

Design and Fabrication of Mechanical Spider

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Abstract: As we know the wheels are ineffective on rough and rocky areas, therefore robot with legs provided with Klann mechanism is beneficial for advanced walking vehicles. It can step over curbs, climb stairs or travel areas that are currently not accessible with wheels. The most important benefit of this mechanism is that, it does not require microprocessor control or large amount of actuator mechanisms. In this mechanism links are connected by pivot joints and convert the rotating motion of the crank into the movement of foot similar to that of animal walking. The proportions of each of the links in the mechanism are defined to optimize the linearity of the foot for one-half of the rotation of the crank. The remaining rotation of the crank allows the foot to be raised to a predetermined height before returning to the starting position and repeating the cycle. Two of these linkages coupled together at the crank and one-half cycle out of phase with each other will allow the frame of a vehicle to travel parallel to the ground. This project is useful in hazardous material handling, clearing minefields, or secures an area without putting anyone at risk. The military, law enforcement.

Keywords: Mechanical Spider

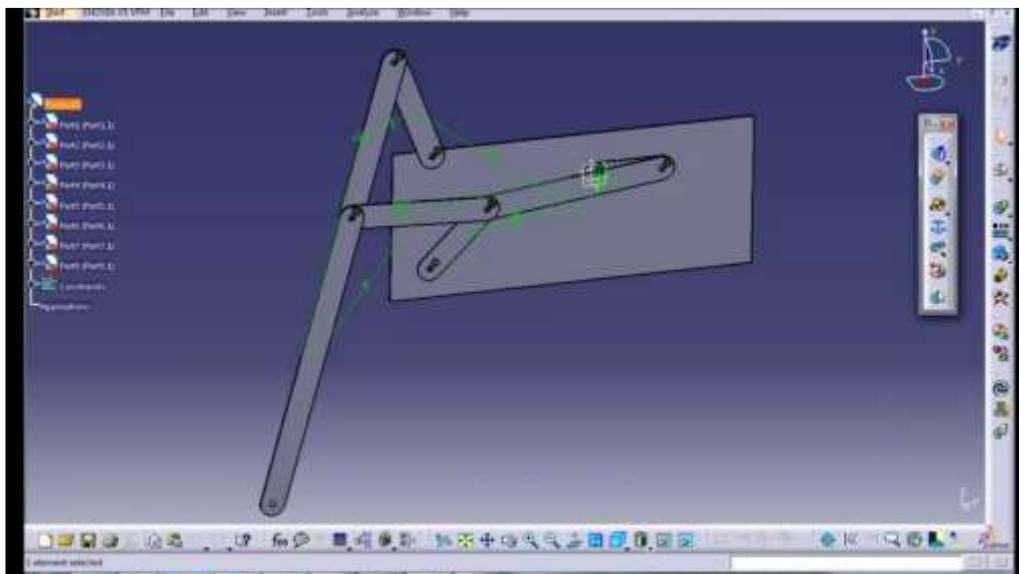
1. Introduction

Why Klann Mechanism?

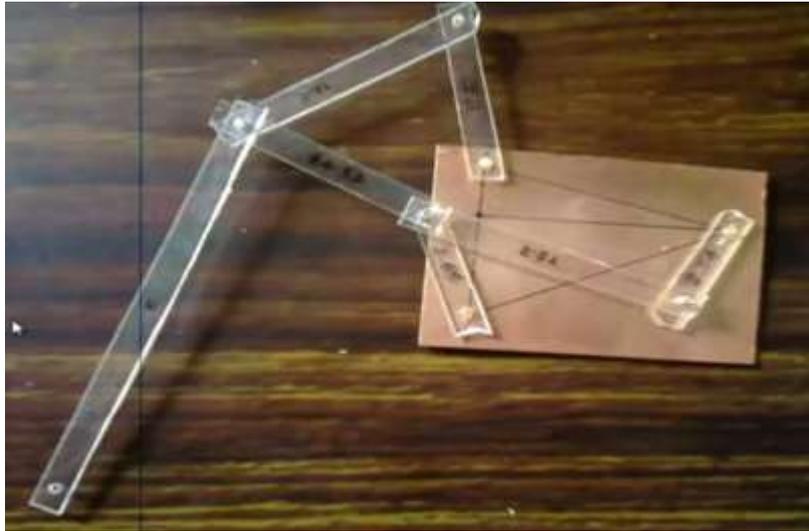
The main advantage of Klann mechanism robots is their ability to access places impossible for wheeled robots. By copying to the physical structure of legged animals, it may be possible to improve the performance of mobile robots. To provide more stable and faster walking, scientists and engineers can implement the relevant biological concepts in their design. The most forceful motivation for studying Klann mechanism robots is

- To give access to places which are dirty.
- To give access to places those are dangerous.

Job which are highly difficult legged robots can be used for rescue work after earthquakes and in hazardous places such as the inside of a nuclear reactor, giving biologically inspired autonomous legged robots great potential. Low power consumption and weight are further advantages of walking robots, so it is important to use the minimum number of actuators. In this context, an objective is set in this project to develop an eight- legged mobile robot whose structure is based on the biomechanics of insects.



Klann Linkage by Catia software



2. Methods

Operations Involved

- 1) Turning (facing, plain turning, step turning , threading etc)
- 2) Facing (flat surface)
- 3) Drilling
- 4) Gas cutting (flat plate, cylindrical rods)
- 5) Shaping
- 6) Welding
- 7) Tapping
- 8) Thread cutting

3. Conclusions

- 1) It would be difficult to compete with the efficiency of a wheel on smooth hard surfaces but as condition increases rolling friction, this linkage becomes more viable and wheels of similar size cannot handle obstacles that this linkage is capable of. Toys could be developed that would fit in the palm of your hand and just large enough to carry a battery and a small motor.
- 2) Eight leg mechanical spiders can be applicable for the making of robots. It has a wide range of application in the manufacturing of robots. A large version could use existing surveillance technology to convert your television into a real-time look at the world within transmitting range.
- 3) It would also relay commands from the remote to the spider bike additional frequencies could be used to operate manipulators for retrieving the mail during unfavorable weather or taking the dog out.
- 4) It can also be used for military purpose. By placing bomb detectors in the machines we can easily detect the bomb without harmful to humans. It can be used as heavy tanker machines for carrying bombs as well as carrying other military goods.
- 5) It is also applicable in the goods industries for the small transportation of goods inside the industry. The mountain roads or other difficulties where ordinary vehicles cannot be moved easily can be replaced by our six leg mechanical spider.
- 6) Heavy loads can be easily transported if we made this as a giant one. It has got further application for the study of

linkage mechanism and kinematic motions. The geometry and conditions can be changed according to application needs. It can travel in rough surfaces very easily, so this machine can be used in rough surfaces where ordinary moving machine cannot travel.

- 7) There would be further benefits if a portion of these tasks should be automated or made more accurate through Global Positioning Systems, infrared viewing, and audio and video recording. It could be programmed to patrol a predefined. Perimeter at random intervals.

4. Future Scope of Work

This mechanism can be made more flexible by using different link lengths for front, middle and hind legs. Intelligence can be induced by introducing Sensors and vision to improve the effectiveness of this robot in future. Range of motion and moments available at each joint are the greatest concern as it is important for achieving stance and insect like walking.

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