

J-Component Report

Course: MEE1009 -New Product Development

2 IN 1 DUAL SANITIZER AND PERFUME BOTTLE

By

19BME1321

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1. IDENTIFYING MARKET OPPORTUNITIES.

The global hand sanitizer market size valued at USD 2.7 billion in 2019 and is expected to grow at a compound annual growth rate (CAGR) of 22.6% from 2020 to 2027. Shifting consumer preference towards convenient hygiene products is expected to drive the market. In addition, the recent COVID-19 pandemic at the beginning of 2020 has spurred the market for hand sanitizer. Pump bottles are an easy way to dispense hand sanitizer and are widely used in multiple end-use industries such as institutions, hospitals, household purposes, offices, and manufacturing industries. The pump bottles are ideal to use as it ensures minimal contact with other surfaces and also saves time.

Thus I have made 2 in 1 Dual Sanitizer and Perfume Bottle which has a common spray nozzle for both the liquids. It has a pump sanitizer system which acts alternatively with the Perfume based on customer use.

- Our product is unique as there is no other similar product in the market.
- The cost of separately buying sanitizer and perfume is costly.
- Our product has good aesthetic design, thus adding to the unique feature of the product
- Our product product is useful for tourists and people who can't carry perfume and sanitizer both at once.
- Our product would be in high demand due to sudden rise in use of sanitizers and pleasant smell of perfume.

2. UNDERSTANDING CUSTOMER AND USER NEEDS

The current climate of COVID 19 Pandemic has invariably forced each and every individual to carry and use a sanitizer such that it is handy and easily portable. Every individual usually carries a perfume with them where ever they go. The idea came from the trouble people face in carrying both a perfume and a sanitizer with them at the same time. Moreover, travellers and tourists need to carry sanitizers in their luggage and perfumes needs to be carried separately along with it. This causes space constraint and also increases the weight of the baggage.

2 in 1 Dual Sanitizer and Perfume bottle's aesthetic appearance of hexagonal designed outer glass along with added advantage gives the customer a product that would satisfy their need.

The customer will have expectations from any product . Thus we are catering to their expectations by understanding their needs from our product. Their expectations are:

- The fragrance of the sanitizer
- The fragrance of the perfume
- Easy to use
- Easy rotation of the bottle without much application of force
- No possibility of leakage
- No possibility of mixing of the two liquids
- Durability
- Be aesthetically pleasing
- The effect of sanitizer against bacteria and viruses
- Long lasting of perfume

3. TRANSLATION OF NEEDS INTO SPECIFICATIONS

The needs of the customers are turned into specifications of the product

- The fragrance of the sanitizer
- The fragrance of the perfume
- Easy to use
- Easy rotation of the bottle without much application of force
- No possibility of leakage
- No possibility of mixing of the two liquids
- Durability
- Be aesthetically pleasing
- The effect of sanitizer against bacteria and viruses
- Long lasting of perfume

The fragrance of the sanitizer

The fragrance of the sanitizer is important for the user. Mostly sanitizers are mainly used in hands, they need to be of refreshing fragrance. They need to smell good and pleasant. Thus the sanitizer used would be of premium quality without any compromise in smell.

The fragrance of the perfume

Perfume fragrance has to smell fresh. It has to be smelt by other people thus being an effective perfume spray. This is ensured in the product.

Easy to use

The bottle can be used pressing the perfume nozzle to get the preferred liquid. If it gives sanitizer, twist the outer bottle body to the left by 180° and the user can get perfume. In this way both the liquids can be used by the user in an easy manner.

Easy rotation of the bottle without much application of force

The rotation of the bottle is easy as the material is glass instead of metal which could be prone to rusting. The glass ensures smooth rotation thus resulting in not much application of force.

No possibility of leakage

The possibility of leakage is extremely less and next to nil due to the design of the product. It has plate like structure above the liquid containers that ensure that liquid from either containers don't leak.

No possibility of mixing of the two liquids

The two liquids in their specific containers are packed tightly without any leakage. This is ensured by the barrier that prevents the mixing of liquids and makes a barrier such that it is easy for the user to identify the liquid.

