Hindawi
Wireless Communications and Mobile Computing
Volume 2023, Article ID 9842758, 1 page
https://doi.org/10.1155/2023/9842758

Retraction

Retracted: Process Optimization and Die Design of Hydromechanical Calendering Based on Wireless Network Communication and IoT

Wireless Communications and Mobile Computing

Received 19 September 2023; Accepted 19 September 2023; Published 20 September 2023

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] Z. Shen, Z. Zheng, L. Zhu, S. Yang, Y. Cai, and M. Wu, "Process Optimization and Die Design of Hydromechanical Calendering Based on Wireless Network Communication and IoT," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 9171876, 7 pages, 2022.

Hindawi
Wireless Communications and Mobile Computing
Volume 2022, Article ID 9171876, 7 pages
https://doi.org/10.1155/2022/9171876

Research Article

Process Optimization and Die Design of Hydromechanical Calendering Based on Wireless Network Communication and IoT

Zhongliang Shen,[1,2] Zijun Zheng,[1,2] Lijun Zhu,[1] Shaozeng Yang,[1] Yonggen Cai,[1] and Mingge Wu[3]

[1]*College of Mechanical and Electrical Engineering, Zhejiang Business Technology Institute, Ningbo 315000, China*
[2]*Zhejiang Molded Products Surface Decoration and Intelligent Forming Technology Collaborative Innovation Center, Ningbo 315012, China*
[3]*School of Mechanical and Electrical Engineering, Wenzhou University, Wenzhou 325035, China*

Correspondence should be addressed to Mingge Wu; 19409011@masu.edu.cn

Received 3 August 2022; Revised 18 August 2022; Accepted 15 September 2022; Published 3 October 2022

Academic Editor: Hamurabi Gamboa Rosales

Aiming at the problem of the study, of high error probability in the practical application of traditional hydromechanical calendering process, the hydromechanical calendering process is optimized based on wireless network communication. GPRS or LORaipot-IOT wireless communication mode is adopted to calculate the impact kinetic energy of hydromechanical calendering, and the simulation model of hydromechanical calendering is built based on AMESim. The characteristics of hydromechanical calendering are analyzed. The oil pressure is controlled by setting the pressure adjusting valve and adjusting the spring pressure to realize the optimization of the hydromechanical calendering process. On this basis, the grinding tool is designed, and the clearance between punch and die is reserved to prevent the blank from cracking. The experimental results show that the error probability of hydromechanical calendering with the optimized design process is significantly lower than that of the control group, which can solve the problem of high error probability of traditional hydromechanical calendering process in practical application and meet the application requirements. *Conclusions*. Hydraulic mechanical calendering may be used to calendar different plastic materials, with a blank thickness of 0.5-3 mm, according to the technology's operating principle, test production, and foreign data. Thicker sheets may be calendered with adequate hydraulic pressure. For the form of parts, the optimum effect is that the projectile, cone, etc. section vary from small too big. For the section does not change or smaller parts also have an impact? Some pieces with an interior concave shape and bottom and side stiffeners are difficult to the calendar. Hydromechanical calendering technologies make it easier to create these pieces.

1. Introduction

Hydraulic machinery is a kind of equipment and tool that can work through fluid, which is common in heavy equipment. In this kind of equipment, the hydraulic oil is transmitted to the actuator in the equipment with high pressure through the hydraulic pump. The hydraulic pump is driven by the engine or electric motor, through the operation of various hydraulic control valves to control the hydraulic oil to obtain the required pressure or flow, the hydraulic components are connected through the hydraulic pipeline [1, 2]. In the work of hydraulic machinery, the calendering process is the key factor to determine the material forming. Hydromechanical calendering is a new calendering process, which was first adopted by SMG Company in West Germany. The process of traditional hydromechanical calendering process is to adjust the pressure control valve to a predetermined pressure and then turn the distribution valve installed on the oil tank to the oil supply position. At this time, the compressed air will send the oil pressure out of the oil tank and enter the cavity composed of the base and the concave template through the one-way valve. When

