Market Analysis

09 - Filament

**Possible Patents:**

# **“Method for producing a supply obtained from the recycling of plastic material of industrial and post-consumer residues, to be used by 3d printers”**

<https://patents.google.com/patent/US20160107337?oq=filament+recycler>

**Summary:** It takes virgin material along with scrap thermoplastics that are able to be used in Fused Deposition Model and Fused Filament Fabrication. It can output normal filament for 3D printers or supply a powder form for Selective Laser Sintering printers. This process includes cleaning and drying the material before putting it through the machine. When in the machine the plastic meets a pulverizer that then goes directly to the screw if normal filament is wanted but can also be taken out before the screw if the powder is what is wanted.

**Date Issued/Expired:** Abandoned, but published in 4/21/2016

**Do these patents show that you have the freedom to operate in this space?:** Yes

**Are there intellectual property issues that might guide your design in a direction where you have freedom to operate? :** No

# **“Apparatus and method for reclaiming polymer waste”**

<https://patents.google.com/patent/US4143001A/en?oq=filament+recycler>

**Summary:** The system recycles high bulk tangled polymer waste. It chops down the polymer waste into pieces of size 15 to 40 millimeters. Chopped pieces are then passed through a charging zone. The charging zone is the hopper where it loosens and distangles the chopped waste. After that distangled chopped pieces are compressed by a screw to 1/4th - 1/5th of its original volume. The compressed waste is moved to an extruder. In the extruder compressed waste is melted, degassed and then extruded to desired shape.

**Date Issued/Expired:** Expired 1/25/1998

**Do these patents show that you have the freedom to operate in this space?:** Yes

**Are there intellectual property issues that might guide your design in a direction where you have freedom to operate?**

Since the patent is expired already we don’t think it should result in any issue. Even if the patent wasn’t expired, still our design is not similar to theirs. The target is the same but it is achieved in a different manner.

**Possible Competition:**

1. **ReDeTec ProtoCycler+**

<https://redetec.com/>

**Summary:** The ReDeTec ProtoCycler+ is a product that appears to have all the necessities for filament recycling built into itself, as it has the equipment to grind, extrude, and spool all on its own. Additionally, it comes with computer software and editable profiles containing optimal settings for multiple types of plastic. However, all consumer feedback notes that the product does not function as claimed, leaving most users unable to successfully produce filament. Customer support is also either nonexistent, unreliable, or fails to respond in a timely manner, making the product almost unusable.

**Cost:** $1,999.99

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| --- | --- |
| Pros | Cons |
| Our design likely be cheaper than the $2,000 price point of the ProtoCycler+ | Our design has a slow base extrusion rate of 0.2 kg/hour |
| Our design will be able to hold more raw material | Our product lacks a built-in grinder and sorting system |
| Our product will be able to use both 110 V and 220 V AC power sources | Our design does not have specific desktop software that can be used to log extrusion data and edit automatic extrusion settings |
| Our design will likely be functional and lack negative customer responses | Our product will only have pre-programmed extrusion settings for PLA |

1. **Felfil Evo Filament Maker**

<https://felfil.com/>

**Summary:** The Fefil bundle is a system that includes everything needed to make filament; it includes their single screw filament extruder and a spooler to wind the filament onto a spool. It is designed for multiple different materials and can extrude from a speed of 1.15 m/minute. It has a standard screw in barrel design to melt the plastic, fans to cool the filament as it is extruded, a sensor to measure the filament diameter, and pullers to wind it onto a spool.

**Cost:** $1199

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| Pros | Cons |
| Our design will come fully assembled to our customer. If a consumer was to purchase the felfil, there is some assembly required. | Ours will not include a sensor to measure and auto-adjust the diameter of the filament |
| Ours will have a large hopper that holds a significant amount of plastic but the felfil is so small that there is not a large hopper | As of now we are only designing for PLA whereas the felfil is designed to recycle multiple different materials |
|  | Our design will only have one nozzle design as opposed to allowing the nozzle to be changed to vary filament diameter between 1.75 mm and 2.85 mm like the felfil |
|  | The temperature of the felfil is limited to 250 degrees C whereas ours will be limited at 180 |