

Building Material Conveying Equipment based on Electrical Automation

Geshun Tang, Xiaoxiao Mou, Yongzheng Liu

School of Intelligent Equipment, Shandong University of Science and Technology, Tai 'an 271019, China.

Abstract

With the rapid development of the construction industry, the conveying of building materials is in an extremely important position. This design not only realizes the adjustment of the Angle of conveying materials, but also can stir the materials during use, which improves the practicability of the device. In addition, it can reduce the input of manpower, financial resources and material resources, and "take the lead" for the successful completion of subsequent buildings.

Keywords

Electrical transmission, Building materials, Electrical automation, Transmission.

1. Introduction

With the rapid development of globalization and the continuous expansion of China's opening to the outside world, One Belt And One Road and other economic activities have created huge job opportunities. The so-called "economic foundation determines the superstructure". Throughout history, have we questioned the process of their construction while admiring their grandeur and splendor? There is no doubt that the painstaking efforts of numerous architects and workers must be condensed under this beautiful building. With the advance of The Times and the progress of science and technology, the original simple physical labor will be replaced by scientific and technological mechanical equipment. The design of this project came into being, which adjusted the Angle of material conveying and stirred the material during use, thus improving the practicability of the device. And can greatly reduce the input of manpower, financial resources, material resources, for the success of the subsequent building "take the lead".

2. Research Background

The advancement of science and technology has brought a lot of convenience to people's life, especially the common development of automation technology and information technology and the integrated application in architecture, which has greatly improved people's living conditions. The application of automation technology in architecture is of great help to the development of architectural engineering. With the rapid development of economy, electrical automation technology in China has been paid more and more attention, and electrical automation has been involved in many fields.

China has made great progress in the research and application of electrical automation technology. In addition, the construction industry is also a hot industry in recent years, and the market of building materials is extremely broad. Building material is a kind of material used in building construction, which needs to be used in conveying equipment after production. With the continuous development of science and technology, although the function of conveying equipment for building materials is more and more comprehensive, the existing conveying equipment for building materials has the following problems:

1 In the process of using the device, it is not easy to adjust the Angle of material conveying, which is difficult for material conveying.

2 There is no mixing process of materials before transportation, which is prone to uneven transportation and increases the difficulty of using the device³. It is more wasteful to put large equipment into use in small scale projects.

3. Design scheme

Construction material conveying equipment based on electrical automation, including floor and mounting rack. There are two shafts on the bottom plate, the left is the first shaft and the right is the second shaft. The outer side of the first shaft is connected with the basket, and the basket is connected with the first shaft.

Described in the installation frame fixed on the end of the floor, and on the top of the mounting bracket fixed outside the box, and between carton and mounting bracket for welding connection, described the internal fixed with a fixed block side of the carton, and the other end of the fixed block connections inside the box, described in the box at the top of the install a second motor, motor and the second set at the bottom of the stirring rod, and the end of the stirring rod fixed place with first gear, as described in the first gear of the lateral connection has the second gear.

Sides of the second gear is fixed with one end of the connecting shaft, as described in the other end of the connecting shaft set have dial the piece, and the connecting shaft connection plate is the middle position of nested, described above the allocated block sealing plate is set up, and seal plate fixed at the bottom of the spring, and between spring and sealing plate for welding assembly, described into the mouth in the box at the top of the reserve, and inside the bottom of the box set discharge tube.

4. Practical analysis

Compared with the existing technology, the beneficial effect of this design is: the construction material conveying equipment based on electrical automation is convenient to adjust the Angle of material conveying, and can be used to stir the material, effectively improving the practicability of the device and the universality of use.

