



WorldStove Corporation

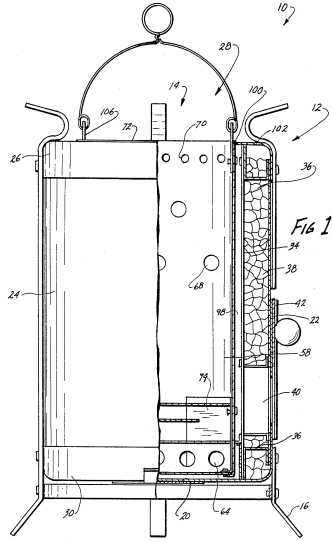
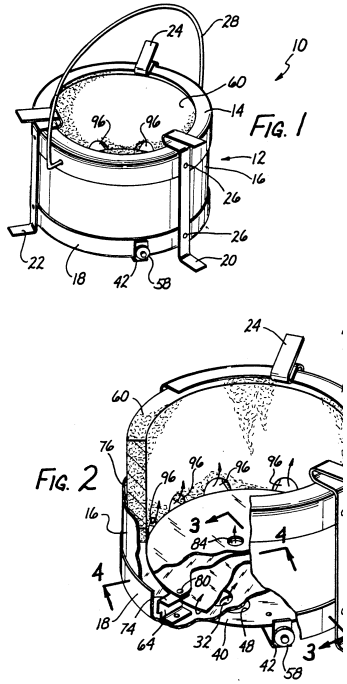
... *a million stoves to help save the world*

The LuciaStove

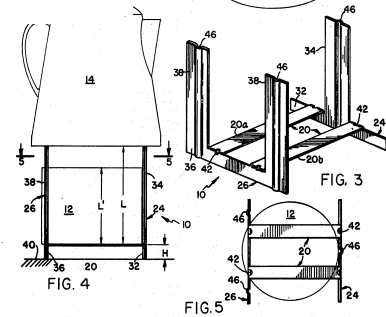
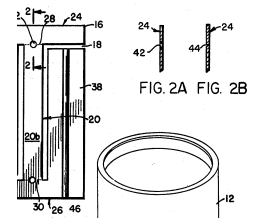
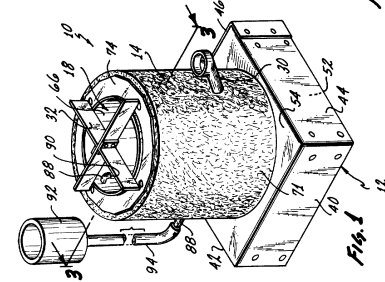
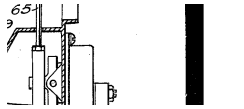
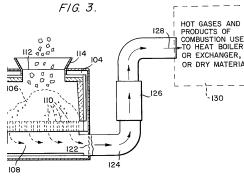
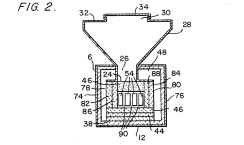
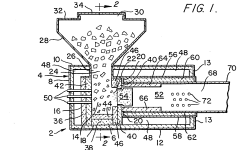
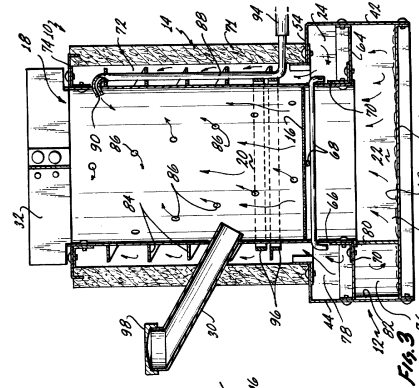
A New Technology and Marketing Approach for the
Production of a Combined Pyrolysis-Gasification
Cookstove and Related Scaled-Up Technologies

ETHOS Conference, North Western University WA
2009



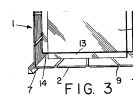
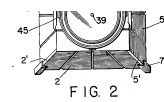
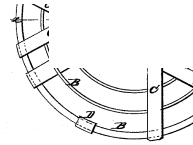


: 148 years



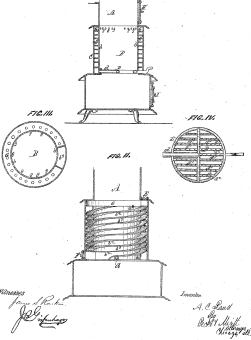
© 2

Witnesses:
William H. Miller
J. Marshall



R.C. REED'S IMPROVEMENT IN COAL BURNERS

No. 119,710. Patented Oct. 9, 1873.



