

EZ DUMP Commercial Trash Receptacle Competitive Evaluation Feb 2014

Phase 1_ Initial Engineering Evaluation and Opinion Velasquez_ Jose

Industry Analysis:

Focus Industry: Commercial Trash Receptacles and Refuse Containers

Industry Description:

Within the commercial waste receptacle arena there are multiple product options with which a commercial operation may choose in relation to their options for refuse receptacles. These options include both metallic and polymer based material choices. It is the intent of this proposal to focus on Thermoplastic refuse containers and in particular the EZ Dump SmartcanMax™ commercial trash receptacle with a removable base.

The commercial refuse receptacle industry is rather stable and multiple manufacturers participate in supplying competitive products into the marketplace. For reasons to be discussed below, it is the opinion of this report that **within this particular industry there is currently no option for improving the safety of user with respect to lift hazards and ease of removal of a liner from a refuse receptacle.**

Thermoplastic refuse containers offer enhanced durability and greater resistance to environmental hazards such as corrosion and various chemical sensitivities that metallic containers are susceptible to. With added UV stabilizers, outdoor use is prolonged. The added ability to easily color polymer based receptacles also allows greater customer choices in matching certain decorative needs.

As a human factors specialist there are many instances of injury based on exertion due to lifting heavy loads over and beyond ones waistline. It is the intent in the following discussion that there are multiple advantages for split container receptacle capabilities inherent in the proposed design. The intent of this opinion is to provide additional substantive reasoning for the improvement in features in refuse receptacle design provided by the EZ DUMP design proposal. Below is a brief overview of the problem.

The Problem:

As mentioned earlier there are a few resultant problems with current standards for receptacle containers. Although the current standards provide for the ability for a receptacle to withstand the abusive use and recurrent cleaning of surfaces, it also includes the need for the container to be water tight. It is important to note, this discussion is simply advocating for the ability of a refuse receptacle to disengage its base in order for the user **to not have to lift its contents above their waist** when removing a full liner.

In instances where liquid egress is deemed hazardous such as in medical refuse or the greater hazard of sharps protruding through the liner, than the standard can remain in effect. It is just this activity, that of lifting the liner above ones waist which

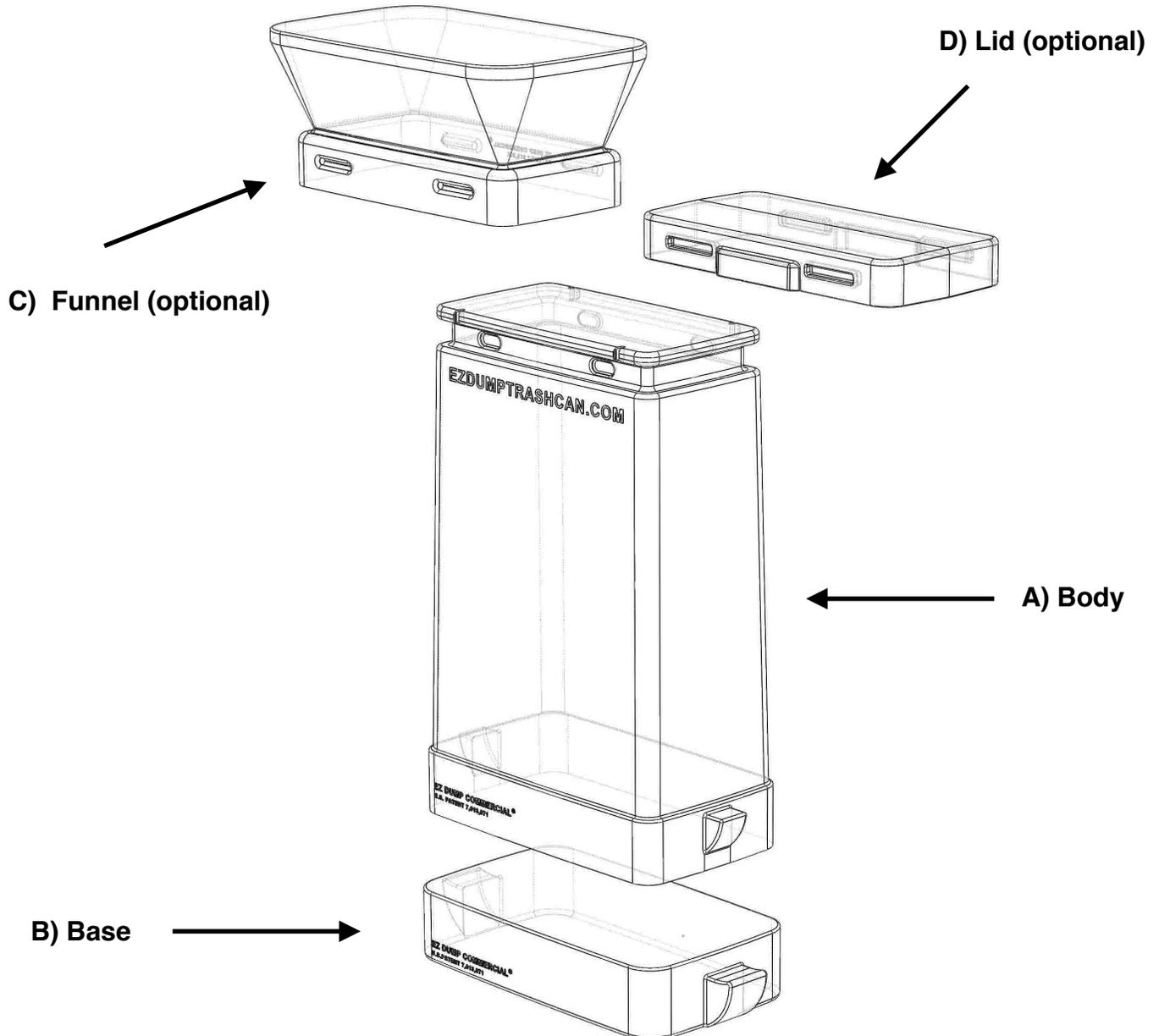
puts the user at an increased risk of injury.