Durability

The durability of the product is maintained due to its design and materials. The nozzle is made of material **Polyethylene terephthalate**, the outer body i.e the bottle is of glass. Thus durability is managed.

Be aesthetically pleasing

The outer body is given an aesthetic appearance by a hexagonal designed outer glass. The color purple of the body makes the customer want to purchase it.

The effect of sanitizer against bacteria and viruses

The ethyl-based sanitizer segment has witnessed tremendous growth since the impact of the COVID-19 pandemic. The growth opportunities can be attributed to the fact that these sanitizers are 40% more effective against viruses than normal sanitizers. Thus ethyl based sanitizer is the only sanitizer that comes in our product.

Long lasting of perfume

Perfumes come in various concentrations. The higher the concentration, the more fragrance -- and the longer the scent will last. The base notes are the final scent to develop and last the longest. They're also a fixative that slows down the evaporation of the top and middle notes, making the overall scent last longer. Our perfumes being of higher concentration and of base notes last longer than other perfumes.

4. COMPETITIVE BENCHMARKING.

Needs and Benchmarking	2 in 1 Dual Sanitizer and Perfume bottle	Hydra Cup- 2 in 1 Shaker and Water bottle	ORILEY Skin Care Hand Sanitizer	GRN Travel Refillable Perfume Glass Bottles
Two liquids	X	X	-	-
Single outlet	X	-	X	X
Leak proof	X	X	X	X
Durability	X	X	X	X
Easy to use	X	X	X	X
Aesthetically pleasing	X	X	-	-

2 in 1 Dual Sanitizer and Perfume Bottle



Hydra Cup- 2 in 1 Shaker and Water bottle



ORILEY Skin Care Hand Sanitizer



GRN Travel Refillable Perfume Glass Bottles



5. TRIZ METHODOLOGY OF INVENTIVE PROBLEM SOLVING

TRIZ presents a systematic approach for understanding and defining challenging problems: difficult problems require an inventive solution, and TRIZ provides a range of strategies and tools for finding these inventive solutions. One of the earliest findings of the massive research on which the theory is based is that the vast majority of problems that require inventive solutions typically reflect a need to overcome a dilemma or a trade-off between two contradictory elements. The central purpose of TRIZ-based analysis is to systematically apply the strategies and tools to find superior solutions that overcome the need for a compromise or trade-off between the two elements.

Worsening Feature		Physical										Performance										Efficiency										Utility										Manufacture/Cost										Maturement																																																																																																																																																					
Improving Feature		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																																																																																																				
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Utility	Features	1	Weight of Moving Object	2	Weight of Stationary Object	3	Length of Moving Object	4	Length of Stationary Object	5	Area of Moving Object	6	Area of Stationary Object	7	Volume of Moving Object	8	Volume of Stationary Object	9	Speed	10	Force	11	Energy	12	Power	13	Stress	14	Stability	15	Temperature	16	Humidity	17	Pressure	18	Conductivity	19	Optical Density	20	Acoustic Density	21	Thermal Conductivity	22	Thermal Expansion	23	Thermal Contraction	24	Thermal Stability	25	Thermal Resistance	26	Thermal Insulation	27	Thermal Protection	28	Thermal Shielding	29	Thermal Isolation	30	Thermal Separation	31	Thermal Segregation	32	Thermal Segregation	33	Thermal Segregation	34	Thermal Segregation	35	Thermal Segregation	36	Thermal Segregation	37	Thermal Segregation	38	Thermal Segregation	39	Thermal Segregation	40	Thermal Segregation	41	Thermal Segregation	42	Thermal Segregation	43	Thermal Segregation	44	Thermal Segregation	45	Thermal Segregation	46	Thermal Segregation	47	Thermal Segregation	48	Thermal Segregation	49	Thermal Segregation	50	Thermal Segregation	51	Thermal Segregation	52	Thermal Segregation	53	Thermal Segregation	54	Thermal Segregation	55	Thermal Segregation	56	Thermal Segregation	57	Thermal Segregation	58	Thermal Segregation	59	Thermal Segregation	60	Thermal Segregation	61	Thermal Segregation	62	Thermal Segregation	63	Thermal Segregation	64	Thermal Segregation	65	Thermal Segregation	66	Thermal Segregation	67	Thermal Segregation	68	Thermal Segregation	69	Thermal Segregation	70	Thermal Segregation	71	Thermal Segregation	72	Thermal Segregation	73	Thermal Segregation	74	Thermal Segregation	75	Thermal Segregation	76	Thermal Segregation	77	Thermal Segregation	78	Thermal Segregation	79	Thermal Segregation	80	Thermal Segregation	81	Thermal Segregation	82	Thermal Segregation	83	Thermal Segregation	84	Thermal Segregation	85	Thermal Segregation	86	Thermal Segregation	87	Thermal Segregation	88	Thermal Segregation	89	Thermal Segregation	90	Thermal Segregation	91	Thermal Segregation	92	Thermal Segregation	93	Thermal Segregation	94	Thermal Segregation	95	Thermal Segregation	96	Thermal Segregation	97	Thermal Segregation	98	Thermal Segregation	99	Thermal Segregation	100	Thermal Segregation
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3. Local quantity

