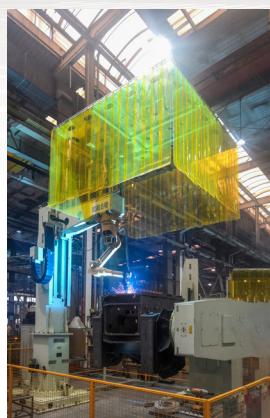


为企业清清洁生产提供专业解决方案
济南嘉禾瑞丰科技开发有限公司



现代制造技术与装备

主管 山东省机械工业协会

主办 山东省机械设计研究院

理事会

理事长：刘卫东

副理事长：林江海

理事：

陈声环	曾庆良	邓德乐	齐晓光	李保民
李胜军	李政军	毛志猛	孟庆堂	尚书旗
孙龙平	孙清洲	孙少军	宋家禄	汤世贤
王新建	魏修亭	徐龙泉	薛兴振	许宪志
许允和	于元波	张万谋	张承瑞	张跃成
张志刚	张世君	晁向博	姜小兴	薛峰
孙振华	郭信学	沙克清	马昭喜	马祖文

杂志社

社长：林江海

副社长：唐炳武 周靖 夏玉海 姚立新

主编：吴小临

副主编：徐民兴

编辑：刘凌 张秀明 许彦红 郭鹏

英译：李莹 王建文

编委：边秀房 丁明 樊炳辉 黄传真

李木森 李军 李玉奎 刘川

刘永飞 石长河 孙宏飞 孙宁

王善坡 徐刚 周以齐 赵玉刚

曹明通

出版：《现代制造技术与装备》杂志社

编辑：《现代制造技术与装备》编辑部

发行：《现代制造技术与装备》广告发行部

刊号：ISSN1673-5587
CN37-1442/TH

广告代理权：现代制造技术与装备编辑部

广告经营许可证：3700004000145

印刷：济南景升印业有限公司

定价：15.00 元

《现代制造技术与装备》杂志社

地址：济南市济洛路129号

邮编：250031

电话：0531-85955168 0531-87116637

[Http://www.sdji.cbpt.cnki.net](http://www.sdji.cbpt.cnki.net)

E-mail:sdjx168@163.com mmte@163.com

zzjsybz@163.com zzjsybz@126.com

万方数据

目次

·设计与研究·

拉伸试验影响因素分析与研究.....	胡海华	杨宝成(1)				
钢筋网自动焊接生产设备的设计.....	崔旭东(4)					
GDX2商标胶缸清洗辅助装置设计.....	念丽波	郭景林(6)				
分析四腔压条的挤出模具机械设计.....		吴治明(8)				
矿石振动筛分装备的研究现状.....	黄宇邦	栗思伟	陈洪堂	郭培全	汪敬海(10)	
对一种平动塞拉机构的运动分析.....					麻冰玲(12)	
基于UG的钣金展开软件开发和应用研究.....					童辉(13)	
间冷塔自动布料车设计.....	齐晓燕	李靖	李霄霄(15)			
用于某转子同心度测量的液性塑料夹具设计.....	宋树林	孙青贵(16)				
轴承环加工的夹具设计.....	邓野(20)					
农机装备云制造服务平台及运行模式研究.....	关盟	李玉林	宋海草(22)			
多面体夹芯结构弯曲刚度影响因素分析.....	张芹	潘金龙	王英杰(25)			
机车用直流接触器电磁线圈参数的快速设计.....			蒋培基(27)			
数控铣刀式分板机专用治具设计.....				胡圣玄(30)		
某热室运输小车抗震计算与分析.....	宋宏伟	吴伟	宋良军	何堂将(32)		
基于粤港澳工程训练的拾放球机器人结构方案分析及设计.....						
	陈显扬	欧阳纬熹	黄林琪	赖泓杰	陈西明	李德荣(34)
基于DOE的调整环端面跳动量静态模拟分析.....	李林	纪彦斌	马翠贞(36)			
基于不同标准的公铁联运铁路货车车体关键焊缝疲劳强度研究.....						
	李晓峰	王瑛琪	李华	贺茂盛(39)		
某雷达天线方位驱动系统设计分析.....			陈浩	仙锦(44)		
机床主轴的振动有限元模态分析.....			余利军	王永强(45)		
二维实数编码遗传算法在滚子链传动系统优化设计中的应用.....			张广阔(47)			
基于MOC8试验的工程模拟器逼真度研究.....	张乐萍	罗世彬(50)				
基于SolidWorks的康复减重步行训练车机架分析与优化.....	陈赞	程爱平	嵇兵(52)			
一种行人闯红灯自动预警及曝光系统.....			张训源(55)			
基于HyperMesh软件的高速动车组齿轮箱有限元建模.....			刘立东	刘东宁(59)		
基于FloEFD的散热器水室内部结构优化设计.....	蔡忠全	马明	王亮	张萌(60)		
基于PLC速度感应可折叠手机壳的控制系统设计.....			李佳园	李耀南(62)		
基于HyperMill软件整体式叶轮五轴联动仿真加工研究.....				毋亚琦(65)		
基于轨迹分析的S型无碳小车设计.....				杨国策(68)		
故障树分析法在岸桥结构可靠性分析中的应用研究.....			王晨(71)			
基于Arduino应用于控制柜节能降本的温度PID算法控制.....			陈飞荣(73)			
工程机械运行状态自动化监测研究.....	毛三华	余峰岗	史振帅	胡伟豪	杨世德(76)	
有向拓扑下二阶时滞多智能体系统一致性研究.....				朱雪芳(79)		

