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ANALYSIS OF REMOTE CONTROL-BASED ONION SPRINKLERS FLOAT

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ABSTRACT

The design of the Portable Floating Water Pump Flush Machine for Red Onions Based on Rc-Remote Control is a portable flush tool to facilitate the work of farmers watering shallots the formulation of this final project problem, namely; (1) How is the design of the Portable Floating Water Pump Flush Machine for Red Onions Based on Rc-Remote Control? (2) What is needed for the manufacture of Portable Floating Water Pump Flush Machine for Red Onion Based on Rc-Remote Control? (3) How is the machining of Portable Floating Water Pump Flush Machine for Red Onion Based on Rc-Remote Control? The method used is identification of needs, design, tool making, testing, and product documentation. Data collection includes; design, manufacture, assembly as follows: (1) Analyzing the needs of the tool, (2) Designing the image first before making the product, (3) Making the product according to the design, (4) Testing whether the product passes or not, (5) Revisions are made if there is a lack of needs during the performance test.The conclusions of this final project are; (1) The work on the tool starts with designing using the Autodesk Fusion 360 application, (2) Materials for manufacturing, namely: bilge submersible pump, 12v battery, container box, rc boat module, pipe, plywood, potentiometer, voltmeter, on / off switch (3) The manufacture of this tool includes; plywood and pvc pip measurements, plywood installation, rc boat module, submersible water pump, potentiometer, voltmeter and battery in the container box.

Keywords: bilge submersible water pump, remote control-rc, product, tool.

1. INTRODUCTION

From 2018 to 2021, red onion consumption is expected to increase, even in 2021, it is estimated that red onion consumption will reach 876,479 tons. Based on data from BPS, it can be concluded that annual national consumption continues to increase. Even though national consumption continues to increase, there are several factors that influence shallot production to be less than optimal. Some of these factors are watering methods that still use traditional methods, namely by farmers taking water directly from water sources (drainage) or irrigation canals and pouring it in. . With this method, there are several weaknesses experienced by farmers, namely: firstly, it takes quite a long time for the watering process, secondly, the water requirement for the plants is not optimal because it is not evenly distributed during watering, thirdly, farmers need a large amount of money to provide sufficient water so that the onion plants remain stable. grows especially in the dry season and must be watered every day (morning and evening). The fourth is that farmers need more money to pay the wages of workers

watering shallots, namely IDR 80,000 per day per person and the fifth is that farmers feel more tired because they have to water. traditionally.
With this problem in mind, in the Final Project of students at the Indonusa Surakarta Polytechnic campus, I intend to create a product "Design and Build a Portable Floating Water Pump Watering Machine for Shallots Based on Rc-Remote Control." "which can simplify/lighten the work of farmers, it is also hoped that farmers will be more prosperous, increase shallot production, be more efficient in using water or costs and farmers' bodies will be healthier because they are not too tired when working on watering the fields, farmers' bodies will become healthier. healthy because you are not too tired from irrigating the fields

The biggest problem for shallot farmers is ineffective irrigation methods. From the background of the problem above, a problem can be formulated, namely: 1) What is the portable floating water pump washing machine with remote control for shallots? 2) What materials are needed to make a Shallot Rc Portable Floating Water Pump Dishwasher with Remote Control? 3) How does the Portable Rc-Remote Control Floating Water Pump Rinsing Machine work? 4) What are the performance test results of the Portable Rc-Remote Control Shallot Floating Water Pump Washing Machine?

Meanwhile, the objectives of this design are: 1) To find out the design and construction of a portable shallot water pump washing machine based on RC remote control. 2) Find out what materials are needed to make a portable shallot washing machine with an RC remote control based water pump. 3) To find out about making a portable remote control floating water pump washing machine for shallots. 4) To find out the final test results of the RC remote control based portable water pump weighing washing machine.

According to research from (Puspito, 2018) included in Mendeley entitled "design of onion sprinkling equipment using dc motors with renewable energy" aims to determine the performance results of portable submersible water pumps. The method used is the design and manufacturing method of the tool. The conclusions of this research are: 1) This shallot watering tool uses a solar panel with a capacity of 120 WP with a maximum panel current of 6.96 A which is used for the accumulator charging process which will be connected to a chopper boost and then connected to the load. 2) This onion sprinkler is supplied via a chopper boost of 36 Volts and the chopper boost itself is supplied from an accumulato of 12 Volts. 3) This tool can water shallots with an initial voltage of 11.1 Volts with a current of 6.09 A. This tool can work optimally if the chopper boost is turned to 100% and the current supplied is 1.79 A with a voltage of 35.3 V. 4) This tool can be applied directly by shallot farmers, but improvements need to be made to the accumulator storage system so that it can be used for a long period of time to make its use more effective.

