

# 机械管理开发

2016年第5期  
(总第157期)

MECHANICAL MANAGEMENT AND DEVELOPMENT

 编辑出版：山西经济和信息化出版传媒中心

一级（优秀）期刊

ISSN1003-773X  
CN14-1134/TH

- 中国核心期刊（遴选）数据库收录期刊
- 中国期刊全文数据库收录期刊
- 中国学术期刊网络出版总库全文收录期刊
- 中国学术期刊综合评价数据库来源期刊
- 中国学术期刊（光盘版）全文收录期刊
- 中文科技期刊数据库（维普网）收录期刊
- 万方数据-数字化期刊群全文上网期刊

ISSN 1003-773X



9 771003 773161

定价：人民币15元

万方数据

# 目 次

## ·设计理论与方法·

- 基于  $6\sigma$  和目标驱动技术的光电跟踪设备托座多目标优化 ..... 吕治军,杜俊峰(5)
- 基于 ANSYS 的径向珩轮的仿真技术研究 ..... 苏永红(8)
- 间歇反应器单一介质换热系统设计 ..... 彭 皓(11)
- 开元煤矿邻近层瓦斯抽采穿层钻孔合理间距研究 ..... 程景奎(14)
- 应用精益六西格玛缩短焊接机箱装配周期 ..... 王 祥(17)
- 大采高综采面煤壁片帮机理及控制研究 ..... 耿 贵(20)
- 绿色模具转型升级研究\* ..... 纪宏波,梁 荣,刘成刚(22)

## ·机械分析与设计·

- 重型汽车变速箱气动助力器优化设计 ..... 李广仁(26)
- 类人型舞蹈机器人“创客”一号设计 ..... 乔 栋,吕贝贝,贾焦予(28)
- 煤矿带式输送机转弯装置的改进 ..... 刘 军(31)
- 汽车盘式制动辅助节能系统 ..... 陈博闻,李 阳,沈 垚(34)
- 浅论露天煤矿护孔机的设计及应用 ..... 李向仲(37)
- 底鼓巷道锚杆支护应用技术研究 ..... 焦 义(41)

## ·测试与诊断技术·

- 浅析矿山电机故障诊断 ..... 薛 斌(44)
- 煤矿综掘机械设备维修中的故障诊断技术 ..... 朱建江(47)
- 束管监测系统在矿井防灭火技术中的运用 ..... 田 野(49)
- 煤矿机电中监测技术的应用与创新 ..... 石方刚(51)

## ·实践与应用·

- 变频调速在成庄矿排矸立井的应用 ..... 李 鹏(54)
- 高位钻孔抽放技术在演马庄矿的应用 ..... 辛志科,王 飞,孙章辉(56)
- 浅谈电网无功补偿装置 ..... 张继保(58)
- 漳村矿 5 号井压风机房噪音治理研究及应用 ..... 王少伟(60)
- 输水工程斜井支洞运输方案 ..... 李奎涛(63)
- 动筛跳汰机在矿井中应用 ..... 赵如华(65)
- 矿井通风系统回风巷构筑物改进 ..... 马卓安,兰显克(67)
- 带式输送机集中控制系统改造 ..... 贾国栋(71)

## ·自动化技术与设计·

- 基于单片机的车位管理系统 ..... 唐 磊,周岳斌(74)
- 滚筒采煤机在煤层开采的自动化与智能化应用 ..... 马 鸿(77)
- 立体车库上用的自锁防落装置的设计研究 ..... 邵海燕(79)
- 单片机在王庄煤矿电气自动化控制中的运用 ..... 孟郑军(81)