the oil level is level with the upper plane of the concave template, the position of the distribution valve will be turned to the position of stopping the oil supply. Put the blank on the concave die plate and the sealing ring on the concave die plate. At this time, start the hydraulic press and press the blank holder ring down to the blank. In this way, the whole bottom dies combination device forms a closed cavity filled with oil [3]. When the punch is pressed down, the oil pressure in the sealing oil chamber rises quickly. When the oil pressure exceeds the preset pressure of the pressure control valve, the oil in the chamber flows back to the oil tank through the pressure control valve. Due to the effect of high-pressure oil in the cavity, on the one hand, it makes the blank close to the punch; on the other hand, it makes the blank between the punch and the concave die roll upward to form a liquid "bump" as shown in the figure. When the punch is further pressed, the blank is calendered on the liquid "cam" to the required part height without direct contact with the fillet of the concave template [4].

The Internet of Things (IoT) paradigm depicts a continuing technological development path by which everything and the environment that is a part of our day-to-day living experience may acquire its own identity in the digital world via the use of the Internet. The Internet of Things is built on top of intelligent surroundings and things that can perform one or more of the following functions. Self-awareness includes the identification, localization, and self-diagnosis of the object or environment; interaction with the environment around it includes data acquisition (sensing and metering) and actuation; and data elaboration includes both fundamental (primitive data aggregation) and more advanced forms (statistics, forecasts, etc.) [5].

In the whole calendering process, the radius of the liquid "cam" is equivalent to the die radius of the actual blank calendering, which decreases with the increase of the calendering height, which is an important feature of the hydromechanical calendering process. At the end of calendering, the punch and the blank holder return, and the distribution valve is turned to put the oil pressure into the oil chamber of the bottom die and eject the parts. It can be seen from the above calendering process that the final shape of the part is obtained by pressing the blank close to the punch under the action of high-pressure liquid in the bottom die cavity, while the die is only a hydraulic cavity, so it can also be called liquid concave calendering.

The contribution of this paper, with the development of wireless network communication, a new challenge for the hydromechanical calendering process is put forward by using IoT. The so-called wireless network communication is a wireless local area network (WLAN) that uses radio waves as the medium of information transmission. It is very similar to the wired network in use. The biggest difference lies in the difference in transmission media. Using radio technology to replace network cables can back up each other with a wired network. Based on wireless network communication, this paper optimizes the hydromechanical calendering process and, through the design of the die, is committed to making the forming of parts much easier by using IoT.

2. Factors Affecting the Quality of Hydromechanical Calendering Process

2.1. Mixing Temperature and Rolling Speed. Part of the heat required by the material in the calendering process is provided by the mixing cylinder, and the other part is generated by the friction between the material and the barrel and the shearing action of the material itself. In addition to the mixing speed, the friction heat is also related to the plasticization degree of the material, that is, it is related to its viscosity [6, 7]. Therefore, the temperature control of different materials is different under the same speed. Similarly, the control temperature is different under the same formula and at different speeds. During calendering, the material is often stuck on the high-temperature or high-speed mixing cylinder. To make the material stick on the rolling cylinder in turn and avoid air entrainment, the temperature of each cylinder is generally increased in turn, but the temperature of the third and fourth wheels is close so that the film can be easily separated from the third rolling. The temperature difference of each rod is 5-10°C.

2.2. Speed Ratio of Cylinder Rolling. The ratio of the linear speed of the two adjacent rollers of the calender is called the speed ratio of the roller cylinder. The purpose of making the calender have speed ratio is not only to make the calenders stick to the mixing cylinder in turn but also to make the plastics plasticize better, because it can make the materials subject to more shear action. In addition, a certain stretching and orientation can be obtained for the calenders, which can reduce the thickness and improve the quality of the film. In order to achieve the purpose of drawing and orientation, the mixing speed of auxiliary machine and calender also has corresponding speed ratio. As a result, the linear speeds of the lead-off, cooling and coiling mixers increase in turn, and they are all higher than the linear speeds of the main wheel cylinder of the calender (generally, the four mixing calender takes three spokes as the criterion). But the speed ratio should not be too large, otherwise, the film thickness will be uneven, and sometimes, the film will produce excessive internal stress. The film should avoid stretching after cooling.