Change an object's structure from uniform to non-uniform, change an external environment (or external influence) from uniform to non-uniform.

- Use a temperature, density, or pressure gradient instead of constant temperature, density or pressure.

Make each part of an object function in conditions most suitable for its operation.

- Lunch box with special compartments for hot and cold solid foods and for liquids.

Make each part of an object fulfill a different and useful function.

- Pencil with eraser
- Hammer with nail puller
- Multi-function tool that scales fish, acts as a pliers, a wire stripper, a flat-blade screwdriver, a Phillips screwdriver, manicure set, etc.

17. Another dimension

To move an object in two- or three-dimensional space.

- Infrared computer mouse moves in space, instead of on a surface, for presentations.
- Five-axis cutting tool can be positioned where needed.

Use a multi-story arrangement of objects instead of a single-story arrangement.

- Cassette with 6 CD s to increase music time and variety
- Electronic chips on both sides of a printed circuit board
- Employees *disappear* from the customers in a theme park, descend into a tunnel, and walk to their next assignment, where they return to the surface and magically reappear.

Tilt or re-orient the object, lay it on its side.

- Dump truck

Use 'another side' of a given area.

- Stack microelectronic hybrid circuits to improve density.

19. Periodic action

Instead of continuous action, use periodic or pulsating actions.

- Hitting something repeatedly with a hammer
- Replace a continuous siren with a pulsed sound.

If an action is already periodic, change the periodic magnitude or frequency.

- Use Frequency Modulation to convey information, instead of Morse code.
- Replace a continuous siren with sound that changes amplitude and frequency.

Use pauses between impulses to perform a different action.

- In cardio-pulmonary respiration (CPR) breathe after every 5 chest compressions.

Solution

Just as TRIZ suggests that moving objects used periodically would increase the durability, similarly twisting/rotating the bottle for each liquid used periodically and only when in use would improve the durability further.

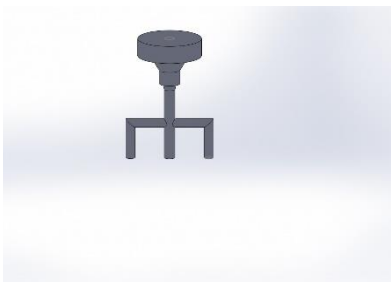
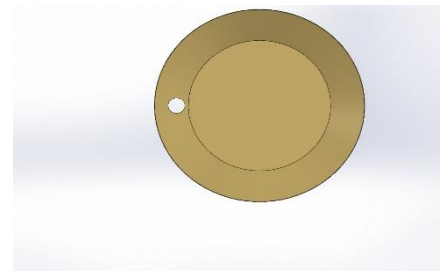
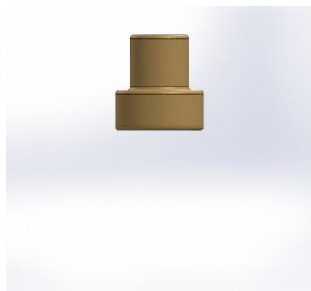
6. CONCEPT GENERATIONS- CONCEPT SCREENING- CONCEPT SCORING

3D design Version 1

I started designing the 3D model of the first version



Parts used in Version 1



3D design Version 2 (Rendered Version)

- ✚ Is the idea feasible?
- ✚ Is the idea desirable?
- ✚ Does the technology exist, or does it need to be developed?

