
MAILBOX DELIVERY NOTIFIER

ME502 - Summer 2013

Project Presentation

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What is the Problem?

- Checking your mailbox when it is empty.
 - Rechecking, and keep rechecking.
 - Forgetting to check the mailbox.
 - Lower efficiency especially in businesses.
 - Missing mail carrier when planning to hand-off something for delivery.
 - Mail tampering and identity theft.
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Prior Art

- U.S. patent 6,046,675 by Robert L. Hanna
 - Mail delivery service
 - A system in which when the door is opened, a circuit is completed and a signal is sent to a receiver
 - The receiver lights up a LED
 - Some key words searched for: "mailbox", "mail", "indicator", "notifier", "notification", "wireless", "smartphone" etc.
 - Example search: (TTL/mail OR TTL/mailbox) AND (TTL/notification OR TTL/delivery OR TTL/indicator OR TTL/indication OR TTL/signal)
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Prior Art

- Mail Chime
 - Possibly the product of the patent on the previous page.
 - Sold on Ebay.

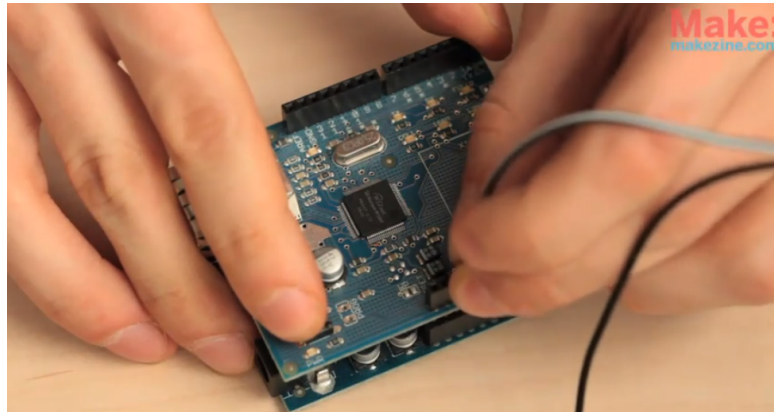


Prior Art

- DIY Mail SmartPhone Notifier
 - Done by LifeHacker.com



A switch



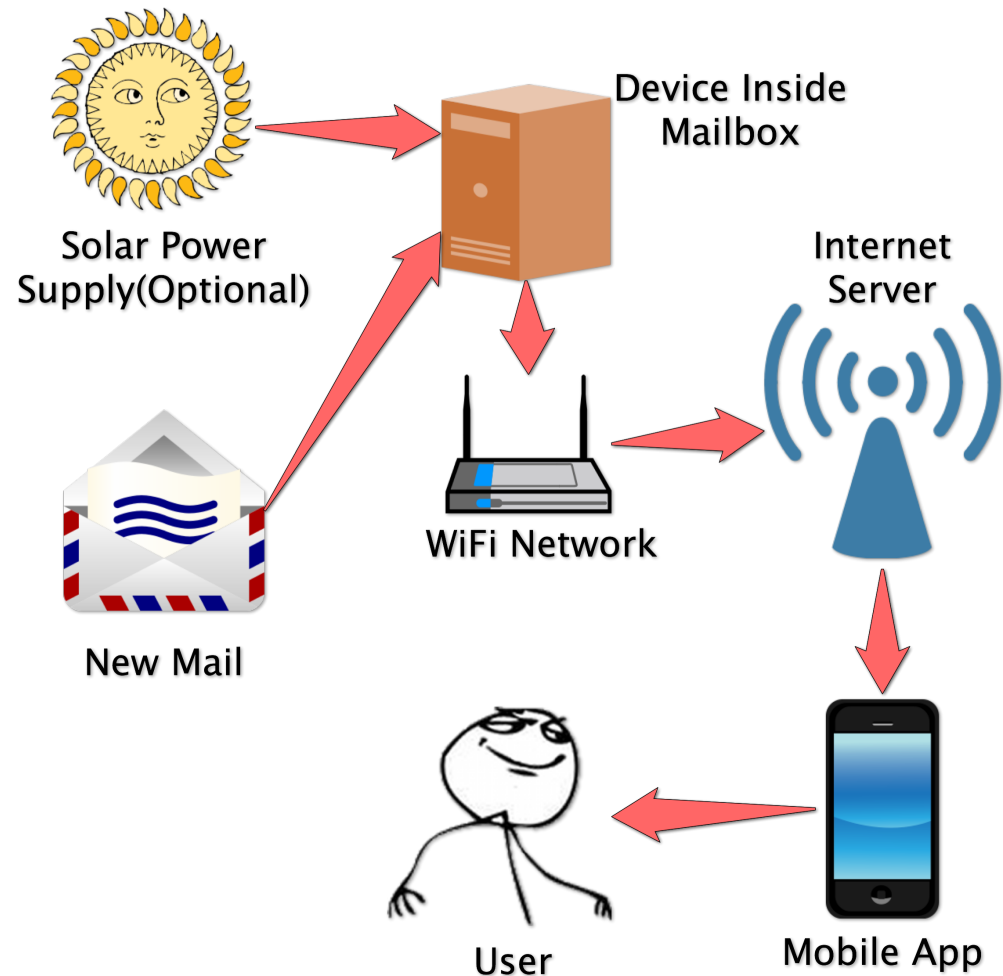
An Arduino

- Not wireless
 - Would not work with apartments where the latch is universal.
 - Another problem is, you receive a notification when you open the door yourself as well.
 - You would go check only to find out it is spam.
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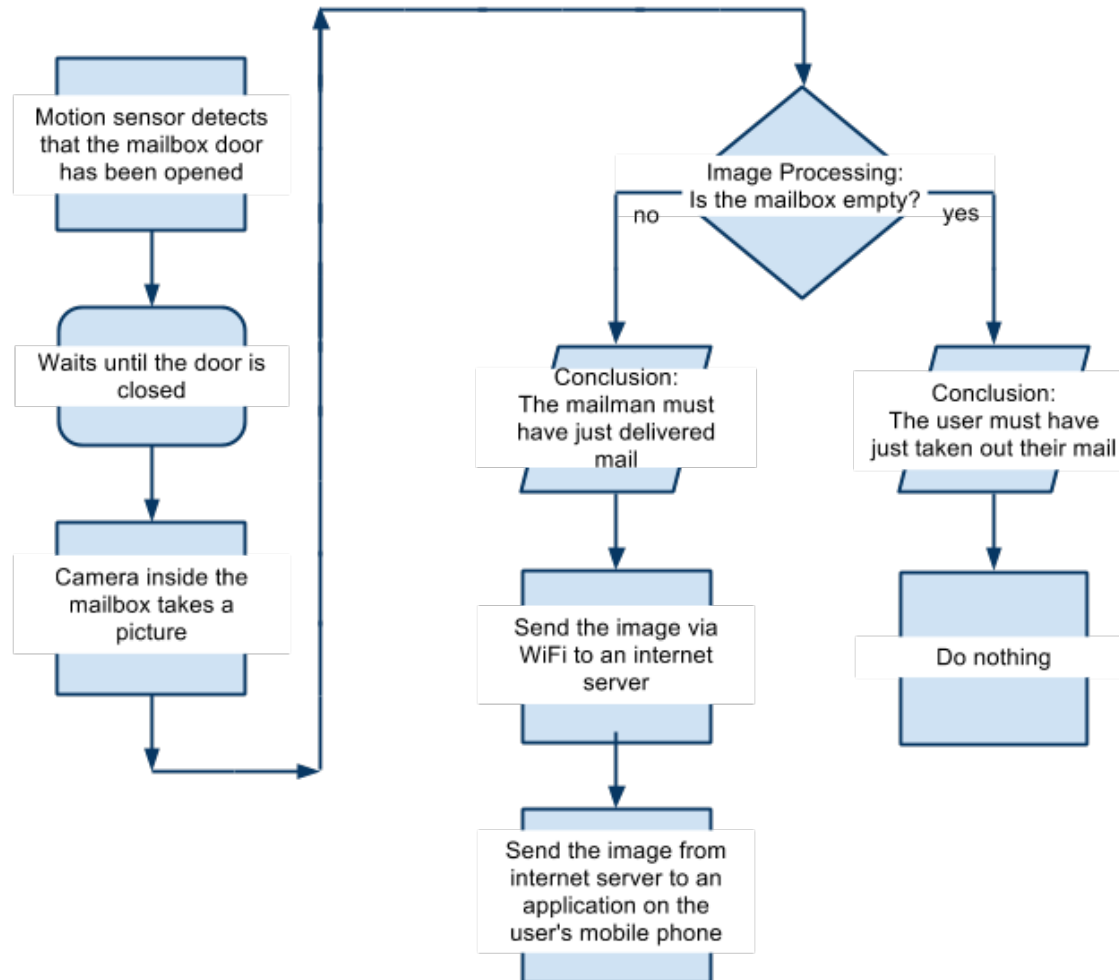
Our Solution

