

青贮玉米收获机打捆装置自动控制系统设计 Design of Automatic Control System on Baling Apparatus for Ensilage Maize Combine

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摘要: 青贮玉米收获机可在玉米摘穗的同时, 将切碎的秸秆打成圆捆, 以便于青贮。为提高作业效率、简化机手操作流程, 设计了一套喂料与送绳自动控制系统, 该系统由传感检测元件、控制电路及执行机构3部分组成。采用四路换向开关作为传感检测元件, 并结合RS去抖电路, 可有效提高控制系统工作可靠性。执行元件为两电磁离合器, 接收控制电路的输出信号, 完成对喂料和送绳过程的实时控制。试验表明: 该系统工作安全、可靠, 料捆成捆率达到100%; 与手动控制方式相比, 有效强化了料捆密度控制的准确性, 使机具的作业效率提高20%。 Ensilage maize combine can ingather corn ear, as well as bundle and ensilage corn stalk when it is used for corn harvest. In order to enhance operation efficiency of ensilage harvester, and to reduce the operating burden of driver, an automatic control system on feedstock and rope-send was designed, composed of three parts, i.e., sensor detection element, control circuit and implementation mechanism. Four-way change-over switch was used as detection element of sensor, and combined with RS de-twitcher circuit, to improve the reliability of the control system effectively. The implementation components that were composed of two electromagnetic clutches responded to the control circuit output, and ultimately actualized the real time control of feeding stalk and sending rope. Experiments show that the designed system can work accurately and reliably, with the baling rate to 100%, compared with manual control, the veracity of bale density control is strengthened effectively, and operating efficiency of the machine is improved by 20%.

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