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(54) **COMBINED CLASSIFIER**

KOMBINIERTER KLASSIFIZIERER

CLASSIFICATEUR COMBINÉ

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Description

FIELD OF THE INVENTION

[0001] This application relates to a scatter classification device, in particular to a combined classifier.

BACKGROUND OF THE INVENTION

[0002] At present, with the rapid development of China's national economy in recent years, the cement production of China has already been up to one billion tons. New production lines are all large-scale production lines having annual production of 700,000 tons or more. Power consumption per ton of cement is about 90-100 kWh, and the power consumption of cement grinding process is 60-70% of the cement production power consumption. The annual power consumption of the cement grinding process is up to about 60 billion kWh. The roller press is successfully applied in the cement grinding system to increase the production of the system by 50%-200% and save the power by 20%-40%. In this way, the energy may be saved and the power consumption of cement production is reduced, thereby realizing the sustainable development. The roller press employs the high-pressure material bed crushing theory and operates in a manner of individual particle crushing groupization. The granularity of fragile materials is reduced rapidly after being pressed under high pressure (the pressure of the pressing area is about 150 MPa), with the content of fine powders smaller than 0.08mm being up to 20-30%, and the content of materials smaller than 2mm being above 70%. Besides, there is a mass of micro cracks in the pressed materials, which improves the grindability of the materials and greatly reduces the energy consumption for grinding the materials in the next procedure. Based on the actual usage data already obtained, compared with the conventional grinding system, the grinding system using the roller press increases the production by 50-200%, reduces the power consumption per unit yield by 20-40%, and decreases the operating noise of the device which improves the worker's working environment, thereby showing remarkable economical benefits and social benefits.

[0003] WO 00/35607 A1 discloses a combined classifier comprising a motor-driven scatter plate, a classifying impeller driven by a classifying motor and an inner cylinder with a side wall having sieve openings therein.

[0004] CN 2 183 829 Y discloses all features of the classifier of WO 00/35607 A1 with the exception that the scatter plate and impeller are driven by the same motor and are mounted on the same shaft.

[0005] WO 87/06279 A1 discloses a combined classifier where the air classifier is mounted outside the housing of the first classifier.

SUMMARY OF THE INVENTION

[0006] The object of the present application is to pro-

vide a combined classifier for scattering and multi-classifying materials pressed by a roller press, specifically, separating materials unpressed and pressed insufficiently by using the combination of air classification and screening and feeding the separated materials back into the roller press to be re-pressed, which has high classification efficiency.

[0007] The technical solutions of the present application are as follows.

[0008] A combined classifier includes an outer cylinder and an inner cylinder fixedly provided inside the outer cylinder, wherein a classifying motor is installed on an upper end of the outer cylinder by a bracket, a rotating shaft extends into the outer cylinder and is fixedly connected to a lower end of an output shaft of the classifying motor, a classifying impeller is located above the inner cylinder and is installed on a lower end of the rotating shaft, a hollow shaft sleeves outside the rotating shaft and is driven by a scatter motor, a material scatter plate is installed on a lower end of the hollow shaft, above the material scatter plate a material inlet is provided in the outer cylinder, a material outlet is provided in a lower end of the outer cylinder, and wherein a cone-shaped material unloading hopper is provided at a lower end of the inner cylinder and is provided with sieve openings on a sidewall thereof, an air classifier is communicatively connected to the material unloading hopper and includes an air intake passage, an air discharging passage, a material discharging passage and a material unloading passage which intersect, and material scatter boards staggered with each other are fixed at an intersection of the passages.

[0009] The air classifier is provided in the outer cylinder, with the air intake passage, the material discharging passage and the material unloading passage all extending out of a side wall of the outer cylinder.

[0010] The material scatter boards preferably are processed for wear-resistance, and are arranged in a fish-bone shape.

[0011] The advantages of the present application are as follows.

[0012] In the present application, materials are classified in multiple stages, resulting in high classification efficiency; and a principle of screening prior to air classification is employed, thus energy consumption is saved.

[0013] The portions fully contacting with the materials are all processed for wear-resistance or made of wear-resistant materials, thus the service life of the device is prolonged.

[0014] A damageable structure needed to be regularly replaced is formed by assembling its components made respectively, which may reduce the weight of the damageable structure and facilitate the assembly and the disassembly.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Figure 1 is a schematic view of the structure of