## ·专题与综述·

- 工作面上隅角瓦斯综合治理技术的研究及应用 ..... 李晓东(83)
- 综采工作面过路落柱技术探析 ..... 杨 蒙(86)

|   |          |
|---|----------|
| 煤矿采煤工艺优化分析 .....                              | 王文龙(88)  |
| 长距离带式输送机胶带跑偏问题的研究及处理 .....                    | 周志刚(90)  |
| 煤矿井下瓦斯抽采技术探析 .....                            | 张旭刚(92)  |
| 地理信息系统技术在环境影响评价中的应用 .....                     | 王永平(94)  |
| 煤矿综采设备维修现状及发展趋势探讨 .....                       | 李志超(97)  |
| 新景公司调整厚煤层动压侧巷道层位的对比 .....                     | 周廷宇(99)  |
| 煤矿机械设备软启动技术探讨 .....                           | 周密林(101) |
| 分层开采技术中下分层外错技术的研究 .....                       | 魏 浩(104) |
| 电动汽车动力系统控制研究 .....                            | 李俊义(106) |
| 浅谈下分层巷道掘进顶板控制 .....                           | 凌红兵(109) |
| 矿井低压电网漏电故障及改进措施探究 .....                       | 李 斌(111) |
| 关于煤矿井下通风灾害预防的研究 .....                         | 王福春(114) |
| 煤矿综采机电设备发展现状及趋势 .....                         | 马冬冬(117) |
| 电气开关故障原因及保护措施探究 .....                         | 肖冰冰(119) |
| 综掘工作面综合防尘技术探析 .....                           | 李永强(121) |
| 井下低压供电系统选择性漏电保护技术探析 .....                     | 常军团(123) |
| 现代化矿井机电设备维修管理模式探析 .....                       | 郝燕杰(125) |
| 综采孤岛工作面开采技术研究 .....                           | 杨富群(127) |
| 综放回采率的计算及提高措施 .....                           | 申随德(129) |
| 深井煤矿开采支护技术的应用研究 .....                         | 李伟良(131) |
| 试析当前中国煤矿供电安全管理 .....                          | 晋煜杰(133) |
| 现场总线技术在矿山电力中的应用研究 .....                       | 马丽茹(135) |
| FBCDZ-10-NO38/2×1 250 kW 主通风机的应用与节能效果研究 ..... | 王鹏飞(137) |
| 煤矿机电控制中 PLC 技术的有效应用研究 .....                   | 谈 正(140) |
| 浅析煤矿巷道掘进成套设备的掘进与施工 .....                      | 段艳强(142) |
| 浅析煤矿地质测量在矿井安全生产中的重要性 .....                    | 张学亮(144) |
| 煤矿供电系统小电流接地选线技术探析 .....                       | 李佳佳(146) |
| 新形势下煤矿环保工作探讨 .....                            | 王继宏(148) |
| 煤矿井下机电设备的维护与维修 .....                          | 刘利虎(151) |
| 矿井提升装备变频技术的发展及应用 .....                        | 郝军峰(153) |
| 煤矿采掘机械液压系统的常见故障探讨 .....                       | 马志伟(155) |
| <b>·经验交流·</b>                                 |          |
| MG300/700-WD 采煤机常见故障处理 .....                  | 吕晓龙(157) |
| 地质条件对矿井瓦斯赋存的影响研究 .....                        | 苗 萌(159) |
| 煤矿采掘机械液压系统常见故障原因探究 .....                      | 郑志伟(161) |
| 水环真空泵常见故障研究分析 .....                           | 郑永生(163) |
| 浅谈煤矿地质测量工作的价值与重要性 .....                       | 王彦鹏(165) |
| 胶带机运输系统高压漏电故障的防治 .....                        | 杨树明(167) |
| 浅析变频技术在煤矿主扇风机上的应用 .....                       | 吕建忠(170) |
| 刍议煤矿机电和运输事故防治的重要性 .....                       | 薛 挺(172) |
| 热电厂风机常见故障及处理 .....                            | 郭志田(175) |
| 煤矿机械传动齿轮损坏原因及解决方式 .....                       | 高 慧(177) |
| 井下盘区胶带机快速更换工艺研究 .....                         | 魏海文(180) |
| 煤矿通风机在安装使用管理中存在的问题及对策分析 .....                 | 师 敏(183) |

注:带★号的为基金资助论文

期刊基本参数: CN 14-1134/TH \* 1986 \* m \* A4 \* 184 \* zh \* P \* ¥15.00 \* 5000 \* 74 \* 2016-05

