# CONCRETE MIXING SYSTEM

## Technical Field

The invention relates to a batching plant, especially to the improvement of a concrete mixing system. The concrete mixing system can be installed in construction sites to meet the needs of large-scale concrete production.

## Background

There are many traditional concrete mixing plants in the prior arts. For example, CN1192397A discloses a motor-driven mixing equipment, which can be easily set up in the construction site. However, the quality of concrete produced by this equipment is not satisfactory. CN102233613A discloses a mobile concrete batching plant and its concrete mixing method. The batching plant comprises a container, which is provided with a group of storage devices for materials to be mixed, a material weighing and conveying device, a mixer and a control unit. Therefore, it can accurately discharge materials based on the formula. However, the storage devices of the concrete batching plant only can store a small amount of materials due to the limited space. When the materials are used up, the plant will have to be shut down first, and then corresponding materials will be repeatedly added into the storage devices with a hoisting bracket or by labors, thus resulting in low production efficiency and a significant consumption of labors. Therefore, the concrete batching plant cannot meet the requirements of large-scale production of concrete.

## Summary of the Invention

The technical problem to be solved by the invention is to provide a concrete mixing system with large-scale concrete output capacity and high production efficiency.

The technical scheme of the invention is as follows: a concrete mixing system consists of a mixing plant and a control unit; the mixing plant is provided with a first group of storage devices consisting of multiple independent storage devices used for storage of multiple materials to be mixed, a material weighing and conveying device as well as a blender.

In addition, it also includes a ground cylinder used for receiving multiple materials, a second group of storage devices used for storage of multiple materials and a conveyer connected with the control unit; the first group of storage devices is provided with a first material distribution device connected with the control unit; the second group of storage devices is provided with multiple independent storage devices and a second material distribution device connected with the control unit; the conveyer connects an outlet of the ground cylinder and the second material distribution device of the second group of storage devices and connects the outlet of the second group of storage devices and the first material distribution device of the first group of storage devices.

Materials in the ground cylinder are transported to the second material distribution device through the conveyer and then distributed to corresponding storage devices of the second group of storage devices; materials in the second group of storage devices are transported to the first material distribution device through the conveyer and then distributed to corresponding storage devices of the first group of storage devices.

It also includes a material transfer platform. The conveyer consists of a first conveyor belt, a second conveyor belt and a third conveyor belt; the first conveyer belt runs below the outlets of the ground cylinder and the second group of storage devices and through the material transfer platform, the second conveyor belt runs through the material transfer platform and above the second material distribution device of the second group of storage devices and the third conveyor belt runs through the material transfer platform and above the first material distribution device of the first group of storage devices.

To distribute materials from the first conveyer belt to the second conveyer belt or the third conveyer belt, the first conveyer belt is arranged at the end of the material transfer platform and above the third conveyor belt; the third conveyor belt is arranged at the end of the material transfer platform and above the second conveyor belt.

Or the material transfer platform is provided with a distributor connected to the control unit for distributing the materials from the first conveyer belt to the second conveyer belt or the third conveyer belt.

The ground cylinder is an independent integral component mainly made of steel.

The ground cylinder has a lower part buried underground and an upper part comprising an

exposed opening for materials input.

It also includes a cement storage device separately arranged adjacent to the first group of storage devices and a fourth conveyer belt, which runs below the outlet of the cement storage device and above the blender.

It also includes a standby storage device separately arranged adjacent to the first group of storage devices and the fifth conveyer belt, which runs below the outlet of the standby storage devices and above the blender.

Compared with the prior arts, the concrete mixing system is separately provided with the ground cylinder and the second group of storage devices and transports required materials to the first group of storage devices by the conveyer. It can continuously output required concrete efficiently without shutdown. In addition, it can realize large-scale production and be temporarily established in the construction site to meet the needs of high-rise buildings. The ground cylinder is an independent integral component. It can be transported to another site for reuse together with the conveyer, the second group of storage devices and the mixing plant after the construction is completed, thus reducing costs for construction and removal expenses and facilitating environment protection.

**Brief Description of Drawings**

Figure 1 is the plan view of the concrete mixing system according to the present invention; and

Figure 2 is the side view of the concrete mixing system according to the present invention;

**Detailed Description of the Preferred Embodiments**

In the following the invention will be discussed in details with reference to the attached drawings and embodiments so that the objective, technical solution and advantages of the invention are more distinct. It should be understood that the particular embodiments as set forth herewith are intended to be illustrative only, not limiting the scope of the invention in any way.

