

AgniR-V27

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AnR-W27 Prototype of a Wall Climber Machine

It has long been a dream of man to possess the power to walk up vertical surfaces. Now AnR-W27 will fulfill this dream of crawling over a vertical surface against the gravity which may provide some super human abilities to normal human. This is a type of wall crawling machine which uses its vacuum pumps to produce a grip against the wall surfaces

It is worn like a backpack, can climb up to any height on any surface - including glass, brick or rock - without a rope. But the most important element was to come up with technology that can grip to any vertical surface.

So we developed the AnR-W27 a personal vacuum assisted wall climber, which is made from two suction pads and household vacuum pump. The pads, unsurprisingly, form an airtight seal when pressed against a vertical surface which is strengthened by the suction from the vacuum.

It can also be operated hands-free, allowing a soldier to wield a weapon or other device without falling to the ground.

'In the next version, technology will be used or developed to suppress, reduce, or cancel the noise of the vacuums and the motors.'

Nomenclature:

AnR-W27 consist of two parts "AnR" and "W27". "AnR" are the first alphabets of name of the developer of AnR-W27. W stands for the wall climber. And 27 stands for the number of attempts we made to develop or create the such device.



Structure of AnR-W27

AnR-W27 is simple to build and use device but need practice before daily use. AnR-W27 wall climber works in three different stages:-

1. Suction
2. Vacuum Creation between suction pads
3. External forces

1. Suction

When the vacuum pumps are started the air inside the control volumes of suction pads starts paddle towards the rotor and the releases in air resulting in creation of vacuum inside the suction pads.

2. Vacuum creation

Air inside the suction pad goes away, where the rubber materials restrict the further movement of atmospheric air inside the pad, resulting to creation of vacuum which is further used to grip the wall.

3. External forces

Due to vacuum creation a mass pressure difference is created, and results an external force acted on the suction pad. This resultant force is high enough to carry a main in air without any ropes on a vertical surface.

Essential components of AnR-w27:

1. Vacuum Pump
2. Electric source
3. Pipelines
4. Suction pads

1. Vacuum Pump

This is the most essential component as the success of this device mostly depends on the configuration of pump used. The pump used must provide a certain amount of flow rate which whole can lift a desired amount of weight in our case man.

So after a huge session of calculation and discussion we came out with using 1400 watt Smart flame vacuum pump which delivers a mass flow rate of air of 5.3 ltr/sec which was enough to carry a man between 60-70 kg weights. For future we are planning for improving the motor capacity for carrying a weight up to 100-120 kgs.

2. Electric Source

This is an important element for failure of our device or projects. As, currently we are using normal home electric supply which is not so reliable source of electricity for a device like this so we are planning for equip this device with a portable electricity generator so that the lack of electricity would not create any problem for climbers.

3. Pipelines

Pipeline plays a major role as the pipeline is responsible for vacuum creation and pressure generation. So the pipeline should possess following properties:

1. Pipeline should be flexible enough to carry out all kind of wear-and-tear.
2. Pipeline should be strong enough to sustain high pressure.
3. Pipeline should rigidly fix with all the by-pass holes between suction pads and vacuum pump supply holes.

So we decided to use a PET pipeline which came in the packaging of vacuum pump.

4. Suction pads

This is the most time taking and complex part of our device. Time taking is a sense producing an appropriate suction pad was hard and a complex procedure. We had attempted about 15-16 times for producing such. Success of the project was completely dependent of design of suction pad.

Suction pad should have following properties for our device:

1. Light weight
2. Easy to carry
3. Flexible enough to overcome wear-and-tear.

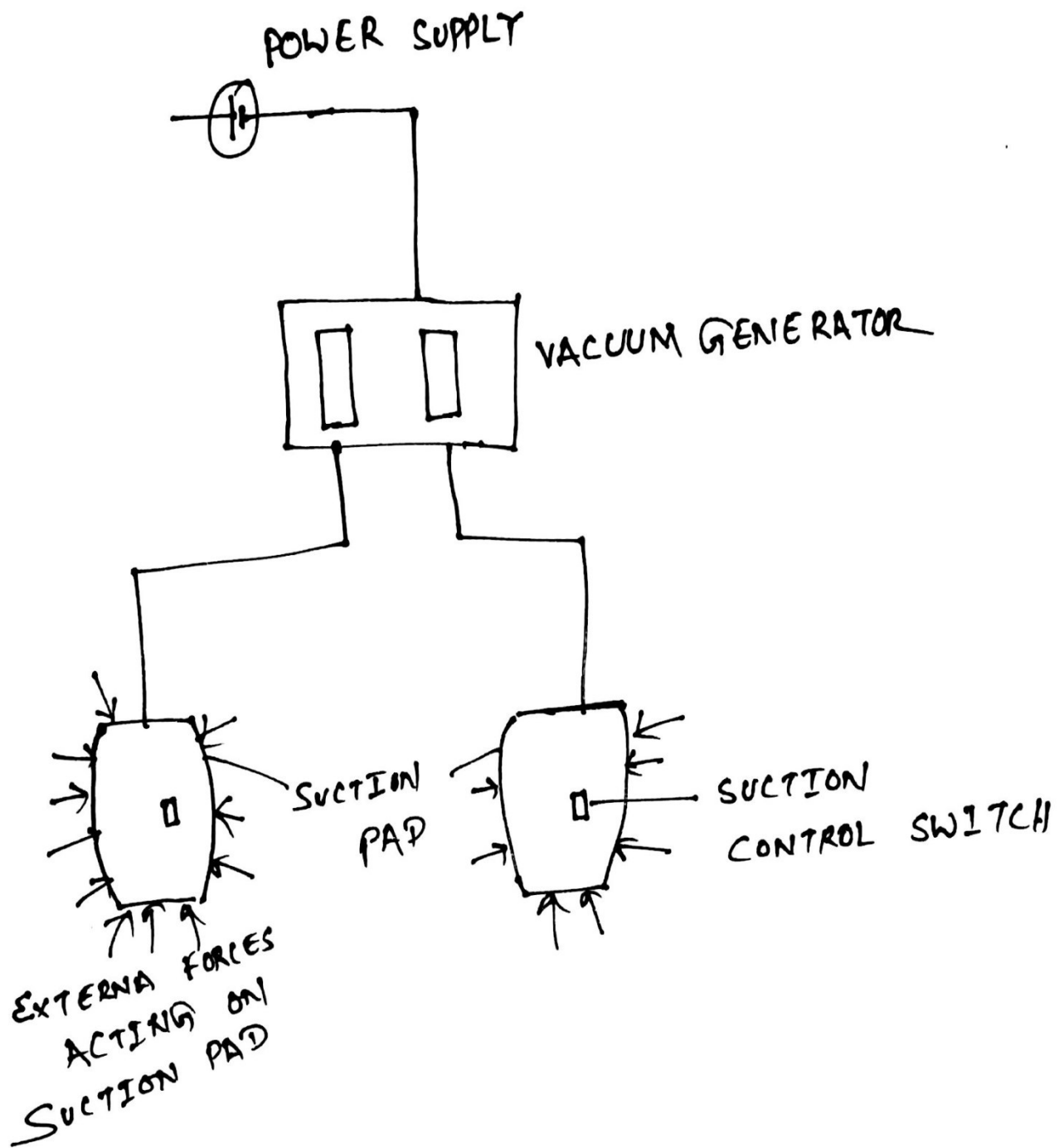


Fig:- Block diagram of AnR-W27

Advantages and disadvantage of AnR-W27-

ADVANTAGES:-

1. Safer climbing process.
2. Reliable to any form of operation.
3. Can climb to any height irrespective of type of surface to climb.
4. Can be used for covert operation in rural areas and urban areas.

DISADVANTAGES

1. It produce noise (in small amount) when operated.
2. It's a bit slow process of climbing for new users but with practice the time factor can be minimize.
3. Currently this configuration of AnR-W27 is not water resistance.
4. Limitation on electricity supply.

Future vision of AnR-W27:

Our future planning is to modify the current version of AnR-W27 in such a way that it will overcome all the disadvantages with some improvement in design procedure of the wall climber.

FUTURE IMPROVE DESIGN

According to our planning we will be focusing on following aspects and follow the follow the same procedure as below.

1. To overcome noise limitation we will use a pump which produces lesser noise as compared to current one. There are lot of motor available in market than can do sub but are costly in price.
2. We can use components which are water proof.
3. Limitation of electricity can be overcome by using portable generators, and one way selector valves can also be used for improving the safety of the climber.