KLANN MECHANISM

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Abstract. The main objective is to design a spider mechanism by using klann mechanism. Therefore, klann mechanism can access to places where the wheels cannot be used and it is even capable to travel any terrain and harmful places where the people can not work or travel like nuclear plants mining etc. now we are trying to obtain a klann mechanism robot which has both the motions in it like walking and climb over obstacle when it is needed by adjusting or changing the dimensions or the angles in the klann mechanism lay out. Its like we want to merge the both trajectory of walking and climbing into one trajectory so it can per from both the motions in needed.

1. Introduction

klann mechanism for any random movements whenever the wheel is not possible to use. it does not require microprocessor controls or multitudes of inefficient actuator mechanism. It can step over curbs and climb stairs or travel areas that are not accessible with wheels. It is the mechanism which is the expansion of the burmster theory that converts the rotating motion of the crank into linear movement of the foot for one half rotation of crank and raises the foot for the second half and it returns to the starting point. And 180 degrees out of phase will function as wheel replacement. The klann linkage mechanism consists of six links per each leg a frame, a crank, two grounded rockers, and two couplers all connected by pivot joints. There is another popular mechanism know as Theo Jansen mechanism it will simulate the smooth walking motion. It has many types of leg mechanism that are eight bar mechanism and strandbeests.
1.1. Why klann mechanism?

And we choose klann over Jansen is here number of links are less in Klann mechanism as compared with Jansen mechanism. Comparison with Jansen, the strength of the Klann system is much less. Klann mechanism has less complicated mechanism over the Jansen mechanism to allow the robot to walk in muddy snowy or slippery surfaces. To allow access to harmful locations and the wheels are the main components of the transportation vehicle. Without wheels the vehicle cannot move from its stationary state. But this wheel is having few drawbacks. We know wheels can catch grip on normal roads easily. But these wheels slip on wet areas, snowy region, in muddy region and also on high elevation. So, to allow vehicles to move on such areas the wheels can be replaced by the insect walking gait pattern. so, we choose the best effective leg mechanisms is Joe Klann Mechanism over Theo Jansen Mechanism for our applications.

2. NOMENCLATURE OF KLANN MECHANISM

The Klann connexion method is a six-connection mechanism.

1. Frame link
2. Crank link
3. supporting link
4. fulcrum
5. leg link
6. pivot link

Frame is the base that holds the pivot arm and fulcrum arm and the crank gear. The main power input from the motor is given to the crank gear that imparts rotary motion to supporting arm and leg is attached with the supporting arm that results in locomotion and to get the gait and pivot arm and fulcrum are provided and all links are connected

3. LITERATURE REVIEW

[1] P. Ramesh (2016) Spider Robot Design and Manufacture Using Klann Mechanism. The Klann fixture is a planar device constructed to mimic the gait of the legged creature to replace the rim. The fit comprises of the floor, the cabinet, two ground rockers & two cupboards linked by pivot joints. To maximise foot linearity for half the cabinet rotation, the proportion of each connexion in the system is defined. The remaining turn of the rotary crank enables the foot to be lifted to a certain height prior to returning to the starting position and completing the cycle. Two of these joints, combined at the crank & a half cycle, result in a car body parallel with the floor. Microprocessor control or large amounts of actuator mechanisms are not required.[2] Mano Raja Paul M (2017) Klann Mechanism Held Telerobot With Security Systems the PIR senses the human body the sensor transmits a triggering signal to the raspberry pi, which in turn triggers the face detection camera installed in the
spider robot. Whenever it is activated, the face detection camera captures the face of the identified individual and then the device memory works to compare the photos with the restored images if the match is found with the previously stored file, the controller receives an authorized individual signal and, if the match is not found, it will write as unauthorized. If the match is found with the file previously stored, the controller receives an authorized individual signal and will write as unauthorized if the match is not found if there is an error in mailing the picture, and another option available is to alert the controller that way2smS.

[3] Ms. Suman Sharma (2017) Mechanical Spider by victimization Klann Process binds the area unit linked by pivot joints during this process and transforms the rotating movement of the crank in a lateral movement comparable to that of moving animals. The ratios of each connexion within the machine area unit were defined to optimise the one-dynamic foot for a small portion of the rotating of the crank. The majority of the movement of the crank causes the foot to be brought up to a certain level before dropping to the starting position. These connections coupled with the crank and the simple fractional cycle from part to part can allow the vehicle frame to move parallel to the bottom. The initiative is useful in the handling of hazardous resources, removing mines or protecting a community while nobody was shot in danger by golf. Military, compliance, Explosive Disposal Ordinance units, and personal security companies that jointly enjoy mechanical spider applications. The aim is to shape an eight beam associate graduate structure to try different walking rules. A framework with the versatility of navigating stairs & various barriers to wheeling or trailing vehicles may be effective. We prefer to loosely base our style primarily on spider as a result of a complicated approach to octopedal locomotion in AI. Hopefully improvements in the law will be beneficial to the AI community and to society in the future.