WITNESSES:
Francis McCreedy
C. Sulgwick

INVENTOR:
 RALLSTON M. SI
 BY
Ernest Booth Miller
 ATTORNEYS

Address:
Booth Street
Wm. Hagger
 by
Chas.

Why have we yet to see millions of stoves?

- **Is it demand?**
- No, 1.6 billion people still cook on open fires
- **Do current designs not work?**
- No, many designs work very well
- **Is it cost?**
- No, while there are some cost \$2,000 or \$300 many range from \$140 to \$25 or less



Why have we yet to see millions of stoves?

- Difficulty with adoption of new cooking techniques
- Unreliable distribution networks in key areas
- Creating the “right” stove that adapts to consumers’ needs and desires
- Inability to produce enough stoves, in enough variety to create a true market place for consumers



Key Issues

- One of the problems that stovers face is to create safe, quality stoves at a very low cost so that they are available for the millions of people that need them.
- Many designs are needed.
- How can we maintain the diversity of quality stove designs and innovations while still striving to meet the greater need?

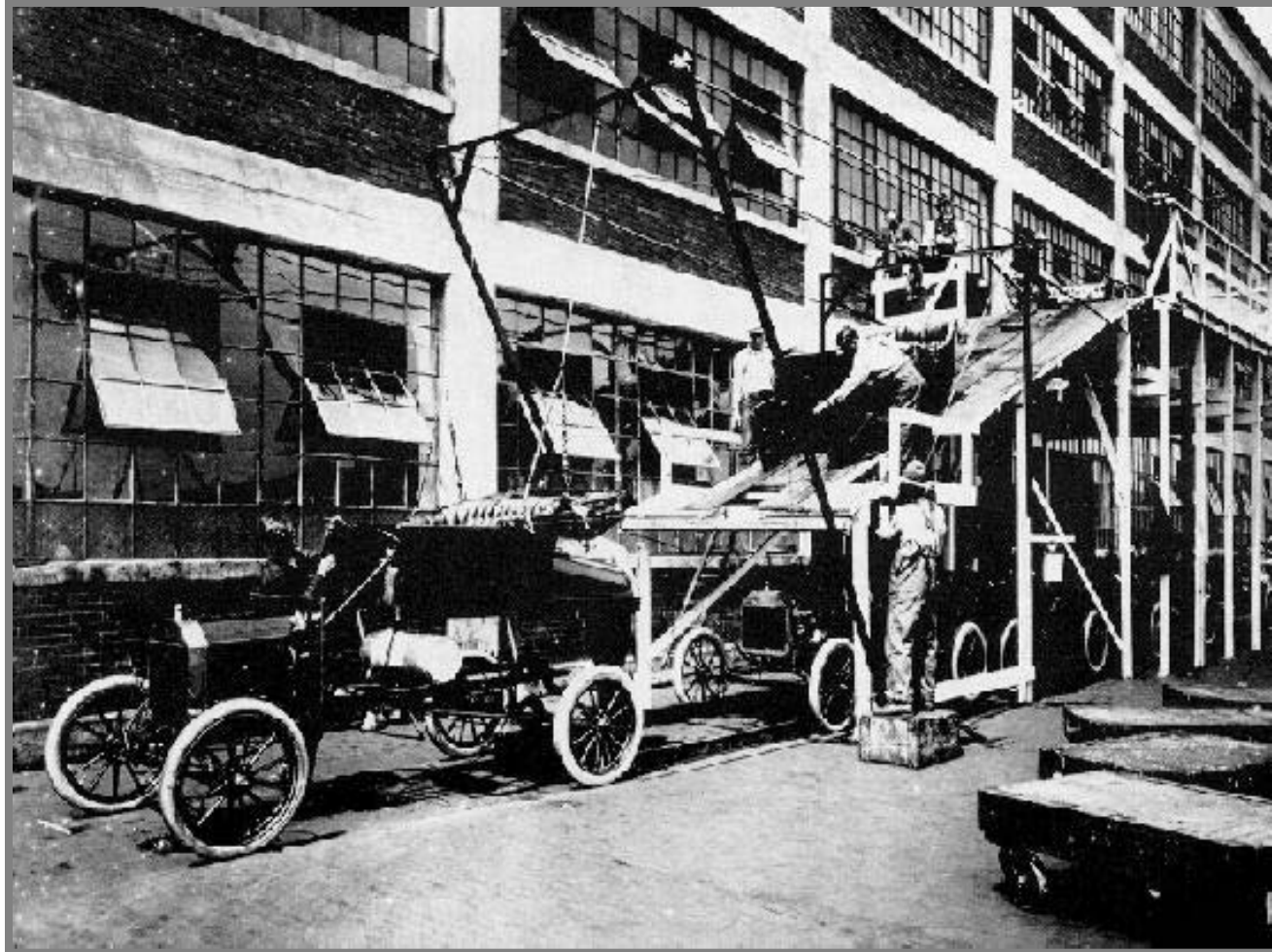


Importance of Stover Community

- Protecting diversity of ideas and innovations
- Ensuring that many designs are industrialized for mass manufacturing so that people in need have product choice
- Continue to support new ideas and new stovers even as field grows to scale



The Industrial Mass Manufacturing Approach



What is Industrialized Mass Manufacturing?

- 1000 stoves a year you are working
- 5000 stoves a year your are working well
- 10000 stoves per year you've got help and neither one of you is sleeping anymore
- 50000 a year you're working your tail off and have a great deal of help
- All or none of the above can be done through industrialized mass manufacturing



Definition

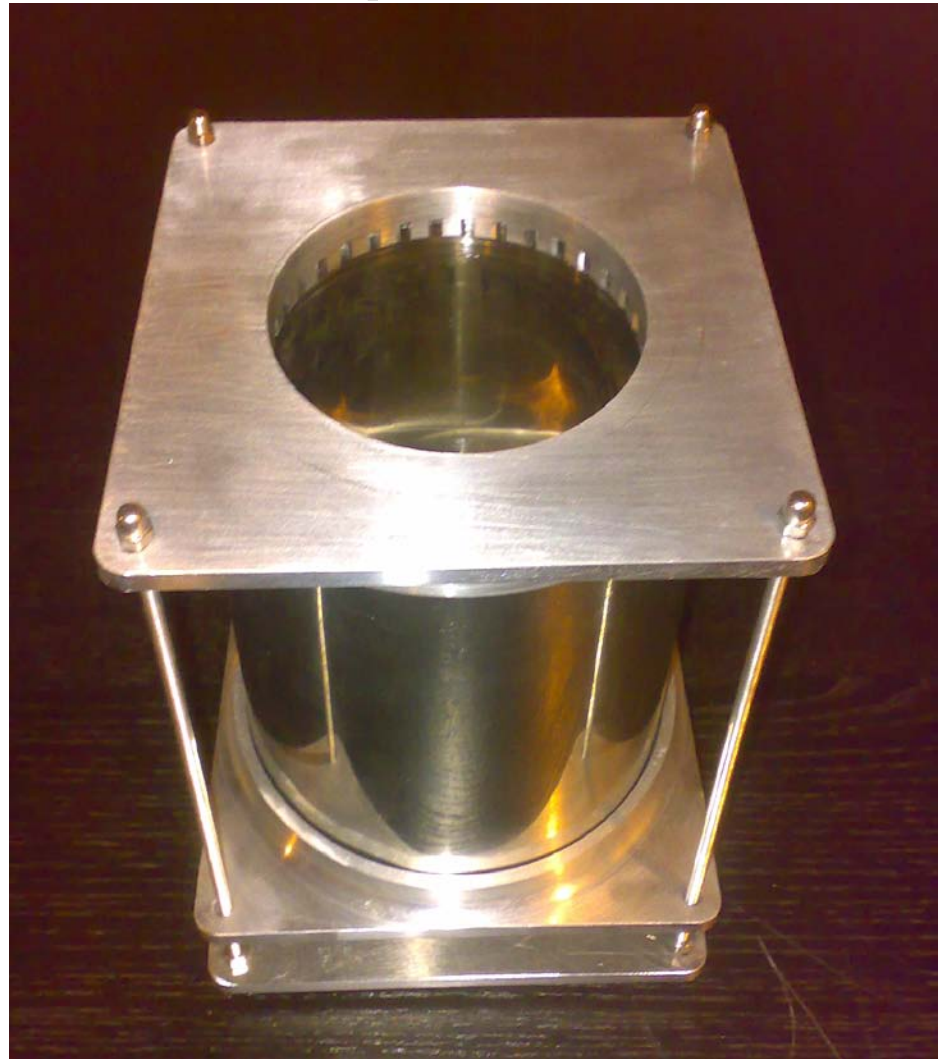
- Industrialized Mass Production: Designs that are specifically for the production of a large number of identical units at a lower cost.
- Any item, any stove can be studied and modified for industrialization.
- However, we are not suggesting all should be.