According to (Yana & Wigraha, 2017) entitled "Design And Building Of A Water Pump Machine With A Recharging System" aims to determine the performance results of a portable submersible water pump. The method used is the method of designing and making tools. The conclusion of this research is that the experiment using this recharging system at 2000 rpm rotation of the water pump machine with this recharging system is capable of producing a current of 8 A and a voltage of 14 volts and is capable of sucking water from a depth of 4 meters with a water jet of 2.27 liters/minute

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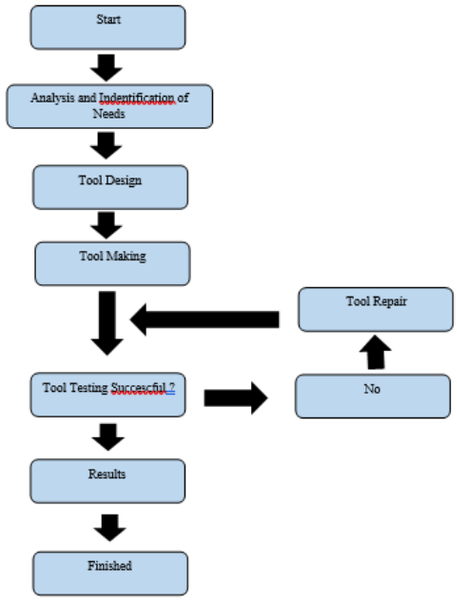
2. METHOD



In designing a portable floating water pump watering machine for shallots based on Rc-Remote Control, there are several paths that can be followed so that the tool can be made according to the plan, as follows:

1. Making tools begins by looking for references with tools that have been made previously from YouTube media and looking for weaknesses in the tools that have been made.
2. Analysis and identification of needs includes observing and researching existing tools as well as planning the form and function of the tools so that they are better than those that have already been made.
3. The tool design here includes the design/drawing of the tool to be made as well as the design of the materials to be used.
4. Tool making is the process of realizing the design of a tool that has been made previously.
5. Tool testing is the step of testing or testing the tool on the vehicle and this is the final step in making the tool. If the tool passes the trial, then the results of the tool can be used by partners, whereas if it has not passed the trial then there will be improvements to the tool.

The tools and materials needed to design a Portable Floating Water Pump Flushing Machine for RC-Based Shallots are as follows:

Table 3.1 Tool

No	Toll	Unit
1	Hacksaw	1
2	electric soldering iron	1
3	Glue gun	1
4	*Roll Meter*	1
5	Whitebord marker	1
6	Screwdriver plus	1

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Table 3.2 Material

No	Material	Unit
1	Kontainer Box	1
2	Submersible water pump	1
3	Pipe ¾	1
4	Pipe connection T	1
5	Cepor	2
6	Modul *RC-Remote Control*	1
7	ACCU 12 V	1
8	*Voltmeter*	1
9	Potensio	1
10	Switch *on/off*	1
11	Cable	1
12	Plywood	1
13	Pipi 4”	1
14	Cork	1

The design of the Portable Floating Water Pump Watering Machine for Shallots Based on RC-Remote Control includes the depiction of a box container, submersible water pump, pipe with exhaust pipe, battery and RC-Remote Control module into one. Following are the design stages:

1. Design the container box, submersible water pump, pipe with exhaust pipe and RC-Remote Control module into one.
2. Design the layout of the container box, submersible water pump, pipe with exhaust pipe and RC-Remote Control module into one.
3. Manufacture of 2D and 3D container boxes, submersible water pumps, pipes with exhaust channels and RC-Remote Control modules into one

Design Concept, at this stage the concept of making a Portable Floating Water Pump Watering Machine for Shallots Based on Rc-Remote Control will be discussed. The initial concept that needs to be considered is knowing the design/drawing of the Portable Floating Water Pump Watering Machine for Shallots Based on Rc-Remote Control which will make the following stages easier.