[4] Rohan Agarwal (2019) Multi Legged Robot Design and manufacture the presence of wheeled and tracked vehicles on the surface of the earth. Machine consists mainly of different mechanisms to get the desired performance to their successful operation. The processes of four bars, the single slider crank mechanism, the dual slider crank mechanism are among the famous processes. The aim is to develop & build multi-legged robots & to connect cinematic deformations with CADD apps. The aim is to provide the transmission of movement & force. In order to accomplish effective build quality, the computational data is being used to develop the wandering robot for comparative purposes. The testing of the automaton is focused on the FEM principle embedded in the technology program Cad ANSYS R16.2. This proposal aims to construct an 8-legged machine to try different walking algorithms & conduct dynamic analysis.

[5] M. M. Asok raj kumar (2018) Spider Design and Manufacture by Using Klann Remote Sensing Mechanism The primaries locate a particular engine for this mission and gather its determination. The engine is a prime machine component. The motor shaft is associated with the legs and wheels. For this paper a 1.2V, 30rpm engine is used. The motor mounted goad outfit in the middle of Klann's heart. This goad outfit is part of another goad adapt. The GodfatherThe outfit is assembled without fitting onto the shaft. The pole is the nut, and the acrylic body is connected on both sides of the nut. Before the change to the acrylic body 2 goad adapt is joined on both sides and this rigging is connected to two side wheels. The front and back of the middle legs work with the one hand of haggling. The other four legs align with the haggling core the proposed work focuses on one degree of incentive six-bar Klann contact. Using measurement, it determines the optimal contact length for the desired locus. The target functions to be a common error of way. This demonstrates and classifies the counterbalance to all precision focuses. The most inspiring way to imagine 8 legs creepy crawly is to provide access to places that are out of reach or that are overly dangerous for humans. The dissident after calamity in dangerous spots inside the atomic reactor regions is hazardous ways to use 8 leg bugs for overview. The 8-legged bug robots are the considerable ability, the suggested technique to replace the wheel's capability bearing in mind the ultimate goal of overcoming the trouble of going into an uneven landscape. This system's most crucial benefit is that it does not require human intervention or massive calculation of the actuator instruments simply by remote control.

[6] U. E. Vanitha (2015) Mechanical Spider Using Klann Mechanism six leg links equally spaced on each side of the frame with three linkages. Six links for each of the three shafts are linked to two shafts of the cranks. On this a joint attaches to their separate cranks & the connecting rod that produces a
crank-rocker level is assisted by a revolving arm which is installed in one end of the crank at the centre of the hip. It twirls on a grounded rocker. It rotates 180 degrees a step by step. The 4-channel relay Module makes it easy & comfortable for drive Strong Load Works, such as 12V relays with 5V optical on your locally compatible 5V output board or other controller. Restrictions on which the model, assembly type or geometry determine. Parameters apply to restrictions Variables such as governing parameters or circle diameters, or geometry such as tangent, Parallel, Concentration, Horizontal or Vertical Parameters, etc. can be combined using ratios to obtain the intended purpose. Parameters can be combined with the use of relationships.

4. METHODOLOGY

- Firstly, I have Selected the dimensions of klann mechanism which the standard given by joe klann.
- Then Next, I had Design a one leg based on that dimensions in the Catia software.
- Then I had decided to make a sample design with any material.
- Then to Change the dimensions or angel of which we selected and conduct the several trials.

In order to obtain the design which can perform the both walking and climbing in single type design

5. A Leg of a robot design with Klann dimensions in Catia

Autonomous driving architecture provides pollution less transportation and cost effective auto driven electric vehicle. End users like business, university campus and entertainment parks will benefit from this design. This innovation used in vehicles helps renewable transport. Physically disabled people will benefit from automated mode.
6. Making of sample leg model from the design which we made in Catia

- I have chosen the ply wood for sample because it is cheap in cost and don’t deformation occur from easily.
- First, I have drawn the dimensions all required on the ply wood.
- Now with help of the electric wood cutter I have cut the all the required parts.
- And then with sand paper I had smoothened the edges and removed the unwanted sharp surface.
- Following then I had joined all parts of the links and obtain the leg by using the klann linkage mechanism.

7. Conclusion

- The purpose of this project is to develop a mobile robot focused on biomechanics of insects.
The main advantage of robots with the Klann system is their ability for wheeled robots to reach places difficult. Through copying into the physical structure of legged animals, the efficiency of mobile robots may be improved.

For the rescue of earthquakes & toxic conditions like the interior of the nuclear reactor, which have tremendous opportunities for genetically driven autonomous legged robots.

Further advantages of walking robots are low power consumption and weight, so it is important to use the minimum number of actions.

We are processing the final design and trying to merge the both the motion. Therefore, we are using Catia software for this operation.