·工艺与装备·

一种药物残留快速检测仪的研究.....	姜秀丽	尹亮	靳宣强(89)	
轻量化材料及成形技术在汽车车身上的应用.....		吕海泳	邵东强(92)	
汽车零部件三化在工艺开发中的应用.....	张菊	吕燕	王业兰(97)	
奥氏体不锈钢的等离子弧焊.....		林桂征	谭启勇(100)	
THS混动系统共线检讨.....			马菁(102)	
离心泵的振动分析和预防措施探讨.....			姜扬(104)	
旋挖钻动力头齿轮断齿分析.....			李伟(105)	
从水平带式输送机的设计流程透射其实践应用.....			张屹峰(107)	
新型火炮发动机早期磨损原因分析及对策.....			杨晓瑞(108)	
WK-35矿用挖掘机铲斗结构特性研究.....			盛迎义(110)	
电缆制作生产线方案.....				
——特种车辆电缆线束生产线方案设计及应用.....			李冠男(111)	
挖掘机铲斗与松散岩石挖掘阻力分析.....			柳学强(113)	
一种新型方形锂离子电池电极制备方法.....			徐永萍(114)	
WGQ600桅杆式起重机抬吊梁.....	李霄霄	翟杰	刘彬(117)	
高强度中厚板结构支撑件多工艺制造关键技术研究.....				
	王占辉	崔忠宝	李瑞达	李占稳(119)
基于UG的焊缝自动清理软件开发和应用.....				王志雄(121)
涂层硬质合金刀具磨损对零件表面粗糙度的影响试验分析.....	张龙	孟稳	(123)	
电缆线路的运行维护以及检修探讨.....			虢韬(125)	
大型离心空压机在钢铁企业中的应用.....			孙薇(126)	