- ✚ The idea is very feasible because it is made using materials that are easily available. It's manufacturing isn't very complicated.
- ✚ The idea is desirable because it would serve people's needs and be useful for them. They would also be willing to purchase the product.
- ✚ The technology exists but it has been modified and its application has been never used in this sector.

7. HUMAN FACTORS DESIGN/USER FRIENDLY DESIGN

Human factors and ergonomics is the application of psychological and physiological principles to the engineering and design of products, processes, and systems. The goal of human factors is to reduce human error, increase productivity, and enhance safety and comfort with a specific focus on the interaction between the human and the thing of interest.



This product is extremely user friendly as it can be used by any individual with ease. It serves two purposes of perfume and sanitizer. The materials used are recyclable. The instructions given to the customers on its operation is clear. Thus its operation is easily understood. It is leak proof. The fragrances of the perfume comes in a wide range based on customer choice. The design of bottle aesthetically makes it unique to other sanitizer and other perfume bottles.

8. DESIGN FOR X

Design for Excellence (DFX) is a systematic approach for product and process engineers while designing a product where X represents targeted objectives or characteristics of product or process. DFX comes under the topic of DFSS which requires a cross-functional team approach with the involvement of stakeholders.

In order to stay successful in the current market companies need to meet customer expectations and continuous efforts should be there to understand these demands. Several aspects such as cost, quality, reliability, recyclability etc. should be considered while designing a product according to these consumer needs.

Design for manufacturing

- Conceptualization
- Analysis
- Redesign
- Conclusion

Conceptualization

- ❖ The fragrance of the sanitizer
- ❖ The fragrance of the perfume
- ❖ Easy to use
- ❖ Easy rotation of the bottle without much application of force
- ❖ No possibility of leakage
- ❖ No possibility of mixing of the two liquids
- ❖ Durability
- ❖ Be aesthetically pleasing
- ❖ The effect of sanitizer against bacteria and viruses
- ❖ Long lasting of perfume

Analysis

- ❖ Components
- ❖ Processes
- ❖ Combined components
- ❖ Main assembly
- ❖ Sub-assemblies

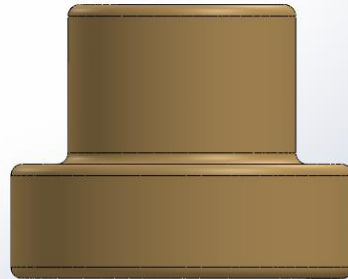
Components

The components used in the product is are body , hole base, nozzle base, nozzle top, spray insert.