Tab.1 Part number table

The serial number	Part name	The serial number	Part name
1	floor	13	Inside the box
2	The first rotating shaft	14	The second motor
3	Carrying baskets	15	Stir bar
4	The telescopic cylinder	16	The first gear
5	The second shaft	17	The second gear
6	The first motor	18	Connection plate
7	Transfer roller	19	The connecting shaft
8	Conveyor belt	20	Dial the piece
9	baffle	21	The seal plate
10	Mounting bracket	22	spring
11	carton	23	Into the mouth
12	Fixed block	24	Discharge tube

1 The device is in use, through the first motor drives the conveyor belt to transport of materials, materials in the pneumatic conveying by baffle to limit of material, when the Angle of the conveyor belt can be carrying baskets of drive to change, when the Angle of the conveyor belt need adjustment, one end of the telescopic cylinder work will be carrying baskets of jacking up, then the carrying basket can flip up through the first axis, using a simple lever principle to finish to adjust the Angle2.

2 The interior of the box was stirring rod, materials, mixing, stirring rod is used to drive the gears, the gear driven in second gear, after the second gear running can turns dial the piece, and the seal plate jacking up, fix the material discharging pipe above, thus able to discharge tube material isolation, avoid excess material output, affect engineering.

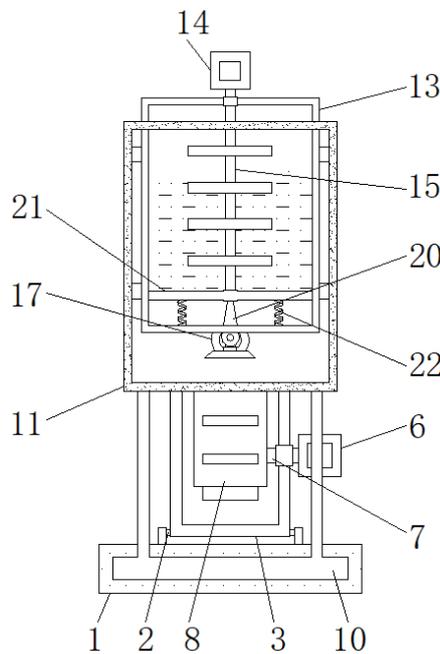


Fig.1 Schematic diagram of the overall face structure of the equipment

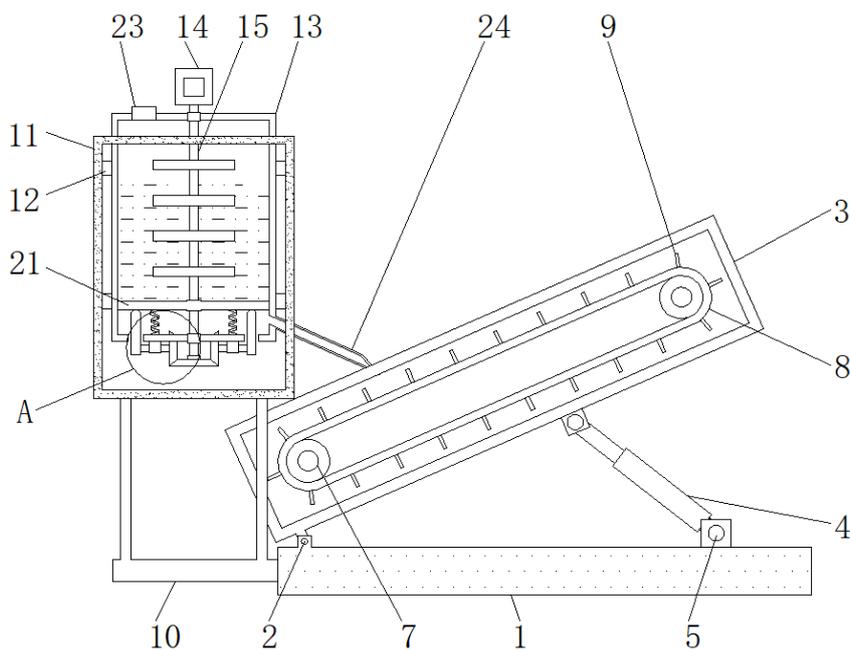


Fig.2 Schematic diagram of overall side view of equipment

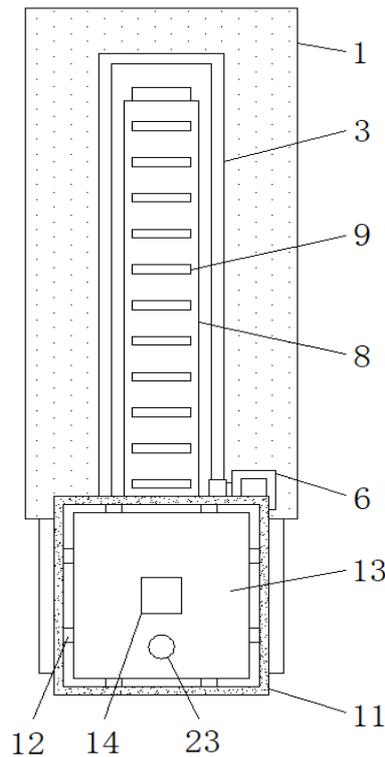


Fig.3 Overall overlooking structure diagram of the equipment

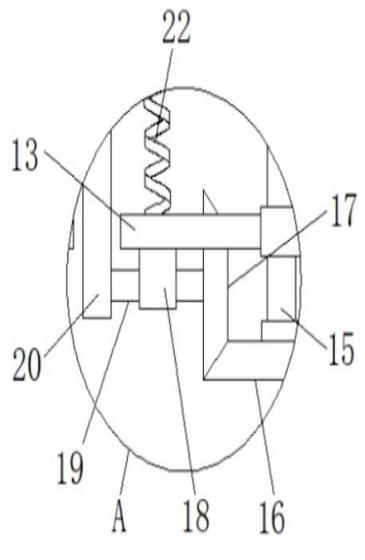


Fig.4 The enlarged structure diagram at A in Fig. 2

5. Operation Plan

1 Based on electrical automation in the use of the building material conveying equipment, first of all, according to the location of the transfer, will be carrying baskets to adjust to the suitable Angle, make the telescopic cylinder work basket will place other people end up squeezing jacking, then carrying baskets can pass the first axis of flip in the first place, the Angle of the basket after the adjustment, will place other people can make the following operation.

2 Place the building material, the interior of the box, and then the second motor drives the stirring rod rotation to mixing of materials, the process of material mixing, the first gear driven in second gear,

