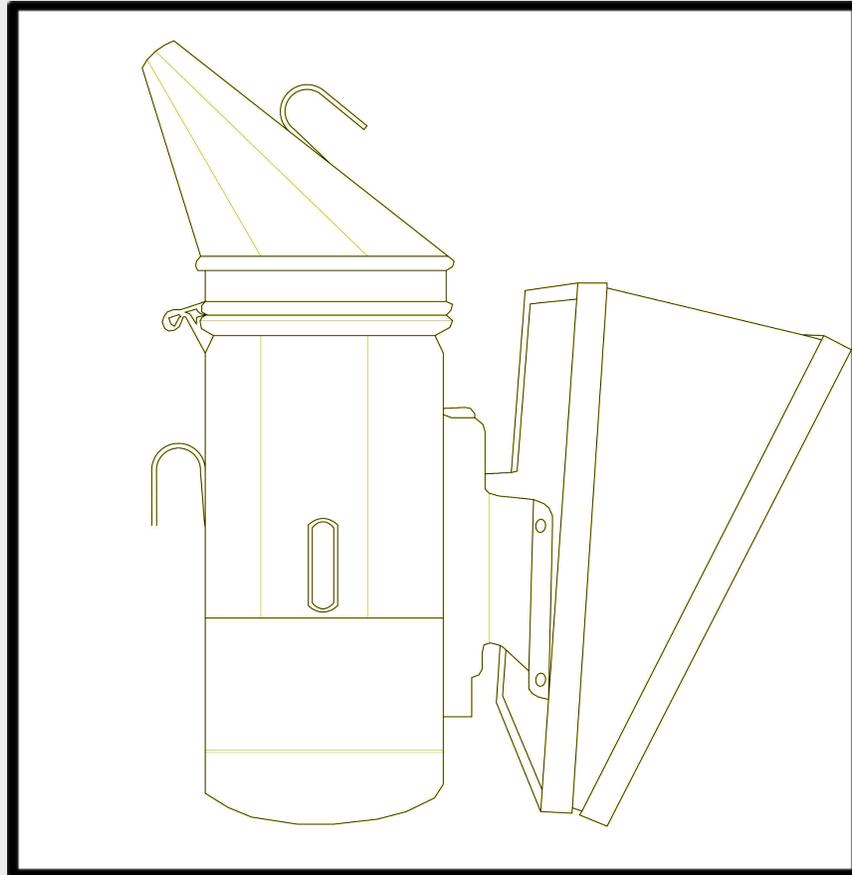


The Smarter Smoker



Bringing Beekeeping into the 21st Century
By: Kyle Boelter



The Smarter Smoker

Executive Summary

Product Owner: Kyle Boelter

Concept Description:

The Smarter Smoker is a safer and easier to use bee smoker to bring beekeeping into the 21st century. Conventional stainless steel bee smokers become hot to the touch with use. Requiring the use of a hive tool to pry open the smoker head and for the keeper to reach into the fire chamber to clear ash and refuel. The Smarter Smoker solves these problems by using a heat-resistant ceramic coated head/firechamber and by placing the fuel stopper and fire chamber base on a hinge, allowing for hot ash/unspent fuel to easily drop out the bottom of the smoker. A Bee Bin is also available for keepers who want an all in one kit to store and discard fuel. Perfect for a keeper with hives across multiple locations.

Opportunity:

The consumer problem that the Smarter Smoker solves is the desire for a safer, easier to use bee smoker. Especially among the hobbyist communities. The Smarter Smoker will also disrupt the current homogeneity of the bee smoker market. As nearly every bee smoker company produces almost identical products. Allowing keepers an alternative choice to the all stainless steel smoker. According to the Agriculture Marketing Resource Center, there are around 130,000 beekeepers in the US. With the majority of them being hobbyists. The total number of beekeepers worldwide is unknown.

Innovative Solution:

The Smarter Smoker redesigns the head, fuel chamber, and fuel stopper to fix the annoyances of using a conventional smoker. Allowing the design to be different enough to entice consumers, but familiar enough so they know what they are looking at. By coating the stainless steel head and firechamber a ceramic coating, keepers will avoid accidentally burning themselves and will no longer rely on using a hive tool and the j-hook loop to open the smoker. Another issue with plain stainless steel heads is they warp over time eventually creating an imperfect seal with the fuel chamber. The ceramic coating will prevent this warping, drastically improving the life of the smoker. Research is still being done on the best type of ceramic and the most effective way to apply it.

The fuel chamber and fuel stopper are being modified to include hinges. Instead of the fuel stopper requiring legs to sit 2 inches above the chamber base, it will instead be held in place through the hinge and a small exterior button. The keeper then just has to push the button and let the spent fuel fall. Avoiding the hassle of having to completely remove/reinsert the hot fuel stopper to clean the smoker. Research is still being done on the most effective way to implement these modifications. The Bee Bin will include an upper removable bucket to store fuel. Ash will be placed at the bottom of the bin far away enough to not light the fuel stores.

Value Propositions:

Currently, keepers have to rely on threading their hive tool through a metal loop and pulling to remove the smoker head. It works, but is clunky and gets increasingly harder to do the more warped the head becomes. Oftentimes the keeper pulls so hard the loop breaks off the head. The only option being to buy the same type of smoker to replace it. A ceramic coating will attract hobbyists who seek a safer smoker and commercial keepers who want a more durable smoker. The hinged fuel stopper/chamber will attract all keepers looking for a quicker way to clean out their smoker. Ideally, a deal will be struck with Mann Lake (one of the premier beekeeper suppliers) to feature the smoker on their website and in their monthly catalog. Allowing customers to purchase through a reputable supplier.

Competitive Advantage:

There is no single large competitor that the Smarter Smoker will have to go up against. Instead, many smaller companies are all selling a similar product. The uniqueness of the Smarter Smoker will set it apart from the competition and add an alternative option in an otherwise homogenous market. Patents will have to be filled to avoid competitors from designing a similar smoker. To enter the market, Smarter Smoker will get a booth at the yearly American Beekeeping Federation trade show. Smarter Smoker will also advertise itself through local beekeeping associations. The goal is to establish enough brand recognition to get a spot in the Mann Lake catalog, a spot on the shelf in Fleet Farms beekeeping section, or gather the funds to host an independent website to purchase from directly.

Entrepreneurial Team:

At the moment, the only member of the Smarter Smoker team is its CEO and founder, Kyle Boelter. Who is overseeing research and development. Later, this role will expand to include head of marketing, company outreach, and sales. In the future, Smarter Smoker will hire to fulfill the roles of manufacturing, financial officers, strategic sourcing, web development, legal, and additional research and development. With the head of manufacturing, strategic sourcing, and additional research/development to be hired within the year to create a workable prototype. Other positions will be hired as needed.

Financial Highlights

More research is needed to determine the financial viability of the Smarter Smoker. With large question marks including what type of silicone is the best fit and how to manufacture such a unique item. Currently, the only figure with a ballpark estimate is the price of a pre-modified Smoker, lower hinge, and quick release button. Ideally, the Smarter Smoker will sell for around \$40. With the optional Bee Bin costing an additional \$20. An investment of \$2000 will be required to conduct further research to determine the feasibility of the product. If proved feasible, additional capital investment will be required to begin production. The amount is currently unknown.

III. Consumer Problem

The Smarter Smoker

Brining Beekeeping into the 21st century

Tired of having to fight against your bee smoker? Introducing the Smarter Smoker! The safer and more efficient bee smoker designed for the 21st century.