As shown in Figure 1 and Figure 2, the concrete mixing system according to the present

invention mainly consists of a mixing plant 1, a control unit, a ground cylinder 2, a second group of storage devices 3, a conveyer 5 connected to the control unit, and a material transfer platform 6. The mixing plant 1 is mounted on a support 91, where a first group of storage devices 11, a material weighing and conveying device, a first material distribution device 12 and a blender 13 are arranged thereon. The first group of storage devices 11 is provided with a plurality of individual storage devices for respective storage of multiple different materials to be mixed. The material weighing and conveying device, the first material distribution device 12 and the blender 13 are connected with the control unit. The control unit controls the first material distribution device 12 to sort out different materials into corresponding storage devices of the first group of storage devices 11. It also controls the material weighing and conveying device to weigh out a certain amount of materials as specified in the formula, and convey them into the blender 13 for mixing. Detailed structure of the mixing plant 1 can refer to CN102233613A and thus is no longer described here. Based on the mixing plant disclosed in CN102233613A, the present invention further comprises the ground cylinder 2, the second group of storage devices 3, the conveyer 5 and the material transfer platform 6, which will be discussed in the following, in order to realize continuous large-scale production.

As shown in Figure 2, the body of the ground cylinder 2 is an independent integral component formed by steel plates, so as to contain different materials, such as sands and stones in different specifications, transported from places outside the construction site. The majority of the ground cylinder 2 is buried underground, with only a small part thereof being exposed on the surface. The top of the ground cylinder 2 is provided with an opening to facilitate the materials to be discharged from trucks and supplied into the ground cylinder 2. The ground cylinder 2 is provided with an outlet on the bottom thereof.

The second group of storage devices 3 is fixed on the support 92, and consists of multiple large independent storage devices and a second material distribution device 31 connected to the control unit. The control unit controls the second material distribution device 31 to sort out different materials into corresponding storage devices of the second group of storage devices 3, which has an outlet on the bottom thereof.

The material transfer platform 6 is supported by a support 93, and used to carry the conveyer 5 and transfer materials.

The conveyer 5 consists of a first conveyor belt 51, a second conveyor belt 52 and a third conveyor belt 53. The first conveyer belt 51 runs below the outlet of the ground cylinder 2 and the

outlet of the second group of storage devices 3 in sequence along the direction from bottom to top, and its highest end is supported by the material transfer platform 6 finally. The lower end of the second conveyer belt 52 is supported by the material transfer platform 6, and the higher end thereof is above the second material distribution device 31 of the second group of storage devices 3. The lower end of the third conveyer belt 53 is supported by the material transfer platform 6 and the higher end is above the first material distribution device 12 of the first group of storage devices 11.

The materials in the ground cylinder 2 are discharged from the outlet of the ground cylinder 2, transported to the material transfer platform 6 through the first conveyer 51, delivered to the second material distribution device 31 through the second conveyer 52, and then distributed to corresponding storage devices of the second group of storage devices 3 for temporary storage according to categories of materials. When the materials in the first group of storage devices 11 are about to be used up, the control device controls the materials to be discharged from the outlet of the second group of storage devices 3, transported to the material transfer platform 6 through the first conveyer belt 51, then transported to the first material distribution device 12 through the third conveyer belt 53, and then distributed to corresponding storage devices of the first group of storage devices 11. In this way, the first group of storage devices 11 can be continuously supplied with different materials, ensuring a continuous concrete production and thus greatly improving the production efficiency.

To transport the materials from the first conveyer belt 51 to the first group of storage devices 11 or the second group of storage devices 3 as required, different schemes can be used. For example, a distributor connected to the control unit can be arranged on the material transfer platform 6, wherein the control device controls the distributor to distribute the materials transported to the second conveyer belt 52 or the third conveyer belt 53, and then the materials are transported to the second group of storage devices 3 or the first group of storage devices 11 through the second conveyer belt 52 or the third conveyer belt 53. Alternatively, the technical scheme of the present embodiment can be used: the first conveyer belt 51 is arranged at the end of the material transfer platform 6 and above the third conveyer belt 53, and the third conveyer belt 53 is arranged at the end of the material transfer platform 6 and above the second conveyer belt 52. Thus, the materials can reach the lower third conveyer belt 53 after they are transported to the material transfer platform 6 through the first conveyer belt 51. At this moment, it is only required to control the third conveyer belt 53 to forwardly transport the materials to the first group of storage devices 11, or to rearwardly transport the materials to the end of the second conveyer belt 52 and then convey them to the second group of storage devices 3 through the second conveyer

belt 52.

