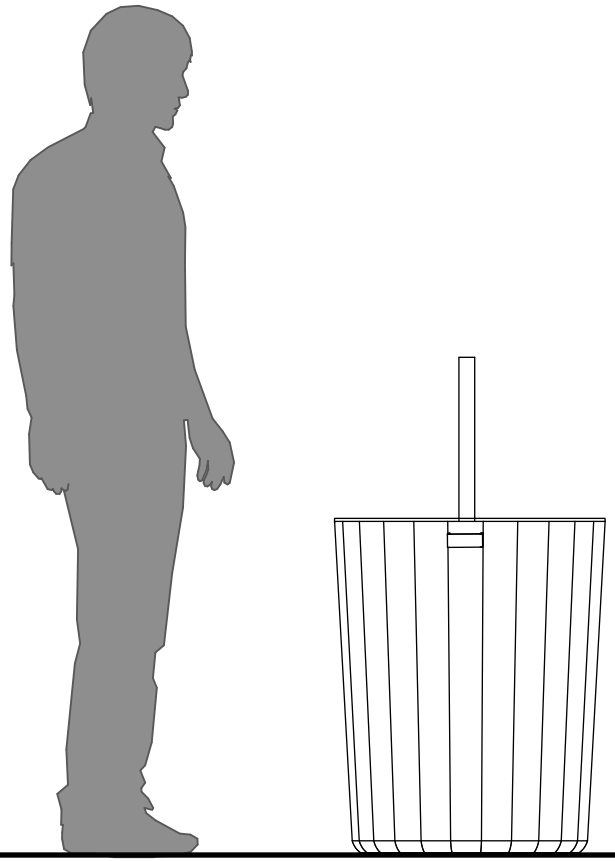
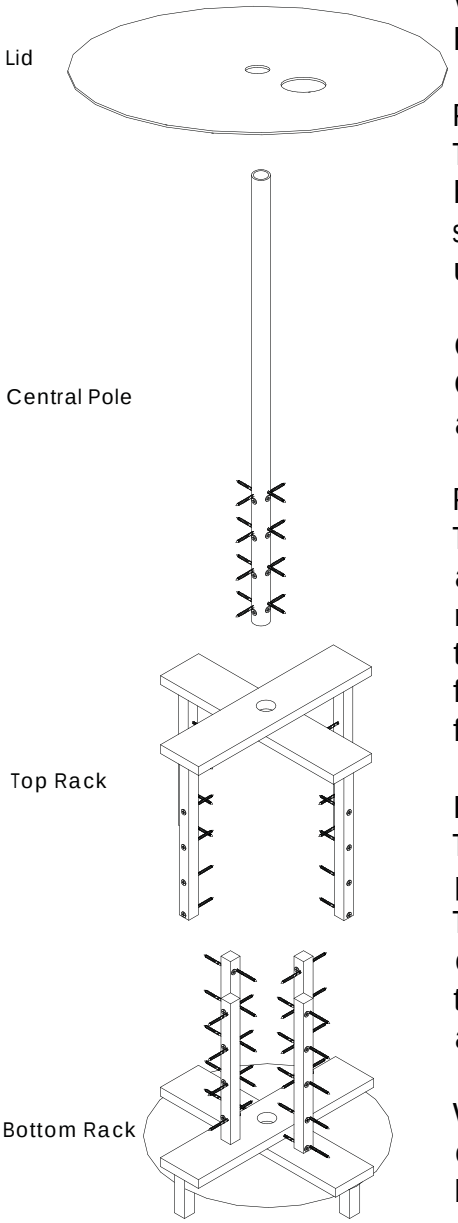
Monarch Watch Presents:

Build Your Own Milkweed Seed and Floss Separator



Introduction



The manual is a guide in building your own milkweed seed and floss separator. Monarch Watch provides this manual as a guide to the general public to promote the harvesting and planting of milkweeds, the exclusive host plants of monarch butterflies.

Purpose

The purpose of the machine is to separate the seed from the floss such that both can be harvested yet be relatively free of extraneous materials. The seed is intended for restoration seed mixes, large-scale milkweed plantings and to start seedlings indoors. The floss can be used in pillows or comforters or sent to Monarch Watch.

Goal

Our intent was to design an apparatus that was cheap, easy to construct, yet effective at separating the seed from the floss with a minimum of effort.