Workflow

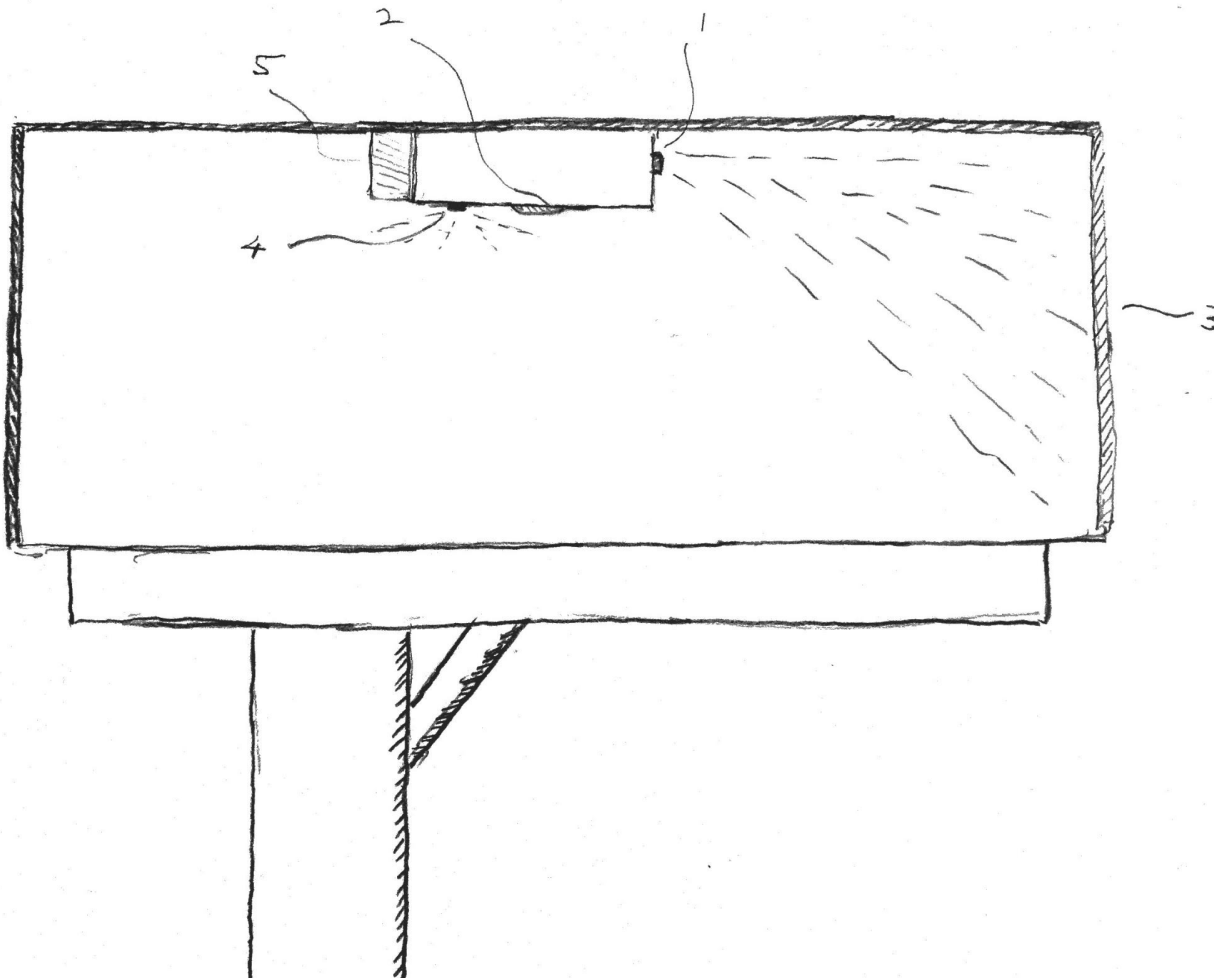
- Battery/Solar
- Wifi Signal
- Internet Server
- Mobile App