Many keepers struggle with accidentally burning themselves or things around them with current smokers. Whether your smoker head warps or your fuel stopper keeps sliding around in the chamber there are plenty of reasons why you would need to stick your hand into a recently used smoker. At least there used to be. Avoid the risk of injury with the Smarter Smoker! With the Smarter Smoker, the fuel stopper and fire chamber base are on a hinge. Allowing for any unspent fuel/ash to fall out the bottom of the smoker at th. Reducing the chance of injury and drastically reducing the amount of time to refuel/clean the smoker. Additionally, a heat retardant ceramic coating has been applied to the smoker head and fuel chamber. Ensuring you never accidentally burn yourself again on your smoker again.

Always on the go? Why not bundle your new smoker with a Bee Bin? The Bee Bin is a two layered bin allowing for safe storage of your fuel and ash. No more stomping out ash piles in your clients yard! Whether you have two hives or two dozen, the Smarter Smoker and Bee Bin will ensure that you can work your apiary quickly and safely.

Find the Simple Smoker at participating Fleet Farm locations, Amazon, and in the Mann Lake Catalog.

\$40 for the Smarter Smoker

\$60 for the Smarter Smoker and Bee Bin

The bee smoker has been an essential tool in beekeeping for centuries. Despite being used for centuries, the design of the bee smoker has remained largely unchanged for over 100 years.

A Bee Smoker from 1911



A Bee Smoker from 2021

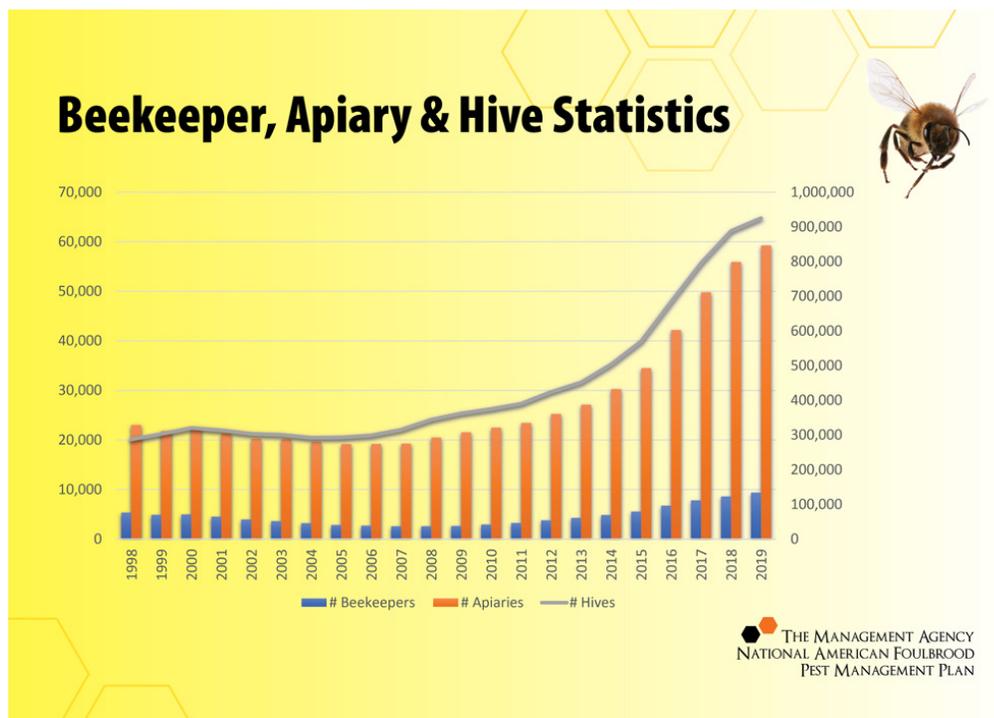


The Smarter Smoker was invented to bring beekeeping into the 21st century. As the current design has some annoying flaws. For one, the stainless steel of the smoker becomes hot to the touch after around 10 or so minutes of use. The current smoker design solves this problem by

having a heat shield around the fire chamber (the cylinder) and a loop to grab onto with some sort of tool (usually the j-hook of your hive tool) to pull the head open if you ever need to refuel or empty the smoker after use. Secondly, the metal can warp over time. Causing the head of the smoker to become increasingly more difficult to remove and reinsert to create a perfect seal between the smoker head and the fire chamber. A problem that is magnified if you have a significant creosote buildup in your smoker. A piping hot smoker head that is hard to remove is a recipe for injury. Thirdly, the fuel stopper is poorly designed and has to be removed every time you want to clear the ash from the bottom of the fire chamber. Not to mention it will often fall out on its own every time you empty out unspent fuel. Causing the keeper to have to grab the hot metal fuel stopper with a rag/glove and then carefully reinsert it back into the hot fire chamber. A task that's hard enough with a cool smoker as it can be difficult to put the fuel stopper at the ideal elevation within the fire chamber.

The target consumer will be hobbyist beekeepers who are newer to the hobby. Since hobbyists make up the vast majority of beekeepers in the USA (90-95% of all keepers in the US) and would be enticed by an easier to use smoker. Although the Smarter Smoker should attract all beekeepers looking to improve from the conventional smoker. There is no difference between customer and consumer in this case. The current number of available customers (beekeepers) in the US varies and only a rough estimate can be given. As much of the data on the subject is either outdated or does not include hobbyist keepers. That being said, it can be estimated that there are around 120,000 beekeepers in the US.

The number in this graph is much lower than the one just stated. This is due to these statistics coming from New Zealand and not the US. No reputable graph of US keeper trends could be found. The important thing to note is the number of keepers is growing. A similar trend can be seen in Great Britain, suggesting it is a trend at least in the western world. Additional graphics can be found in section X.



Personas:

Kathy

Personal Background:

Kathy is a recently retired school nurse in her mid 60's. She lives out in the country where her and her husband Mark have around 10 acres. Over the years they have turned their little slice of the American dream into an Eden. Kathy went through the process of becoming a master gardener and has a garden that is the envy of the county. She even submits her produce to the state and county fair. The couple even partakes in animal husbandry. Owning a few horses and about half a dozen chickens. Kathy has recently gotten interested in beekeeping after watching her friend's son working in his apiary one day. She thinks they will make a great addition to their property and hopes the extra pollination will be the push she needs to get her that blue ribbon. Kathy is characterized as a novice. She wants whatever is the easiest to use.

Career Background:

Kathy is recently retired, but had a 40 year long career as a school nurse at a local elementary school. She's now looking for some new hobbies to take up some of newly acquired free time.

Life Style:

Kathy has always had a fondness for the outdoors. Growing up on a farm, she has understood from an early age the pride that comes along with making your own product. Her favorite place in the world is her backyard. She's worked hard over the years to build it into something she can look at with pride. And she believes a few beehives will finally complete her yard. She's an old school person and hates complexity, but is a little nervous stepping into a new hobby like beekeeping.

Personal Care and Pain Points:

Since Kathy is new to the hobby and hates complexity, she's prioritizing finding items that will be the easiest to use. Including something she can't hurt herself with by accidentally mishandling. She's also confused on what type of fuel she should use. It seems that every website she reads or beekeeper she talks to has a different opinion on the matter.