This need to lift the entire contents of a receptacle above one's waist to remove it from the container has been consistently shown to be detrimental to the user. With continual and repetitive lifting of large amounts of weight above one's waist injuries will eventually occur.

An Alternate Solution:

In reference to the below image one will immediately notice that the top middle and base of the **EZ Dump SmartcanMax™** are four separate pieces. The intent here is to allow the user to be able to remove the support structure of the receptacle to expose the inner polymer flexible liner. Effectively, a user will tie off the liner prior to removal of the center structure.

Image 1



Method: Removal of inner liner once filled to intended capacity

With reference to Image 1 you will notice there are 4 main parts to the intended design improvement. Listed below with descriptions.

A_ main body of receptacle with a ...

B_ bottom structure that is capable of removal from part A

C_ funnel cape to assist in the disposal of trash with a wider mouth opening

D_ removable lid to be placed either on part A

The main body of the proposed design solution allows for the main body to be easily removed from the base. It is important here to note that based on the requirement for the receptacle to be 0.5% or less in physical weight than what the receptacle may hold, removal of this component is much less effort intensive than the lifting the entire contents of the receptacle from inside itself. Benefits here are.....

- No need to lift the entire contents above one's waist.
- Foot activated disengagement from base leaving hands free
- Damage to base part would require replacement rather than a new entire unit
- Funnel attachment allows for easy filling of the receptacle.

Once the main body of the receptacle is removed from its base than the inner liner with its contents sits upon the base structure. A user than can remove the liner by lifting the contents minimally the height of 3.5 inches to clear the base part B rather than the typical 33 inches for all other commercial refuse containers.

This ability to allow the contents to remain close to the floor is the key to the ergonomic benefits of the proposed solution. Without proper training, and the assumption that training provided does not guarantee proper posture when using traditional receptacles the proposed solution provides a alternative to the forced lifting of a traditional method and structure.

Material: Thermoplastic Polymer

High-density polyethylene (HDPE) and linear low-density polyethylene (LLDPE)

These particular polymer families are conducive to the benefit of having great qualities in the following areas of physical characteristics.

Materials characteristics: HDPE LLDPE

- Material chemical resistance is high.
- Resistance to abrasion and long life cycle use is great.
- Impact resistant high....
- Resistant to stress cracking due to manufacturing method of rotational molding
- Material is recyclable.

Common In Use Observations: of traditional receptacles.

By observational monitoring and ethnographic research of the commercial environment, some common activities were observed.

- Many receptacles were filled to over capacity, making them conditionally more problematic when emptying the receptacle.
- Many of the receptacles were filled with materials that protruded from the top of the container.
- Recyclables and landfill trash mixed within the same receptacle.
- Liners rarely able to withstand the rigors of an entire day without failing seal.
- Lifting of overfilled container or liner from container made for unsafe conditions.
- Lifting of inner liner by short stature individuals nearly impossible.
- Open top of most receptacles were prone to being missed as the target zone.
- Almost all containers were greater than 30 inches in height.