# CONTENTS

## •Design Theory and Methods•

|  |  |
|--|--|
| Multi-objective Optimization of Photoelectric Tracking Equipment Bracket Based on 6 $\sigma$ and Goal Driven ..... | Lv Zhijun, Du Junfeng(5)                 |
| The Simulation Technology Research of Radial Honer Based on ANSYS .....  | Su Yonghong(8)                           |
| On the Design of Single Medium Heat Exchange System of Batch Reactor .....   | Peng Hao(11)                             |
| Study on the Reasonable Distance of the Adjacent Layers' Gas Release Drilling of Kaiyuan Coal Mine .....           | Cheng Jingkui(14)                        |
| Shorten Period of Crate with Lean Six Sigma .....  | Wang Xiang(17)                           |
| Principal and Control of Rib Spalling in Fully Mechanized Face of Large Mining Height .....                        | Geng Gui(20)                             |
| Intelligent Transformation and Upgrading of Green Mold .....   | Ji Hongbo, Liang Rong, Liu Chenggang(22) |

## •Mechanical Analysis and Design•

|  |                                      |
|--|--------------------------------------|
| Pneumatic Booster Design of Heavy Vehicle Transmission .....                                     | Li Guangren(26)                      |
| Design of Robots Dancer "Maker" No.1 Like Human .....  | Qiao Dong, Lv Beibei, Jia Jiaoyu(28) |
| Improvement of Turning Device of the Belt Conveyor in Coal Mine .....                            | Liu Jun(31)                          |
| Auxiliary Energy-Efficient System for Disk Brake .....   | Chen Bowen, Li Yang, Shen Yao(34)    |
| Design and Application of Protecting Hole Machine in Perforation Job in Open Pit Coal Mine ..... | Li Xiangzhong(37)                    |
| Application of Rock Bolting in Mine Roadway with Floor Heave .....                               | Jiao Yi(41)                          |

## •Test Technology•

|  |                   |
|--|-------------------|
| Simple Analysis of the Fault Diagnosis of Mine Motor .....                                     | Xue Bin(44)       |
| Fault Diagnosis Technique of Coal Mine Comprehensive Tunneling Machinery and Equipment .....   | Zhu Jianjiang(47) |
| Application of Tube Monitoring System in Mine Fire Prevention Technology .....                 | Tian Ye(49)       |
| Innovation and Application of Monitoring Technology in Coal Mine Electricity and Machine ..... | Shi Fanggang(51)  |

## •Practice and Application•

|   |                                       |
|---|---------------------------------------|
| On the Application of Frequency Conversion-Speed Control in Waste Stone Exhaust Vertical Shaft .....  | Li Peng(54)                           |
| Application of High Level Borehole Gas Drainage Technology in Yanmazhuang Coal Mine .....             | Xin Zhike, Wang Fei, Sun Zhanghui(56) |
| Reactive Power Compensation Device of Power Network .....   | Zhang Jibao(58)                       |
| Study and Application of Noise Treatment in Compressor House in No.5 Mine in Zhangcun Coal Mine ..... | Wang Shaowei(60)                      |
| On the Transport Program of Inclined Sub-tunnel in Water Conveyance Project .....                     | Li Kuitao(63)                         |
| On the Application Effect of Moving Sieve Jigger in Mine .....  | Zhao Ruhua(65)                        |
| On the Improvement of the Mine Return Air Roadway Structures in Mine Ventilation System .....         | Ma Zhuo'an, Lan Xianke(67)            |
| Reform on Centralized-control System of the Ribbon Conveyor .....                                     | Jia Guodong(71)                       |

## •Automation Technology and Design•

|  |                           |
|--|---------------------------|
| Parking Management System Based on Single Chip Microcomputer .....             | Tang Lei, Zhou Yuebin(74) |
| Automation and Intelligence of the Shearer in Coal Mine .....                  | Ma Hong(77)               |
| Design of Self-locking Fall Prevention Device in Stereo Garage .....           | Shao Haiyan(79)           |
| Application of Single-chip in Automation Control of Wangzhuang Coal Mine ..... | Meng Zhengjun(81)         |

