

**THANK YOU FOR YOUR PURCHASE AND SUPPORT OF ROPE O'MATIC!!!**  
PLEASE READ ALL SAFETY INSTRUCTIONS AND TERMS OF SALE BEFORE YOU BEGIN.

# SAFETY WARNING:

**SMALL PARTS IN THE KIT AS WELL AS THE PACKAGING MATERIAL MAY PRESENT A CHOKING OR SUFFOCATION HAZARD FOR CHILDREN. KEEP PARTS AWAY FROM CHILDREN! DISPOSE OF PACKAGING IMMEDIATELY.**

**ALWAYS WEAR EYE PROTECTION:** Small parts may become airborne, glue may become airborne, other unforeseen problems could endanger your eyes. **SERIOUSLY**, always wear eye protection while assembling or using Rope O'Matic

**ROPE O'MATIC MAY HAVE SOME SHARP EDGES. ALWAYS WEAR GLOVES WHEN HANDLING IT.** Thin dexterous latex dipped knit gloves are perfect. If you find a sharp edge simply dull the edge using a nail file.

**DANGEROUS CYANOACRYLATE ADHESIVE IS USED IN THIS KIT:** Also known as **SUPER GLUE** or **KRAZY GLUE** or **SPECIAL GLUE**. This glue poses a risk of serious **EYE DAMAGE**. **ALWAYS WEAR SAFETY GLASSES**. This glue poses a risk of skin adhesion. **ALWAYS WEAR GLOVES**. This glue poses numerous risks to Children and Pets : **ALWAYS KEEP OUT OF REACH OF CHILDREN AND PETS. DISPOSE OF TUBE PROPERLY AFTER ASSEMBLY TO ELIMINATE ONGOING RISK. FOR MORE INFORMATION ON CYANOACRYLATE:** <http://en.wikipedia.org/wiki/Cyanoacrylate> **POISON CONTROL IN THE USA:** American Association of Poison Control Centers: **DIAL 1 (800) 222-1222**

**DO NOT USE SHARP EDGED TOOLS, RASOR BLADES OR KNIVES IN THE ASSEMBLY OF ROPE O'MATIC.** The Kit was designed to use standard tools with no dangerous sharp edges.

**HAIR ENTANGLEMENT HAZARD. WEAR HAIR BACK AND COVER.** Long hair may become entangled in the machine. take care to keep hair safely contained and away from the machine.

**POTENTIAL PINCH HAZARD:** It is possible but unlikely to pinch oneself on the machine avoid the discomfort by having a single operator. The machine is hand driven and the operator will stop if a small pinch begins.

**DO NOT MODIFY** or motorize this machine.

**WHAT YOU MAKE CAN BECOME HAZARDOUS - ROPE CAN BE HAZARDOUS. YOU ARE RESPONSIBLE FOR ANYTHING YOU MAKE ON THIS MACHINE.** Rope has been the cause or implement in many human and animal injuries and even deaths. **IT IS THE SOLE RESPONSIBILITY OF THE USER TO ENSURE THAT THE FINAL PRODUCT IS USED SAFELY. NEVER USE ROPE MADE ON THIS MACHINE IN A WAY THAT COULD CAUSE INJURY. NEVER USE ROPE MADE WITH THIS MACHINE TO CLIMB, SUPPORT HEAVY LOADS, OR IN ANY WAY THAT INJURY COULD RESULT!**

## Instructions for assembly of Rope O'Matic

**Step 1:** Assemble a good work station:

A large open table top, something to protect surface like a cutting mat.

**Step 2:** Gather Tools: Find all the tools you will need. Do not start without all the tools, quality will suffer.

Safety Glasses - Seriously, wear safety glasses it may save your eyesight someday!

Gloves: Thin tough gloves the knit type dipped in flexible plastic are best.

A basic fine tooth file. A basic fine tooth file used for metal, wood or plastic working will be fine. It must be flat.

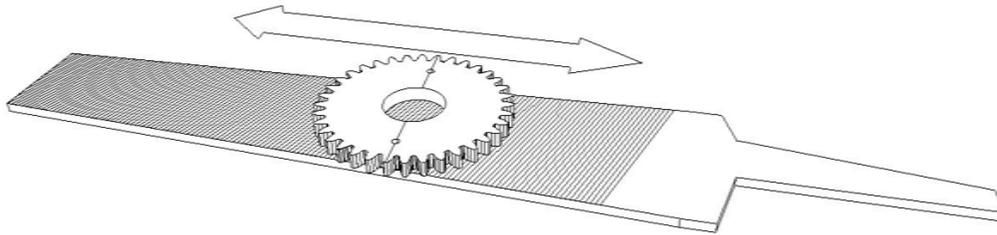
Pair of 3/8" open ended wrenches and one 3/8" socket. Needle nose pliers work but will be considerably more difficult. Pair of 5/16" open ended wrenches again a pair of needle nose can work here too.

