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TSM型煤粉计量与控制系统

TSM COAL WEIGH & CONTROL SYSTEM

主要技术优势
Main technical advantages

- 系统运行稳定，计量精度高；
- 适应煤粉性能强；
- 完全自主开发的电控系统，运行可靠性高；
- 采用电机减速机与转子主轴直联方式，提高传输效率，避免了丢转现象，同时拆装维护更加方便；
- 电气控制具有过载保护及卡位自动回转停车系统，可更好减少不必要的停车事件发生；
- 转子与密封板采用特殊自润滑系统，避免了调试及开车时，长时间空转带来的干磨现象，当煤质较差时，其优势更加明显。

- stable operation and high accuracy
- wide-adaptability to pulverized coal
- self-developed electrical control system and high reliability
- reducer directly coupled with rotor shaft, so as to increase transmission efficiency and easy for maintenance
- overload protection and automatic reverse shutdown system, in order to minimize unnecessary shutdown incidents
- special auto-lubricating system available between rotor and seal plate, so as to avoid wear due to long term idle running during commissioning and startup

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Tianjin Cement Industry Design & Research Institute Co.,Ltd.

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1 概述 GENERAL

水泥工业中，回转窑和分解炉的喂煤系统对于烧成系统至关重要。煤粉计量与控制对稳定窑的热工制度，提高熟料的产量和质量，节约能源和减少有害气体的排放，有着极其重要的作用。TSM型煤粉计量与控制系统（如图1）正是基于解决以上问题而开发出来的新型计量设备。近年来，本公司相继开发出了TSM1000、TSM1200以及TSM1400等一系列规格型号的煤粉计量与控制系统，在配套建设的实验平台（如图2）上经过一系列严格的性能检测后，推向市场，为每一位业主提供一套具有专业化的、针对性的煤粉计量与输送方案。

In cement industry, coal feeding system is very important to operation on rotary kiln and calciner. The stable and reliable weigh and control to pulverized coal play a very important role to stabilize kiln operation, improve clinker capacity and quality, save energy and reduce hazard emission. TSM coal weigh and control system (See Figure 1) is developed and designed based on aforesaid consideration. In recent years, we developed types of coal weigh and control system such as TSM1000, TSM1200, TSM1400. After a series of strict performance test in laboratory platform (See Figure 2), it is promoted in the market with purpose to provide professional pertinent pulverized coal weigh and feeding solution.

图1 TSM1200型煤粉计量与控制系统
Figure 1 TSM1200 Coal Weigh & Control System

2 技术特点 CHARACTERISTICS

TSM系列煤粉计量与控制系统采用天平计重原理。由于充分考虑到工厂现场应用条件、物料特性等因素的影响，具有较强的适应能力，它具有以下六方面技术特点：

- 系统运行稳定，计量精度高；
- 适应煤粉性能强；
- 完全自主开发的电控系统，运行可靠性高；
- 采用电机减速机与转子主轴直联方式，提高传输效率，避免了丢转现象，同时拆装维护更加方便；
- 电气控制具有过载保护及卡位自动回转停车系统，可更好减少不必要的停车事件发生；
- 转子与密封板采用特殊自润滑系统，避免了调试及开车时，长时间空转带来的干磨现象，当煤质较差时，其优势更加明显。

TSM series coal weigh and control systems are based on the balance weighing theory. Considering working condition at site and impact of coal characteristics, it is of high adaptability with the following characteristics:

- stable operation and high accuracy
- wide-adaptability to pulverized coal
- self-developed electrical control system and high reliability
- reducer directly coupled with rotor shaft, so as to increase transmission efficiency and easy for maintenance
- overload protection and automatic reverse shutdown system, in order to minimize unnecessary shutdown incidents
- special auto-lubricating system available between rotor and seal plate, so as to avoid wear due to long term idle running during commissioning and startup

图2 煤粉计量与控制系统实验平台
Figure 2 Platform of Coal Weigh &Control System

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3 技术参数
SPECIFICATION

TSM系列煤粉计量与控制系统具有以下技术参数：
Technical specification of TSM series coal weigh and control system is as the following:

