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(54) COOLING ROLLER WAY FOR IMPROVING COOLING UNIFORMITY OF SPINNING COIL AND ITS METHOD

KÜHLROLLENBAHN ZUR VERBESSERUNG DER KÜHLGLEICHMÄSSIGKEIT EINER SPINNSPULE UND VERFAHREN DAZU

CHEMIN DE ROULEAU DE REFROIDISSEMENT POUR AMÉLIORER L'UNIFORMITÉ DE REFROIDISSEMENT D'UNE BOBINE DE FILAGE ET SON UTILISATION

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to the technical field of wire production equipment, in particular to a cooling roller way for improving the cooling uniformity of a spinning coil as specified in any of claims 1-3 and use of the cooling roller way as specified by claim 4.

BACKGROUND

[0002] In the process of high-speed wire production, it is of great importance to improve the comprehensive properties of steel. However, there are many methods to homogenize the microstructure in steel and improve its composition segregation, which mainly include controlling the solidification structure of steel, controlling the cooling rate and adjusting the alloy elements in the steelmaking process. A heating system and a controlled cooling process are included in the rolling process. The controlled cooling process is mainly formulated according to the "C" curve or "CCT" curve of different steel grades. The running speed of the roller way body and different air volumes distributed to the area are controlled by motor power and an Optiflex device, respectively. As shown in FIG. 5, under the existing Stelmor air-cooling process, the coils are distributed in a continuous circle on the air-cooling roller way body, so that the stacking thickness of overlapping points is large at both sides and the stacking thickness is small in the middle, the stacking thickness of the whole uncoiled circle is non-uniform, and the temperature at the position of the edge overlapping points fluctuates greatly, which will not only lead to non-uniform heating of the overlapping points, but also affect the performance of the finished wire products in the same coil.

[0003] PTL1 (BE 789 039 A) describes an apparatus and a method of cooling wire in a wire-forming machine comprises blowing air diagonally from above and below and from the sides laterally to cool the wire.

[0004] PTL2 (JP H06 19907 U 15) describes a uniform quenching apparatus and method for a hot rolled wire rod.

[0005] PTL3 (EP 0 384 010 A1) describes a method for transporting hot-rolled wire rod and an apparatus therefore.

SUMMARY

[0006] The technical problem to be solved by the present disclosure is as follows. The present disclosure provides a cooling roller way for improving the cooling uniformity of a spinning coil as specified in any of claims 1-3and use of the cooling roller way as specified by claim 4in order to overcome the problems in the prior art that the coils are distributed in a continuous circle on the roller way body, so that the stacking thickness of overlapping points is large at both sides and the stacking thickness is small in the middle, the overlapping points are non-uniformly heated, and the performance of the finished coils is degraded.

[0007] The technical scheme used by the present disclosure to solve the technical problem is as follows. A cooling roller way for improving the cooling uniformity of a spinning coil comprises a roller way body and several guiding mechanisms installed at both sides of the roller way body, wherein the guiding mechanisms at both sides of the roller way body are staggered, the roller way body is used to transport a coil, and the guiding mechanisms are used to change the running trajectory of the coil, so that overlapping points of the coil are uniformly distributed. The design of the guiding mechanisms on the roller way body can change the running trajectory of the wire, stagger the overlapping points with a larger stacking thickness in order, reduce the cooling non-uniformity, improve the organizational structure of the wire, make the temperature fluctuation of the overlapping points on the edge of the air-cooling roller way body achieve an ideal effect, reduce the performance of the coils in the same circle, and realize the homogenization of the coiling performance of the wire.

[0008] In order to solve the problem of producing and installing the guiding mechanisms and adjusting coils with different sizes guided by a guide wheel, further, the guiding mechanism comprises a fixed seat and a guide wheel, the guide wheel is adjustable in position and is installed on the fixed seat, and the position adjustment direction of the guide wheel is staggered with the transmission direction of the roller way body. The fixed seat is adjustable in position and is installed on the roller way body, and the adjustment direction of the fixed seat is parallel to the transmission direction of the roller way body. The guide wheel and the fixed seat which are adjustable in position can change the running trajectories of coils with different specifications, and the application range is increased.