Websites Kathy Visits:

- Beelab.umn.edu
- Davesgarden.com
- Various Facebook Bee and Gardening Groups

Smarter Smoker: The Smarter Smoker will allow Kathy to have peace of mind knowing she won't accidentally hurt herself using a tool she's not very familiar with. The included smoker starter pack will also provide an easy to use fuel. No more stripping pine trees for needles.

IV. Product Problems

The Smarter Smoker allows the keeper to not have to fight against their smoker. It does this by solving arguably the two largest issues that conventional smokers have. The inability to touch the smoker body/head during use and the inconvenient process of dumping out the unspent fuel/ash then having to realign the fuel stopper. These problems affect all bee smokers on the market as nearly all bee smokers on the market are identical. The head of a conventional smoker can easily reach 150° fahrenheit after about 15 or so minutes of use. The team at Smarter Smoker also tested what an over-packed smoker could reach, testing what could be called a “rookie mistake” by a new keeper. The team’s thermometer maxed out at 215° fahrenheit. A temperature hot enough to cause 3rd degree burns. The Smarter Smoker looks to solve this problem by applying a layer of heat resistant ceramic coating around the inside and outside of the smoker head and fuel chamber. Providing two layers of heat protection and allowing the smoker to be worked without the need of a hive tool or heavy gloves. The ceramic coating will also have the benefit of preventing the buildup of creosote inside the smoker and negating the need for a wire-frame heat shield.

The Smarter Smoker also looks to improve the process of dumping out unspent fuel/ash. Instead of having to fiddle with opening a piping hot smoker head and then carefully adjusting/reinserting the fuel stopper. The Smarter Smoker has the base of the fuel chamber and the fuel stopper on a hinge. At the press of a quick release button the base of the fuel chamber and fuel stopper will swing open allowing the unspent fuel/ash to fall out the bottom of the smoker. Think of it like the reverse of one of those AUTOPOP water bottles. Having the debris fall out the bottom at the push of a button will drastically reduce the amount of time it takes to empty a smoker. It also solves the issue of having to readjust the fuel stopper, since part of the fuel stopper will be on a hinge.

The Smarter Smoker is still in the concept stage, with possible prototypes being designed. A possible prototype has been drawn, but will need further evaluation before a prototype can be ordered. The Smarter Smoker will be able to fit in a 10” long (with bellow clamped) x 12” high x 6” wide box. More specific dimensions of the Smarter Smoker can be found below. Keepers will also have the option to bundle the Smarter Smoker with a 8” diameter x 8” high stainless Bee Bin. Inside is a removable bucket used to store smoker fuel. Allowing a keeper on the move to have a safe place to store fuel and not leave ash on a client's lawn. The fuel bucket and base of the container are far enough away to not spark the fuel. The bundle will also include a 5L bag of pine shavings so the smoker is ready to use out of the box.

Features and Benefits:

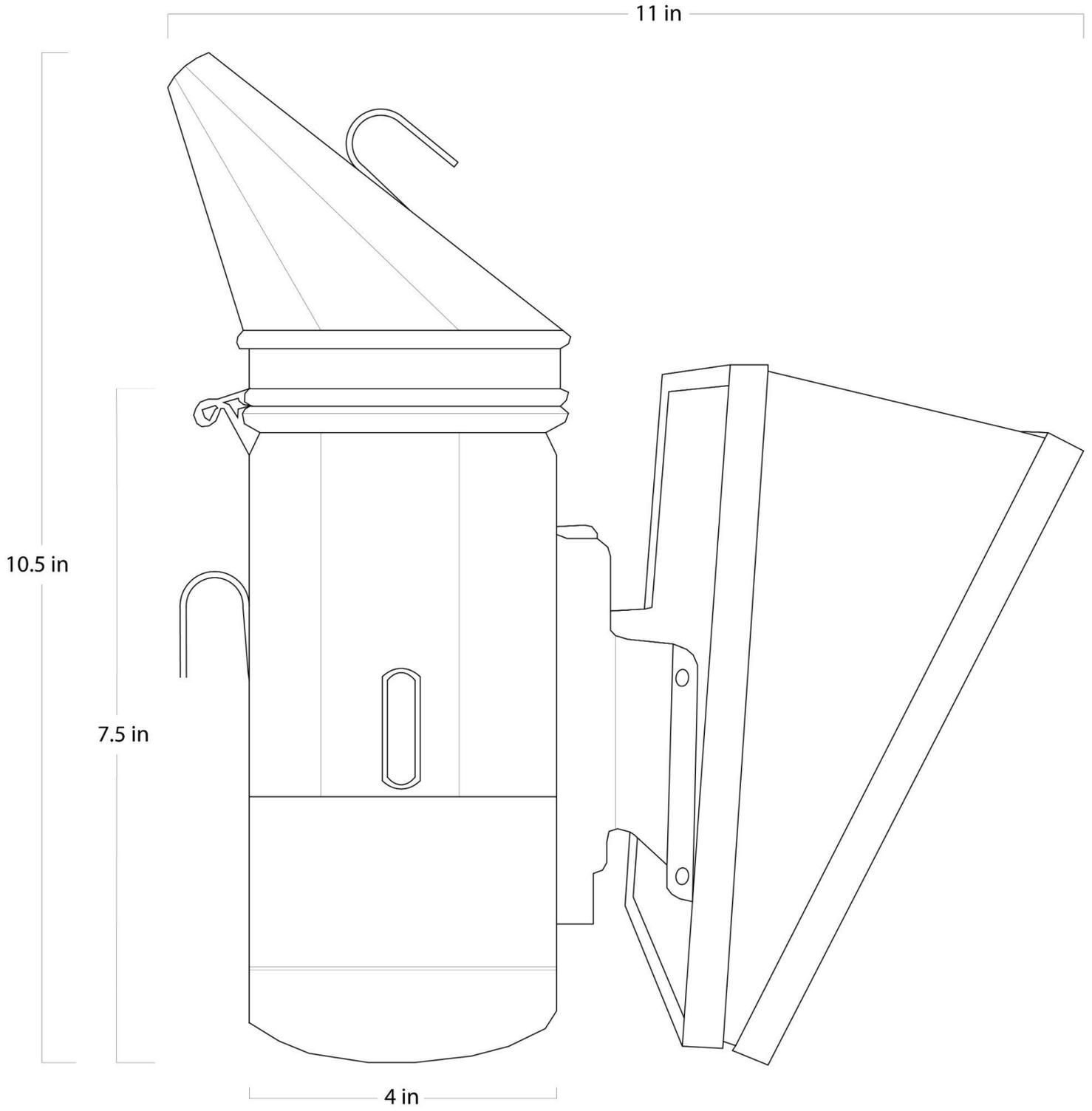
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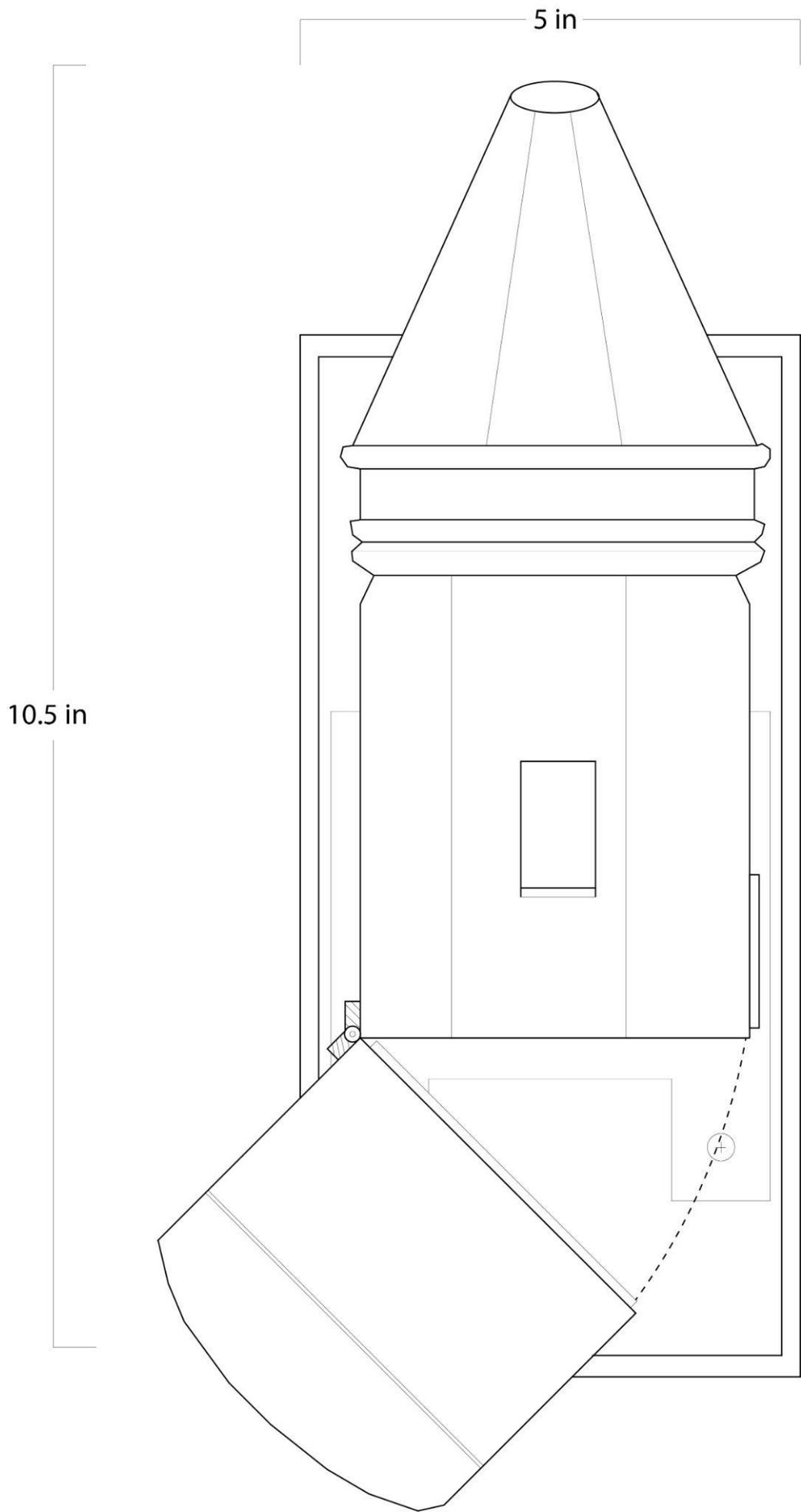
1. Hook on smoker head
2. Hook on fire chamber body
3. Ceramic coated fire chamber and smoker head
4. Hinge connecting the smoker head to the body
5. Quick release button
6. Smoker bottom and fuel stopper on a hinge
7. Bellow
8. Air holes
9. Bee Bin
10. Removable stainless steel bucket inside bin