Processing

To process the milkweed seed and floss, load the container with 6 inches or so of seed and floss that have been separated from the pods and spin the center pole for a few minutes. The motion of the center pole and top rack creates a tearing action that separates the seed from the floss. The heavier seed drops to the bottom of the container and the lighter floss rises to the top where it can be drawn off with a vacuum or blown off by placing a fan in front of the hole at the top of the container (outdoors of course).

Design and Construction

The manual breaks the machine into four separate stages of construction: the lid, central pole, top rack, and bottom rack as shown in the schematic on the left.
The design presented here is based on the use of a 32 gallon metal trash can as the container. Larger or smaller containers could be used but the scale and construction of the internal parts would have to be modified accordingly. The trash can is only a base and the internal apparatus can be removed and stored when not in use.

When in operation, the center pole and top rack move – either back and forth or in a continuous circular manner, depending on whether the user prefers to move the center pole back and forth between the hands or adds a handle at the top of the to accommodate continuous motion.

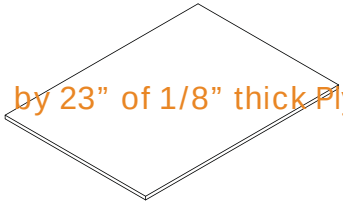
Materials Used in Model

All materials are optional. The machine was created with found materials at our lab. This document is just a guide.

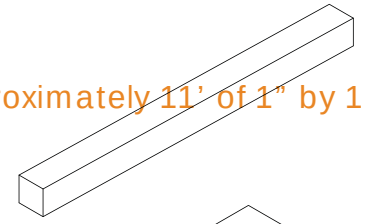
A shop vacuum can be used to gather the floss. If you do not wish to save the floss the alternative is to put the completed machine in front of a fan outdoors when churning the seed and floss. The floss will just float away.

We strongly advise you to wear safety goggles and use a dust mask, since the floss can become very fine during processing.

A 3D computer model of the machine is available with the use of a computer program named Sketch-Up. The program is free to download at: sketchup.google.com

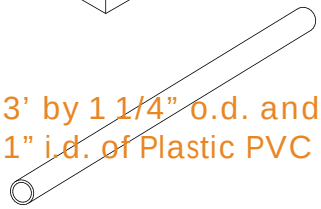


23” by 23” of 1/8” thick Plywood



Approximately 11’ of 1” by 1” Lumber

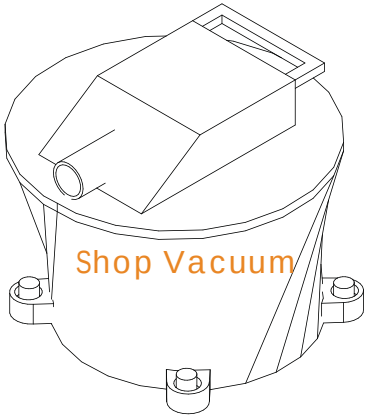
Approximately 6’ of 4” by 1” Lumber



3’ by 1 1/4” o.d. and
1” i.d. of Plastic PVC

Screws

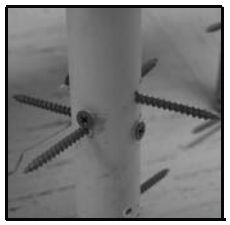
Approximately 78 or 1 lb of 3”,
eight 1”, and two 2” screws.