Basic Philips screwdriver.

**Day 1:** The assembly should be broken into two days to allow glue to dry.

**Step1:** Preparing for assembly of gears.

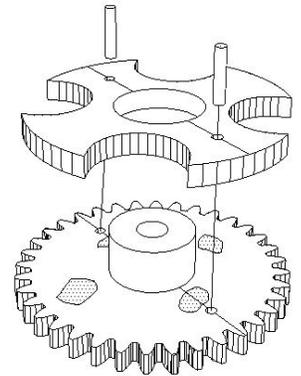
Find the all the one and a half inch spur gears, there are 9. Notice one side is etched with a line, this is the TOP of the gear. We must deburr all the gears so they can lie flat against each other and the base of the machine. Lay the flat file on the work surface take the gear with two fingers (wear gloves) and slide it back and forth a few times rotate the gear 30 degrees and repeat . Rotate once more 30 degrees and repeat. Flip the gear and repeat the process until both sides of the gear have been well deburred. Now find the 8 Geneva wheels. Deburr these in a similar way by placing them flat on the file on the table. Rotate 90 degrees and repeat, flip and repeat. Make sure all the tiny holes are clear. The filing will have cleared most of them but a ball point pen can push out the remaining pieces if necessary.



**Step 2:** Glue up.

Find the baggie with two nylon spacers and 4 tiny roll pins. Also locate the Glue.

**Warning: The glue is the most dangerous tool in this kit. It can cause severe eye damage so wear safety glasses! Seriously! It also poses a risk to children and pets so keep super glue in a safe place. The tube included is labeled Special Glue but is generic for CYANOACRYLATE ADHESIVE aka super glue. The number for poison control if you have any trouble is 1 (800) 222-1222**



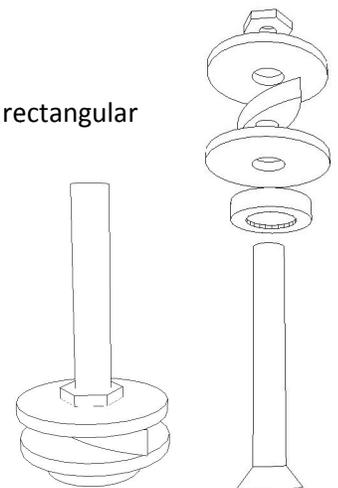
Find the TOP of each gear and each Geneva wheel placing them all face up. This is important it all surfaces are not face up the machine will not work.

Place the white plastic (nylon) spacer in the center hole of the gear. Use the spacer and the roll pins to align and glue the gear to the Geneva wheel with both tops facing up. Four drops of glue should be sufficient. See that the roll pins point straight up meaning there is proper alignment. For best results you can allow time to dry. Place glued gear aside to dry where it will not get disturbed. After about 30 seconds carefully extract the nylon spacer and the two roll pins so they do not become stuck to the assembly. be careful not to disrupt the alignment of the gears to the wheels.

**Allow all the gears to dry overnight**

**Step 3:** Drive gear assembly:

Find the two #8 screws in the same bag as the glue. Find the 3" diameter drive gear and the rectangular piece with three holes. Deburr the parts as before. Place the machine screws through the outer holes on the rectangular piece and tighten the nuts 1/8th turn past finger tight. Now take this assembly and glue it to the 3" drive gear. The heads of the #8 machine screws should just fit into the holes in the drive gear. Once the assembly is glued and in a safe place not to be disturbed place a drop of glue on in the threads of each nut that is facing up. The glue will wick into the threads and secure the nuts in place. **Allow the entire assembly to dry overnight.**



**Step 4:** Assembling the Bobbins:

Preparing the 3D printed bobbins parts: Remove all the 3D printed parts from the raft of

material they are built on. DO NOT USE A KNIFE OR SHARP OBJECT - it is not necessary and may damage the parts. Wear safety glasses and be indoors. Bend the raft back and forth curving the plastic base do this from a number of directions. This is similar to popping ice cubes out of a tray. Keep bending this way and that until all of most of the pieces pop off. Sometimes you will get a couple parts that are adhered too well to the base individually twisting the stuck parts. If a part was stuck it may have some unwanted debris that can be easily removed by a file.