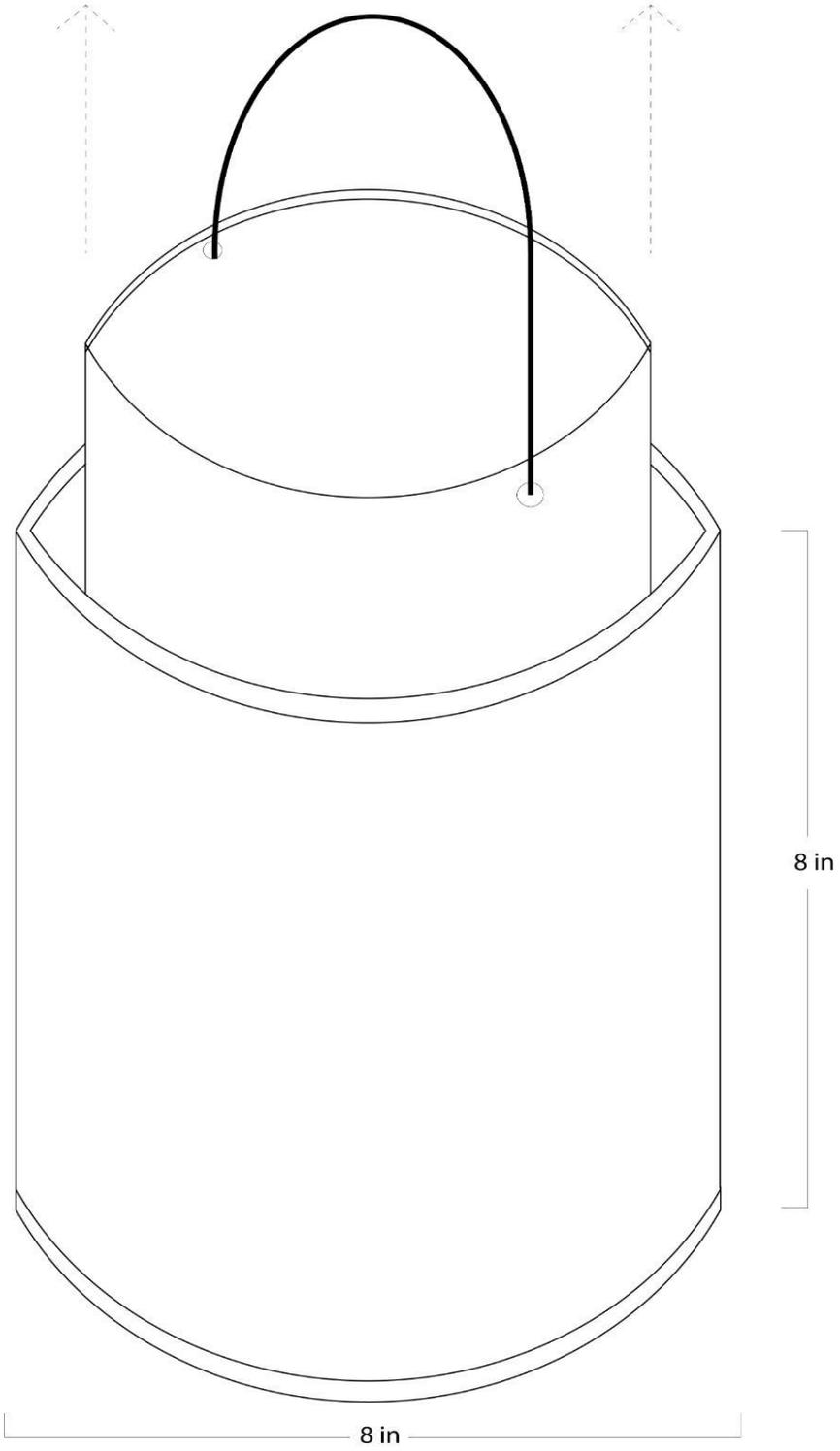
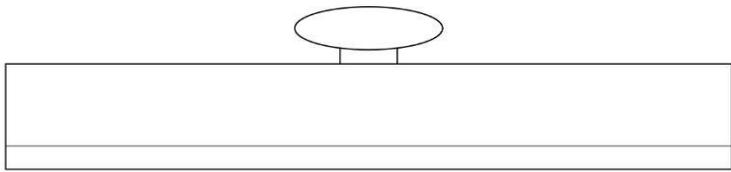
Benefits:

1. Gives the keeper an easy spot to grab and open the smoker head
2. Allows the keeper to hang the smoker on the hive body and other places
3. Prevents the exterior of the smoker from getting hot enough to cause injury
4. Durable enough to be opened and closed many times
5. Quickly discharge of debris within the smoker
6. Swings open to allow debris to fall, easy to replace and re-lock into position
7. Acts as a handle to operate the smoker with as well as provides air flow when needed
8. Allows the air to leave from the below and enter the fire chamber
9. Provides a location to store spent fuel or ash without sullyng you or your clients yard
10. Provides a location to store fuel

Diagrams:







V. Market Problem

The current current market segment that the Smarter Smoker is aiming to break into is that of hobbyist beekeeping. Since hobbyists make up the majority of beekeepers (90-95%) and newer hobbyists would be the most intrigued by a safer smoker. Although, the quick release debris dump should attract beekeepers of all types. The largest issue that the current bee smoker market faces is homogeneity. Nearly all bee smokers on the market follow the same Bingham design that has been used since the turn of the century. If you are unhappy with your bee smoker, you're pretty much out of luck and are forced to buy a similar smoker from a different company that hopefully uses better material. These smokers can range anywhere from \$20 to \$40 dollars depending on the company. The Smarter Smoker hopes to break this cycle by providing consumers a second option over the stagnant combination of the Bingham design and stainless steel. Although, the Smarter Smoker will be implementing some elements of the Bingham design to keep it recognizable to consumers and to respect its iconic shape.

It can be difficult to measure the exact market size and trends of the hobbyist beekeeping market due to how niche it is. As mentioned before, numbers vary depending on sources and oftentimes hobbyists are not counted in the official total. The most reputable data found was put out by the Agriculture Marketing Resource Center in 2021 with a figure of between 115,000 to 125,000 beekeepers in the US. However, this is the same exact figure put out by Bee Culture Magazine in a 2012 industry survey. Meaning either the market has remained stagnant for nearly a decade or the same study has been copy and pasted over the years. The idea of the market remaining stagnant also counteracts the graphic shown in section 3, but that graphic may be misleading since it may only consider commercial keepers. The team at Smarter Smoker would like to target 20% of this market or about 25,000 keepers. That would create \$1,000,000 in revenue with only the base package (just the smoker) being purchased. If successful, the Smarter Smoker would be marketed worldwide. Nations like China, India, and Turkey would be heavily targeted since they are the world's leading honey producers. Although further research would have to be done in order to see how such a product would fare in international markets. Local bee associations would be the primary source of initial customer reactions. They will also be our initial customer base and spread word of the Smarter Smoker through word of mouth.

Feature Comparison Table:

<p>The Smarter Smoker Price: \$40 - \$60</p>	<p>Vivo Bee Hive Smoker Price: \$25</p>
Hook on smoker head	Hook on smoker head
Hook on fire chamber body	Hook on fire chamber body
Ceramic coated fire chamber	Wire frame "Heat Shield"
Bellow	Bellow
Hinged smoker head	Hinged smoker head
Fuel stopper on a hinge	Fuel stopper on 3 legs
Bottom of fuel chamber on a hinge	
Quick release button	
Ceramic coated smoker head	
Optional: Fuel storage and ash bin	

The table above showcases the feature comparison between the Smarter Smoker and your average smoker. Although the Smarter Smoker only has a few more features than your traditional smoker. These features are significant enough to warrant the near double in price. Being able to clear out a smoker with the push of a button will be enough to entice many keepers to take the risk and try something new. Same goes for the ceramic coating. It negates the need for the wireframe saving about a pound of weight and the possibility of accidentally catching your suit on the frame. The ceramic coating also provides better protection than the wire fire and adds protection to the smoker head where the Vivo smoker has none. The coating will also make the smoker more resistant to warping and creosote buildup. Getting rid of all the annoyances of your conventional smoker.

VI. Business Model Program

The targeted consumer base for the Smarter Smoker is hobbyist beekeepers. Leaning towards those who are newer to the hobby. This is because less experienced keepers will be looking for an “idiot proof” device that they will feel comfortable using (i.e. something they can’t burn themselves on). Hobbyist keepers also make up the Experienced keepers will be more enticed by the ability to easily dump spent smoker fuel at the press of a button. No more fiddling with the fuel stopper! The ceramic coating will also interest keepers looking for a more durable smoker. Since the coating will prevent the metal from warping and make it easier to remove creosote buildup within the smoker. The optional Bee Bin will attract keepers who have hives across multiple locations or do not want to dump ash in a clients yard. The ability to try a different type of smoker should peak the curiosity of keepers who are sick of the near homogeneity of the market.

Overt Benefit: Provides the keeper with a less frustrating smoker experience

The Reason to Believe: The ceramic coating and the quick release fuel drop

Dramatic Difference: No smoker on the market has a ceramic coating or a quick release fuel drop. This will separate it from all the other identical smokers on the market.

Adoption Hurdles: Tradition. The Bingham design has been in use for over 100 years and it still works fine as a smoker design. Despite its frustrations. Many more experienced keepers may see the ceramic coating and quick release fuel drop as a gimmick. Why need a ceramic coating? Just don’t touch it when it’s hot or wear a large glove. Thoughts like that will be large hurdles in getting consumers to switch. Especially when they can just use the ol’ tried and true method for 20 dollars. Even if they have to replace that smoker every few years.

Social Sufficiency: Consumers will be able to purchase this smoker in person at various fleet farm locations that include a bee section. As well as online through sites like Mann Lake and Amazon.

There is no difference in the transactional model that the Smarter Smoker uses vs any other type of bee smoker on the market. The Smarter Smoker separates itself from the competition by being dramatically different enough to catch the eye of consumers. And have enough benefits over the traditional smokers to encourage switching behavior. Online videos showing the Smarter Smoker in-action should be enough to convince keepers to make the switch.

There will be two different ways to purchase the Smarter Smoker. The first way is to just purchase the Smarter Smoker individually. The second way is to purchase our starter kit. Which

includes the Smarter Smoker, pine wood shavings to use as fuel, and the Bee Bin. The team at Smarter Smoker is assuming that the individual smoker will be the more popular option. Since, many consumers won't be beginners or may see the bin as something they could find in their garage. A 80/20 split favoring just the smoker being purchased is projected. Ideally we capture 20 percent of the US market and sell 25,000 smokers to hit a revenue of \$1,000,000.

However, there are still a few consumer hypotheses we have to consider. For one, do some keepers like the ability to choose their fuel stopper height? This won't be possible with the Smarter Smoker since it lies on a hinge. Will creating a more heat resistant smoker encourage bad behavior like over packing a smoker? If the keeper doesn't have to worry about burning themselves on the smoker they may feel obliged to put as much fuel in as necessary. Creating a smoke that is too hot and potentially damaging bees.

Researching the cost to produce a bee smoker has been difficult due to it being a very specialized tool in a very niche market. The following table has been created but still leaves much to be desired.