The requirement of adjusting the speed ratio is that the material cannot be packed or not absorbed. If the speed ratio is too high, there will be packing phenomenon, otherwise, there will be no suction wheel phenomenon, so that air will be brought in and bubbles will appear in the product. If it is for the hard chip, there will be "shelling" phenomenon, poor plasticization, and quality degradation.

2.3. Editing Distance and Stock Quantity. The purpose of adjusting the track is to adapt to the requirements of different thickness products and also to change the stock. The track of the calendar is larger than this value except that the last track is roughly equal to the product thickness. In addition, the order of the mixing cylinder of the press calendar increases gradually from bottom to top, so that there is a small amount of material stored in the gap of the collecting cylinder, which plays a role in the reserve, supplement, and

further shaping in calendering forming [8, 9]. The quantity of stock and the state of stock rotation should affect product quality. If there is too much material, the film surface appears rough and more and easy to produce bubbles. There will be cold scars in hard chip production. In addition, too much stock is not good for the equipment, because it increases the load of the reel. If the stock is too little, the film surface will be rough due to insufficient pressure. For example, there will be deformation holes in the hardware [10]. Too little stock is easy to cause the breakage of the edge material, which makes it difficult to use the calendar. Poor rotation will cause uneven transverse thickness of the product, bubbles in the film, and cold scars on the hard film. The reason for the bad rotation of stock is that the temperature of stock is too low, the temperature of the reel is too low, or the adjustment of stock distance is improper. Therefore, to sum up, it can be seen that the stock of stock gap needs to be observed and adjusted frequently in calendering operations.

3. Optimization of Hydromechanical Calendering Process Based on Wireless Network Communication

In this paper, based on wireless network communication, GPRS or LORapot-IOT wireless communication mode is adopted to optimize the hydromechanical calendering process. The specific optimization content is described below.

3.1. Determinations of Data Entry Parameters in Wireless Network Communication. Based on wireless network communication, the data entry parameters of hydraulic mechanical calendering must be determined in advance. In this paper, each group of hydromechanical calendering data is divided into 16 bytes, 4 rows, and 4 columns, with 10 iterations. Produce 4×4 state matrix in order. The process of wireless network communication starts from the initial state and carries out 10 rounds of operation. The first nine rounds perform 4 steps, and the last round performs less than one column obfuscation operation. Let these operations be functions, and the formula is shown in the following equation.

$$k + 1 = \arg\min \sum_i \|x - y\| \Phi \left\| \frac{x - y}{h} \right\|. \tag{1}$$

In formula (1), x refers to the network communication rate; y is the average delay; h refers to the working state of IP core; i refers to the wireless network communication IP interface signal. Through formula (1), in the process of data transmission, after identifying different wireless network communication IP interface signals, the data is combined with each other.

3.2. Calculation of Impact Kinetic Energy of Hydromechanical Calendering. After determining the data entry parameters in wireless network communication, considering that the impact kinetic energy is the most important point in the characteristics of hydromechanical calendering, the impact kinetic energy of hydromechanical calendering must be determined by calculation [11, 12]. First, in the process of calculating the impact kinetic energy of hydromechanical calendering, the transmission angle of hydromechanical calendering should be calculated as the key index to analyze the force transfer performance of hydromechanical calendering. Let its expression be α, then, formula (2) can be obtained.

$$\alpha = 90 \circ - \varphi. \tag{2}$$

In formula (2), φ refers to the speed of hydro mechanical calendering around the center, in rad/s. Through formula (2), the transmission angle in the process of hydromechanical calendering is obtained. The value of α must be between 40° and 50°, so as to avoid the phenomenon of mechanism sticking in the process of hydromechanical calendering. On this basis, the equation for calculating the impact kinetic energy of hydromechanical calendering is derived. Let T be the formula for calculating the impact kinetic energy of hydromechanical calendering, and the formula (3) can be obtained.

$$T = \frac{1}{2} m r^2 \alpha^2. \tag{3}$$

In formula (3), m refers to the structural mass of the hydro mechanical calender, in kg; r refers to the radius length of the turning center of hydromechanical calendering, in m. Through formula (3), the impact kinetic energy of hydromechanical calendering is obtained, which is the core parameter of hydromechanical calendering process optimization, and provides basic data for building hydro mechanical calendering simulation model based on AMESim.