1. Design of a Portable Floating Water Pump Watering Machine for Shallots Based on Rc-Remote Control.
2. Preparation of the place for the manufacturing process
3. Prepare tools and materials
4. Tool design process
5. Tool work test results

3. RESULTS AND DISCUSSION

3.1. Design of a Portable Floating Water Pump Watering Machine for Shallots Based on Rc-Remote Control

Autodesk fusion 360 is a cloud-based 3D, CAD, CAM, CAE and PCB modeling software platform for product design and manufacturing. To make it easier to make this tool or need a picture, therefore this 3D design functions as a view of the product that we will make, thereby simplifying the process of making a Portable Floating Water Pump Flushing Machine for Shallots Based on Rc-Remote Control. To make this tool, use the Autocad Fusion 360 design application which uses a container box measuring 35x26x20cm, a submersible water pump measuring 5.5x10cm, a battery measuring

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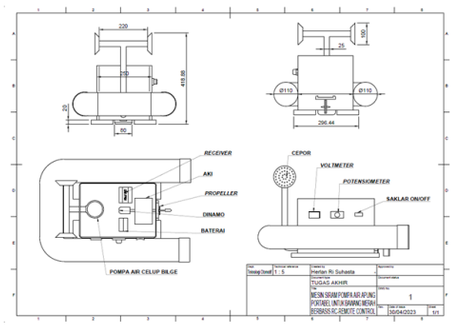
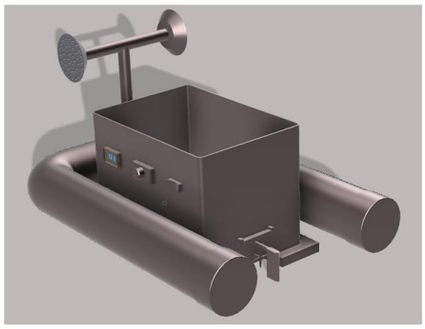
11x7x9cm, an output pipe with a height of 30cm and a cap measuring 10cm, resulting in dimensions measuring 70x45x42cm.



Picture 4.1. Produck Design 2D

Information :
1. Receiver
2. Battery
3. Propellers
4. Dynam
5. Battery
6. Bilge submersible pump
7. Cepo
8. Voltmeter
9. Potentiometer
10. On/off switch



Picture 3.1. Produck Design 3D

3.2. Materials needed to make products

The materials needed are as follows:

1. Container Box
   This component is used as a holder for submersible water pumps, PVC pipes, RC-Remote Control modules, and batteries.
2. 1100 GPH Bilge Submersible Water Pump
   This component functions as a place to suck/channel water from below to the output/cepor channel.
3. 12V Dry Batter
   This component functions to provide the electricity source needed by the submersible water pump when operating.
4. RC-Remote Control Boat Module
   These components function to move the box container/as a controller for the box container when operating which can be controlled from a maximum distance of 150m.
5. Potensio Electric Sprayer Electric Water Pump DC 12V

This component functions as a regulator of the water flow that will come out of the submersible water pump into the output/cepor channel.

6. DC voltmeter
   A voltmeter is a measuring instrument that functions to measure the amount of electric voltage in an electrical circuit in certain quantities and units.
7. On/off switch
   An on/off switch is a device used to disconnect an electrical network, or to connect it.
8. ¾" PVC pipe
   This component functions to channel water from bottom to top/output channel.
9. Cepor / Spray
   This cepor/spray is used as a flush tool to produce water that spreads and condenses using a 3/4 inch connecting pipe (hose).
10. 4” pipe
    This component functions to keep the box container floating in the water and maintain the balance of the box container

3.3. Process of Making

1. The process of measuring 4" PVC pipe according to the specified size using an iron meter.
2. The process of cutting the 4" PVC pipe according to the specified size using a hacksaw.
3. Attach the L elbow pipe to the end of the pipe, then put a pipe cap on the other end, do the same thing on the second pipe, then connect the 2 pipes with a 20 cm long pipe through the L elbow.
4. Cut the plywood using a hacksaw according to the specified size which will be used as a battery holder.
5. After the plywood has been cut to the specified size, then install the battery holder in the container box and then install the battery.
6. Measure the cork using an iron meter according to the specified size, then it will be used as a bearing for the box container.
7. After the cork has been cut to the specified size, then attach the piece of cork to the bottom of the container box as a buffer using hot glue.
8. Then, at the bottom of the container box, a hole is provided as a place for the input channel for the submersible bilge water pump as well as a seat for the pump. After that, place the bilge submersible water pump in the hole, then apply hot glue to the sides so that water does not seep into the container box. Then also install the ¾” output pipe which is connected to the output channel of the bilge submersible water pump.
9. Then the next step is to make mounting holes for the voltmeter, potentiometer and on/off switch on the top side of the box container using electric soldering iron which has previously been made to size using an iron ruler. Then glue it using hot glue on the outside and inside of the container. box.
10. Install the receiver, dynamo and battery on the plywood holder by using hot glue as an adhesive and combined with bolts so that these components do not shift.
11. Connect the cables between receiver, dynamo, battery,
12. potentiometer, voltmeter, on/off switch, rear light, and bilge submersible water pump cable.
13. Install a 4" U-shaped pipe as a float, by applying hot glue to the sides and bottom so that it is strong/doesn't shake, then after that we paint the entire body to make it more durable and resistant to hot weather