Ball Park Smarter Smoker Costs:		Smarter Smoker Price:	\$40
Unaltered Smoker:	\$5-\$10 before shipping	+ Starter kit: \$60	
Quick release button:	\$5	Start up Costs:	
Lower hinge:	\$3	Ceramic coating (1 Gal):	\$100
Price of coating per smoker:	?	Coating Application tool:	\$115
Labor to make altercations:	?	Additional tools needed:	?
	= \$18 + ?	Rent:	?
Optional:		Patent Fees:	?
Bee Bin:	\$15	= \$225 + ?	
1L of pine shavings:	\$1		
	=\$16		

The largest question marks are the price of coating, labor, and the price of shipping. These totals need to equal under 20 dollars for this product to be viable. If necessary, the price for the base Smarter Smoker could be increased to \$50, increasing the price of the additional Bee Bin to \$70. The price could be lowered once the firm grows and gets the benefits of economies of scale. Researching alternative ceramic coatings could be another tactic to lower costs. Either way the profit margin for the Smarter Smoker will most likely be slim.

VII. Operations/Commercialization Problem

Actually getting the Smarter Smoker to market will take some time. A rough draft of the Smarter Smoker dimensions has been made. The next step would be to further these designs in a 3D drawing program like CAD and provide these plans to someone who can actually create a working prototype. Ideally, it would take 6 months to create a working prototype. This prototype would be showcased at local bee association meetings to gather feedback. If the prototype is deemed viable, creating the supply chain and manufacturing plan alongside hiring the appropriate staff will take an additional year.

The current manufacturing plan is to purchase already built smokers at bulk cost from factories in China and make the necessary alterations in house. Either here in the States or in a foreign country to keep down costs. The required alterations that are needed is the removal of the wire frame heat shield, the addition of a quick release hinge system, and the coating of the ceramic shield on the inside and outside of the smoker. A manufacturer for the Bee bin will also have to be found.

The packaging of the product should not be a huge issue. Mainly because there will be close to zero packaging. We want the Smarter Smoker to just have a tag on the store shelves. That way consumers can test out the product for themselves and are hopefully impressed with the results. Simple cardboard boxes will be used to transport the product from the warehouse to brick and mortar stores like Fleet Farm and through online retailers like Amazon and Mann Lake. However, some sort of box may be required for the Bee Bin.

VIII. Resource Problem

There are still many product questions that have to be answered before production can begin.

- Is the ceramic coating toxic? Will it hurt the bees?
- Does the ceramic coating actually insulate enough heat to allow for a bare hand to be placed on the smoker? Or does it just reduce the temperature by a small fraction?
- What ceramic coating works the best? Automotive? What's most cost effective?
- Will the button get hot/melt if the smoker is in use?
- What will the seal be like around the lower hinge? Can smoke get out?
- Are there legal issues with altering a different company's product and selling it?
- Would it be easier to have the factories make the alterations instead of doing it in house?
- How much does it cost to patent a product?
- What's the cost of rent in a workshop/warehouse? Is a true workshop needed?

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Optional:		Patent Fees:	?
Bee Bin:	\$15		= \$225 + ?
1L of pine shavings:	\$1		
	= \$16		

All of these questions need to be answered before the Smarter Smoker can be brought to market. Smarter Smoker will need to hire a material science specialist, manufacturing specialist, a strategic sourcing specialist, and a legal consultant to answer these questions.

The most important question to be answered is the viability of the ceramic coating. If the coating does not work as hypothesized then either a new material must be found, plans altered to only include the benefit of the hinged bottom, or the project must be scrapped. Currently, the prices used for the ceramic coating is based on a brand used in automotive products. Additional research must be done to conclude if this is the best and most cost effective process for applying a ceramic coating to stainless steel. Research also needs to be done on how much of the coating is applied per smoker (i.e. how many smokers can you coat per gallon bucket.) That's a critical question that needs to be answered in order to see if this product is cost effective.

The labor needed to make the alterations is also a critical factor that needs to be answered. In Minnesota, the average machine shop worker is paid \$16 per hour. How many smokers can be created per hour with one person working? Should multiple people be hired to increase efficiency? Do the skills required to create such alterations demand a wage above \$16 per hour?

Strategic relationships need to be formed as well for the Smarter Smoker to succeed. Contact needs to be made with retailers like Mann Lake and Fleet Farm in order to get our product on the shelves and in the eyes of the most consumers possible. Networking should also occur at the yearly American Beekeeping Federation conference and tradeshow. If possible, a stand should be purchased to promote the product.

Smarter Smoker is looking for a \$2,000 dollar investment in order to create a multitude of prototypes. This money will be used to hire the required professionals to answer the questions above, as well as to acquire the necessary equipment in order to build the prototypes. If one of the prototypes is proved successful, then an additional investment of an unknown quantity will be required in order to begin production.

IX. Recommendation

This project is a GO! But just barely. There are still glaring holes in this product's financial feasibility and more questions have been raised than can be answered about the product's design. The current team at Smarter Smoker just does not have the available industry, manufacturing, or material science knowledge to answer all these questions. Google can't answer everything. However, with outside help the team still believes they can create a product that can be successful and will only truly accept defeat if a successful prototype cannot be made. The idea is still good. It's if that idea can be made into a cost effective product that remains to be seen. There is still significant research required to answer that question.

Firstly, additional market research must be done. The team at Smarter Smoker was able to reach out to a handful of keepers who all seemed interested in such a product. Especially the quick release ash dump feature. However, the sample size researched was still very small and will need to be expanded in order to further see the desirability of such a product. The team will need to hire an industry specialist with more connections to such a niche industry.

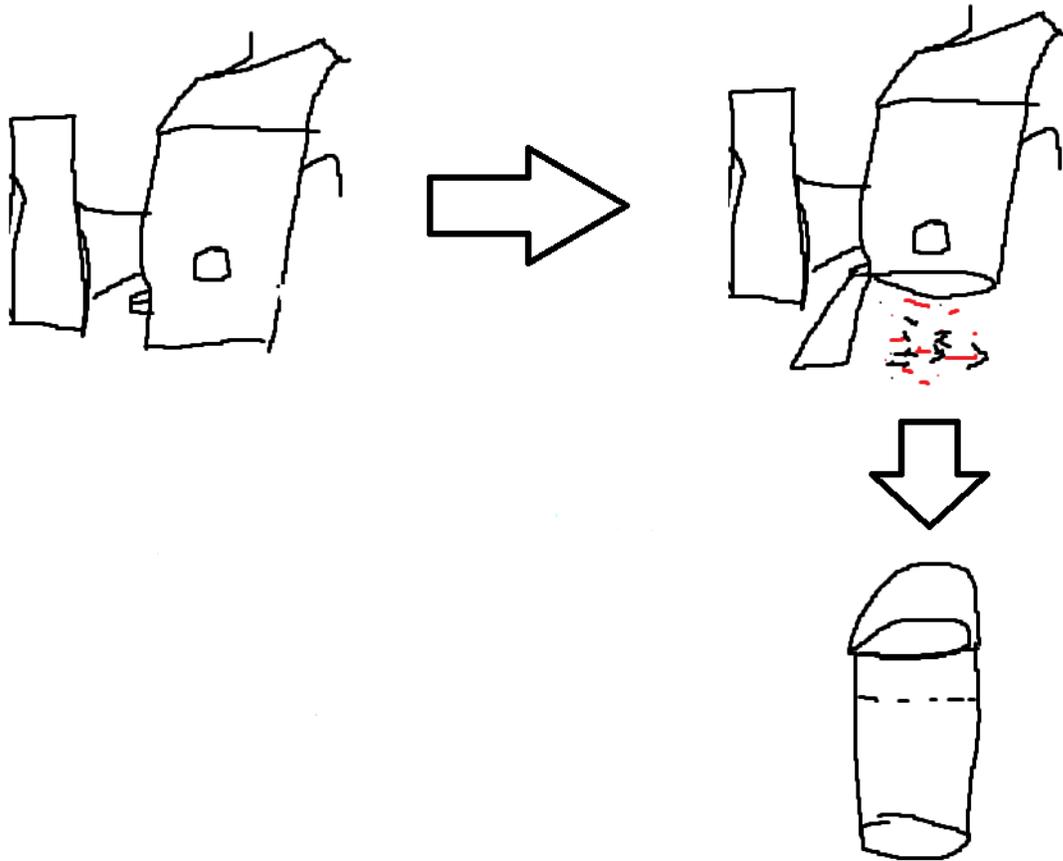
Secondly, a material science specialist must be brought in to consult on the viability of the ceramic coating. The ceramic coating is just the best working theory, but still leaves too many questions to be answered before production can begin. It's possible the material type could change all together. Materials like silicone, bronze, and graphene have already been ruled out by the team, but that doesn't mean there isn't a better material out there the team just isn't aware of.