## •Report and Summary•

|  |                     |
|--|---------------------|
| Analysis and Application of Comprehensive Treatment for Gas of the Upper Corner .....  | Li Xiaodong(83)     |
| Discussion on the Passing through Collapse Column Technology in Fully Mechanized Coal Mining Face .....                                | Yang Meng(86)       |
| On the Optimization Analysis of Coal Mining Process .....  | Wang Wenlong(88)    |
| Research and Treatment of Belt Running Deviation Problem in Long Distance Belt Conveyor .....  | Zhou Zhigang(90)    |
| On the Analysis of Gas Extraction Technology Underground Coal Mine .....   | Zhang Xugang(92)    |
| Application of the Geographic Information System Technology in Environmental Impact Assessment .....                                   | Wang Yongping(94)   |
| Treatment of Equipment Faults in Fully Mechanized Coal Mining Face .....   | Li Zhichao(97)      |
| Comparison in Thick Coal Seam Roadway Layer Dynamic Pressure of Xinjing Company .....  | Zhou Tingyu(99)     |
| Soft Starting Technology of Machinery Equipment .....  | Zhou Milin(101)     |
| Study on the Bottom Slice Unofficial Mining Technology of Slice Mining Technologies .....  | Wei Hao(104)        |
| Dynamic System Control Analysis Based on Electric Vehicle .....  | Li Junyi(106)       |
| Discussion on the Roof Control in Bottom Slicing Tunnel Excavation .....   | Ling Hongbing(109)  |
| Faults and Improvement Measures of Leakage of Low-voltage Grod .....   | Li Bin(111)         |
| Analysis on Prevention for Risks of Ventilation under the Coal Mine .....  | Wang Fuchun(114)    |
| Development and Trend of Electromechanical Device in Coal Mine .....   | Ma Dongdong(117)    |
| Faults Reasons and Protection of the Switch .....  | Xiao Bingbing(119)  |
| Dust Prevention Technology for the Fully Mechanized Excavation Face .....  | Li Yongqiang(121)   |
| Discussion and Analysis of Selective Leakage Protection Technology of Underground Low-voltage Electric Leakage Protection System ..... | Chang Juntao(123)   |
| Analysis of Maintenance Management Modes of Modern Mine Mechanical and Electrical Equipment .....                                      | Xi Yanjie(125)      |
| Study on the Mining Technology in Island Fully Mechanized Working Face .....   | Yang Fuqun(127)     |
| Improvement Measures and Calculation of Mechanized Top-caving .....  | Shen Suidel(129)    |
| Applied Research on Deep Coal Mining Supporting Technology .....   | Li Weiliang(131)    |
| On the Safety Management in Current Coal Mine Power Supply .....   | Jin Yujie(133)      |
| Application of the Fieldbus Technology in Coal Mine Electric Power .....   | Ma Liru(135)        |
| Application and Effect of Energy Conservation of FBCDZ-10-NO38/2 x 1250 kW Main Fan .....  | Wang Pengfei(137)   |
| Application of PLC Technology in Electrical Machine Control in Coal Mine .....   | Tan Zheng(140)      |
| On the Complete Sets of Tunnelling Equipment and Construction Technology Used in Coal Mine Roadway Drivage .....                       | Duan Yanqiang(142)  |
| On the Importance of Coal Mine Geological Survey in Coal Mine Safety Production .....  | Zhang Xueliang(144) |
| On the Application Analysis of Small Current Grounding Line Selection System Used in Coal Mine Power Supply System .....               | Li Jiajia(146)      |
| Discussion on Environment Protection of Coal Mine under the New Circumstance .....   | Wang Jihong(148)    |
| Maintenance and Repair of Electromechanical Equipment under the Coal Mine .....  | Liu Lihu(151)       |
| Work Principal of Converter Technique of Hoisting Device .....   | Hao Junfeng(153)    |
| Common Faults of Hydraulic System of Digger of Coal Mine .....   | Ma Zhiwei(155)      |