汽车制造业螺栓拧紧工艺及控制方法.....	于 虹 李永波 (130)
锂电池极片真空干燥工艺研究.....	高士强 (132)
典型起落架零件车铣加工优化设计及应用研究.....	李海滨 (134)
五轴联动加工中心摆轴的检测分析.....	陈亚林 张续林 张 瑞 (135)
泡沫铝在新能源汽车车架结构设计中的应用研究.....	邓剑锋 (137)
机床外挂信号油缸解决位置检测的实例应用.....	杜淑媛 周 真 苏晓伟 (138)
地铁站台门和电梯层门异同点的比较研究.....	冯双昌 刘小畅 陈式清 (140)
螺纹钢纵肋扭转形成原因分析与改进.....	郭其江 (142)
汽车空调的特点与汽车热舒适性的分析.....	何志敏 (144)
刮板机常见故障分析与处理措施研究.....	刘伟立 (146)
液压缸的结构及机械加工工艺分析.....	丁 伟 (147)
对砼搅拌站自动配料方式的实用性分析.....	王秀宇 (149)
过程装备控制技术在设计应用中的问题与对策研究.....	孟江超 (150)
锅炉压力容器及四大管道焊接技术的应用探讨.....	孟显伟 (152)
液压系统故障诊断与维修.....	陈映良 (154)
现代机械制造工艺及加工技术分析.....	唐 莎 (155)
汽车工厂钢结构厂房建设控制要点分析.....	吴 鹏 (157)
机电设备故障维修与维护保养技术的运用探讨.....	包郁琳 (158)
现代机械制造技术及发展探究.....	张光曙 (160)
集装箱起重机吊具防摇和防扭技术分析.....	曹中恬 (161)
一种新型3-PUU并联机构.....	管 峰 (163)
轻灰煅烧炉炉气系统旋风分离器的技术改造.....	张 民 (166)
钢结构工程焊缝无损检测技术及其运用分析.....	邵 阳 (167)
圆盘浇铸机液压系统常见故障诊断及维修技术研究.....	毛旭升 (169)
热弯玻璃及其模具制作工艺探析.....	陈 攀 (171)
一种便于变压器油箱自动化焊接的结构改进.....	胡安超 陈洪波 陈伦伦 张 志 孙 凤 刘冠军 (172)
车载移动式变压器关键技术研究与应用.....	陈光胜 陈伦伦 唐 军 张 志 (174)
· 自动化与控制 ·	
一种基于Arduino交互式控制排爆机器人的设计.....	赵连强 林博原 杨凯迪 陈永康 郭海杰 (176)
基于单片机控制的气动机械手设计与研究.....	赵忠玉 王得宏 (179)
水箱拉丝机全自动收线机的设计.....	常永旺 王 瑜 顾雪娟 (181)
智能爬杆机器人研究综述.....	陈骥晖 (183)
基于工业机器人的冲压自动化生产线系统的实现.....	李 光 侯 丽 (185)
数控加工中CF卡传输程序的应用研究	张田荣 曹宏伟 (186)
单晶炉联网集控自动化改造.....	韩永龙 高俊伟 宋生宏 杨延生 何 旭 高玉顺 (189)
机械制造与自动化设计中的节能设计理念分析.....	安仲举 (191)
机械制造与自动化中的节能设计理念.....	黄国通 (192)
机械设计制造及其自动化中计算机技术的应用研究.....	李文彬 (194)
基于变频器和触摸屏的工业洗衣机的PLC控制.....	白 银 王海波 (195)
检测技术在机械自动化制造系统中的应用研究.....	励 杰 (198)
自动化技术在机械设计制造中的应用研究.....	潘建宇 (200)
3D打印技术在机械自动化领域的应用研究	代东洪 (201)
智能型机械自动化应用趋势探讨.....	赵凯定 (203)
· 行业交流 ·	
基于工装设计标准化的航空制造效率提升研究.....	刘宇欣 (205)
工学结合模式下高职学生软实力提升策略研究.....	李芳丽 (206)
军校指挥类专业“信号与系统”课程教学改革研究.....	贺 寅 李 利 徐 池 韩 东 王永超 (209)
《传感器与检测技术》课程教学改革初探.....	黄美莲 (211)
新时代部队装备质量管理应对策略探析.....	李俊虎 (214)
多轴微型数控实训教学设备的研发与应用 ——烟台机电工业学校数控专业教学模式探索纪实.....	赵洪胜 (217)
高职机电一体化专业“双元制”教学模式研究.....	陈 亮 周正啟 (218)
EN45545防火标准实施探讨	谢 芳 戴鸿斌 徐 园 (220)
基于中职学校零部件测绘与CAD成图技术项目比赛改进教学方式的探讨.....	黎 银 (222)
新型武器装备维修能力建设对策探析.....	李培庚 赵英俊 程小会 刘 捷 (223)