Thirdly, a manufacturing specialist must be brought in to consult on the manufacturing process and to create the prototype. It's possible a small team may be able to build the product from scratch without altering already made smokers. That all depends on the final material used to make the Smarter Smoker heat insulating. It's also possible that the alterations could be made on the assembly lines in the Chinese factories. These are all questions the manufacturing specialist will be tasked with answering for such a niche product. Once an acceptable prototype is constructed, a fully filled in cost table can be constructed to determine the financial viability of the product.

The Smarter Smoker team believes that an investment of \$2000 will be required to answer all of these questions and make a variety of prototypes over a 6 month period. If answers can be found for all these problems and the product seems to be financially viable, then an additional investment of an unknown quantity will be required. After this investment, it's estimated to take an additional 12 months to create a manufacturing model that can successfully bring the Smarter Smoker to market.

X. Concept Portfolio

Initial Concept Drawing:



Persona:

Max

Personal Background:

Max is a hobbyist beekeeper who has been keeping Bees for the better part of 5 years now. He doesn't consider himself an expert by any means, but knows the basics and is able to get a small honey harvest each year and has an over winter success rate of around 75%. He's in his mid 20's and is the youngest member of his local bee association. He visits the bi-weekly meetings over the summer to talk shop and get advice on how to better care for his bees. Max enjoys new and innovative technology.

Career Background:

Max is a mechanical engineer by trade. He's obsessed with adding efficiency and reducing design flaws

Life Style:

Max's happy place is in his apiary and in his workshop. That's why he enjoys Beekeeping. It allows him to use his woodworking skills. He builds all of his hive bodies and frames from scratch. Although, he still purchases his screened bottom board and hive cover from Mann Lake. He's also designed his own honey spinner using the motor of an old ice fishing auger.

Pain Points:

Max has grown to resent his beesmoker over the years. It worked fine at first and he quickly learned to be careful with it during use. However, his smoker has begun to warp over the years and is becoming increasingly hard to open. He's also frustrated with how cumbersome emptying the smoker is. He would like to build a better smoker, but hasn't found a way to create a smoker that won't cost him an arm and a leg. He visits online beekeeping forums and his local association for information.

Websites Max uses:

- R/Beekeeping and R/Engineering on Reddit.com
- Mannlakeltd.com
- Youtube.com

Six C's Model:

Circumstance:

The consumer circumstance is having a smoker that is safer and less annoying to use. They would like to have a smoker that they know they can't accidentally burn themselves on and a smoker that is easier to empty out. They are also looking for a more durable Smoker that won't warp over time. The best circumstance for the Smarter Smoker is with a newer keeper who may have issues either overpacking their smoker or creating too hot of a flame. Although the hinged fuel stopper and fuel chamber base should be ideal in any circumstance due to its convenient quick release fuel dump mechanic. An optional Bee Bin is also available for purchase that will allow the keeper a convenient place to store fuel and debris.

Context:

Injuries can occur from misuse of a bee smoker. The temperature of a smoker can easily reach temperatures of 150° fahrenheit. Causing burns in seconds. This risk of danger is multiplied if you have a warped smoker head that can be hard to remove. Once the smoker head is open, the process of dumping the ash can be cumbersome. This is because the fuel stopper usually falls out or shifts inside the fire chamber. Meaning you have to stick your hand into the fire chamber in order to realign the stopper.

Constraints:

The Smarter Smoker may have some adoption hurdles to overcome. Since keepers have been using the conventional smoker design for over 100 years and may see any alterations as nothing but a gimmick. The cost of the Smarter Smoker is also a constant since it costs about double that of a conventional smoker.

Compensating Behavior:

Consumers are looking for choice in the bee smoker market. Currently, nearly all smoker designs on the market are identical stainless/galvanized steel models. The Smarter Smoker will allow keepers to try something new that promises to fix the main issues of the conventional smokers.

Criteria:

The ceramic coating of the smoker will prevent it from getting too hot to touch. The hinged fuel stopper and fuel chamber base will allow the keeper to drastically reduce the time and frustration required to empty the smoker.

Consequence:

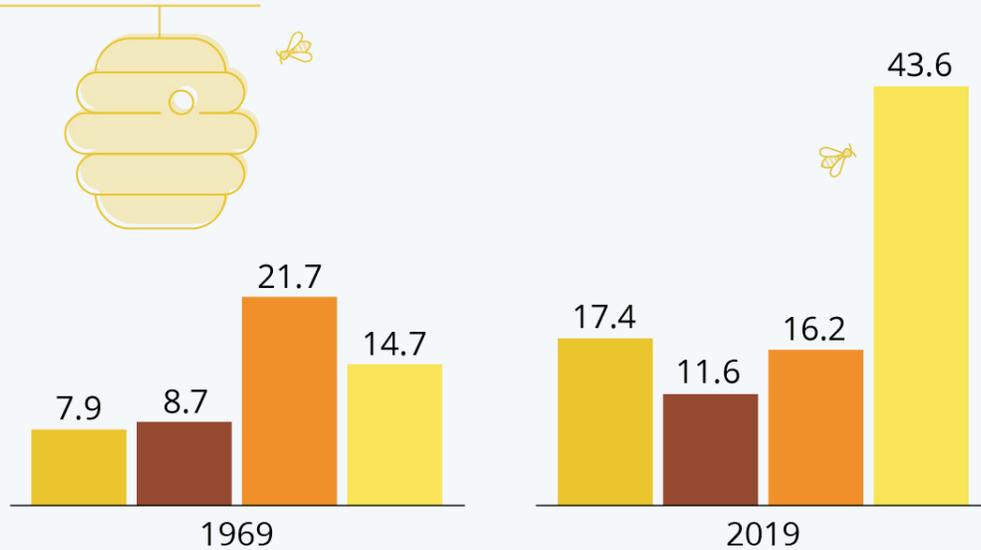
The consumer wants to remove unnecessary grief when doing a hobby they love like beekeeping. The target consumer is looking for a bee smoker they can't hurt themselves on and is easier to use. It's hard enough not getting stung, there's no need to be burned at the same time.

Then & Now: Who Let the Bees Out?