3.3. Construction of Hydromechanical Calendering Simulation Model Based on AMESim. Based on calculating the impact kinetic energy of hydromechanical calendering, this paper constructs the hydromechanical calendering simulation model based on AMESim [7, 13]. First, the simulation parameters of hydromechanical calendering are input into the hydraulic library of the AMESim platform, and the gravity simulation environment is set as -9.5 m/s2. In the modeling process of hydraulic mechanical calendering, according to the complex system modeling principle of AMESim, first, enter the AMESim environment. Find the required components in the hydraulic component library based on AMESim; select the appropriate components from the mechanical library, hydraulic library, and hydraulic component design library; drag them to the drawing area; and click the port line to indicate the oil circuit [14]. It should be noted that do not forget the oil source component, that is, the water drop pattern. On this basis, according to the schematic connection, enter the model selection environment and generally choose the priority model parameter environment. Finally, set the parameter simulation environment, set the running step and time, combined with the dynamic characteristics of hydraulic mechanical calendering, run the digital simulation, and complete the simulation modeling of hydraulic mechanical calendering based on AMESim [15]. The simulation model of hydromechanical calendering was built using an

AMESim pressurization circuit. The simulation model of hydromechanical calendering is built based on AMESim, as shown in Figure 1.

In Figure 1, A refers to the longest rod in the two frames of the hydromechanical calendering rotary pair; B refers to the shortest rod in the two frames of the hydromechanical calendering rotary pair; P refers to the extreme angle of the connecting rod structure of the hydraulic support. As shown in Figure 1, considering the wide variety of components involved in hydromechanical calendering, the model provided in the standard hydraulic component library can also be established [16, 17]. Through the simulation model of hydraulic mechanical calendering based on AMESim, it can show hydraulic mechanical calendering intuitively.

3.4. Analysis of Hydromechanical Calendering Characteristics. After building the simulation model of hydromechanical calendering based on AMESim, the simulation results of hydromechanical calendering characteristics are analyzed. According to the simulation model of hydromechanical calendering, one of the two frames of the hydromechanical calendering rotary pair must be shorter, and the sum of the shortest rod and the longest rod is less than the length of the two rods [12, 16, 18, 19]. Therefore, the characteristic of hydromechanical calendering is quick return, that is to say, the empty return stroke of hydromechanical calendering must be faster than the working stroke. In this paper, the angle between the extreme positions of the connecting rod structure of P hydraulic support is used to express the quick return characteristics of hydromechanical calendering. The calculation formula of P can be obtained, and there is the following formula.

$$P = 180 \circ \left(\frac{(K\text{-}1)}{(K+1)}\right). \tag{4}$$

In formula (4), K refers to the stroke speed ratio coefficient of hydromechanical calendering. Through formula (4), the included angle of the extreme position of hydro mechanical calendering is calculated. When $P = 0$, there is no quick return characteristic in hydromechanical calendering. When $P > 0$, there is a quick return characteristic in hydromechanical calendering. The larger the value of P is, the more obvious the quick return characteristic is.

3.5. Optimization of Hydromechanical Calendering Process. Based on defining the characteristics of hydromechanical calendering, this paper sets up a pressure adjusting valve to control the required oil pressure by adjusting the pressure of the spring, to optimize the hydromechanical calendering process. The maximum oil pressure of the pressure regulating valve set in this paper is 1000 kg/cm^2. The structure and parameters of the spring can be designed and calculated according to this data. The diameter of the overflow hole on the valve body is 5 mm, which can meet the requirements of the general speed hydraulic press. In the manufacture of a force control valve, the key is to match and press the overflow hole of the valve body with the valve needle, which is very strict. The cast iron rod with the same cone angle as the overflow hole and needle of the valve body is finely ground to meet this requirement. This kind of pressure control valve is not very sensitive, but it is simple in structure, easy to manufacture, and it does not need pressure response when calendering, so it can still meet the requirements of use.

