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INSTRUCTIONS FOR COVINGTON # 381 SPHERE MAKER

INTRODUCTION

Almost any compact gem material of sufficient size can be utilized for sphere cutting. Making a sphere is relatively simple. It is, however, time consuming and thorough clean up of the machine and cutting cups is necessary between cutting cycles.

DESCRIPTION

Sphere unit is mounted on a cabinet with shelf and comes complete with two 1/3 HP, 110V motors, two cutter cups, two grit pans, two 8" muslin buffs, instructions and guarantee.

The downward slanted cutter cups and shafts of the machine run the preformed gemstone sphere in a bath of grit. This eliminates the need for constantly dabbing the preform with grit from a brush and also causes the grit slurry to run away from the bearings and grit slingers. In addition, the cutting action is much faster as the preformed sphere runs in grit. The grinding heads are spring- loaded so continuous adjustment is not necessary.

PREFORMING OF MATERIAL

Select material that is free of visible fractures or defects. Saw the material into a cube larger than the sphere to be made. Cut all corners from the cube. Complete the preforming process by grinding off all corners and sharp edges until the cube is a rough sphere. Sometimes grooving the corners with a saw blade can make the grinding process quicker. The remaining small grooves serve as lodging places for the grit slurry when the preform is abraded with the cutter cups. When all the material is removed, the preform will be half its original weight.

INSTALLATION

Safety: Before plugging your unit into your electrical supply, read the Covington Safety Demand Sheet.

Lubricate the threaded ends of the cup shafts with marine grease and install fiber washers so the cups will not rust onto the shaft.

Install a pair of cutter cups that are ½ to 3/4 the diameter of the preform sphere. Next, adjust the two top hand wheels so both cups will run at a slight downward angle.

Now insert the preform sphere in the cups by adjusting the two side hand wheels. Position the sphere in the approximate center of the machine. Ascertain both cutter cups are still at the same height. Allow just enough space between the cups so the sphere is free enough to be turned by hand.

PREPARATION

Using an 80 grit silicon carbide and "Old Miser" grit carrier, make a mixture of 4 parts to 1 part "Old Miser" and place in the flat pan that will set under the sphere. Add enough water to make a creamy slurry. Adjust the pan so the preform sphere will pick up the mixture.

CAUTION: Do not get grit into the bearings. Tape a plastic sheet over the ways and motors for protection.

OPERATION

Start the motors and brush the mixture onto the sphere. Adjust the tension on the cutter cups to ensure abrasive grinding, but not hard enough to cause the cups tp groove the sphere. The sphere should constantly change position so the abrasive grinding will not groove or wear a wart on the inside of a cup.

Check frequently that the mixture is the proper texture and the preform sphere is picking up a coating of grit from the pan. If the slurry is too thick or too thin, it will not be picked up properly.

Increase the down angle of the cups slightly after the cutting operation is running smoothly to increase the cutting ability.

IMPORTANT: Adjust tension on the cups occasionally so good cutting action is maintained.

If it becomes difficult to determine if the sphere has obtained a final round shape, remove and clean the sphere. Coat sphere with a quick drying black varnish. Reinstall the sphere between the cups and abrade. It will soon be apparent if the proper shape has been obtained.

Grind the sphere until all the low spots have disappeared and the sphere has a uniform 80 grit texture.

FINISHING

After all the low spots have disappeared, and the sphere has a perfect 80 grit texture all over, it is ready for the 220 grit. This changing of grit requires a COMPLETE clean up. Should one grain of a coarser grit be carried from one operation to another, a final polish will never be obtained. When the 220 grit texture is obtained over the entire surface of the sphere, clean up and change to 400 grit. Proceed as before.

IMPORTANT: During the final grinding and polishing process, the sphere must be continuously kept in motion.

After the 400 grit cycle clean up, carefully examine the sphere. Deep scratches or pits will require the sphere to be abraded again. As a general rule, 100 grit abrades twice as fast as 220; which abrades twice as fast as 400. Choose the grit size which will remove the scratch and, after abrading, again make a careful, complete clean up before changing to a smaller grit size. Each smaller grit used should improve the surface texture.

If the surface texture is satisfactory and there are no scratches, proceed with the polishing cycle.

If the finished 400 grit surface is too rough in texture, prepare for a 600 grit cycle. Place a piece of clean 10 oz. Canvas, or light rug over each cup and secure so the canvas will turn with the cup. Abrade with 600 grit until the surface has a uniform fine texture. Make a thorough clean up before starting the polish cycle.

POLISHING

Pre-polish: If working with glass or a similar material, a pre-polish cycle using 2F pumice powder is recommended. Use the final polish procedure.

Polish: Again, after a thorough clean up, prepare for the final polish cycle. Install clean canvas over the cups as before. Prepare the cerium oxide, or other polish, by mixing with water to the consistency of thick cream. Brush the polish into the canvas "pockets" and proceed with the polish cycle.

The polish cycle can be shortened by manually holding a muslin buff on the sphere to increase the contact surface of the polishing action. A clean kitchen cloth "hot pad" sewn like a mitten is a good substitute for the buff. Again, it is important the sphere be in continuous motion while polishing.

The finished product will be a beautiful sphere.

MAINTENANCE

Keep moving parts greased or oiled to prevent rust.

To oil bearings, lift up the covers on the four oil ports on the two heads and oil each with about 8 drops of # 30 oil. Add oil to the bearings approximately every 6 months.