Modern Manufacturing Technology And Equipment

Contents

• Design and research •

Analysis and Research on the Influence Factors of Tensile Test	(1)
Design of Automatic Welding Equipment for Steel Fabric	(4)
Design of One-stop Auxiliary Device for Cleaning GDX2 Trademark Rubber Cylinder	(6)
Analysis of Mechanical Design of Extrusion Die for Four-Cavity Bead	(8)
Research Status of Vibrating Screening Equipment for Ore	(10)
Motion Analysis of a Translational Sierra Mechanism	(12)
Development and Application of Sheet Metal Unfolding Software Based on UG	(13)
Design of Automatic Distribution Car for Intercooling Tower	(15)
Design of Liquid Plastic Fixture for Concentricity Measurement of a Rotor	(16)
Fixture Design of Bearing Ring Machining	(20)
Research on Cloud Manufacturing Service Platform and Operation Mode of Agricultural Machinery Equipment	(22)
Factors Affecting the Bending Stiffness of Polyhedron Sandwich Structure	(25)
Quick Design of Electromagnetic Coil Parameters of DC Contactor for Locomotive	(27)
Design of Special Metallurgical Tools for CNC Milling Cutter Type Plate Separator	(30)
Aseismic Calculation and Analysis of a Heat Chamber Transporter	(32)
Analysis and Design of the Structure Scheme of the Ball Picking and Releasing Robot Based on the Engineering Training of Guangdong, Hong Kong and Macao	(34)
Static Simulation Analysis of Adjusting Ring Surface Runout Based on DOE	(36)
Research on Fatigue Strength of Key Welds in Freight Waggon Body of Intermodal Railway Based on Different Standards	(39)
Design and Analysis of a Radar Antenna Azimuth Drive System	(44)
Finite Element Modal Analysis of Machine Tool Spindle	(45)
The Application of Two Dimensional Real Coded Genetic Algorithm in the Optimal Design of Roller Chain Drive System	(47)
Research on Fidelity of Engineering Simulator Based on MOC8 Test	(50)
Analysis and Optimization of Rehabilitation Weight-loss Walking Training Vehicle Frame Based on SolidWorks	(52)
An Automatic Early Warning and Display Exposure System for Pedestrians Going Through a Red Light	(55)
Finite Element Modeling of Gearbox of High Speed EMU Based on HyperMesh Software	(59)
Optimization Design of Internal Structure of Radiator Water Chamber Based on FloEFD	(60)
Design of Control System for Foldable Phone Case Based on PLC Speed Sensing	(62)
Research on Five Axis Linkage Simulation Machining of Integral Impeller Based on HyperMILL Software	(65)
Design of S-type Carbonless Car Based on Trajectory Analysis	(68)
Application of Fault Tree Analysis Method in Reliability Analysis of Shore Bridge Structure	(71)
Temperature PID Algorithm Control Based on Arduino Applied to Energy Saving and Cost Reduction of Control Cabinet	(73)
Research on Automatic Monitoring of Construction Machinery Operation Status	(76)
Research on Consistency of Two Order Delayed Multi-agent Systems with Directed Topology	(79)
• Technology and Equipment •	
Study on a Rapid Detector for Veterinary Drug Residues	(89)
Application of Lightweight Materials and Forming Technology in Automobile Body	(92)
Application of Parts' Platformization, Generalization, Modularization	(97)
Plasma Arc Welding of Austenitic Stainless Steel	(100)
The Collinear Review of THS	(102)
Vibration Analysis and Preventive Measures of Centrifugal Pump	(104)
Analysis of Broken Teeth of Power Head Gear of Rotary Drilling Machine	(105)
Transmitting Its Practical Application from the Design Process of Horizontal Belt Conveyor	(107)
Cause Analysis and Countermeasure of Early Wear of New Type Gun Engine	(108)
Study on Bucket Structure Characteristics of WK-35 Mining Excavator	(110)
Cable Production Line Plan—Design and Application of Special Vehicle Cable	(111)
Harness Production Line	(113)
Resistance Analysis of Excavator Bucket and Loose Rock Excavation	(113)
A Preparation Method for a Square Lithium Ion Battery Electrode	(114)



Bimonthly

No.5, 2020

Total Issue No.282

Published on May 2020

Sponsor: Shandong Machinery Design
And Research Institute
Shandong Mechanical Engineering Society

Publisher: The Periodical Office Of
Modern Manufacturing Technology
And Equipment

Editor: The Editorial Office Of
Modern Manufacturing Technology
And Equipment

Distributor: The advertising Office Of
Modern Manufacturing Technology
And Equipment

International Code: ISSN1673-5587

Domestic Code: CN37-1442/TH

Advertising Agent: Editorial Department of
Modern Manufacturing Technology and Equipment