Next the assembly: Find the 16 machine screws with the tapered heads (a.k.a. flat). First put the recessed head puck on so the head of the screw fits into the conical recess. Next place a flat washer, next a boat shaped follower and then another washer then a nut finger tight. DO NOT over tighten the assembly! Tighten finger tight only. If the washers are still loose and wiggle in the assembly. It may be necessary to put a 16th turn past finger tight this should not be necessary in most cases. Finally, apply a drop of glue on the threads of the nut, it will wick into the threads making it permanent. **Set the assembly aside overnight to dry.**

## Day 2 Assembly of machine and making rope

### Step 1: Assembling the machine:

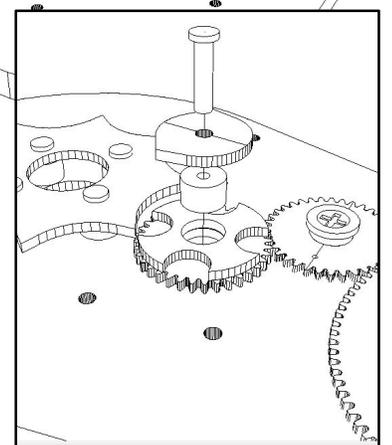
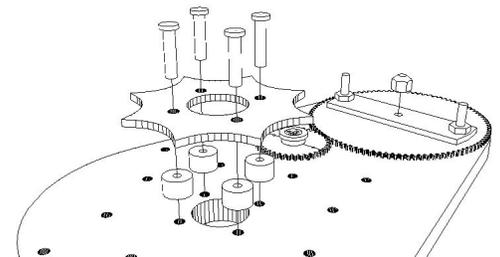
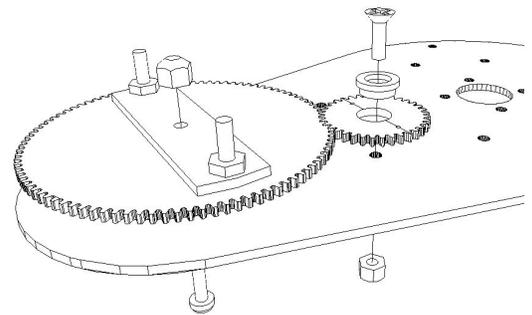
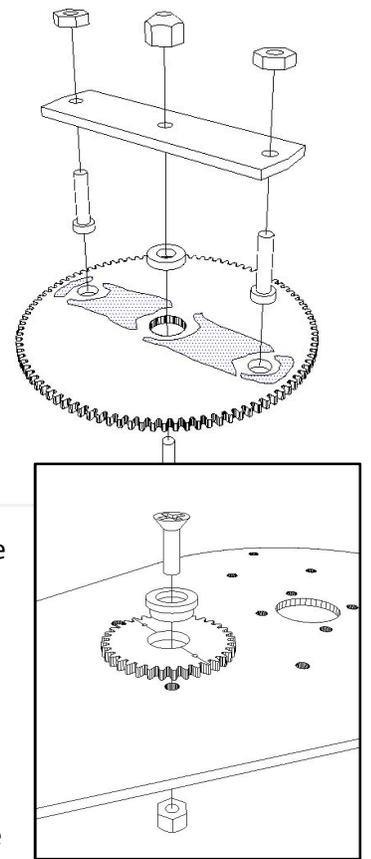
Start with the drive gear assembly. There is a small clear laser cut bushing that goes with this assembly. Using one of the 3/4" #10 Machine screws, drive it through the hole from the bottom of the base. Place the bushing on the bolt and then the drive gear. Place one of the nylon insert nuts on the shaft and turn it down until it holds the gear in place but does not add friction to the assembly. The next gear is the only left- over 1-1/2" gear. Using the biggest part from the 3D printed parts and the only #10 flat by 1/2" machine screw, attach the gear to the base with the nylon insert nut on the bottom tighten just enough that the printed bushing makes flat contact with the base. Over tightening will result in added friction. If the gear has too much friction you may want to file the edge and apply some canola oil.

Now, to attach the deck: The deck consists of an inner star, eight cams or "islands" and an outer ring. There is a ring resulting from the cut out of the track that will be used temporarily to tighten the deck.

Every connection on the deck will be supported by 1/2" OD white plastic spacers.

Start by attaching the inner star using four #10 machine screws through the inner star first then the spacers then the deck and tightened on the bottom with a #10 nut. Next the outer ring, starting with the two, 4" #10 machine screws driven through, from bottom to top, in two outer ring holes opposite each other. Next, a spacer, and then the outer ring and then the nuts. Next, the remaining holes with #10 machine screws, spacers and a nut.