[0009] In order to solve the problem of adjusting and installing the fixed seat, further, a bracket is fixedly connected to the fixed seat, the bracket is erected on the roller way body, a base is fixedly connected to the bracket, and the base is located outside the roller way body. The base plays the role of increasing the counterweight, thus improving the stability of the guiding mechanism after being erected.

[0010] In order to solve the problem of adjusting and installing the guide wheel, further, the fixed seat is provided with a notch for the guide wheel to move, the top surface of the fixed seat is provided with a supporting arm and two positioning plates, the supporting arm and the notch are both located between the two positioning plates, the positioning plate is provided with an adjusting hole extending to the center line of the roller way body, a fixed screw is provided in the adjusting hole, a rod part of the fixed screw is in threaded connection with the supporting arm, the bottom surface of the supporting arm is

provided with an axle, and the guide wheel and the axle are rotatably connected and axially fixed. The design of the notch on the fixed seat, the supporting arm and the adjusting hole on the positioning plate can make the guide wheel move longitudinally to adjust the distance between the guide wheels at both sides according to the coil size.

[0011] In order to solve the problem that the coil wire enters the gap between the guide wheel and the roller way body, further, guide plates are provided at both sides of the fixed seat. The guide plates additionally provided at both sides can effectively prevent the head and tail of the wire from entering the gap between the guide wheel and the inner side of the roller way body and avoid production accidents such as inverted insertion and a large number of crawling.

[0012] In order to solve the problem of installing and using the guiding mechanism, further, the use comprises the following steps: according to the rolling specifications of a coil, adjusting the distance between two adjacent guide wheels at the same side of the roller way body or/and adjusting the length of the guide wheels extending to the center of the roller way body, so that the guide wheel is in contact with the coil so as to change the running trajectory of the coil, and finally the running trajectory is S-shaped, so that the overlapping points of the coil are staggered in order.

[0013] The present disclosure has the following beneficial effects. The present disclosure provides a cooling roller way for improving the cooling uniformity of a spinning coil as specified in any of claims 1-3 and use of the cooling roller wayas specified by claim 4. The design of the guiding mechanisms on the roller way body can change the running trajectory of the wire, stagger the overlapping points with a larger stacking thickness in order, reduce the cooling non-uniformity, and improve the organizational structure of the wire.

[0014] The temperature fluctuation of the overlapping points on the edge of the air-cooling roller way body achieves an ideal effect, the performance of the coils in the same circle is reduced, and the homogenization of the coiling performance of the wire is realized.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The present disclosure will be further described with reference to the attached drawings and embodiments.

FIG. 1 is a structural schematic diagram of the present disclosure.

FIG. 2 is an enlarged structural schematic diagram of a guiding mechanism according to the present disclosure.

FIG. 3 is a side structural schematic diagram of a guiding mechanism according to the present disclosure.

FIG. 4 is a front structural schematic diagram of a guiding mechanism according to the present disclosure.

FIG. 5 is a schematic diagram of the transportation structure of a coil in the original state.

[0016] 1, roller way body, 2, guiding mechanism, 21, base, 22, bracket, 23, fixed seat, 231, notch, 24, supporting arm, 25, axle, 26, guide wheel, 27, positioning plate, 271, adjusting hole, 28, fixed screw, 29, guide plate, 3, coil, 31, overlapping point, 32, non-overlapping point

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0017] The present disclosure will now be described in further detail with reference to the attached drawings. These drawings are simplified schematic diagrams, which only illustrate the basic structure of the present disclosure in a schematic manner. Therefore, only the components related to the present disclosure are shown.

[0018] FIG. 1 is a structural schematic diagram of the present disclosure. A cooling roller way for improving the cooling uniformity of a spinning coil comprises a roller way body 1 and several guiding mechanisms 2 installed at both sides of the roller way body 1. The guiding mechanisms 2 at both sides of the roller way body 1 are staggered. The roller way body 1 is used to transport a coil 3. The guiding mechanisms 2 are used to change the running trajectory of the coil 3, so that overlapping points 31 of the coil 3 are uniformly distributed. The design of the guiding mechanisms 2 on the roller way body 1 can change the running trajectory of the wire, stagger the overlapping points with a larger stacking thickness in order, reduce the cooling non-uniformity, improve the organizational structure of the wire, make the temperature fluctuation of the overlapping points on the edge of the air-cooling roller way body 1 achieve an ideal effect, reduce the performance of the coils 3 in the same circle, and realize the homogenization of the coiling performance of the wire.