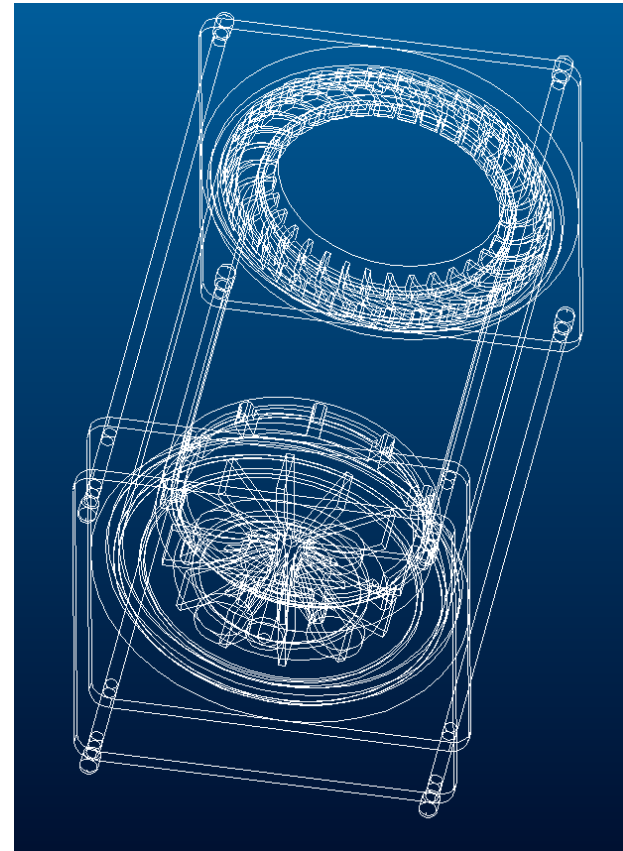
