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FIRE FIGHTING PORTABLE MONITOR

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Abstract -A robot that is able to locate and extinguish fire in a given environment, A movable monitor is mounted on the upper part of the chassis and includes a movable nozzle for being attached through a flexible hose. A bearing and dc motor is mounted at monitor so it gives moment in all direction throw bearings and dc motors. A receiver is mounted within the chassis for receiving the water throw pipes, and circuitry within the chassis is responsive to the output of the receiver in order to control and the movement of the monitor and nozzle.

Key Words: **Fire, Extinguisher, Water, Portable, Automation, Robot Arm**

1. INTRODUCTION

The development and modification of fire equipment by transforming hand operated water monitor to remote controlled monitor.

In water monitor the main application is the machine is running with the help of wheels which are operated by the remote controller.

The problem was that part called "nozzle" which is not rotating in any direction we modified with the help of dc motor which is help in rotating the nozzle in proper direction. The machine will mechanically blow out the fire and perfectly works in all directions
In this machine we made design in which conditions of fire where fire fighter is not get into the fire the water monitor is get into the fire and blow out the fire.

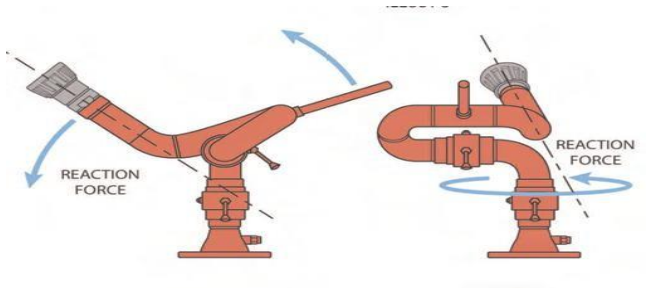

Figure 1 Water monitor

2. Working of the Invention

2.1 Working Principle

A water monitor is mounted on the base and connected with the hosepipe of fire truck. base is mounted on wheel that move in Forward and reverse direction. In water monitor two bearing attached for rotating of pipe and in bearing one is horizontal 360 degree moving and vertical is 180 degree moving.

The bearing is rotating with the help of dc motor which has 12volts and dc motor is operated by remote controlling and remote has three functions which are forward, reverse, speed controlling regulator. So we can cover area of fire.

2.2 CONSTRUCTION

Construction of remote operated firefighting equipment is very simple, there's so many parts used in construction like nozzle, bearing, dc motor, flange, reducer, speed control circuit, pipes etc.

In the construction at the base of the equipment the wheel is mounted so equipment freely move in all direction, chassis is mounted on the wheels so that give stability to equipment, full load of monitor is mounted on the chassis, chassis is made from iron angle. The remote controlled water monitor is mounted on the chassis that water monitor is rotate in all direction, in remote controlled water monitor bearing and dc motor mounted in water monitor to give moment in all direction.

One bearing and dc motor is mounted at nozzle side that help to rotate nozzle, and other bearing and dc motor is mounted at water monitor that help to rotate water monitor. At the top of the water monitor single jet nozzle is mounted that increase the pressure of water.

And all the moment of the equipment is controlled by remote, speed control circuit is controlling the speed of the dc motor so that can control the movement of the nozzle.

2.3 OPERATIONS

1. Operation should be conducted by qualified personnel only. Water jet & reaction forces can be hazardous & deadly to properly & life. Use with extreme caution.
2. Inspect unit to make sure all parts are operational. Make sure all connections to the monitor are tight.
3. All travel rotation are locked
4. Monitor outlet is not pointed to people, property or animals.
5. Attach holes.
6. Open water supply valve slowly.
7. Check for leaks
8. At this point slowly loosen the travel locks so you can rotate the monitor.
9. For shutdown lock travel locks in position. Slowly turn off water supply.

2.4 APPLICATION

- Fire at oil & Gas Plants
- Shore Platforms, Oil Refineries
- Chemical & Fertilizer Plant, Steel Plants
- Power Plants, Air Port Run-Ways
- Naval Ships and Submarine
- Marine and refineries

2.5 OBJECTIVE

- The main aim of this project that overcome from traditional method.
- From this project we can improve the safety of people and fire-fighters.
- To save lives from fire.
- To provide inter disciplinary studies.
- To reduce accident happens with fire fighters

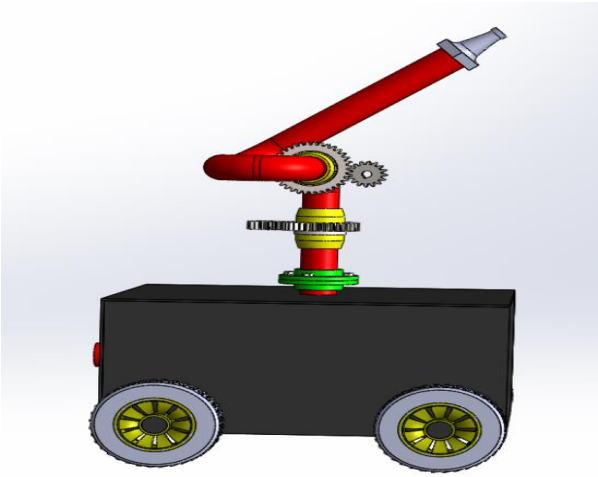

Figure 3 Model of Invention

Figure 2 Application of water monitor

3. DESIGN CALCULATION

- **Data :**

➢ Inlet diameter (D1) = 5cm = 0.05m
➢ Outlet diameter (D2) = 1.5cm = 0.015m
➢ Inlet pressure (P1) = 10kg/cm^2 = 9.807bar
➢ Outlet pressure (P2) = 5kg/cm^2 = 4.90bar

- **Continuity Equation :**

➢ A1 V1= A2 V2
➢ Where A1= area of entrance
➢ A2= area of exit

- **Inlet and outlet velocity**

➢ By continuity equation we get inlet velocity
➢ V1 = 0.09*V2
➢ Now, above value put in BERNOULLI EQATION
➢ So, we get outlet velocity
➢ V2 = 31.74m/s
➢ Now put this value in V1
➢ V1 = 2.85m/s
➢ Theoretical flow rate:
➢ Q = A*V
➢ A = area of pipe
➢ V = velocity of water
➢ Q o/t = A2*V2
➢ 5.608*10^(-3) m^2/s
➢ **Q = 336.48 LPM**

4. Components

1.nozzel
2.Bearing
3.Flange
4.D.C. Motor
5.Controling Circuit
6.Pipe
7.Wheels

8.Copuling
9.Gear Box

CONCLUSIONS

The present invention is directed to a fire fighting monitor and, more specifically, to a remote controlled firefighting monitor that can be used as a deck gun or as a portable monitor. Portable firefighting monitors are specialized fire-fighting equipment that are used in conjunction with a nozzle such as a fixed nozzle or adjustable nozzle, such as a

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