## •Experience Exchange•

|   |                      |
|---|----------------------|
| Treatment on Common Faults of MG300/700-WD Coal Cutter .....  | Lv Xiaolong(157)     |
| Study on the Influence of the Geological Conditions on Mine Gas Occurrence .....                        | Miao Meng(159)       |
| Study on Common Faults Reasons of Hydraulic System in Coal Mining Machinery .....                       | Zheng Zhiwei(161)    |
| Faults Analysis on Water Ring Vacuum Pump .....   | Zheng Yongsheng(163) |
| Value and Importance of Geologic Survey of Coal Mine .....  | Wang Yanpeng(165)    |
| Introduction to Prevention and Treatment of High Pressure Leakage Fault of Belt Conveyor System .....   | Yang Shuming(167)    |
| The Application of Frequency Conversion Technology in Main Fan in Coal Mine .....                       | Lv Jianzhong(170)    |
| Discussion on the Importance of Accident Prevention and Control of Mining Machinery and Transport ..... | Xue Ting(172)        |
| Common Faults and Treatment of Fans in Thermal Power Plant .....  | Guo Zhitian(175)     |
| Broken Reason and Countermeasures of the Transmission Gear .....  | Gao Hui(177)         |
| Study on the Quick Change Process of Panel Belt Conveyor underground Coal Mine .....                    | Wei Haiwen(180)      |
| Problems and Countermeasures of Installation of Coal Mine Ventilator .....                              | Shi Min(183)         |

# 太原市新型墙体材料管理中心

## 新型墙材描绘世纪蓝图

终结黏土类传统墙材主导墙材市场长达上千年的历史，是时代的选择，是科技发展的选择，是社会经济发展的必然选择。太原市新型墙体材料管理中心以其高度的时代责任感推动着这场变迁。

### 挑战秦砖汉瓦，转型升级让行业步入良性发展

“十二五”期间，太原市新型墙材管理中心按照省墙改办和市经信委的统一部署，立足全面提升新型墙体材料产业整体发展水平，进一步规范墙材市场秩序，逐步解决行业发展存在的问题，探索持续推进墙改工作向纵深发展的办法和机制，狠抓新型墙材产品结构调整，着力推动全市新型墙材产业转型升级。

**调结构，促转型。**“十二五”期间，太原市加大了对既有建筑节能的改造步伐，仅2015年就完成了412万平方米的既有建筑节能改造。此项改造全部使用6cm厚的B1级聚苯保温板，使本土外墙保温材料生产企业寻找到了广阔的用武之地。目前，太原市城区建筑的新型墙体材料的应用率达到90%以上，工业固废利用率达61%，实现了建筑节能、土地节约、环境保护、废旧资源综合利用等多重效益。

**订《条例》，严执法。**《太原市发展新型墙体材料条例》经山西省第十二届人民代表大会常务委员会第十八次会议于2015年1月23日批准，自2015年6月1日起实施，标志着太原市墙体材料革新工作进入一个新的阶段，墙改执法有了可操作依据，也将进一步促进太原市新型墙材管理步入法制化、规范化、长效轨道化。

**抓队伍，强素质。**健全墙体材料革新工作管理机制，形成管理、监督、服务、执法“四位一体”的管理体系，加强行业管理能力建设一直是太原市新型墙材管理中心这几年来追求的目标。“十二五”期间，太原市新型墙材管理中心狠抓支部、工会和执法三支队伍建设，使其在全市墙改工作中发挥了很好的骨干带头作用，全面提升了中心工作。

### 告别秦砖汉瓦，“十三五”展宏图

“十三五”期间，太原市新型墙材工业行业将紧紧抓住产业结构调整和资源转型的有利时机，认真贯彻落实山西省委“十三五”规划，积极采取措施，力求做到“六个结合”（和全市墙改发展规划、产业政策相结合；和发改、住建、技术监督、房地产管理等部门重点工作相结合；和市政府简政放权相结合；和建筑节能工作相结合；和太原市的实际情况相结合；和产业结构调整相结合），推动新型墙材产业的产品结构、技术结构、组织结构和产业链结构优化调整和转型升级。