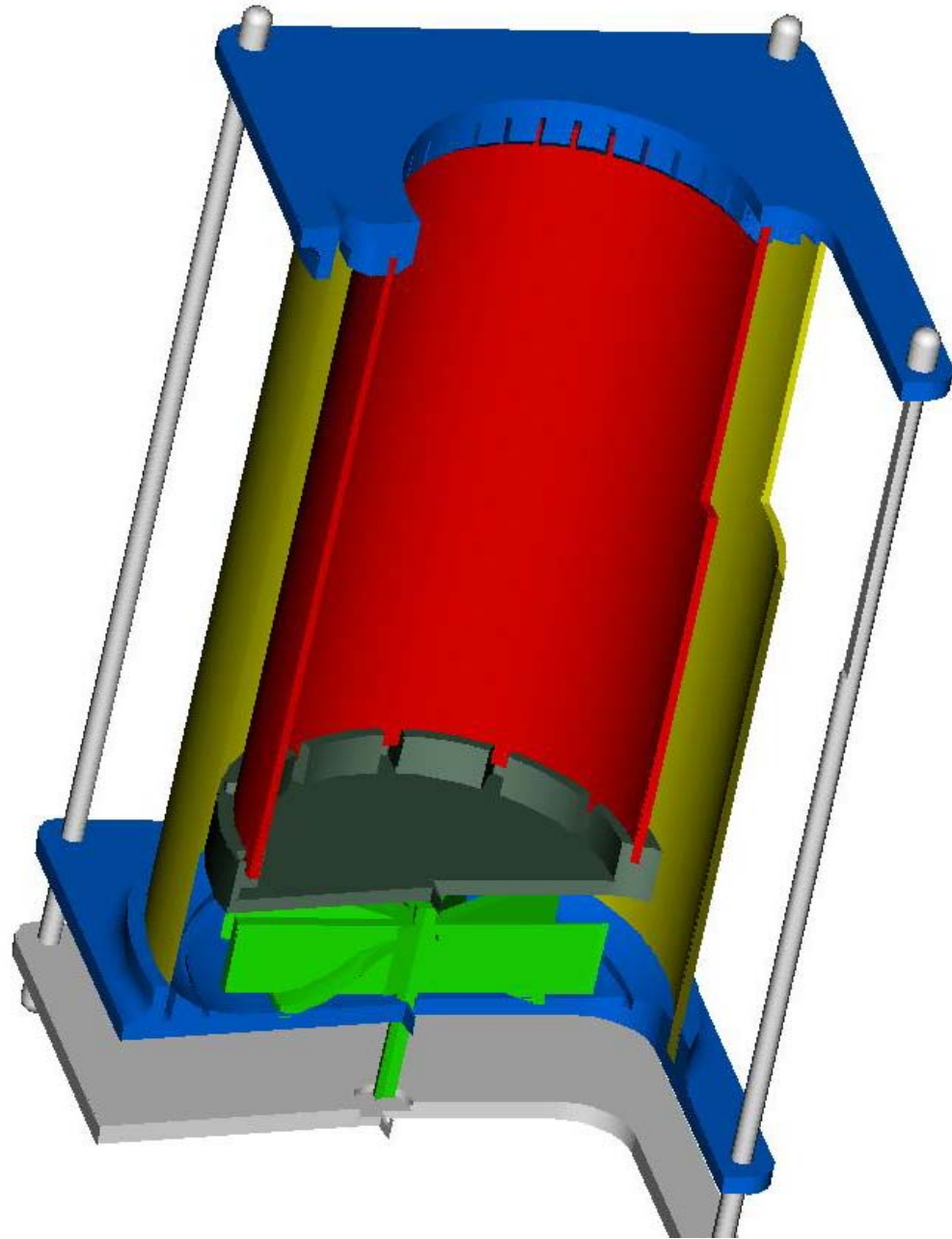
The LuciaStove Example

