
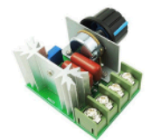

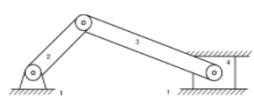




Morphological Chart							
EXCITATION							
Subfunction	Design Spec.	Solution 1	Solution 2	Solution 3	Solution 4	Solution 5	Solution 6
Wireless Communication	Electrical control of motor speed. Remote-controlled. Does not overheat. Compact.	 Arduino Nano	 Arduino Uno	 ATmega32U4 Pro Micro AVR®	 DFRobot Bluno	 ATmega328P Sceduino Nano AVR®	 Accelerometer
Electric Control Module	Frequency Control (Adjust frequency according to branch/beans).	 RC Brushless ESC 80A	 FlyFun 80A Opto Brushless ESC	 LiPolice Brushless ESC 80A-Opto	 Motor Speed Controller	 IDH DC 10-55V 60A PWM Motor Speed Controller	 PWM (High-Power) DC Motor Speed Controller
Generator of Vibration	Rotating Unbalance Assembly (lwh): 20 cm x 20 cm x 20 cm (Compact Motor design). Two (high-speed) motors (w/offset masses). Detachable from Extender Arm (Can be detached and placed on branch manually). Powered by Rechargeable Battery. Lightweight.	 Rotating Unbalance	 Mini Fan	 Slider Crank	 Eccentric Vibrator	 Speaker (Sound)	
Transmits Vibrations to Branch	Adjustable Strap (Help secure to branch (up to 10 cm diameter)). Extender Arm: Pole, Grip (Improve control; prevent slippage). Extender Arm: Retractable, (Compact, easy storage), power button to activate rotating unbalance. Rubber grip handle, Adjustable in length.	 C-Shaped Grip	 Metal Hook	 Adjustable Plastic Component Mounts	 2-Finger Gripper	 Pipe Clamp	 Snap Clamp
Excites Mesquite Bean Pods	Compact Motor design. Canopy (Full-Spread) Radius: 2 m. Canopy Carrier (lwh): 1 m x 0.75 m x 0.75 m Mobile, compact. Easy to move around.	 Mesquite Tree Branch	 Mesquite Tree Trunk	 Mesquite Bunches			

COLLECTION	Design Spec.	Solution 1	Solution 2	Solution 3	Solution 4	Solution 5	Solution 6	Solution 7	Solution 8
Funnel (Guide) Fallen Bean Pods	<p>Canopy (Full-Spread) Radius: 2 m (Large catch diameter; Wide enough to catch fallen mesquite beans from consecutive branches). Retractable Canopy (easy storage when not in use), manual/automated deployment, adjustable funnel/tarp angle (wide/narrow collection area), wind resistant (does not sway. Remains stationary when in use). Tough, thick tarp (does not easily rip from thorns, foldable/collapsible material for storage).</p>	 <p>Sweep Net</p>	 <p>Collecting Net</p>	 <p>Heavy-duty Tarp</p>	 <p>(Upside Down) Teepee Tent</p>	 <p>(Upside Down) Canopy</p>	 <p>Rain Saucer (Funnel Part)</p>	 <p>Fruit Collecting Net</p>	
Stores Fallen Bean Pods	<p>Storage: Latch Door (Help release/transfer mesquite beans into another container). Easy access to bean pod storage (once bean pod storage container is full, remove, and put in a new one. Or empty into other container & insert back).</p>	 <p>Heavy Duty Storage Box</p>	 <p>Storage Bucket</p>	 <p>Wheeled Storage Box</p>	 <p>Wooden Bucket with Handle</p>	 <p>Stacking Plastic Crates</p>	 <p>Transport Drum</p>	 <p>Wooden Storage Container</p>	 <p>Plastic Clear Storage Container</p>
Transports Harvested Bean Pods	<p>Canopy Carrier (lwh): 1 m x 0.75 m x 0.75 m (Mobile, compact. Easy to move around). Off-road Wheels (Mobility in rough terrain).</p>	 <p>Heavy-Duty Steel Utility Cart</p>	 <p>Heavy-Duty Cargo Trailer</p>	 <p>Poly Dump Cart</p>	 <p>Plastic Wheelbarrow</p>	 <p>Tractor Trunk</p>	 <p>Steel 2 Wheel Trailer Container</p>	 <p>Steel Trailer Container</p>	