after the second gear running through the connecting shaft turns dial the piece, then dial the piece to rotate, the sealing plate, no pressure can be affected by its own gravity and spring force moves down, the seal plate down to the lower part of discharge tube, the material through the discharge pipe.

3 When the stirring rod continues to rotate, the sealing plate moves upward to isolate the discharge pipe, so as to intermittently transport materials and avoid excessive one-time materials, which will affect normal transportation and work. At the same time, the first motor works by driving the conveyor belt to rotate to transfer the material.

6. Analysis of special structure

A. The basket and bottom plate constitute an inverted installation structure, and the basket and the telescopic cylinder constitute a rotating installation structure. The basket can be driven upward by the telescopic cylinder to make the basket turn upward and complete the change of Angle.

B. The baffles are evenly spaced on the surface of the conveyor belt, and the baffles and the conveyor belt are set perpendicular to each other. The baffles with equal spacing can play a role in limiting the position of materials to avoid sliding of materials.

C. There is a coaxial connection between the second gear and the dial block, and the section of the dial block is cone-shaped. The coaxial connection can drive the dial block to turn when the second gear turns, and then the dial block can push up the sealing plate.

D. The dial block is symmetrically set with two axes of the inner box, and the dial block and the inner box constitute a rotating installation structure. The dial block symmetrically set rotates at the same time, which can improve the uniformity of force on the sealing plate and avoid the situation of being stuck when moving upward.

E. the seal plate and the inner box elevator installation structure, and board edge sealing side and inner box tightly between the lining and affected by pressure seal plate move up, after the seal plate moving up, the location of the discharge tube at the lower part of seal plate, at this time there will be no material on outward, then seal plate spring tension and the influence of its own gravity moves down, so that they can lose again.

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