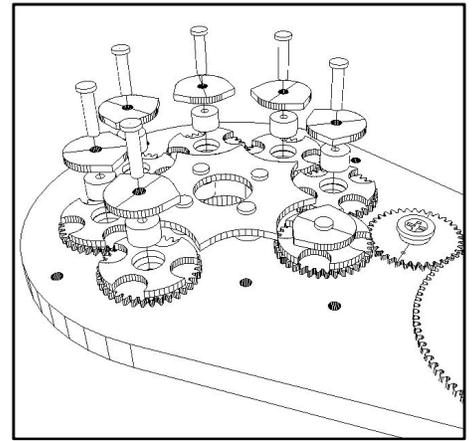
Now place the gear assembly starting with the first driven gear. No orientation is necessary on the first gear so place it, then place a plastic spacer then a cam and then the machine screw from the top. Do not tighten the shaft fully until all seven gears are loaded. Next, place the first gear to the right and continue on counter clockwise until all but one is installed. Each gear must be carefully aligned with the previous gear so the slots line up. If one set of slots line up they all will line up. Next use the track ring to



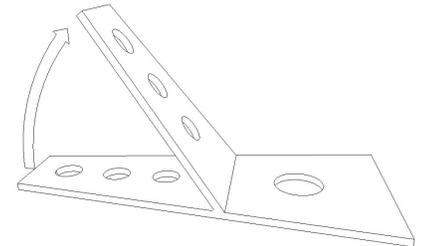
hold all the cams in position while tightening all the shaft machine screws. NOTE: The machine WILL NOT spin freely without the bobbins installed. The gears need the bobbins loaded to function properly. The bobbins actually hold the gears down against the base so they do not bind. Once everything is tightened you are ready to lubricate the moving parts with a little spray canola oil and then load the machine with bobbins.

**Step 2:** Loading the machine with bobbins:

Now that the machine is assembled it is time to load the machine with bobbins. This is tricky and takes concentration so be patient! This task can take hours. The first gear to the left of the driven gear should not be installed yet. Turning the crank clockwise you will see on the left side of the missing gear pockets moving to the outside and away from the missing gear.

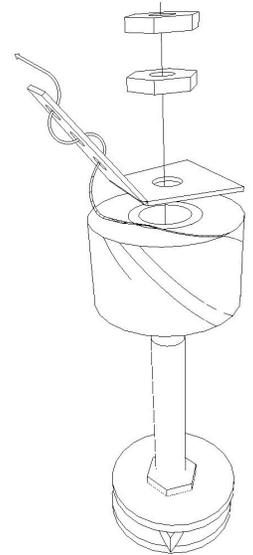


Put a bobbin into one of these pockets and start it on its way to the outside let it travel just until it is secure. Now on the right side of the missing gear you will see a slot appear traveling on the inner track and away from the missing gear. Skip the very next available slot and place the bobbin in the following slot. There are now two bobbins placed. Focus your attention back to the left side of the missing gear and see that only one slot passed without receiving a bobbin. Place a bobbin in the next available slot. When loading the machine there is always one empty space left between bobbins traveling the same direction. Continue alternating left traveling and right traveling bobbins until there is only one remaining bobbin. Carefully position the machine so there are bobbins on either side of the missing bobbin symmetrical about the empty space. the final bobbin goes in the space towards the outside of the circle. To get it into that position and to place the final gear is difficult. First place the gear and center spacer careful to align the slots with the gears to both sides. Next loosen the bolts holding the exterior ring in place until the exterior ring can feely raise up off the bed about an 1/8th inch. Place the bobbin on the exterior ring and then into the outer most pocket in the gear. once the bobbin is placed the outer ring can be re tightened. now place the cam and bolt in the center of the final gear and tighten making sure the alignment is correct using the guide lines.



**Step 3:** Loading the bobbins with material: See images on following page.

Place a wound bobbin on the shaft of the bobbin assembly. Be consistent with direction clockwise or counterclockwise. Next place the tension tab above the bobbin assembly. Bend the tension tab in the middle where there are no holes in it. This is done so it holds the thread up and out of the way of passing bobbins. Next place two nuts onto the bobbin shaft. Make sure the bobbin can spin completely freely without friction then tighten the nuts against each other in a jam nut fashion. Now thread the tension tab. The tension tabs have three holes you can create different amounts of tension buy using the holes in different ways. In the beginning you may simply want to come up through the nearest hole down through the second hole and up through the end hole. This is a good amount of tension for most materials.