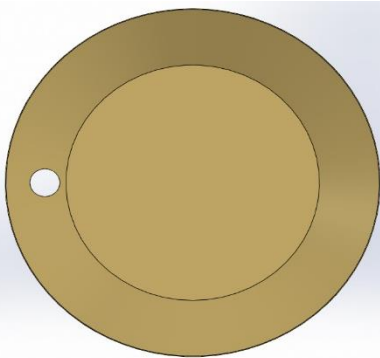
Nozzle top



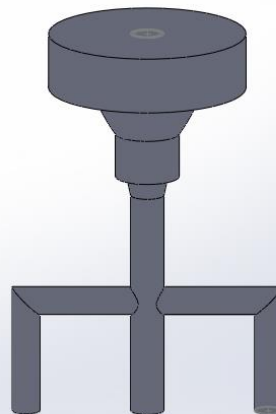
Nozzle bottom



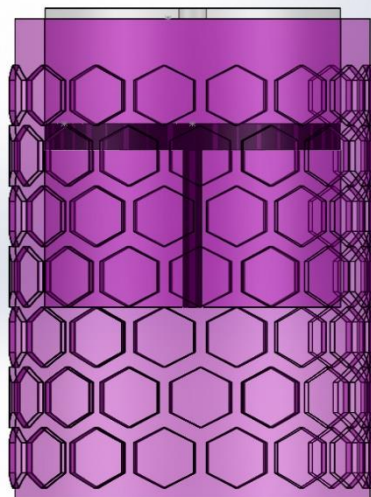
Hole base



Insert spray



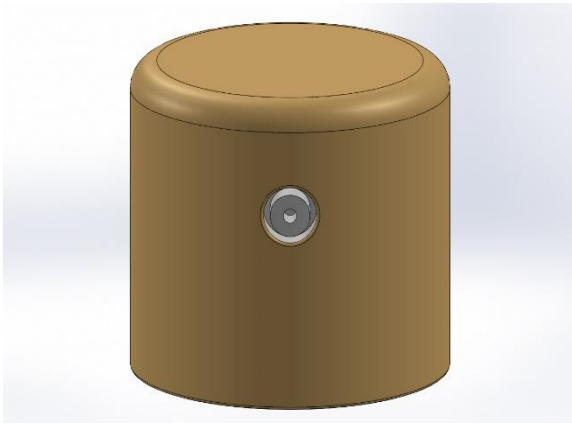
Body



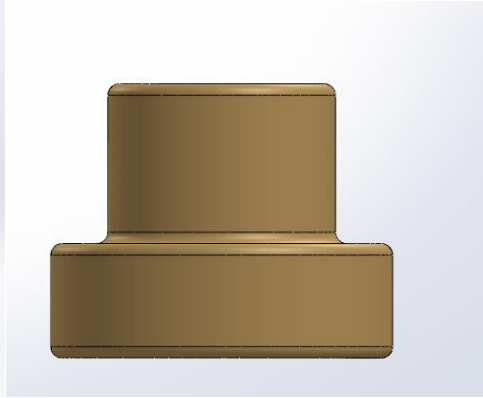
Processes

- ❖ To combine nozzle top, nozzle bottom and spray insert

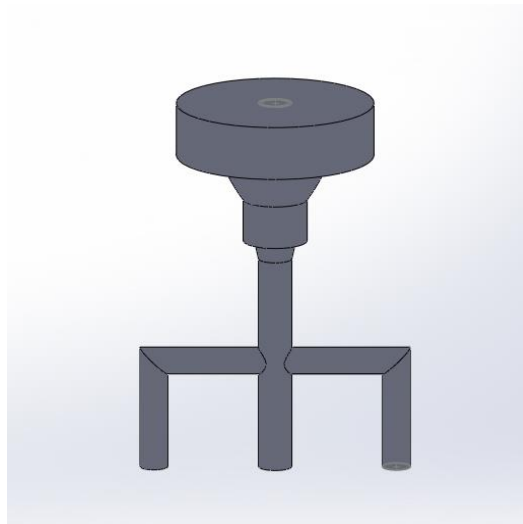
Nozzle top



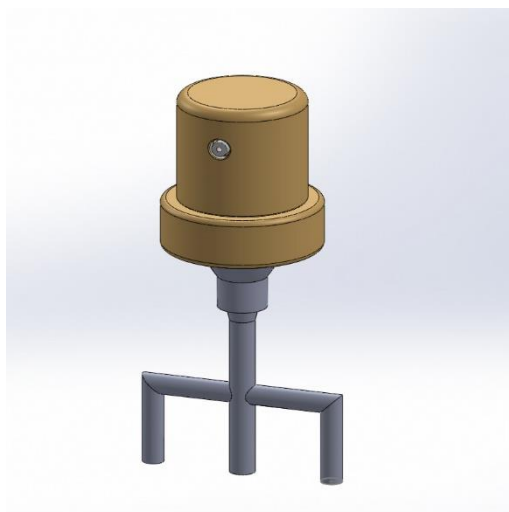
Nozzle bottom



Spray insert



Nozzle



- ❖ To combine all the other parts in the assembly.