Cements have a high requirement for storage. They cannot become damp; otherwise, they will be coagulated. Therefore, the concrete mixing system according to the present invention further includes a cement storage device 7 separately arranged adjacent to the first group of storage devices 11 and a fourth conveyer belt 54. The cement storage device 7 is fixed on a support 94, and provided with an outlet on the bottom thereof. The fourth conveyer belt 54 runs below the outlet of the cement storage device 7 and above the blender 13. It is also controlled by the control unit, and provided with a weighting device for weighing out required amount and feeding the materials into the blender 13.

In addition, a standby storage device 8 and a fifth conveyer belt 55 are arranged adjacent to the first group of storage devices 11. The standby storage device 8 can be used for storing the materials less used, such as ash, and the fifth conveyer belt 55 runs below the outlet of the standby storage device 8 and above the blender 13. Similarly, the fifth conveyer belt 55 is also controlled by the control unit, and provided with a weighting device for weighing out required amount and feeding the materials into the blender 13.

The mixing system can be temporarily established in the construction site so as to flexibly produce concretes according to different requirements. The mixing plant 1, the ground cylinder 2, the second group of storage devices 3, the conveyer 5 and the material transfer platform 6 can be conveniently moved to another site for reuse, thus greatly reducing costs and removal expenses and facilitating environment protection.

While the invention has been described in conjunction with the preferred embodiments outlined above, it is evident that the foregoing is not intended to limit the invention. Any alternatives, modifications and variations without departing from the spirit and scope of the invention should be fallen within the protection scope of the invention.

## Claims

1. A concrete mixing system, comprising a mixing plant (1) and a control unit, the mixing plant (1) being provided with a first group of storage devices (11) including a plurality of individual storage devices for respective storage of multiple different materials to be mixed, a material weighing and conveying device and a blender (13),

characterized in that, the concrete mixing system further comprises a grounding cylinder (2) for receiving multiple materials, a second group of storage devices (3) for storing multiple materials, and a conveyer (5) connected to the control unit; the first group of storage devices (11) is provided with a first material distribution device (12) connected to the control unit; the second group of storage devices (3) is provided with a plurality of independent storage devices and a second material distribution device (31) connected to the control unit; the conveyer (5) connects an outlet of the ground cylinder (2) with the second material distribution device (31) of the second group of storage devices (3), and connects an outlet of the second group of storage devices (3) with the first material distribution device (12) of the first group of storage devices (11);

materials in the ground cylinder (2) are transported to the second material distribution device (31) through the conveyer (5) and then distributed to corresponding storage devices of the second group of storage devices (3) through the second material distribution device (31), and materials in the second group of storage devices (3) are transported to the first material distribution device (12) through the conveyer (5) and then distributed to corresponding storage devices of the first group of storage devices (11).

2. The concrete mixing system according to claim 1, characterized in that the concrete mixing system further comprises a material transfer platform (6), and the conveyer (5) comprises a first conveyor belt (51), a second conveyor belt (52) and a third conveyor belt (53);

the first conveyer belt (51) runs below the outlet of the ground cylinder (2) and the outlet of the second group of storage devices (3) and through the material transfer platform (6), the second conveyor belt (52) runs through the material transfer platform (6) and above the second material distribution device (31) of the second group of storage devices (3), and the third conveyor belt (53) runs through the material transfer platform (6) and above the first material distribution device (12) of the first group of storage devices (11).

3. The concrete mixing system according to claim 2, characterized in that the first conveyer belt (51) is arranged at the end of the material transfer platform (6) and above the third conveyor belt (53), and the third conveyor belt (53) is arranged at the end of the material transfer platform (6)

and above the second conveyor belt (52).

4. The concrete mixing system according to claim 2, characterized in that the material transfer platform (6) is provided with a distributor connected to the control unit for distributing the materials from the first conveyer belt (51) to the second conveyer belt (52) or the third conveyer belt (53).

5. The concrete mixing system according to any one of claims 1 to 4, characterized in that the ground cylinder (2) is an independent integral component mainly made of steel.

6. The concrete mixing system according to claim 5, characterized in that the ground cylinder (2) has a lower part buried underground and an upper part comprising an exposed opening for materials input.

7. The concrete mixing system according to any one of claims 1 to 4, characterized in that it further includes a cement storage device (7) separately arranged adjacent to the first group of storage devices (11) and a fourth conveyer belt (54), which runs below the outlet of the cement storage device (7) and above the blender (13).

8. The concrete mixing system according to claim 7, characterized in that it further includes a standby storage device (8) separately arranged adjacent to the first group of storage devices (11) and a fifth conveyer belt (55), which runs below the outlet of the standby storage devices (8) and above the blender (13).