In the design of the calendering device, the versatility of the base is considered, so the diameter of the base oil cavity is often designed to be larger to adapt to the calendering of more parts. But at this time, there will be a problem, that is, the diameter of the die mouth and the diameter of the base oil cavity sometimes differ greatly, which causes the screw connecting the two to bear a great tensile force, sometimes even beyond its bearing capacity and fracture. To avoid this situation, an annular pressure-reducing sleeve can be added to the oil chamber to reduce the area difference between the two and reduce the tension on the connecting screw. A sealing device should be added to the pressure-reducing sleeve. In the forming process, there is always high-pressure liquid acting on the blank between the punch and the die, which can effectively prevent material instability in this area and avoid the formation of wrinkles. The common calendering process, to overcome the wrinkle, often uses the method of increasing the blank holder force or calendering resistance: such as the use of calendering ridge or reverse calendering, which will inevitably increase the calendering force and cause additional stress, so the allowable degree of deformation will be reduced accordingly, the hydraulic mechanical calendering does not exist this problem. In this way, the hydromechanical calendering process is optimized.

4. Mould Design

The die is mainly used for the first calendering process of cylindrical parts. Other types of parts can also be calendered with this type of die. For the cylindrical parts, the die structure forms. The structural feature of the die is that the contact surface of the blank holder ring and the blank is provided with a groove to hold the liquid convex ridge. Without this groove, the liquid convex ridge cannot be formed even under high liquid pressure due to the small gap between the convex and concave dies, which will reduce the process effect. In this paper, we design and manufacture the mould device for test and production, as shown in Figure 2.

As shown in Figure 2, the punch is made of T8 steel with a heat treatment hardness of HRC53-68°. The shape requirement of the punch is consistent with the inner shape of the f parts. According to the actual use, the punch can also be made of 45 steel, and the hardness of heat treatment can be HRC35-40°. The concave template is also made of T8 steel with a heat treatment hardness of HRC50-55°. When designing this kind of die, it is different from that of the conventional calendering die. First, there should be a semicircular ring groove on the upper plane to place the sealing ring. Second, the gap between punch and die can be as large as 2-3 times the thickness of the blank (at the beginning of the design, due to inexperience, the single side gap is 5.2 mm, and the actual use effect is not ideal so that the height of

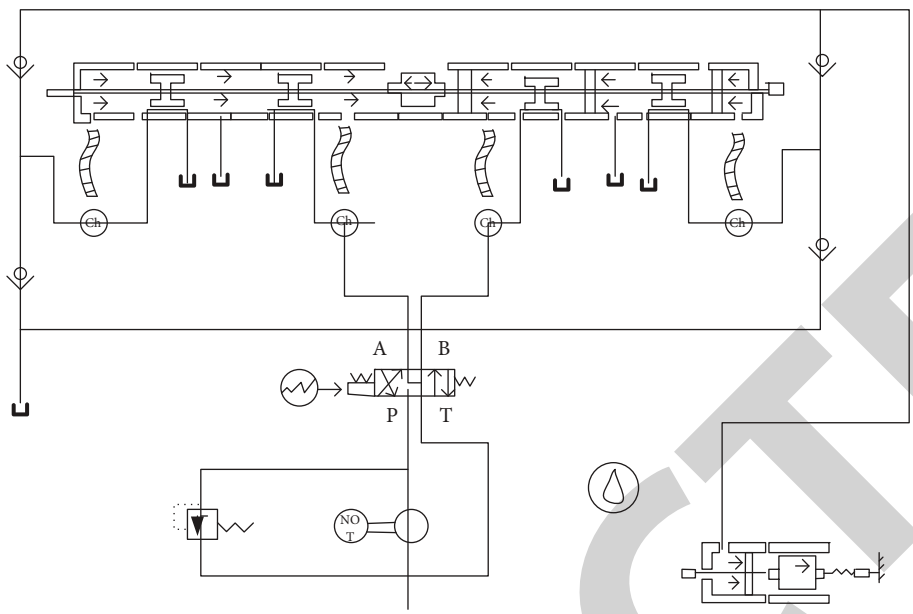

Figure 1: Simulation model of hydromechanical calendering based on AMESim.