The LuciaStove

- Designed to be able to produce over 4000 stoves per day
- Additional benefits of the approach . . .



Geometries that were first studied to avoid drilling of holes, permitted opportunities for greater control of fluid dynamics.



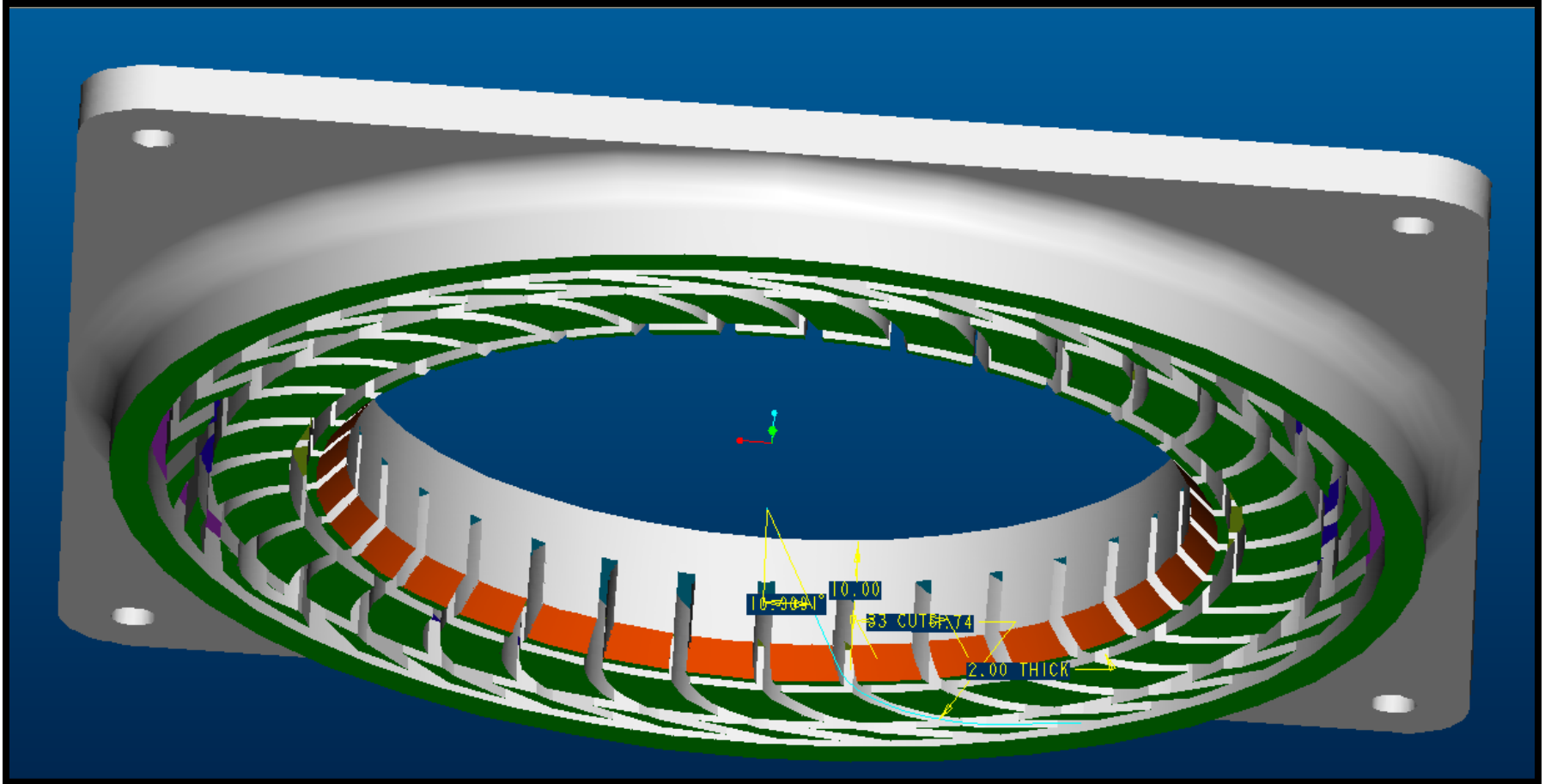
Which in turn provides better combustion