Shop Vacuum

32 Gallon Trash Can

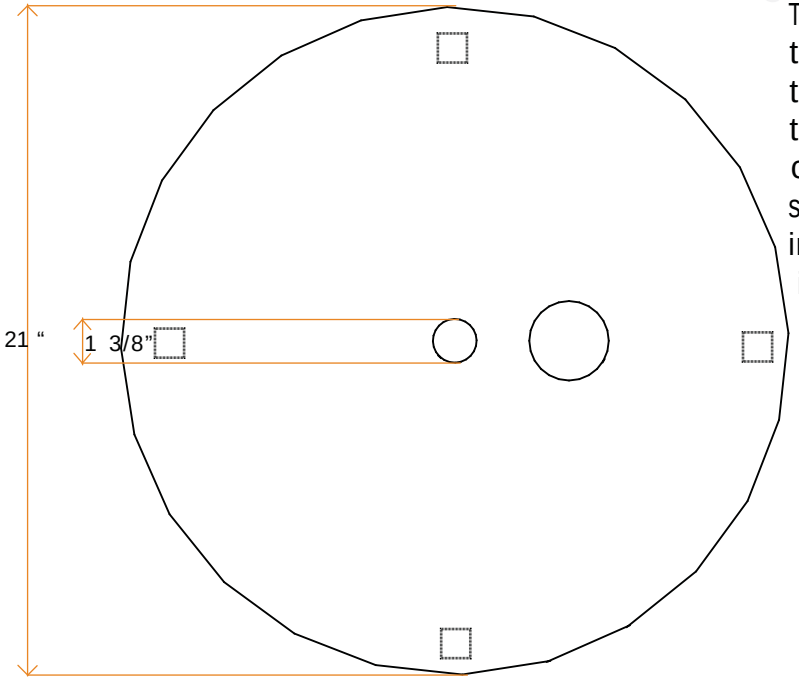
Lid and Central Pole



Central Pole

The purpose of the pole is to rotate within the trash can. Screws attached to the pole act like teeth as seen in the image to the left. Referencing the photo to the left, place four screws all perpendicular to each other into the 1" space as seen in the line drawing. Do this four times in the designated spots as seen in the line drawing. The 3/4" spacing at the bottom of the pole is the width of the 1" by 4" board. (The real size of this dimensioned lumber is 3/4" by 3 3/4".) If you use any other dimensioned lumber add or decrease this spacing.

Example: If you use a 2" by 4", change the space added on the end of the pole from 3/4" to 1 1/2".