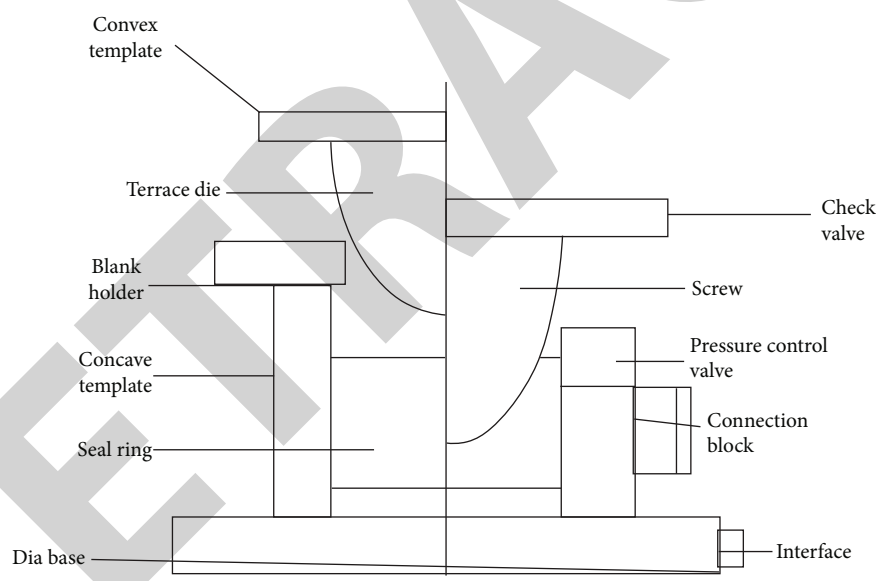

Figure 2: Mould device.

the die sticking section is reduced, and in the initial stage of calendering if the liquid pressure is too high, it is easy to cause the blank fracture on the gap section). Third, the fillet radius of the die can be smaller, because in the actual calendering process, its influence is very small, and it only works near the end of calendering. Liquid seal all use "O" type hard rubber seal ring; its life can be rolled 20-30 parts each.

In conclusion, the die designed in this paper is a composite process of blanking, common calendering, and hydraulic mechanical reverse calendering. At the same time, there are also core dies in the pressure chamber to play the role of stamping, which makes the parts with more drastic changes in the profile be formed. This stamping forming method is different from the common stamping forming method. Because of the effect of high-pressure liquid, the blank can basically form the required outline, and the core die only plays a further stamping role, so the thinning of the blank can be greatly reduced. In this mould structure, the edge pressing ring has three functions: the outer ring is the blanking punch, the inner ring is a common calendering die, and also the blank pressing ring of hydraulic machinery. The parts have the double functions of common calendering punch and hydraulic mechanical die.

5. Experiments

In order to test the application effect of the above optimized process, experiments are carried out below.

Table 1: Wireless network communication parameter setting.

Serial number	Parameter variable value	Rated value
(1)	Experimental network coverage/m^2	$2.4^*10^3 \times 2.4^*10^3$
(2)	Energy consumption of signal transmission/kJ	15
(3)	Define the shortest transmission path	5 ~ 7
(4)	Data node value/piece	150
(5)	Starting point coordinates/(x, y)	(0, 0)

Table 2: Comparison table of error probability of hydromechanical calendering.

