

Athena Ross
Flow Visualization
Film 4151
Team assignment 3



I. Purpose

This image was created for the Flow Visualization course, Film 4151. It was the third team image. For this assignment the group decided to experiment with fire. For my image I wanted to look at the way a lighter creates a flame. The most difficult part of this assignment was getting the camera to work. I worked with Vigneshwaran Selvaraju.

II. Flow Apparatus

I used a standard lighter for this assignment. The lighter was filled Butane. When the spark wheel is turned using the force of my finger, my finger falls onto the fork, which releases the gas from the lighter and the momentum of the spark wheel creates a spark. When the spark comes in contact with the fluid it creates a flame, which is maintained as long as the fork is held down. Figure 1 shows the break down of lighters.

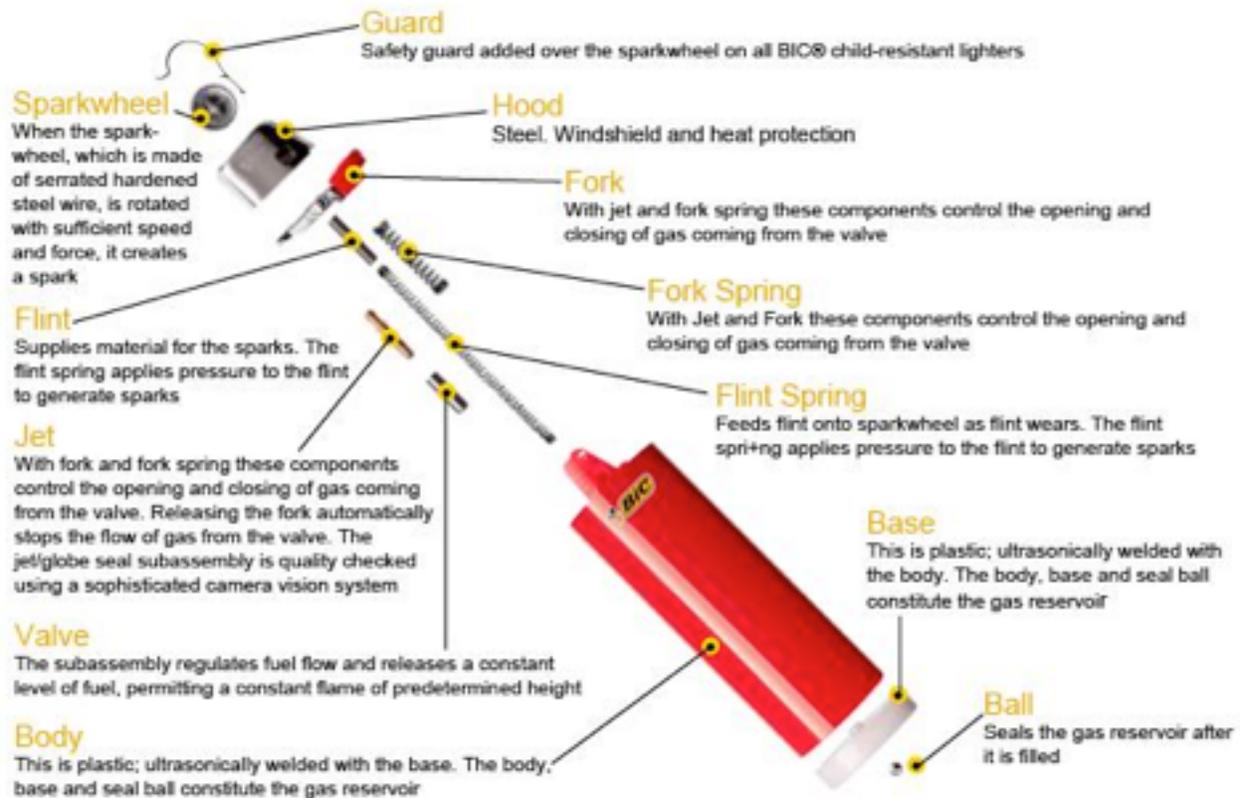


Figure 1¹

III. Visualization Technique

Large amounts of lighting were required in order to shoot at high frame rates. Two LED lights were placed on either side of the camera, slightly below it and pointed at approximately a 10 degree angle so they would shine onto the lighter and the background. One work light sat about 60cm away from the camera and pointed at a slight angle towards the subject.

IV. Photographic Technique

The video was taken on the Olympus I-Speed high speed camera at 400FPS. Information on ISO, F-stop, and aperture are unavailable because everything was automatic. The focal length was set to 1.3' to avoid having the lighter overly close to the lens, and also to make focusing easier so the subject wouldn't have to be at such a distance focusing became difficult. The lens used was 15mm lens.

Minimal editing occurred. The exposure was brought up in order to make things more visible since the image was dark, and the saturation was increased in small increments to give color. The hue of the colors was also changed to be slightly blue so as to keep a cold, industrial feel. All editing was done in Final Cut Pro X. Figure 2 shows an example of a frame from the original video. The original product was 2 minutes 29 seconds and it was edited down to 58 seconds, including credits and any sections of black. The final dimensions were 1920x1080, with an Apple ProRes 422 compression. Finally music was added. The song was entitled "Steel and Seeting". It was written by Kevin MacLeod and used under creative commons attribution licensing.



Figure 2

V. Conclusion

This image demonstrates how something as simple as a lighter works. It shows the motion in slow motion, giving a visual demonstration of the process of combustion. In the end I was very happy with this video. The image turned out well even given the low recording quality of the camera. If I could go back and do it again I'd try and get access to a camera that shot at a higher resolution, but otherwise I was very happy. Next time it would also be nice to have some sort of camera Manual. The camera didn't have one and it was impossible to find one online so I was left doing a lot of experimenting and spending time running unnecessary test runs in order to figure out the camera. It also would've been nice to have access to at least one more light since the original recording was kind of dark.

References

I.Vaganay, A. (n.d.). How does a BIC® lighter work? | mybiclighter. How does a BIC® lighter work? | mybiclighter. Retrieved April 29, 2014, from <http://www.mybiclighter.com/en/safety-quality/how-does-bicr-lighter-work>