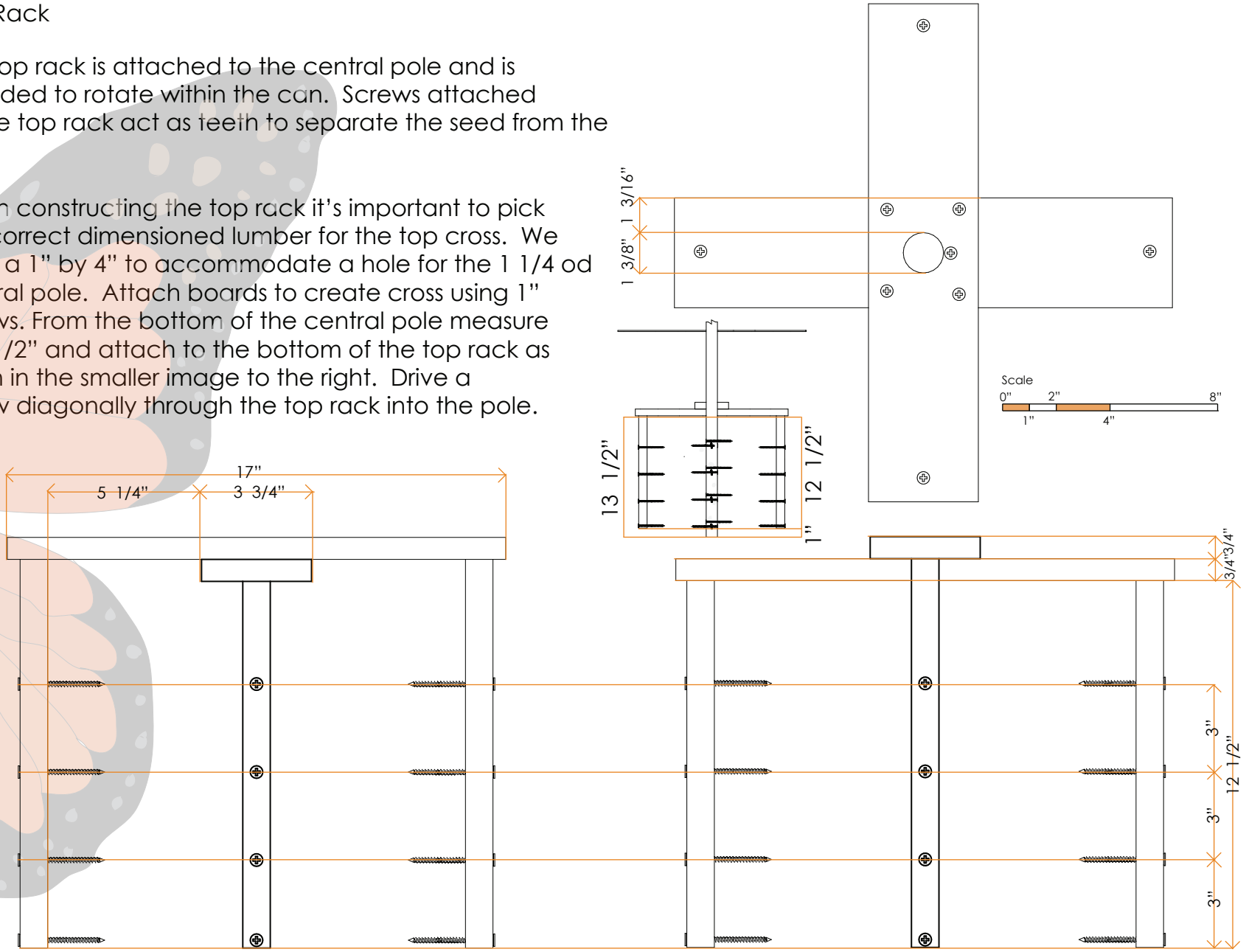
Lid

The lid is used to contain the floss, to be the anchor for the center pole and, with the offset hole, to provide a way in which the floss can be removed from the container. The lid is held in place by four small blocks or pegs that are placed just inside the bottom edge of the lid as shown in the image to the left.

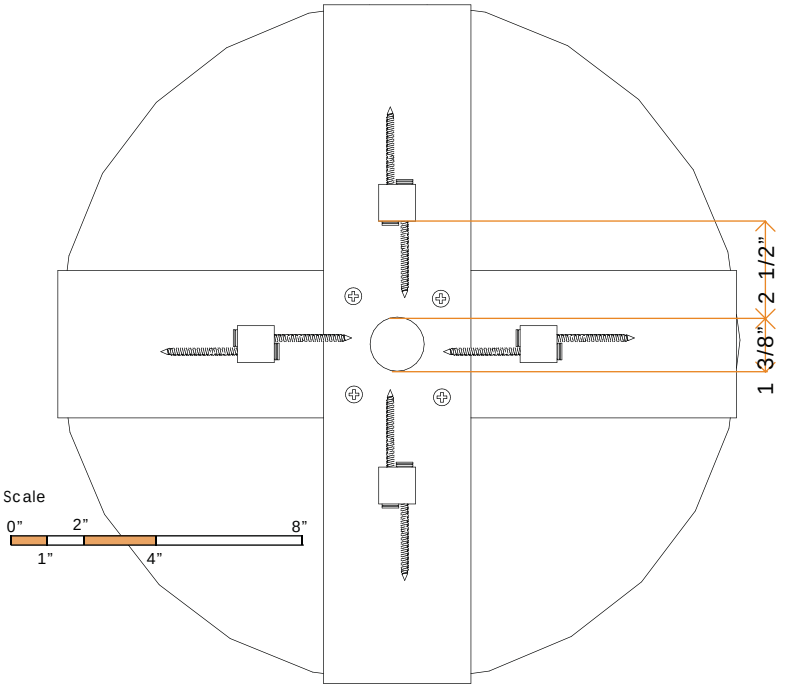
Top Rack

The top rack is attached to the central pole and is intended to rotate within the can. Screws attached to the top rack act as teeth to separate the seed from the floss.

When constructing the top rack it's important to pick the correct dimensioned lumber for the top cross. We used a 1" by 4" to accommodate a hole for the 1 1/4 od central pole. Attach boards to create cross using 1" screws. From the bottom of the central pole measure 1' 1 1/2" and attach to the bottom of the top rack as seen in the smaller image to the right. Drive a screw diagonally through the top rack into the pole.



