



Magnetic shock absorber

CONSOLATION

Kalpita Patil, a 19 year old diploma student of Computer Science is from Pachora, Maharashtra. Her father is the office superintendent in M.M. College and her mother is a home-maker. Her younger brother is in his B.Com final year. After completing her diploma, Kalpita wishes to do her MCA and later if possible to do Research and Development in computers. Her hobbies are reading and software development. She has this advice to give other youngsters who wish to innovate, *"If you have any idea, please implement it and make it public so that others will also benefit from it."*

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Scouted by

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Genesis Kalpita has developed an idea for a magnetic shock absorber - (for automobiles and two-wheelers) which makes use of the magnetic repulsion between dipoles to achieve shock absorption. Often when riding on her two-wheeler, Kalpita used to face some problems while moving on the bumpy road due to its unevenness. But one specific incident stands out. It happened a year before and she was in a hurry to get to class. She was on the highway and was about to take a turn to the right side, when in the middle of the highway, her two-wheeler's shock absorber broke. The next thing she knew was that she had fallen on the middle of the road and was not able to either get up or walk. At that time from her right, a heavy vehicle was coming at her with full speed and then she shouted loudly and some people gathered around her and stopped that vehicle and admitted her in hospital.

This incident made a deep impact on her. She analyzed the source of the accident as the shock absorbers which were worn out and were not performing well. A student of science, she got an idea of making shock absorbers with magnets.

She observed that the like poles of two magnets of the same properties and strength repulse each other and they keep a constant distance between each other because of their magnetic fields. This made her think that if the shock absorbers are made of magnets with similar poles facing each other, it may give better performance and no maintenance would be required for the same.

Once she got the idea, she made a prototype of the shock absorbers with plastic pipes and magnets. She covered the similar poles of the magnets with the same coloured plastic and used a different colour for the other pole, to differentiate between the opposite poles. Thus about two to three months after her accident, she developed this magnetic shock absorber.

The innovation

The unit comprises of two circular magnets and a rod (straight cylindrical rod which can be used as axle). One magnet is attached at the bottom of the rod and is the base magnet. The other magnet is free, with a float and has the similar pole placed towards the base magnet. The



similarity of poles creates repulsion and a certain distance is maintained. As per load condition, the floating magnet moves and closes the gap until the magnetic repulsion is strong enough to create the damping action. In this manner a shock absorber without springs working on the basic law of magnets -Opposite poles attract and similar poles repel- is prepared.

Advantages

This shock absorber will eradicate the problems faced in the spring shock absorbers due to friction and other factors. This will also reduce the maintenance costs as it does not need repairing, changing of springs or dealing with leakage problems as in spring or oil shock



absorbers. This magnetic shock absorber can be used in vehicles carrying heavy or less load. Improving on her concept she says that to make these magnetic shock absorbers even better, a chain of more than two magnets can be used to tolerate the shocks or weight and make the vehicle more comfortable

She has made only one model. NIF has integrated the innovator's concept by making another model. The sample model costs about Rs.10-Rs.15. She hasn't publicized this innovation and is currently working on incorporating the idea in the barber's chair.

Support and encouragement...

"Various incidents and experiences give me ideas for facing any problems that come up in life"

Though triggered by an accident, Kalpita rates her experience of innovation as quite interesting. She showed it to her family who felt very happy and inspired and encouraged her to do even better. She specially acknowledges all the help provided by her younger brother who brought her any material which she required for the experiment. In their town, most of these materials were not available but still he managed to get it somehow. She would like to also thank Mr.Samir Raosaheb who encouraged her to do such innovative work.

More ideas...

Kalpita has also got an idea of making a pesticide from the leaves of a poisonous herb - zahari nagin (*Ipomoea carnea*). She has observed that there is never a single worm or pest on the leaves of this herb and considers that as proof of how poisonous the plant is. She feels that if the desired quantity of the essence of this herb can be mixed with water and sprayed on the crops through spray pump, it might kill all germs and pests. According to her this would be a very cheap and effective method of pest control.