Flowchart



Drawing



1. Sensor

2. Camera

3. Door

4. Flash

5. Battery

Mechanisms

- **Camera** takes a photo after open-and-close of latch
 - **Image Processing Unit** compares current photo with "empty state" photo
 - If not empty, send a **notification** to user
 - **Hibernate** when not triggered
 - Every device has a unique **ID**
 - User **registers** the app with the ID
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Patentability: Why this is novel

1. With mobile app, get notified remotely.
 2. By camera, check mail information instantly.
 3. Works for apartments with universal latch.
 4. Won't notify when user takes mail out.
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Major Patent Claim

1. A mail delivery notification system that alerts a mobile device application of the presence of physical mail in a designated mailbox, comprising of:
 - a. a sensor that detects the opening and closing of a mailbox door;
 - b. a camera that takes a picture of the mailbox contents;
 - c. an image processing unit that determines if mail has been delivered;
 - d. a battery and/or solar panel;
 - e. internet access through a WiFi network;
 - f. an accompanying mobile software application that receives the mail delivery notification and image.
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Commercialization: Potential Market

- Fact: 300 Mail Chime units are sold according to Ebay page.
Also sold on their website.
(People need better product!)
- Fact: In each day, 1 million people visit usps.com
- Demand: USPS delivers to more than 152 million homes, businesses and P.O boxes



Commercialization:Cost

- Cost of each device

- Wifi module: \$3
- motion sensor: \$3-6
- Camera CMOS sensor: \$9
- DSP unit: \$6-10
- Total: \$21-28

- Cost of Software

- Smartphone app:(one-off development)
 - 1 developer: $20 \text{ days} * 8 \text{ h/day} * \$30/\text{h} = \$4800$
 - Server (per year):
 - Amazon EC2(small): $365 * 24 * \$0.06/\text{h} = \525
 - EC2 (extra large): $365 * 24 * \$0.48 = \4200
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Commercialization: Estimate

Market penetration: 0.2%

Estimate # sold: 152 million * 0.2% = 0.3 million

Estimate unit price: 35

Estimate revenue: 0.3 million * 35 = 10.5 million

approx. profit: 0.3 million * (35-28) = 2.1 million

Commercialization:Barrier of Entry

- Competitor: Mail Chime is sold for \$44.95.
 - Power consumption.
 - WiFi network range: routers running 802.11n have an approximate range of 300 ft indoors and 600 ft outdoors.
 - Installation difficulty.
 - Needs to be sold for a competitive price.
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Questions