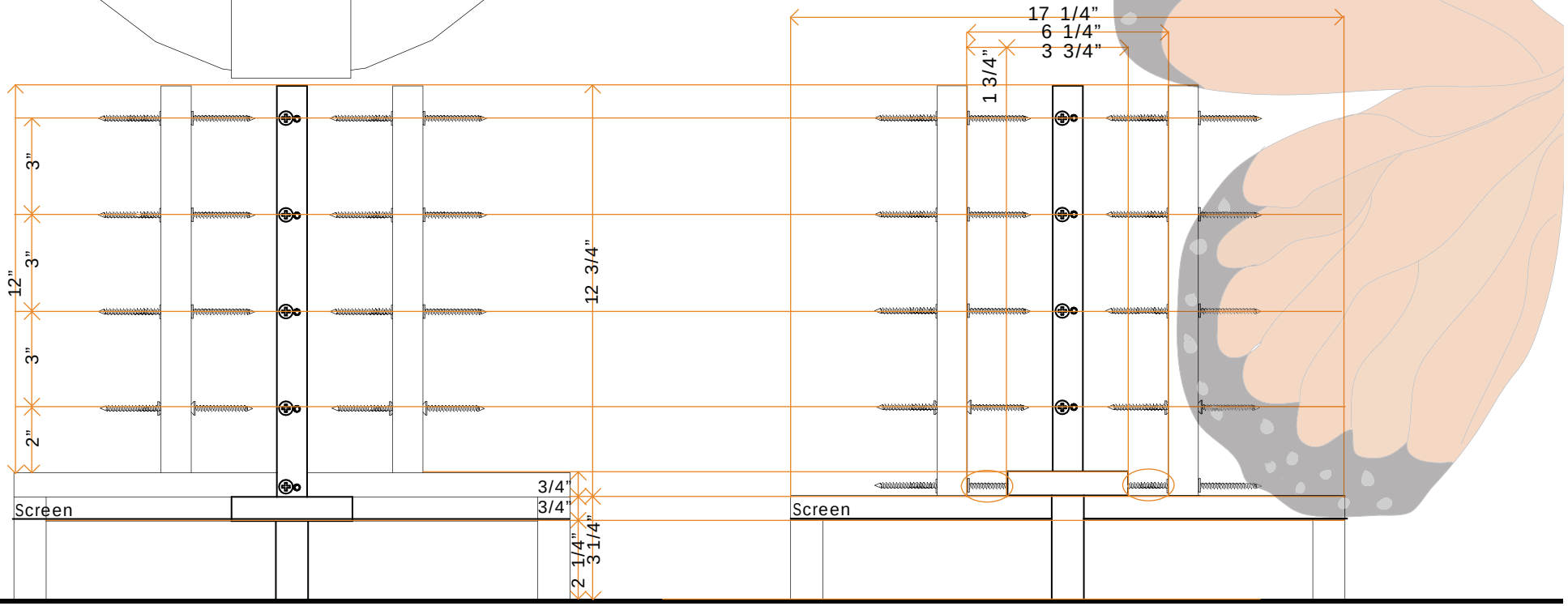
Bottom Rack



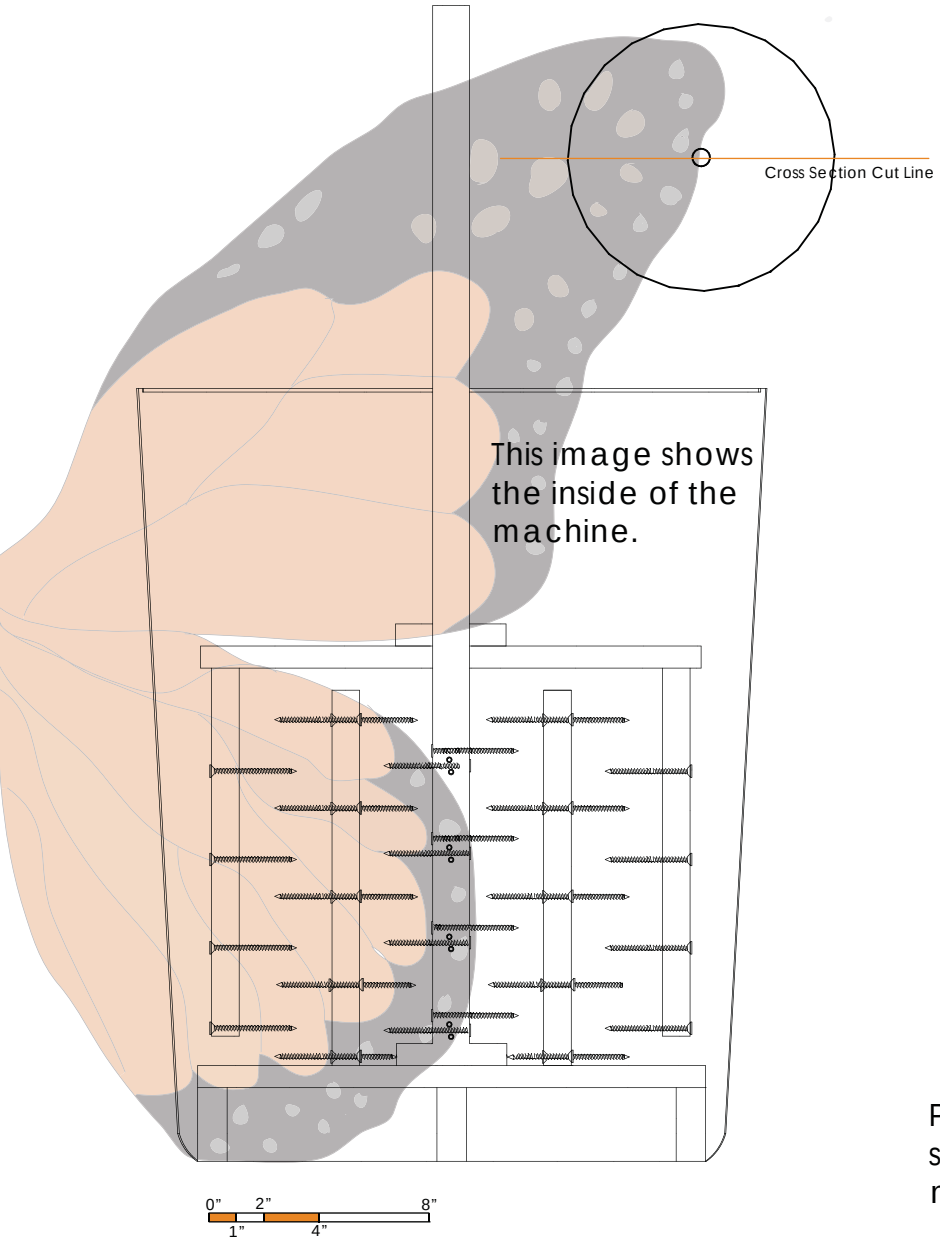
Bottom Rack

The bottom rack is placed inside the trash can. Its purpose is to stay stationary and allow the central pole and top rack to pivot within it. Screws attached to the bottom rack also act as teeth to help separate the floss from the seed.

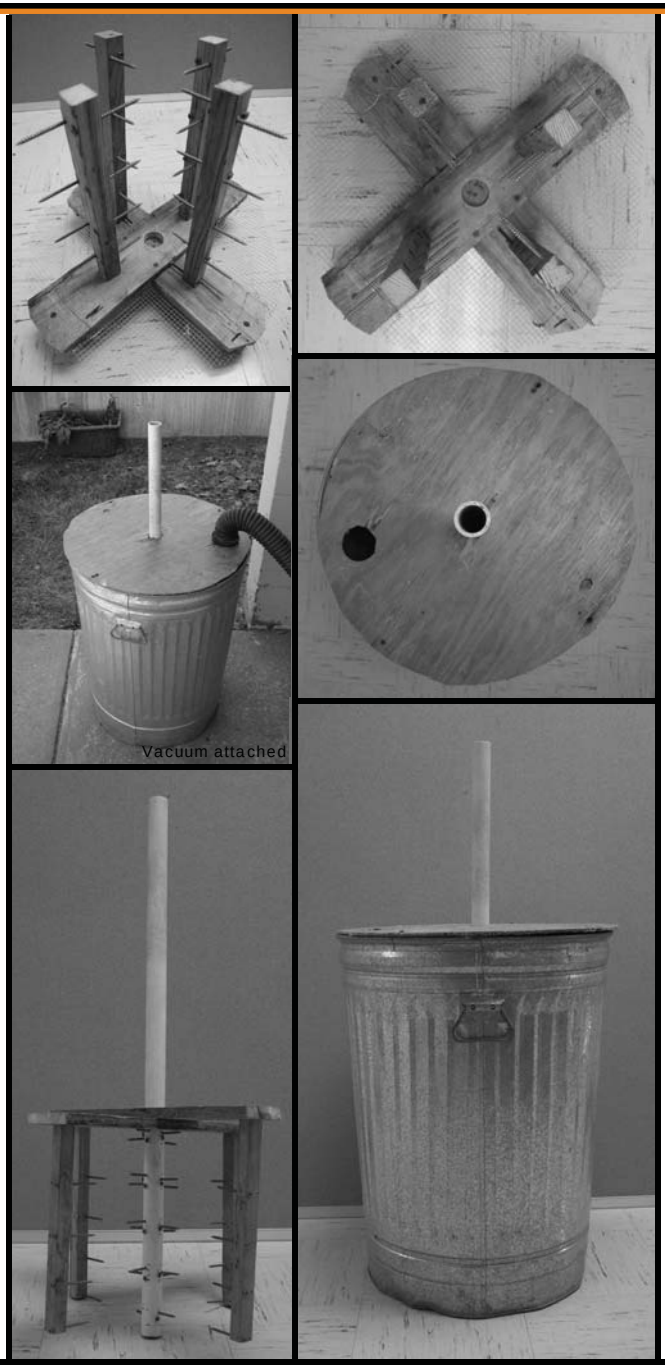
Again, pick dimensioned lumber based on the diameter of your pipe since you will be drilling a hole completely through the top board, but not the second. This creates a hole for the pipe to rotate in. The screws that are circled should be 2" long. After constructing the bottom rack, cut your 1/4" by 1/4" metal screen (hardware cloth) to the diameter of 1' 5 1/4" or to the diameter of the bottom of your trash can. Attach the screen to the bottom of the two crossing boards or see diagram below and Detail Photos page for placement of screen.