**The Periodical Office Of
Modern Manufacturing Technology
And Equipment**

Add: 129 JiLuo Road, Jinan

Post Code: 250031

Tel: (0531) 85955168
(0531) 87116637

Http://www. sdji. cbpt. cnki. net

E-mail: sdjx168@163. com

mmte@163. com

zzjsybz@163. com

zzjsybz@126. com

Lifting Beam of WGQ600 Mast Crane	(117)
Research on the Key Technology of Multi Process Manufacturing of High Strength and Medium Thick Plate Structural Support	(119)
Development and Application of Automatic Cleaning Software Based on UG	(121)
Experimental Analysis of the Influence of the Wear of Coated Carbide Tools on the Surface Roughness of Parts	(123)
Discussion on Operation, Maintenance and Overhaul of Transmission Lines	(125)
The Application of the Large Centrifugal Air Compressor in Steel Plant	(126)
Bolt Tightening Technology and Control Method in Automobile Manufacturing	(130)
Study on Vacuum Drying Technology of Lithium-ion Battery Electrode	(132)
Research on Optimization Design and Application of Turning and Milling of Typical Landing Gear Parts	(134)
Detection and Analysis of Cycloid in Five Axis Machining Center	(135)
Application of Foam Aluminum in Frame Design of New Energy Vehicle	(137)
The Example Application of Machine Tool External Signal Cylinder to Solve the Position Detection	(138)
Research on the Comparison of Subway Platform Doors and Elevator Landing Doors	(140)
Analysis and Improvement of the Cause of the Torsion of the Longitudinal Rib of the Screw Steel	(142)
Characteristics of Automobile Air Conditioning and Analysis of Automobile Thermal Comfort	(144)
Research on Common Fault Analysis and Treatment Measures of Scraper Machine	(146)
Structure and Machining Technology Analysis of Hydraulic Cylinder	(147)
Analysis of the Practicability of the Automatic Batching Method in the Concrete Mixing Plant	(149)
Problems and Countermeasures of Process Equipment Control Technology in Design and Application	(150)
Discussion on the Application of Welding Technology for Boiler Pressure Vessel and Four Major Pipelines	(152)
Fault Diagnosis and Maintenance of Hydraulic System	(154)
Analysis of Modern Mechanical Manufacturing Process and Processing Technology	(155)
Analysis of the Control Points of Steel Structure Workshop Construction in Automobile Factory	(157)
Discussion on the Application of Mechanical and Electrical Equipment Fault Repair and Maintenance Technology	(158)
Modern Machinery Manufacturing Technology and Development	(160)
Analysis on Anti Sway and Anti Twist Technology of Container Crane	(161)
A New 3-PUU Parallel Mechanism	(163)
Technical Reform of Cyclone Separator for Gas System of Light Ash Calciner	(166)
Nondestructive Testing Technology and Its Application Analysis of Steel Structure Engineering Weld	(167)
Research on the Common Fault Diagnosis and Maintenance Technology of the Hydraulic System of the Disc Casting Machine	(169)
Discussion on Hot Bending Glass and Its Mould Making Process	(171)
The Structural Development for Automatic Welding of Transformer Tank	(172)
Research and Application of Key Technologies of Mobile Transformer	(174)
• Automation and Control •	
Design of an Explosive Removal Robot Based on Arduino Interactive Control	(176)
Design and Research of Pneumatic Manipulator Based on MCU	(179)
The Design of Full-automatic Water Tank Wire Drawing Take-up	(181)
A Survey of Intelligent Climbing Robot	(183)
Realization of Stamping Automated Production Line System Based on Industrial Robot	(185)
Application Research of CF Card Transmission Program in NC Machining	(186)
Transformation of Centralized Control Automation of Single Crystal Furnace Networking	(189)
Analysis of Energy Saving Design Concept in Mechanical Manufacturing and Automation Design	(191)
Energy-saving Design Concept in Mechanical Manufacturing and Automation	(192)
Research on the Application of Computer Technology in Mechanical Design and Manufacture and Its Automation	(194)
PLC Control of Industrial Washing Machine Based on Frequency Converter and Touch Screen	(195)
Research on the Application of Detection Technology in the Mechanical Automation Manufacturing System	(198)
Application Research of Automation Technology in Mechanical Design and Manufacture	(200)
Research on the Application of 3D Printing Technology in the Field of Mechanical Automation	(201)
Discussion on the Application Trend of Intelligent Mechanical Automation	(203)
• Industry exchange •	
Research on Aviation Manufacturing Efficiency Improvement Based on Tooling Design Standardization	(205)
Research on the Strategy of Improving the Soft Power of Higher Vocational College Students under the Mode of Combination of Work and Study	(206)
Research on the Teaching Reform of "Signal and System" Course in Command Major of Military Academy	(209)
On the Teaching Reform of "the Sensor and Detection Technology" Course	(211)
Analysis on the Countermeasures of Military Equipment Quality Management in the New Era	(214)
Research and Application of Multi Axis Micro CNC Practical Teaching Equipment——A Record of the Teaching Mode of Numerical Control Major in Yantai Mechanical and Electrical Industry School	(217)
Research on "Dual System" Teaching Mode of Mechatronics Major in Higher Vocational Education	(218)
Discussion on the Implementation of EN45545 Fire Protection Standard	(220)
Discussion on the Improvement of Teaching Method Based on the Competition of Spare Parts Mapping and CAD Mapping Technology in Secondary Vocational School	(222)
A Brief Discussion on the Countermeasures of New Weapon Equipment Maintenance Support Capability Construction	(223)