Number of beehives by world region (in millions)

■ Africa ■ Americas ■ Europe ■ Asia & Middle East



Source: FAO



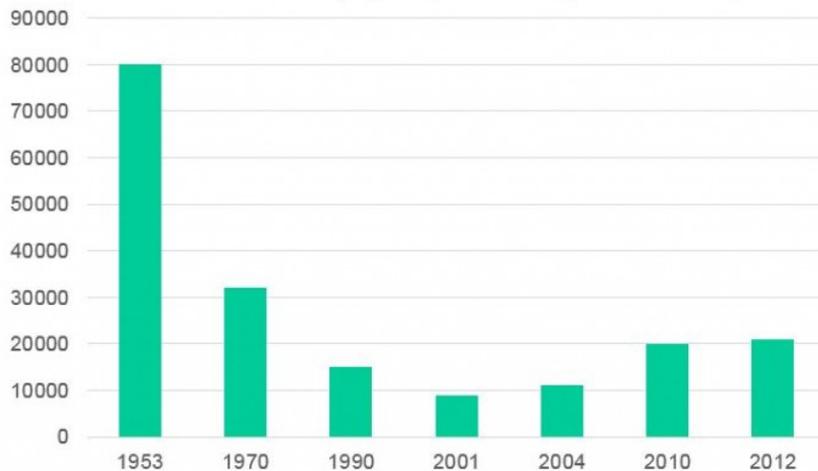
statista

Beekeepers – 60 years decline & resurgence



BBKA members in England and Wales

Source BBKA membership figures (not all beekeepers are members)



Sources:

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**“OEM Beekeeping Stainless Steel Corium Bee Smoker.” *Made in China*,
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**Shahbandeh, M. “Beehive Numbers by Leading Countries Worldwide 2019.”
Statista, 5 Feb. 2021,
<https://www.statista.com/statistics/755243/number-of-beehives-in-leading-countries-worldwide/>.**

“Statistics: The Management Agency, National American Foulbrood Pest Management Plan New Zealand.” *The Management Agency, National American Foulbrood Pest Management Plan New Zealand | Elimination of American Foulbrood (AFB) Disease in New Zealand*, 30 June 2019, <https://afb.org.nz/statistics/>.

The Smarter Smoker

"A new way to beekeep for the 21st century"

Kyle Boelter
APEC 3551

The Problem

A Bee Smoker from 1911

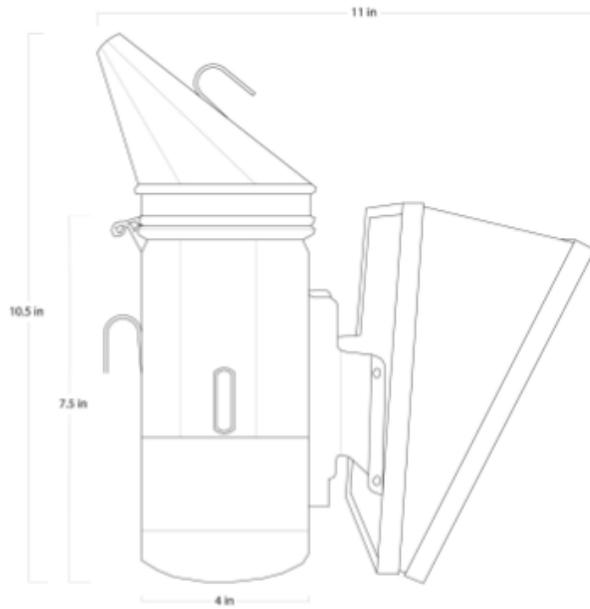


A Bee Smoker from 2021



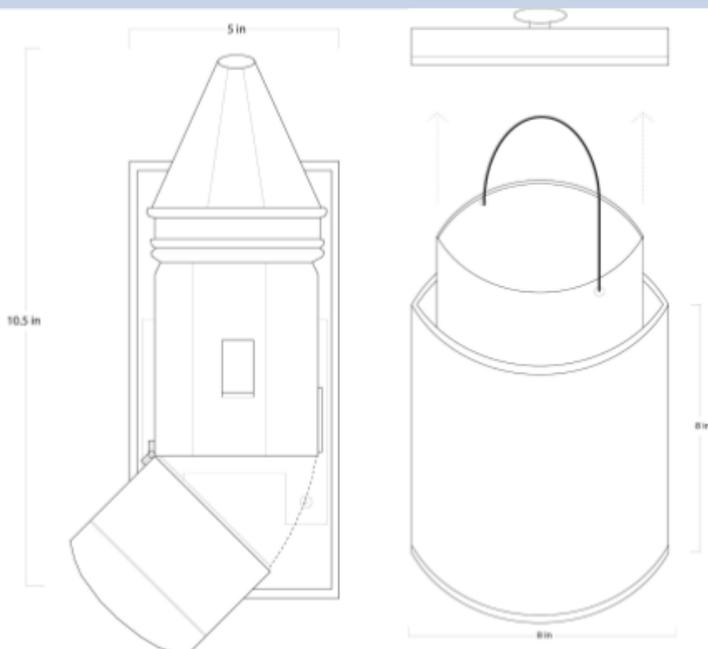
- Design of the Bee Smoker has remained nearly unchanged for 100 years
- Many issues with the current design (heat, warping, annoying to use)
- No alternatives

The Solution



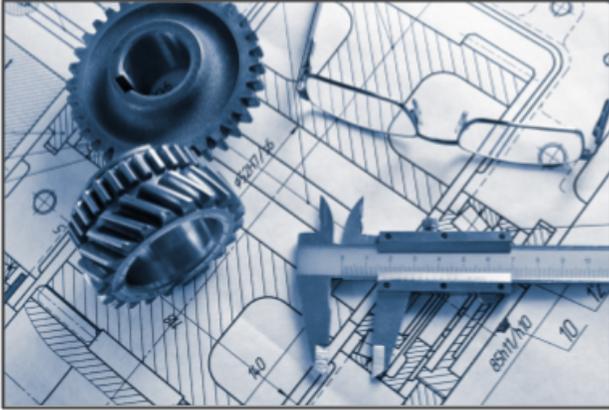
- Ceramic coating able to withstand temperatures up to 500°
- Quick release button connected to hinged smoker bottom and fuel stopper
- Bee Bin to store ash and fuel

How Does It Work?



- Ceramic coating should insulate the heat
- Hinged smoker bottom/fuel stopper will allow ash to quickly fall out
- Ash will then fall into the Bee Bin

Market and Manufacturing



- According to the Agriculture Marketing Resource Center there are around 215,000 beekeepers in the US
- 90-95% of keepers are hobbyists
- Further testing needs to be done
- Alterations made to existing smokers

Next Steps



- The Smarter Smoker is a go!
(with a few caveats)
- Need \$2000 dollars to create a variety of prototypes
 - Used to purchase materials and hire necessary consultants
- Road to \$1,000,000
 - Capture 20% of the US Market (25,000 keepers)
 - Sell the Smarter Smoker at \$40
(does not include the option to bundle the Bee Bin)

Q and A

- 1.** What temperature does the head reach when there is a fire in the smoker? How do you know the ceramic coating will withstand those temperatures?
- 2.** Why not also sell an "ashes bin" that you transfer the fire parts into when you are done with the smoker to quickly stop the fire and allows for the smoker to cool down?
- 3.** Why not also sell natural wood shavings in a 5 lb bucket and make an entire smoker kit so you have all the supplies you need and they buy it from you?