[0019] As shown in FIG. 2, the guiding mechanism 2 comprises a fixed seat 23 and a guide wheel 26. The guide wheel 26 is adjustable in position and is installed on the fixed seat 23. The position adjustment direction of the guide wheel 26 is staggered with the transmission direction of the roller way body 1. The fixed seat 23 is adjustable in position and is installed on the roller way body 1, and the adjustment direction of the fixed seat 23 is parallel to the transmission direction of the roller way body 1. The guide wheel 26 and the fixed seat 23 which are adjustable in position can change the running trajectories of coils 3 with different specifications, and the application range is increased.

[0020] During installation, the tail end of the guide wheel 26 will be inserted between the rollers in the roller way body 1 to play a role of limiting and fixing, so that the guiding mechanism 2 will not be offset.

[0021] As shown in FIG. 3, a bracket 22 is fixedly connected to the fixed seat 23. The bracket 22 is erected

on the roller way body 1. A base 21 is fixedly connected to the bracket 22. The base 21 is located outside the roller way body 1. The base 21 plays the role of increasing the counterweight, thus improving the stability of the guiding mechanism 2 after being erected.

[0022] As shown in FIG. 2, FIG. 3 and FIG. 4, the fixed seat 23 is provided with a notch 231 for the guide wheel 26 to move. The top surface of the fixed seat 23 is provided with a supporting arm 24 and two positioning plates 27. The supporting arm 24 and the notch 231 are both located between the two positioning plates 27. The positioning plate 27 is provided with an adjusting hole 271 extending to the center line of the roller way body 1. A fixed screw 28 is provided in the adjusting hole 271. A rod part of the fixed screw 28 is in threaded connection with the supporting arm 24. The bottom surface of the supporting arm 24 is provided with an axle 25. The guide wheel 26 and the axle 25 are rotatably connected and axially fixed. The design of the notch 231 on the fixed seat 23, the supporting arm 24 and the adjusting hole 271 on the positioning plate 27 can make the guide wheel 26 move longitudinally to adjust the distance between the guide wheels 26 at both sides according to the coil size.

[0023] As shown in FIG. 2 and FIG. 4, guide plates 29 are provided at both sides of the fixed seat 23. The guide plates 29 are fixed by welding, which can effectively prevent the head and tail of the wire from entering the gap between the guide wheel 26 and the inner side of the roller way body 1 and avoid production accidents such as inverted insertion and a large number of crawling.

[0024] The present disclosure relates to a usage method of a cooling roller way. The method comprises the following steps: according to the rolling specifications of a coil 3, adjusting the distance between two adjacent guide wheels 26 at the same side of the roller way body 1 or/and adjusting the length of the guide wheels 26 extending to the center of the roller way body 1, so that the guide wheel 26 is in contact with the coil 3 so as to change the running trajectory of the coil 3, and finally the running trajectory is S-shaped, so that the overlapping points 31 of the coil 3 are staggered in order. The distribution distance is 2 to 4 meters.

[0025] Guide wheels are additionally installed at both sides of the cooling roller way of the high-speed wire, which can change the running trajectory of the spinning coil 3, stagger the overlapping points of the stacking coil 3 transported on the cooling roller way in order, make the cooling speed uniform, reduce the temperature difference between high and low temperature points of the high-speed wire coil 3, and make the cooling uniform, thus ensuring the uniform performance of the microstructure of the overall length of the high-speed wire.

[0026] Inspired by the above-mentioned ideal embodiment according to the present disclosure, those skilled in the art can make various changes and modifications in the scope without deviating from the technical idea of the present disclosure through the above description. The technical scope of the present disclosure is not limited to the contents in the specification. The technical scope must be determined according to the scope of the appended claims.

Claims

1. A cooling roller way for improving the cooling uniformity of a spinning coil, comprising a roller way body (1) and several guiding mechanisms (2) installed at both sides of the roller way body (1), wherein the guiding mechanisms (2) at both sides of the roller way body (1) are staggered, the roller way body (1) is used to transport a coil (3), and the guiding mechanisms (2) are used to change the running trajectory of the coil (3), so that overlapping points (31) of the coil (3) are uniformly distributed; wherein the guiding mechanism (2) comprises a fixed seat (23) and a guide wheel (26), the guide wheel (26) is adjustable in position and is installed on the fixed seat (23), and the position adjustment direction of the guide wheel (26) is staggered with the transmission direction of the roller way body (1); and wherein guide plates (29) are provided at both sides of the fixed seat (23).

