Product Design Specifications – February 12th 2008

Device to Assist in Removal of Pills from Bubble Wrapped Packaging

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Problem Statement

Patient safety issues involving the improper use of medication has lead to packaging of over the counter drugs that is increasingly difficult to access. This type of packaging is referred to as blister pack or bubble wrap style packaging and it is especially challenging for elderly patients with decreased hand strength or others with hand weaknesses or deformities. These difficulties lead struggling patients to alternative access methods that are often dangerous. It has been proposed to design a device capable of aiding patients in the removal of over-the-counter medication from bubble wrap style packaging.

Client Requirements

The prototype must be designed to meet the following requirements set forth by the client

- Device must require little hand strength
- Device must be able to remove a variety of over the counter drugs which vary in size and shape
- Device should be able to open punch out blister packaging and peel away packaging
- Device should be designed to fit on a kitchen countertop
- Device can contain no exposed blades or mechanisms that may be dangerous to elderly users
- Device must leave pills unaltered following removal from packaging

Design Requirements

Physical and Operational Characteristics

a. *Performance requirements:* The pill removal device must provide adequate assistance in removing pills from difficult packaging while requiring little hand strength. Device must remove pill from packaging unharmed and should require no more than one attempt to remove. Pill should be delivered to a location where it is easy for the patient to pick up and take the pill.

b. *Safety:* The device should contain absolutely no sharp edges or exposed blades and should be designed to minimize the potential of injury due to pinch in mechanical/moving parts. If moving blades are to be incorporated, a safety mechanism must keep them unexposed throughout use.

c. *Accuracy and Reliability:* This device should be capable of opening the pill on the first trial. It should also be designed such that it is easy to configure (align pill packaging with removal device). Device should not cut, crush, or shave the pill, or alter it in any manner.

d. *Life in Service:* If used properly, this device should not have a limited life in service, barring any unforeseen electrical or mechanical malfunctions.

e. *Shelf Life:* The pill removal device will likely be stored on a kitchen/bathroom countertop or closet. If stored in a safe environment, the shelf life of the device should be unlimited. There is

potential for the device to become defective if contacted with any outside agents such as water or cleaning solution.

f. *Operating Environment*: The first generation device will be designed primarily for home use.

g. *Ergonomics*: The device should be designed according to human factors and ergonomic principles. The product/user interface should be designed for comfort and ease of use, keeping in mind the age of the projected user. All adjustment controls should be large and very simple to use. In addition any instructions to be printed on the device should be written in large font with significant contrast making them easy to read for the elderly user. It may be important to consider anthropometry in later generations.

h. *Size:* The device should be designed to fit on a countertop and be easily stored in a household closet.

i. *Weight:* Device should be designed such that it is easily transported by an elderly user from room to room within his or her own home.

j. *Materials*: Materials used for this design should be non-hazardous, lightweight and durable.

k. *Aesthetics*, *Appearance, and Finish*: Device should be aesthetically appealing in a home kitchen or bathroom setting.

Production Characteristics

a. *Quantity*: Initially one prototype will be constructed, however there is potential for mass production if device is deemed patentable.

b. *Target Product Cost*: The cost of the device should not exceed $1000, however the design team is confident that a working prototype can be constructed for far less money than that.

Miscellaneous

a. *Standards and Specifications:* This product is not required to meet any standards put forth by an outside organization. All requirements are specified above, and have been provided by the client.

b. *Customer:* The target customer for this device will be primarily elderly patients with decreased hand strength and dexterity.

c. *Patient-related concerns:* The device should be easy and safe to use and present minimal harm to the patient if used both properly or improperly.

d. *Competition:* Currently there is no commercially available device that fit these exact specifications. There are similar devices however they still require substantial hand strength for use. Further research will be necessary to determine whether the proposed design is a patentable idea.