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3.4. How to Operate the Tool

1. Make sure all batteries are fully charged, including AA batteries in the remote, AA batteries in the receiver and the battery.
2. Connect/connect the port between the receiver's AA battery to the receiver port, then close the box container tightly.
3. Install the cepor on the output pipe.
4. Place the box container in the water and make sure the water sensor is exposed to water, so that the receiver can be connected to the Remote Control.
5. Turn on the on button on the remote for the signal synchronization process between the remote and the receiver, until you hear two sounds "tit...tit...." on the remote and the indicator light on the remote stops flashing as a sign that the remote and receiver are successfully connected
6. Set the propeller rotation speed and water control turning angle using the setting button on the remote.
7. Turn on the on switch on the box container.
8. Turn the potentiometer to the right to turn on the water pump and adjust the rotation speed of the water pump/current output by looking at the voltmeter.
9. Portable Floating Water Pump Watering Machine Tool for Shallots Based on Rc-Remote Control is ready to operate.

3.5. Tool Work Test Results

Picture 3.3. Tool Work Test Results

This RC-Remote Control Based Portable Floating Water Pump Watering Machine for Shallots was tested by knowing the ability to float, the range of the water jet through the cepor, the ability to turn when in the irrigation channel and leaks in the body which will be used as a benchmark for testing the tool. By using The 4 dim pipe as a float for the box container can function well because it has a cross-sectional area that is wide enough to hold the box container and its components. If we turn the potentiometer to the right until we get a current of 3 Amperes and it can be seen on the voltmeter, the amount of water that comes out is through. The cepor will emit a maximum of +/- 1 meter, by using the Remote Control you can set the water steering to be used when turning on the irrigation canal, after testing the irrigation canal three times there are no leaks in the body or float because it has been glued evenly and firmly .

4. CONCLUSION

Based on the results and discussion above, the final project with the title "Design of a Portable Floating Water Pump Flushing Machine for Shallots Based on Rc-Remote Control" can be concluded as follows:

1. The design of the Portable Floating Water Pump Watering Machine Tool for Shallots Based on Rc-Remote Control uses Autodesk Fusion 360 software covering all sizes with 2D and 3D designs with dimensions of 700x450x420mm.
2. The materials used to make the Portable Floating Water Pump Watering Machine for Shallots Based on Rc-Remote Control include: box container measuring 35x26x20cm, submersible water pump measuring 5.5x10cm, output pipe with a height of 30cm, 4" pipe with a size of 44x70 and a cepor size of 10cm, resulting in dimensions measuring 70x45x42cm.
3. The process of making this tool includes: the measuring process using an iron ruler and roll meter, the process of cutting materials using a hacksaw, connecting PVC pipes and box containers using hot glue and paralon glue, as well as the painting process using iron color paint.
4. This Rc-Remote Control Based Portable Floating Water Pump Watering Machine for Shallots was tested by determining the ability to float, the range of water jets through the cepor, the ability to turn when in the irrigation channel and leaks in the body which will be used as a benchmark for testing the tool. By using a 4 dim pipe as a float for the box container, it can function well because it has a cross-sectional area that is wide enough to hold the box container and its components inside. If we turn the potentiometer to the right until we get a current output of 3 Amperes which is visible on the voltmeter then the range the water that comes out through the cepor will radiate a maximum of up to +/- 1 meter, by using the Remote Control you can set the water steering to be used when turning on the irrigation channel, after testing three times on the irrigation channel there are no leaks in the body or float because it has been tested. glued evenly and firmly

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