（1）物料参数 Material

物 料	煤 粉
粒度（80μm筛余%）	3.0~15.0
容重（g/cm^3）	0.45~0.70
水份（%）	0.5~7.0
输送特性	气力输送

Material	Pulverized coal
Particle Size (% 80μm)	3.0~15.0
Bulk Density (g/cm^3)	0.45~0.70
Moisture (%)	0.5~7.0
Transport characteristics	Pneumatic conveying

（2）产品规格型号及相应技术参数 Product Types and Specification

产品规格型号	TSM1000	TSM1200	TSM1400
喂煤能力(t/h)	0~12	0~23	0~35
精度(%)	静态0.5,动态1.0	静态0.5,动态1.0	静态0.5,动态1.0
转子直径(mm)	1000	1200	1400
主机功率(kw)	4	5.5	7.5
搅拌电机功率(kw)	4	5.5	7.5
转子转速(r/min)	0~8.0	0~8.0	0~8.0
重量(kg)	约3000	约4500	约5300

Product types	TSM1000	TSM1200	TSM1400
Capacity (t/h)	0~12	0~23	0~35
Accuracy (%)	static0.5, dynamic1.0	static0.5, dynamic1.0	static0.5, dynamic1.0
Dia. Of Rotor (mm)	1000	1200	1400
Main Motor(kw)	4	5.5	7.5
Mixer Motor (kw)	4	5.5	7.5
Speed (r/min)	0~8.0	0~8.0	0~8.0
Weight (kg)	~3000	~4500	~5300

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4 工艺流程描述
PROCESS DESCRIPTION

（1）物料煤粉由储存仓经气动插板阀喂入带有独立驱动的搅拌器内；
（2）煤粉从搅拌器经下溜子进入到测量单元计量机构格子内进行称重计量；
（3）在经过计量称重后，煤粉被从罗茨风机输送过来的风通过管道气力输送到窑头或分解炉内。

(1) Pulverized coal will, via pneumatic flapper valve, fed into mixer.
(2) pulverized coal is fed, through the tube, to weigh bin for weighing.
(3) After weighing, pulverized coal is transported to kiln burner or calciner burner through roots blower.

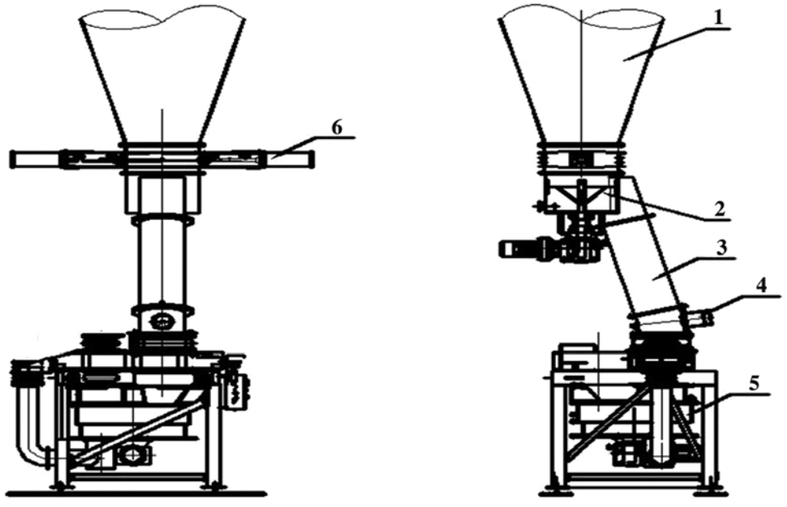

图3 TSM煤粉计量与控制系统工艺流程
1–储存仓 2–搅拌器 3–下料溜子 4–预留排风口 5–计量机构 6–气动阀
Figure3 Process of Coal Weigh &Control System
1-storage silos 2-mixer 3-tube 4-exhaust pipe 5-weighing part 6-pneumatic flapper valve

5 应用
REFERENCE

此产品可应用于水泥及电力等行业中的粉料计量与输送，目前在北京水泥厂有限责任公司3000t/d熟料生产线应用一台（如图4）。2011年又签订三台供货合同。

It can be widely used in pulverized coal weigh and feeding in cement and power generation industry. Presently, there is one applied in Beijing Cement Co., Ltd (3000t/d) (See Figure 4). Another 3 orders have been signed in 2011.

图4 北水3000t/d生产线技改用煤粉计量与控制系统外形图
Figure 4 Coal Weigh & Control System in Beijing Cement Co., Ltd (3000t/d)

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