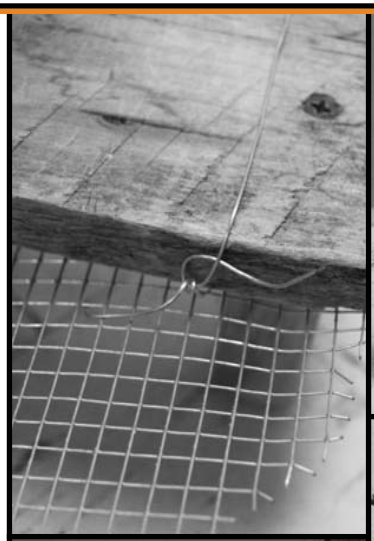
Final Photos

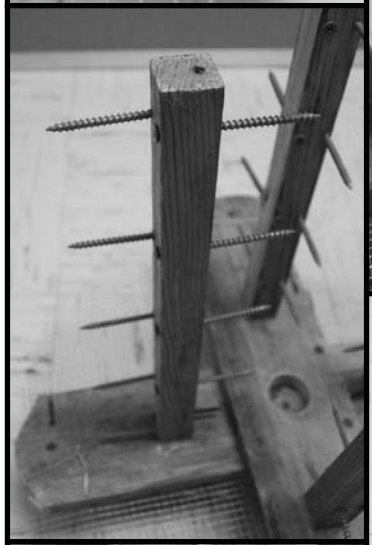


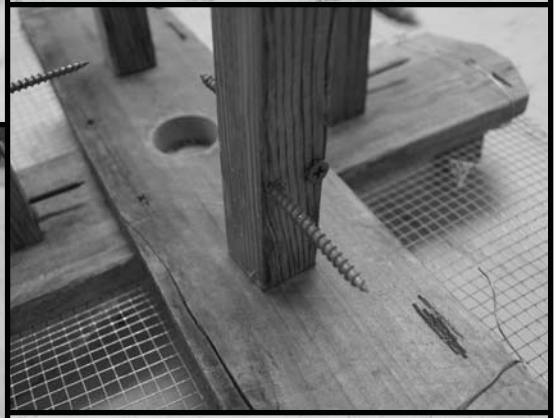
Photos on the right show our completed machine.