the present application.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0016] Referring to figure 1, a combined classifier including an outer cylinder 1 is shown. An inner cylinder 2 is fixedly provided inside the outer cylinder 1. A classifying motor 3 is installed on an upper end of the outer cylinder 1 by a bracket. A rotating shaft 4 extending into the outer cylinder 1 is fixedly connected to a lower end of an output shaft of the classifying motor 3. A classifying impeller 5 located above the inner cylinder 2 is installed on a lower end of the rotating shaft 4. A hollow shaft 6 sleeves outside the rotating shaft 4 and is driven by a material scatter motor 7. A material scatter plate 8 is installed on a lower end of the hollow shaft 6, and above the material scatter plate 8 a material inlet 9 is provided in the outer cylinder. A material outlet 10 is provided in a lower end of the outer cylinder 1. A cone-shaped material unloading hopper 11 is provided at the lower end of the inner cylinder 2, and is provided with sieve openings on the sidewall thereof. An air classifier 12 is communicatively connected to the material unloading hopper 11, and includes an air intake passage, an air discharging passage 13, a material discharging passage 14 and a material unloading passage 15 which intersect. Material scatter boards 16 staggered with each other are fixed at an intersection of the above passages, and are processed for wear-resistance, and are arranged in a fishbone shape. The air classifier is provided in the outer cylinder, with the air intake passage, the material discharging passage and the material unloading passage all extending out of a side wall of the outer cylinder. Alternatively, the air classifier may also be provided outside the outer cylinder.

Claims

1. A combined classifier comprising an outer cylinder (1) and an inner cylinder (2) fixedly provided inside the outer cylinder (1), wherein a classifying motor (3) is installed on an upper end of the outer cylinder (1) by a bracket, a rotating shaft (4) extends into the outer cylinder (1) and is fixedly connected to a lower end of an output shaft of the classifying motor (3), a classifying impeller (5) is located above the inner cylinder (2) and is installed on a lower end of the rotating shaft (4), a hollow shaft (6) sleeves outside the rotating shaft (4) and is driven by a scatter motor (7), a material scatter plate (8) is installed on a lower end of the hollow shaft (6), above the material scatter plate (8) a material inlet (9) is provided in the outer cylinder (1), a material outlet (10) is provided in a lower end of the outer cylinder (1), and wherein a cone-shaped material unloading hopper (11) is provided at a lower end of the inner cylinder (2) and is provided with sieve openings on a

sidewall thereof, an air classifier (12) is communicatively connected to the material unloading hopper (11) and comprises an air intake passage, an air discharging passage (13), a material discharging passage (14) and a material unloading passage (15) which intersect, and material scatter boards (16) staggered with each other are fixed at an intersection of the passages, and the air classifier (12) is provided in the outer cylinder (1), with the air intake passage, the material discharging passage (14) and the material unloading passage (15) all extending out of a side wall of the outer cylinder (1).

2. The combined classifier according to claim 1, wherein the material scatter boards are processed for wear-resistance, and are arranged in a fishbone shape.

Patentansprüche

1. Kombisichter, welcher einen Außenzylinder (1) und einen Innenzylinder (2), der fest in dem Außenzylinder (1) vorgesehen ist, umfasst, wobei ein Sichtungsmotor (3) durch eine Halterung an einem oberen Ende des Außenzylinders (1) angebaut ist, sich eine drehende Welle (4) in den Außenzylinder (1) erstreckt und mit einem unteren Ende einer Ausgangswelle des Sichtungsmotors (3) fest verbunden ist, sich ein Sichtungslaufrad (5) über dem Innenzylinder (2) befindet und an einem unteren Ende der sich drehenden Welle (4) angebaut ist, eine Hohlwelle (6) die sich drehende Welle (4) umgibt und von einem Streumotor (7) angetrieben wird, ein Materialstreuteller (8) an einem unteren Ende der Hohlwelle (6) angebaut ist, oberhalb des Materialstreutellers (8) ein Materialeinlass (9) in dem Außenzylinder (1) vorgesehen ist, in einem unteren Ende des Außenzylinders (1) ein Materialauslass (10) vorgesehen ist, und wobei an einem unteren Ende des Innenzylinders (2) ein kegelförmiger Materialentladetrichter (11) vorgesehen ist und an einer Seitenwand desselben mit Sieböffnungen versehen ist, ein Luftsichter (12) mit dem Materialentladetrichter (11) kommunizierend verbunden ist und einen Lufteinlasskanal, einen Luftablasskanal (13), einen Materialablasskanal (14) und einen Materialentladekanal (15), die sich schneiden, umfasst und Materialstreuplatten (16), die zueinander versetzt sind, an einem Schnittpunkt der Kanäle befestigt sind und der Luftsichter (12) in dem Außenzylinder (1) vorgesehen ist, wobei sich der Lufteinlasskanal, der Materialablasskanal (14) und der Materialentladekanal (15) alle aus einer Seitenwand des Außenzylinders (1) heraus erstrecken.
2. Kombisichter nach Anspruch 1, wobei die Material-

streuplatten für Abriebbeständigkeit bearbeitet und in einer Grätenform angeordnet sind.