Combined components

There are no combined components are in this product

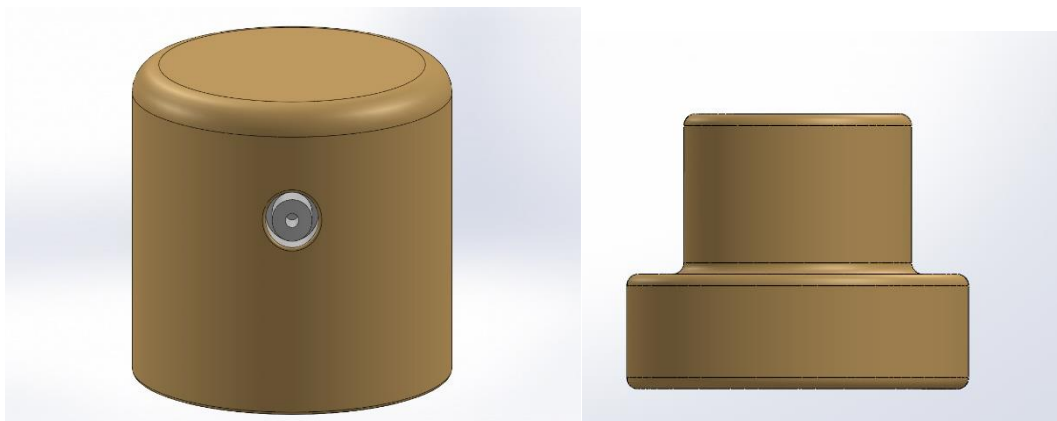
Main assembly

This is the main assembly

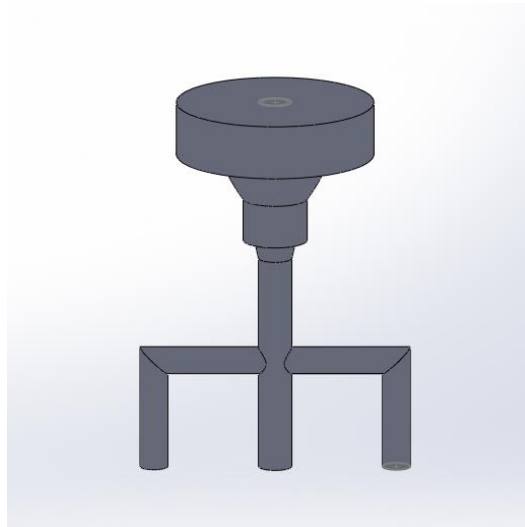


Sub-assemblies

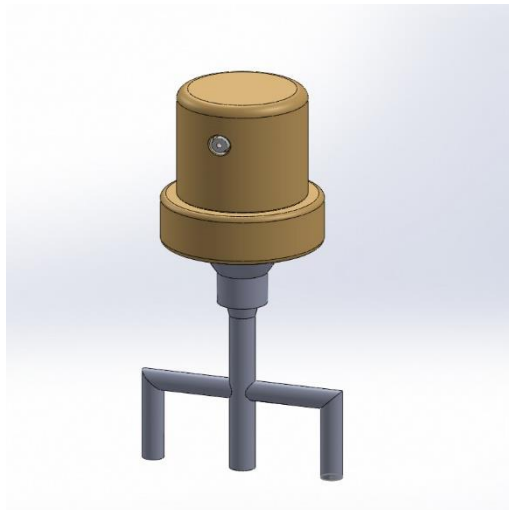
The only sub assembly is the product is the nozzle



Spray insert



Nozzle



Three Elimination Questions (to find suspect Components)

1. Should the component move or be able to move in relation to the preceding component in the assembly diagram?

A. Yes (for the nozzle)

2. Are there fundamental reasons for the component being made of a different material which does not otherwise occur in the product?

A. Yes(for insert spray – PET)

3. Should the component be fitted or removed separately because otherwise assembly or disassembly of other theoretical essential components would be impossible?

A. Yes, even if one of the components of the product is taken the product won't fill its purpose

Redesign

As the design of the product is right, the product doesn't need a redesign

Conclusion

As this design considered all the constraints properly and the product was designed in the proper way the product didn't need a redesign and then design is X

References

Include an alphabetically ordered list of the works you have cited in your article.

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