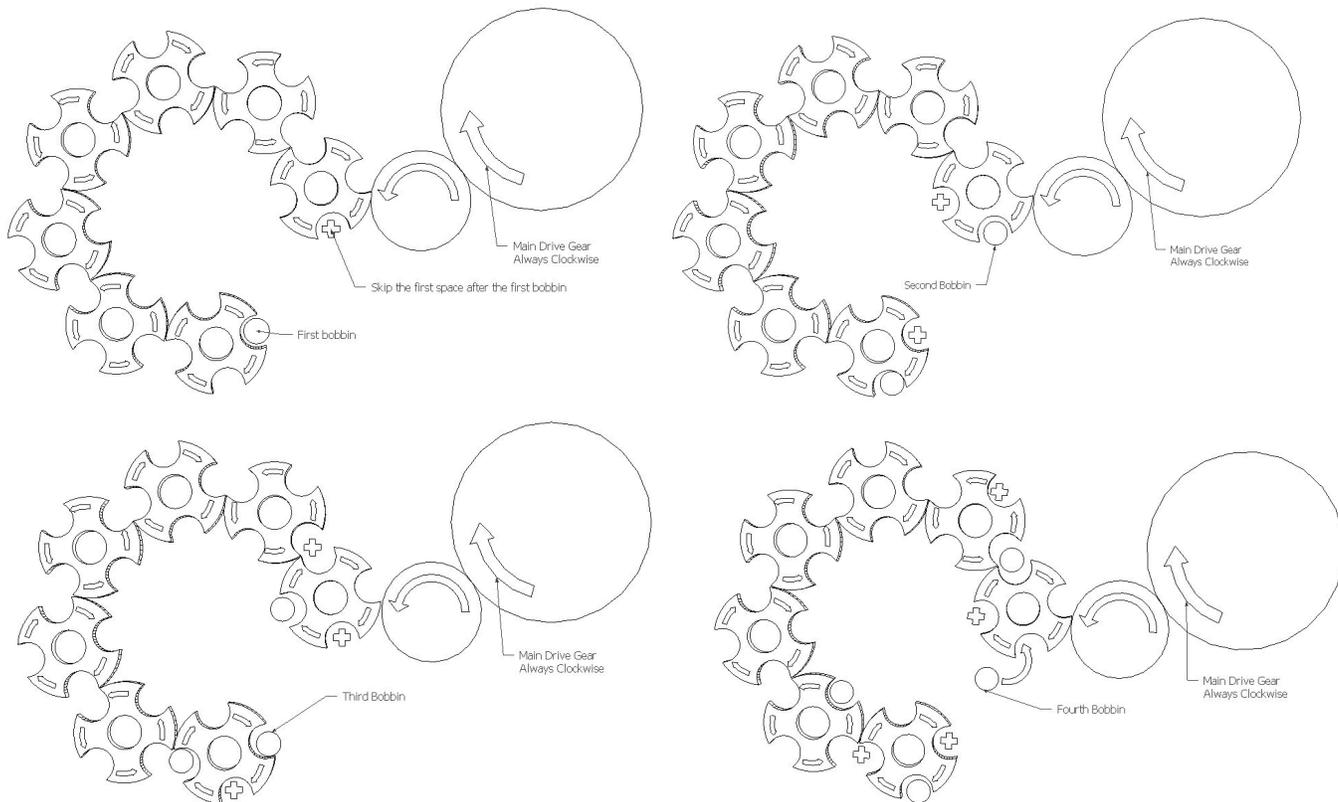
**Step 4:** Making rope

Once all the bobbins are loaded and the thread or other material is passed through the tension tab you are ready to make rope. Making rope will be pretty easy making prefect rope will take lots of practice. Be patient this is a neat skill to master. Take the bitter end of one of the strings of the bobbin pull about 8" of it out through the tab to verify the bobbin is working properly. You want the tension to be consistent you will experiment with different tensions for different types of rope later. Now pull out 8" of one of the nearest bobbins combine it in one hand with the first, continue until you have 16 threads or yarns gathered together in the space above the machine. take some electrical tape and as tightly as possible tape the bunch together where ever you are sure to get them all. Now cut off the sloppy

ends right at the edge of the electrical tape. Pass this taped end through the closest approximate hole for its diameter. Check that all the threads are pulled strait and have no chance of getting tangled around other bobbins. Visually follow each thread from the end of the tension tab to the gathering hole. It may be necessary to tape the bunch again if a few are too slack.

Once all the threads are gathered you can begin to turn the crank slowly. If you encounter resistance NEVER force the crank! Simply back up a little bit and try again. Also if you can't go forward check for bobbins that have picked up a snag. Always keep the convergence of all of the strands at the bottom of the convergence hole. If you braid without keeping tension on the strings or allow the braid to drop too close to the moving parts you will have problems.

Diagram for loading bobbins into the machine. The circles indicate bobbins and the "x" is space left empty that is to be noted.



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