Revendications

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1. Classificateur combiné comprenant un cylindre extérieur (1) et un cylindre intérieur (2) placé fixement à l'intérieur du cylindre extérieur (1), dans lequel un moteur de classification (3) est monté sur une extrémité supérieure du cylindre extérieur (1) au moyen d'un support, un arbre rotatif (4) s'étend dans le cylindre extérieur (1) et est relié fixement à une extrémité inférieure d'un arbre de sortie du moteur de classification (3), un rotor de classification (5) est situé au-dessus du cylindre intérieur (2) et est monté sur une extrémité inférieure de l'arbre rotatif (4), un arbre creux (6) enveloppe l'arbre rotatif (4) et est entraîné par un moteur de dispersion (7), une plaque de dispersion de matériau (8) est montée sur une extrémité inférieure de l'arbre creux (6), une entrée de matériau (9) est prévue dans le cylindre extérieur (1) au-dessus de la plaque de dispersion de matériau (8), une sortie de matériau (10) est prévue dans une extrémité inférieure du cylindre extérieur (1), et dans lequel une trémie de déchargement de matériau (11) conique est prévue sur une extrémité inférieure du cylindre intérieur (2) et est pourvue d'orifices de tamisage sur une paroi latérale de celle-ci, un classificateur à air (12) est relié à la trémie de déchargement de matériau (11) de manière à communiquer avec celle-ci et comprend un conduit d'entrée d'air, un conduit de sortie d'air (13), un conduit de rejet de matériau (14) et un conduit de déchargement de matériau (15) qui s'entrecoupent, et des planches de dispersion de matériau (16) disposées en quinconce les unes avec les autres sont fixées à une intersection des conduits, et le classificateur à air (12) est prévu dans le cylindre extérieur (1), le conduit d'entrée d'air, le conduit de rejet de matériau (14) et le conduit de déchargement de matériau (15) s'étendant tous hors d'une paroi latérale du cylindre extérieur (1).
2. Classificateur combiné selon la revendication 1, dans lequel les planches de dispersion de matériau sont traitées pour résister à l'usure et elles sont agencées en arêtes de poisson.

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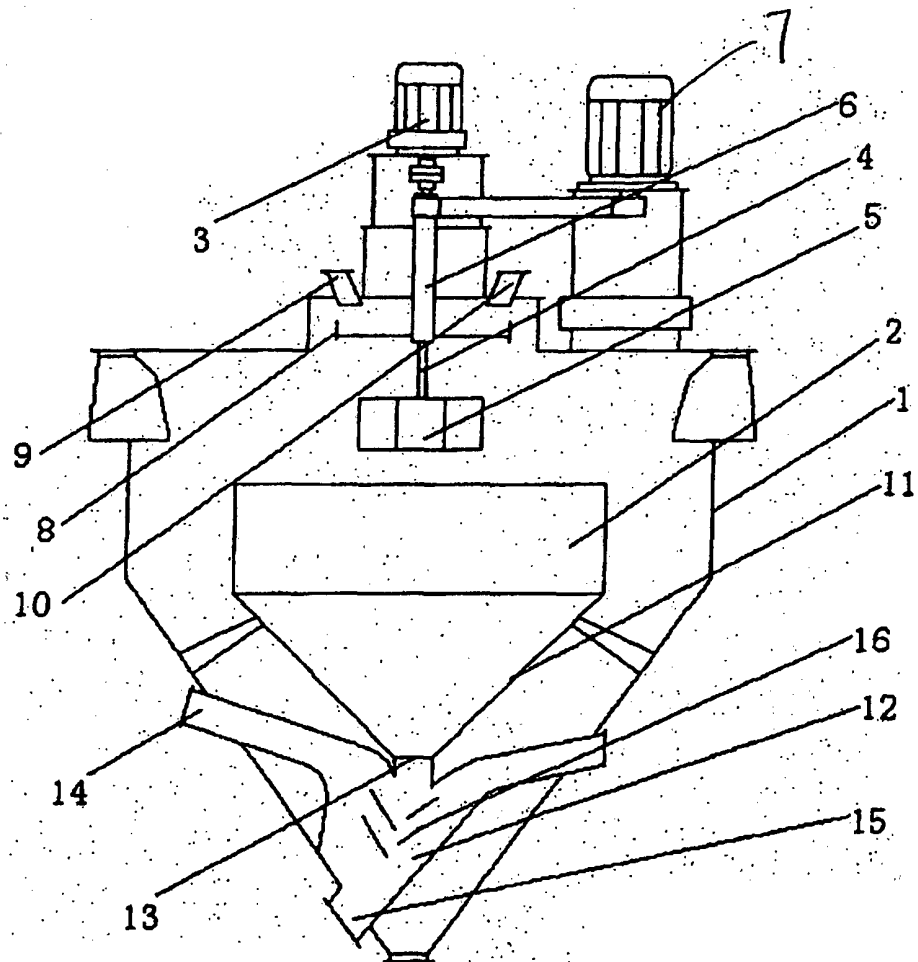


Fig. 1

REFERENCES CITED IN THE DESCRIPTION

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