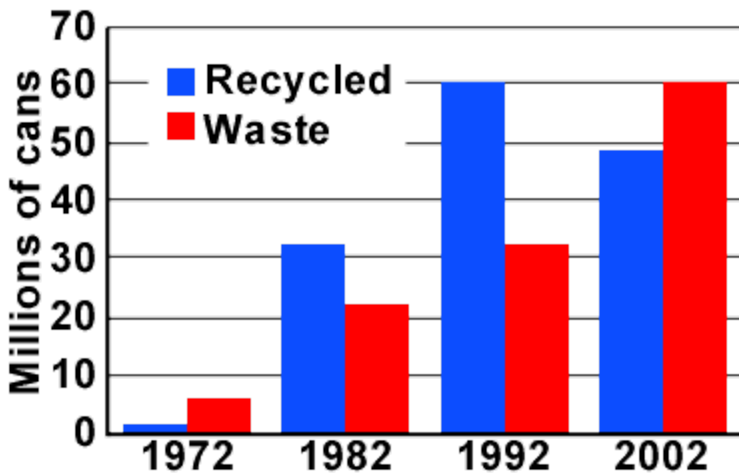
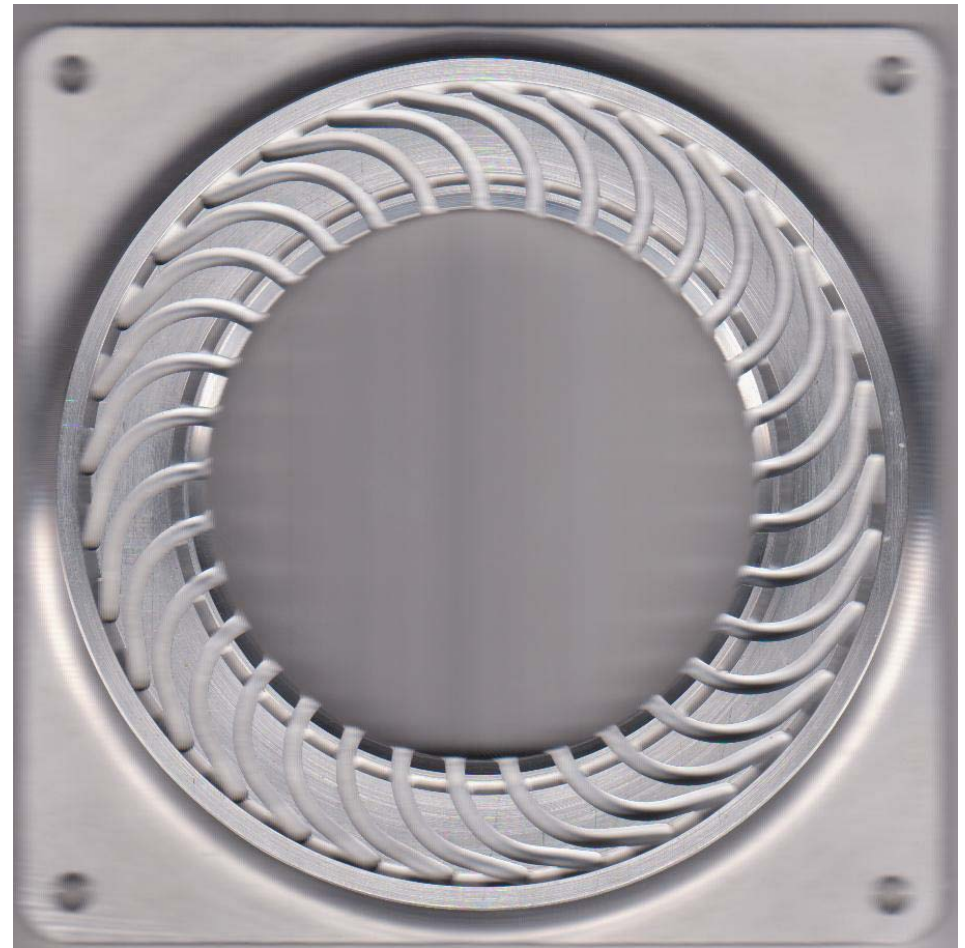
Fibonacci series swirl not only is nice to look at but it assures better heat transfer to pot
Without the need for a pot skirt



Injection molding of key components assures low cost and high quality



And it can be made of recycled material.



Ships flat



Adaptable to local or most economical technology



The end result is a stove that is:

- Adaptable to user habits, needs, wishes, cooking habits, available fuel
- Low cost to make and ship (ships flat)
- Life tested to last ten years
- EU emissions certified (66 ppm CO)
- Consumable parts are replaceable
- Can function either as a **coaxial gasifire** or a **pyrolytic stove**
- Adaptable to almost any type of fan or even used without
- Creates local workforce opportunities and earnings
- And at the end of its life is recyclable



What does this mean for stovers?

Industrialization can be:

- Expensive
- Risky

BUT

- Provides new development opportunities
- New geometry options
- Consumers become innovators

