Winch Actuated Dumping Trailer

Researchers at the University of South Florida have developed a dumping trailer for lifting the dumping bed of the trailer with the use of a winch.

A dump trailer is a truck used for transporting loose material (such as sand, gravel, or demolition waste) for construction. A typical dump trailer is equipped with an open-box bed, which is hinged at the rear and equipped with hydraulic rams to lift the front, allowing the material in the bed to be deposited ("dumped") on the ground behind the truck at the site of delivery. The cost associated with hydraulic systems is significant when compared to a winch. A hydraulic system of equivalent strength to a winch cost 650% more. A hydraulic system also requires maintenance of components to prevent damage to the hydraulic actuator.

Researchers at USF have invented a novel dumping trailer using a winch. The winch system features two arms connected to the trailer frame which pivot and lift by the pulling of the lifting cable of the winch. Once the arms lift into place, two brackets connected to the front of the dumping bed, which contain pulleys, help lift the bed. Once lifted up, the contents of the dumping bed slide out. The winch is reversed to lower the dumping bed, then the lifting arms. This mechanism can be redesigned to fit a plethora of different bed sizes. The cost of winch actuated dumping trailer is 19% less than the cost of hydraulic actuated dumping trailer. The winch requires no additional assistance as all the components move into place during dumping and move back on their own. Therefore, the winch actuated dumping trailer proves to be an effective technology.

ADVANTAGES:
- Cost effective
- No additional assistance required
- Can be redesigned for different bed sizes
- Requires less maintenance than the hydraulic actuator

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