DESIGN AND FABRICATION OF A LOW COST RAGI DE-HUSKING MACHINE

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Abstract :
Ragi is the main food grain for many people in India, constituting 25% of the food grains grown in India. It is the staple food grain for most of the poor people living in rural areas. Post harvest process of Ragi involves two steps, namely, Threshing and De-Husking. Small farmers carry out threshing by passing heavy rollers over the dry stacks and de-husking is done manually. This is highly labour intensive, most of the time women carry out this slow and laborious work. There is a need to carry out this labour intensive work systematically and well in time when required. In this view a low cost Ragi de-husking machine is developed successfully.

Introduction :
INDIA is predominantly an agricultural economy; around 40-50% of Indian economy is generated by agriculture. Even though India has seen great advancement and progress in science and technology, the application of such modern techniques to agricultural field is still not effective. Traditional and conventional agricultural practices have hindered expected levels of advancement in agricultural field of India.

So it is important for today’s engineers to strive towards application of modern technology in agricultural practices. This would not only improve productivity but also economic status of farmers in the country. Even though technically advanced equipments and machinery are available, it’s a known fact that’s it’s not reaching to our farmer either because of high cost or affordability problems.

Mainly post-harvesting procedures require efficient and effective equipment. Sometime delay in post harvesting procedure because of conventional method needs to grain deterioration and spoils the grain thus leading to heavy losses for the farmers. In this view a low cost Ragi de-husking machine is developed.

Design :
Components of Ragi de-husking Machine

1. Hopper
2. Roller drum unit
3. Endless belt
4. Side strips
5. Mounting frame
6. Pressure pad unit
7. Motor unit
8. Blower unit
9. Ragi conveyor

Motor connection and blower connection should be switched on. Ragi with husk has to be fed from hopper. Rubbing action takes place in pressure pad area, husk and Ragi grain get separated and flows further down due to rolling conveyor belt air from the blower fan blows off the husk and only de-husked Ragi grains get collected in the tray placed below the conveyor.

If the husk is not getting removed completely then screws of the pressure pad has to be tightened. If Ragi is getting powdered then pressure pad screws has to be loosened to reduce the pressure. This procedure has to be repeated until Ragi without husk is collected in the tray.

If there is power failure then the machine can be operated using crank and collected Ragi grains can be allowed to fall from 10 feet from the ground so that husk will fly in air and Ragi will fall down.

Results And Discussion:

Testing of the machine was carried out with a sample of one kilogram of threshed Ragi grains. Manually Ragi grains with husk was poured through the hopper and collected in the tray. It took 3 minutes to complete the operation including initial optimization. It takes 15-20 minutes to de-husk manually using crank. It takes around 45-50 minutes to de-husk Ragi by hands.

Conclusion:

Currently in rural places there is a major issue with availability of laborers. This machine will help farmers to minimize the dependency on laborers for Ragi de-husking which is time consuming and a labor intensive process. It is observed that the machine is much cost effective in comparison to other de-husking machines commercially available. The entire unit is light in weight and hence portable. Provision is made to operate it manually.

References:

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