Number of experiments	Hydraulic frequency (Hz)	Error probability of hydromechanical calendering in experimental group (%)	Error probability of hydromechanical calendering in control group (%)
(1)	0.15	0.1523	0.4587
(2)	0.15	0.1735	0.5632
(3)	0.15	0.1802	0.4578
(4)	0.15	0.1631	0.5024
(5)	0.15	0.1754	0.4976
(6)	0.15	0.1523	0.4587
(7)	0.15	0.1735	0.5632
(8)	0.15	0.1802	0.4578
(9)	0.15	0.1631	0.5024
(10)	0.15	0.1754	0.4976

5.1. Experimental Preparation. Design example analysis, select hydraulic machinery as the experimental object, according to the actual situation of hydraulic mechanical calendering, set the parameters of hydraulic components in the hydraulic mechanical structure, the specific contents include the hydraulic oil density is 800 kg/m; the dynamic viscosity was 48 cP; the bulk modulus of oil is 16500 bar; the spring stiffness of relief valve is 9890 N/m; the diameter of relief valve core is 18 mm; the spring stiffness of hydraulic check valve is 118 N/m; the valve core diameter of the hydraulic check valve is 16.5 mm. After setting the basic parameters, the experimental platform is carried out in the experimental environment with Intel Core 6-280 64 GB memory, windows 2020.VS2018CPU, and X2500 CPU. Randomly select a computer running XP. First, a dual port 10 Gigabit routing coordination controller is installed on the computer. The installation process needs to strictly follow the Internet connectivity standards and allow the wireless network or storage network to share it, to unify the network pattern. Second, the defined communication range of network nodes is (2.4*103) 2 m two-dimensional rectangular area, which scrambles the data in the area. Relevant parameter settings are shown in Table 1.

Combined with the parameters set in Table 1, according to the above experimental environment, the characteristics of hydromechanical calendering are analyzed. First of all, use this paper to optimize the design process, carry out the hydromechanical calendering, use MATLAB software to obtain the error probability of hydromechanical calendering, and record it as the experimental group. Then, the traditional process was used to carry out the hydromechanical calendering, and the error probability of hydromechanical calendering was obtained by using MATLAB software, which was recorded as the control group. In this case analysis, the test index is the error probability of hydromechanical calendering. The lower the error probability of hydromechanical calendering, the higher the forming accuracy of the process. MATLAB software is used to obtain the error probability of the two processes, and the experimental results are recorded, to compare the performance of the two processes in practical application.

5.2. Experimental Results and Analysis. Through the practice of the two processes and the arrangement of the experimental data, the comparison results of the error probability of hydromechanical calendering are obtained, as shown in Table 2.

As shown in Table 2, the error probability of the hydromechanical calendering process optimized in this paper is significantly lower than that of the control group. This indicates that it is possible to realize the optimal design of the hydromechanical calendering process and that it has practical promotion value.

6. Conclusions

According to the working principle of this technology, the situation of test production, and the reports of relevant foreign data, hydraulic mechanical calendering can also be applied to the calendering of various plastic materials, and

the blank thickness can be in the range of 0.5-3 mm. If enough hydraulic pressure is used, the sheet with a thickness greater than 3 mm can also be calendered. For the shape of parts, the ideal effect is that the section of the projectile, cone, etc. changes from small to large, for the section does not change or smaller parts also have a certain effect, for the asymmetric shape of parts, using this processing method can also achieve satisfactory results. For some parts with an inner concave shape and stiffener at the bottom and side wall, it is very difficult to form them by common calendering. However, it is very easy to form these parts by using the hydromechanical calendering process, which is also a special range of hydromechanical calendering processes.

Data Availability

The data used to support the findings of this study are included within the article.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

This study is funded by (1) Welfare Research Program of Zhejiang Province, no. LGG20E050001; and (2) Zhejiang Province Science Foundation, no. Q20E060028

References

[1] A. H. Anwer, N. Khan, M. Z. Ansari et al., "Recent advances in touch sensors for flexible wearable devices," *Sensors*, vol. 22, no. 12, p. 4460, 2022.

[2] Z. Haixia, Z. Tao, and X. Chaoxu, "Design and simulation of hydraulic system optimization of the scissor lift platform based on AMESim," *Machine Design And Manufacturing Engineering*, vol. 48, no. 10, pp. 20–22, 2019.

[3] L. Xing-Mu, H. Wei, and W. Wei-Ying, "Design of an elastic die for simulating joint bearing assembly," *Mechanical Research & Application*, vol. 32, no. 1, pp. 90–94, 2019.