Proposed Benefit and User Centered Approach to Removal of Internal Liner:

With the increased awareness of adverse events of stress/strain injuries on skeletal and muscular systems along with repetitive use injuries accrued during employment activities, it is apparent that continuous improvement in the area of reducing lifting injuries is a serious concern. So much so, focusing on the reduction of these injuries by way of reducing the constant lifting necessary with today's receptacle designs is the key opportunity offered in presenting this alternative to the commercial refuse receptacle market.

Additional improvements in the retention of the liner with **C) Funnel** along with the ease of removal of said liner once full is the **novel approach to trash removal for commercial settings.**

With the added benefit of the **funnel design to Part C** to the receptacle design, these benefits enhance the usability of the design improvements. Below are the manufacturers perceived benefits to the design.

Opportunities:

- Innovative new product design: novel invention, patented technology
- Reduction in commercial accidents with lifting injuries.
- Ease of user activity throughout cycle of trash removal to new liner.
- High impact polymer utilization with rotational molding capabilities.
- Efficiency gains in automated manufacturing.
- Additional capacity of the main structure.

New product opportunities in the Commercial Refuse Container industry are rare and remain difficult to implement due to from costly development hurdles. Many industries throw around the concept of INNOVATION as if it is a clearly defined process that can be applied at will. In reality, the act of product innovation is a confluence of many interrelated activities and events administered by a unique set of personnel and expertise working within a team based development activity.

Innovation is key for the industry to thrive in the US and Europe. Any consumer product device definition of Innovation is crucial here. **Innovation in a refuse container is very rare let alone unique as this is in a completely new product, protected by an intellectual property.** Unfortunately these advances are tempered when confronting the preconceived standards that were relevant to past efforts in receptacle design.

In Conclusion:

The commercial refuse receptacle industry has many intriguing future business directions that can be exploited by advancements in user centered design efforts. The industry relies upon innovation and the development of novel apparatus' to improve user competency and usability. Safety of the user is critical to the success of any commercial use of a product due to litigation and employee injuries looming over any employer. It is this concern within the US and European standards that have driven advances within this particular novel approach to refuse receptacle design.

It is the goal of this discussion to identify opportunities utilizing advanced design approaches and related ethnographic user realities that will define a particular product need. The ability to define user activities and the inherent ergonomic realities to a given activity, identify the failures of a given design and provide a unique approach to a solution to the problem is evident in the approach provided by the EZ Dump SmartcanMax™.

Below are the listed benefits provided to me by the Manufacture in preparing this evaluation. Found on www.ezdumpcommercial.com

Design Benefits: reference www.ezdumpcommercial.com

1. The EZ Dump SmartcanMax™Max™ base can be easily replaced at a fraction of the cost of a traditional garbage can and the EZ Dump SmartcanMax™Max™ body can be reused repeatedly.
2. The EZ Dump SmartcanMax™Max™ body fits inside the base, so spills on the outside wall of the can collect inside the EZ Dump SmartcanMax™Max™ and not on your floor.
3. The EZ Dump SmartcanMax™Max™ removable base virtually eliminates all back and upper body strain caused from trying to lift a full trash bag out of a traditional trash can.
4. The EZ Dump SmartcanMax™Max™ eliminates the potential of torn bag liners when removing the bag.
5. The EZ Dump SmartcanMax™Max™ large funnel easily locks the bag liner in place everytime. If you prefer, you can simply use the V-grips already integrated into the SmartcanMax™Max™ rim to lock the bag liner in place.
6. The EZ Dump SmartcanMax™Max™ allows you to fill your trash bag to its full capacity, so you use fewer trash can liners and eliminate frequent emptying, which increases employee productivity.
7. The EZ Dump SmartcanMax™Max™ potentially reduces workers' comp claims by eliminating back and upper body strain.
8. The EZ Dump SmartcanMax™Max™ finish is smooth, so it is easier to clean and maintain. Employees can wash the base, funnel and body easily.
9. The EZ Dump SmartcanMax™Max™ is also made of 100% recyclable material.
10. The EZ Dump SmartcanMax™Max™ can be customized with graphics, branding, or colors of your business, hospital, school, or university. These can be embedded in the plastic and are not removable.

ADDITIONAL ACCESSORIES/OPTIONS

For government and military clients we offer a flat lid that latches in place.

Replacement bases extend the life of your EZ Dump SmartcanMax™Max™ and reduce your replacement costs.

Advertising sleeves slip over the outside of the EZ Dump SmartcanMax™Max™ for revenue generation.

Full EZ Dump SmartcanMax™Max™ surface customization is available.

Please if you have any questions feel free to email me at the following address.

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