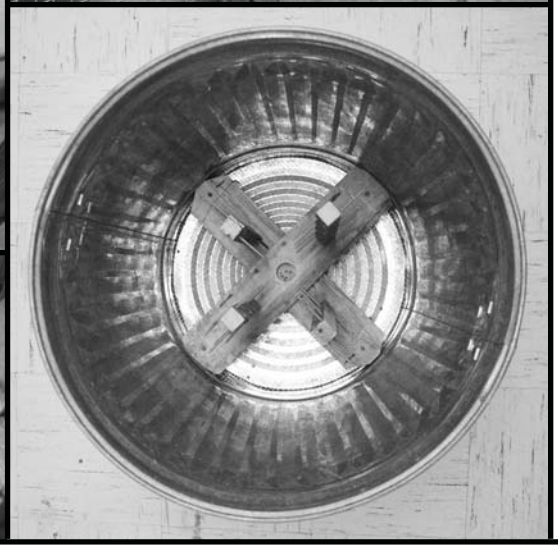


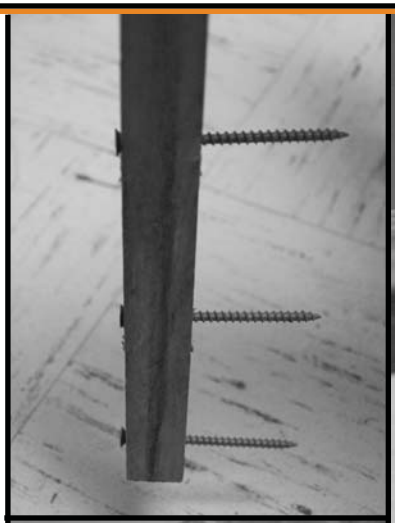
Detail Photos

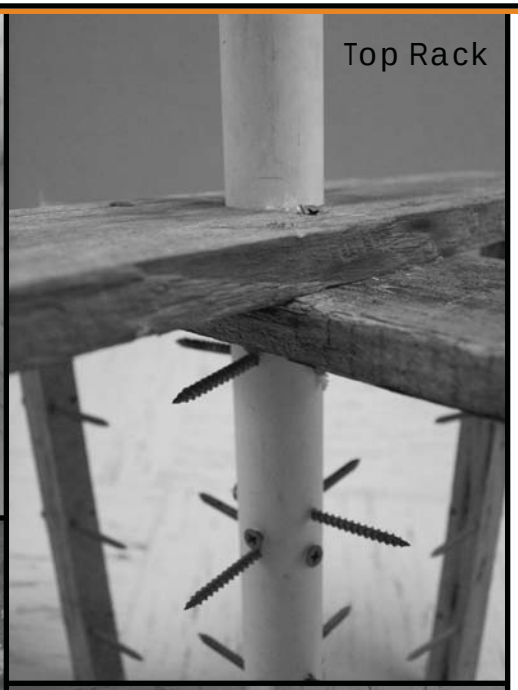












Procedure

After picking seed pods make sure to let them dry out completely. For best results, do not compress the floss when storing and drying it. The floss should be fully expanded, light, and dry before placing into the machine. Do not compress the seeds and floss either before or after placing into the machine. If compressed, the floss will not float upward when rotating the pole.

How to properly load your Milkweed Seed Separator

1. Place bottom rack and top rack with attached central pole into trash can.
2. Add floss and seed to trash can. Only place 6 to 8 inches of floss and seed in the container as seen in the photo to the right. Do not put pods into mix.
3. Put lid on.
4. Spin top rack for 1 minute.

Method A

5. Turn on vacuum.
6. Continue to spin until floss is gone.
7. Once done remove top and bottom rack.
8. Pour seeds from the bottom of the trash can into a new container.

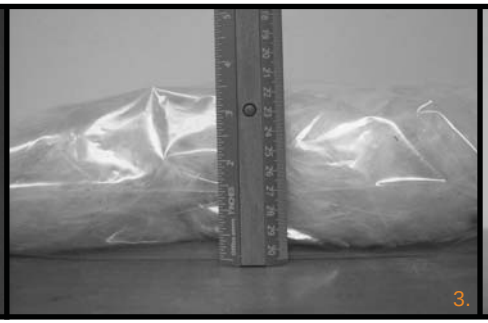
Method B

5. Remove lid.
6. Place trash can in front of a large fan outdoors. Fan should be at the same level as the opening of the trash can blowing horizontally across opening of trash can.
7. Turn on fan.
8. Continue to spin top rack until all floss is gone. Fan should slowly remove all floss by floating it away.

Results: From one full onion bag the size of 15 by 25 inches as seen in image 1; we harvested 0.14 lbs of floss seen in images 2 and 3. The floss was put into a 25 by 14 inch bag. The onion bag also yielded 0.20 lbs of seed. The seed is being stored in a 5 by 5 inch container as seen in images 4 and 5.


1.


2.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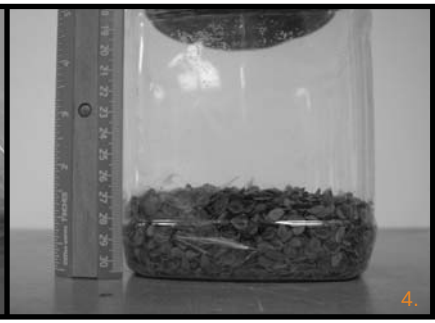
4.


5.