[4] M. B. Alazzam, N. Tayyib, S. Z. Alshawwa, and M. Ahmed, "Nursing care systematization with case-based reasoning and artificial intelligence," *Journal of Healthcare Engineering*, vol. 2022, Article ID 1959371, 9 pages, 2022.

[5] J. Iannacci, "Microsystem based energy harvesting (EH-MEMS): powering pervasivity of the internet of things (IoT) - a review with focus on mechanical vibrations," *Journal of King Saud University-Science*, vol. 31, no. 1, pp. 66–74, 2019.

[6] A. Sakuraba, Y. Shibata, G. Sato, and N. Uchida, "Performance evaluation of V2V and V2R communication based on 2-wavelength cognitive wireless network on road state information GIS platform," in *International Conference on Intelligent Networking and Collaborative Systems*, Oita, Japan, 2019.

[7] M. A. Abd-Elmagid, T. Elbatt, and K. G. Seddik, "Correction to: optimization of energy-constrained wireless powered communication networks with heterogeneous nodes," *Wireless Networks*, vol. 25, no. 2, pp. 731–731, 2019.

[8] J. Chelliah and N. Kader, "Optimization for connectivity and coverage issue in target-based wireless sensor networks using an effective multiobjective hybrid tunicate and salp swarm optimizer," *International Journal of Communication Systems*, vol. 34, no. 3, 2021.

[9] A. A. Almukhtar, A. K. Abass, and M. H. Ali, "Optimization and performance evaluation of C+L band wavelength division multiplexing based on free space optical communication," *Journal of Physics: Conference Series*, vol. 1795, no. 1, article 012069, 2021.

[10] P. Sojka and V. Jaros, "Design of a wireless communication based on low power RF transceivers," *Transportation Research Procedia*, vol. 40, pp. 505–510, 2019.

[11] M. B. Alazzam, F. Alassery, and A. Almulihi, "Federated deep learning approaches for the privacy and security of IoT systems," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 1522179, 7 pages, 2022.

[12] S. K. Tripathi, M. Kumar, and A. Kumar, "Graphene based tunable and wideband terahertz antenna for wireless network communication," *Wireless Networks*, vol. 25, no. 7, pp. 4371–4381, 2019.

[13] R. Kunst, L. Avila, A. Binotto, E. Pignaton, S. Bampi, and J. Rochol, "Improving devices communication in industry 4.0 wireless networks," *Engineering Applications of Artificial Intelligence*, vol. 83, no. AUG., pp. 1–12, 2019.

[14] A. M. Zungeru, S. Subashini, and P. Vetrivelan, "Efficient relaying for enhanced network longevity for E-health IOT services in medical body area networks," in *Wireless Communication Networks and Internet of Things*, vol. 493 of Lecture Notes in Electrical Engineering, , pp. 13–19, Springer, 2019.

[15] H. Ullah, M. Abu-Tair, S. McClean, P. Nixon, G. Parr, and C. Luo, "Connecting disjoint nodes through a UAV-based wireless network for bridging communication using IEEE 802.11 protocols," *EURASIP Journal on Wireless Communications and Networking*, vol. 2020, no. 1, 2020.

[16] A. N. Uwaechia and N. M. Mahyuddin, "A comprehensive survey on millimeter wave communications for fifth-generation wireless networks: feasibility and challenges," *IEEE Access*, vol. 8, no. 99, pp. 62367–62414, 2020.

[17] A. Raza, S. J. Nawaz, S. Wyne, A. Ahmed, M. A. Javed, and M. N. Patwary, "Spatial modeling of interference in inter-vehicular communications for 3-D volumetric wireless networks," *IEEE Access*, vol. 8, no. 99, pp. 108281–108299, 2020.

[18] M. Badr, S. Al-Otaibi, N. Alturki, and T. Abir, "Deep learning-based networks for detecting anomalies in chest X-rays," *BioMed Research International*, vol. 2022, Article ID 7833516, 10 pages, 2022.

[19] N. Tabassum, G. D. Devanagavi, R. C. Biradar, and M. T. Lazarescu, "Comparative node selection-based localization technique for wireless sensor networks: a bilateration approach," *International Journal of Communication Systems*, vol. 33, article e4559, 2020.