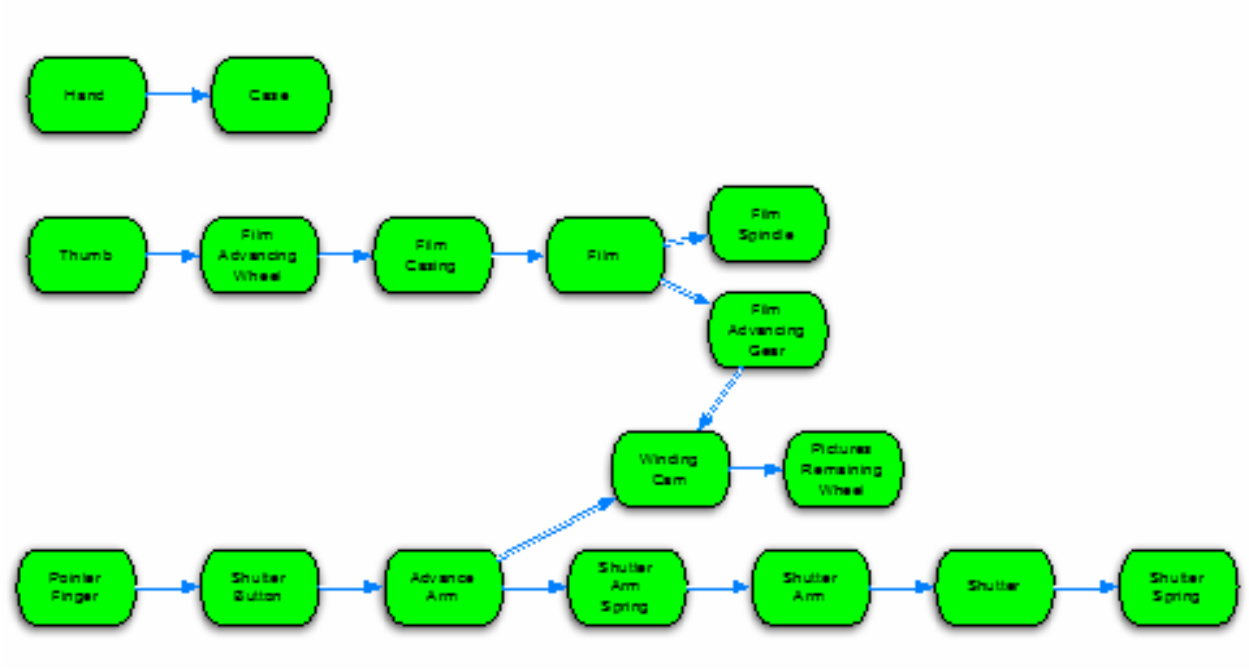
Production Assembly Chart



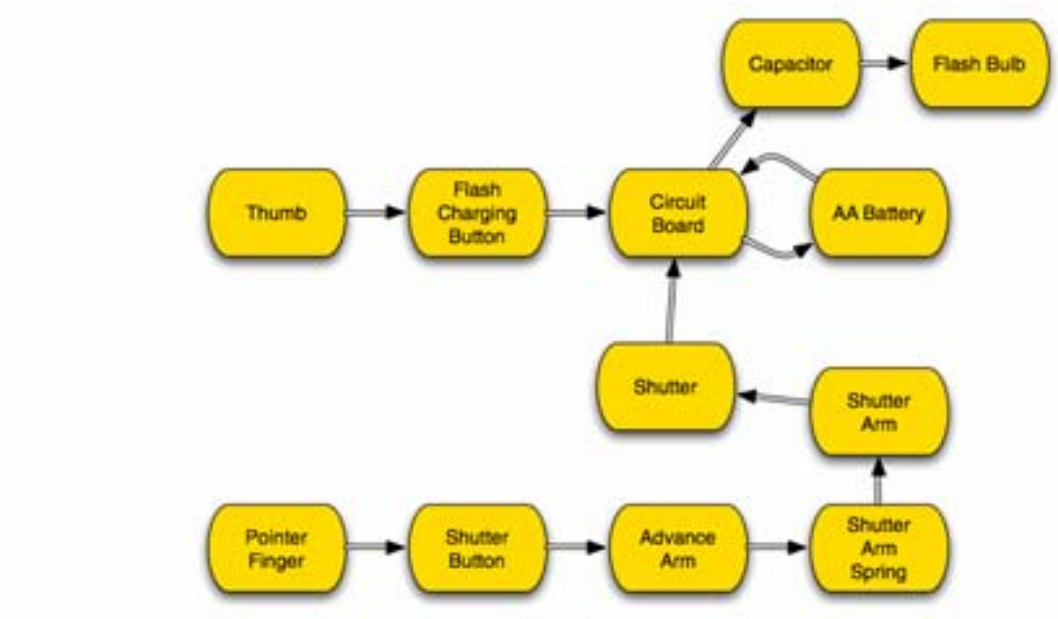
Product Functional Diagram:



Force Flow Diagram: Shutter



Force Flow Diagram: Flash



7. Concept generation and selection

Based on the result of customer needs analysis, durability, low cost, ease of use, ease of Changes, recyclability, accessibility and aesthetics, our group use brain storm to generate the concept for redesign related to customer need. Some of concepts are in the following line:

(1) Waterproof casing

Origins: information of Fujifilm Quicksnap Waterproof

(The FujiFilm QuickSnap Waterproof 35mm Film Camera is a great camera for underwater snorkeling and for those places where you don't want to take a chance of losing or damaging a finer camera whether point and shoot digital or SLR. That would include sandy beaches, pool areas and water-parks.)
Meeting customer need: avoid the damage to camera and increase durability
Result: Reject
Reason: plastic component cannot achieve waterproof

(2)Smaller battery

Origins: from the dissection of the camera, we find AA Battery is expensive compared with other part of camera and take much volume in the shell.

Meeting customer need: decrease the price to meet the low cost and reduce the volume of camera to meet the durability and also aesthetics.
Result: Reject
Reason: some scale of battery cannot provide enough power to flash and watch batter is available but the price is so high.

(3)Winding mechanism

Origins: the structure of previous transportation of film is so complex and *user spend* more time on rotating it to change to another film.

Meeting customer need: *More simple structure make* ease of use and durability and improve the aesthetics.
Result: Reject
Reason: we do not have clear and better design.
Use spelling checker before you submit.

(4)Change color scheme

Origins: more attractive appearance for customer.

(Although it is just a toy but colorful camera is really attractive)
Meeting customer need: Aesthetics.
Result: Reject
Reason: standard black and yellow versatile.

(5)Add nylon strap

Origins: when we took pictures we find the camera is easy to fall down from the hand and very difficult to be held.

Meeting customer need: increase the safety of the camera meets the durability and it the camera is not broken it can be recycled. Ease to be held increase the accessibility to camera.
Result: Accept
Reason: not hard to be achieved and the price is friendly.

(7)Integrate component to eliminate middle shell

Origins: some camera is really thin.

(Although digital camera, thin enough is easy to be held)
Meeting customer need: remove the inner shell to decrease the price and reduce the volume of the camera meet the customer needs of low cost, ease of use, and aesthetics.
Result: Accept
Reason: the idea is specific and it is worth to redesigning.

8. Embodiment Design and Final Design Description

Embodiment Design

- Firstly, we deal with the battery problem. We notice that the battery is supported by the inner shell and then connected to the circuit. Our idea is that fix the battery on the circuit directly with iron wires, like the way in which the capacitor is fixed. Then one part of the inner shell can be eliminated and one function of the inner shell can be transferred to the circuit.
- Secondly, in the original camera, the whole film mechanism and shutter assembly are held by the inner shell. We want to move these two parts onto the front shell and design a new part on the front shell to support the very detailed parts. So another function of the inner shell which is to support the film mechanism and the shutter assembly is transferred to the front shell. And at the same time, also combine the lens brace, shutter button, view finder lens, and pictures remaining window to the new designed part. So we have moved the main functions of inner shell to the front shell.
- Thirdly, right now, we have to find out a new position for another two main parts which are lens assembly and the chamber. Making the lens assembly part first, and then fix it onto the center of the front shell. After that, separate the chamber out of the inner shell and put it above the lens assembly, just make sure the chamber and the lens assembly fit each other very well. Finally, the whole inner shell can be got rid of.
- The last remaining part would be the film itself. We design to fix the film under the film mechanism and put a runner under the film to prevent it from falling down. So the film can also be fixed on the front shell directly.
- Add a wrist strap at the side of the camera case.

9. Conclusion and References

Conclusion:

This report introduced two main designs for a disposable camera. We presented information about introduction, mission statement, customer needs analysis, research, and final design description with very detailed description. The new designed disposable camera would be a little bit more expensive than original camera, but it is important to develop a more durable and much easier used camera for people to catch the funny moment in real life.

References: This is not a reference, but rather bibliography because you have not cited it in your report.

"Group 10 – Kodak Flash Camera"
http://gicl.cs.drexel.edu/wiki/Group_10_-_Kodak_Flash_Camera

Grade: 57 out of 60