2. The cooling roller way for improving the cooling uniformity of a spinning coil according to claim 1, wherein a bracket (22) is fixedly connected to the fixed seat (23), the bracket (22) is erected on the roller way body (1), a base (21) is fixedly connected to the bracket (22), and the base (21) is located outside the roller way body (1).

3. The cooling roller way for improving the cooling uniformity of a spinning coil according to claim 1, wherein the fixed seat (23) is provided with a notch (231) for the guide wheel (26) to move, the top surface of the fixed seat (23) is provided with a supporting arm (24) and two positioning plates (27), the supporting arm (24) and the notch (231) are both located between the two positioning plates (27), the positioning plate (27) is provided with an adjusting hole (271) extending to the center line of the roller way body (1), a fixed screw (28) is provided in the adjusting hole (271), a rod part of the fixed screw (28) is in threaded connection with the supporting arm (24), the bottom surface of the supporting arm (24) is provided with an axle (25), and the guide wheel (26) and the axle(25) are rotatably connected and axially fixed.

4. Use of the cooling roller way according to any one of claims 1-3, wherein the use comprises the following steps: according to the rolling specifications of a coil (3), adjusting the distance between two adjacent guide wheels (26) at the same side of the roller way body (1) or/and adjusting the length of the guide

wheels (26) extending to the center of the roller way body (1), so that the guide wheel (26) is in contact with the coil (3) so as to change the running trajectory of the coil (3), and finally the running trajectory is S-shaped, so that the overlapping points (31) of the coil (3) are staggered in order.

Patentansprüche

1. Kühlrollenweg zur Verbesserung der Kühlgleichmäßigkeit einer Spinnspule, umfassend einen Rollenwegkörper (1) und mehrere Führungsmechanismen (2), die an beiden Seiten des Rollenwegkörpers (1) angebracht sind, wobei die Führungsmechanismen (2) an beiden Seiten des Rollenwegkörpers (1) versetzt angeordnet sind, der Rollenwegkörper (1) zum Transport einer Spule (3) vorgesehen ist und die Führungsmechanismen (2) dazu dienen, die Laufbahn der Spule (3) zu verändern, so dass Überlappungspunkte (31) der Spule (3) gleichmäßig verteilt sind; wobei der Führungsmechanismus (2) einen Festsitz (23) und ein Führungsrad (26) umfasst, das Führungsrad (26) in seiner Position einstellbar ist und am Festsitz (23) angebracht ist, und die Positionseinstellrichtung des Führungsrades (26) versetzt zur Übertragungsrichtung des Rollenwegkörpers (1) ist; und wobei an beiden Seiten des Festsitzs (23) Führungsbleche (29) vorgesehen sind.

2. Kühlrollenweg zur Verbesserung der Kühlgleichmäßigkeit einer Spinnspule nach Anspruch 1, wobei eine Halterung (22) fest mit dem Festsitz (23) verbunden ist, die Halterung (22) auf dem Rollenwegkörper (1) aufgestellt ist, eine Basis (21) fest mit der Halterung (22) verbunden ist und die Basis (21) außerhalb des Rollenwegkörpers (1) angeordnet ist.

3. Kühlrollenweg zur Verbesserung der Kühlgleichmäßigkeit einer Spinnspule nach Anspruch 1, wobei der Festsitz (23) mit einer Aussparung (231) für die Bewegung des Führungsrades (26) versehen ist, die Oberseite des Festsitzs (23) mit einem Stützarm (24) und zwei Positionierungsplatten (27) versehen ist, der Stützarm (24) und die Aussparung (231) beide zwischen den zwei Positionierungsplatten (27) angeordnet sind, die Positionierungsplatte (27) mit einem Einstellloch (271) versehen ist, das sich zur Mittellinie des Rollenwegkörpers (1) erstreckt, eine Feststellschraube (28) im Einstellloch (271) vorgesehen ist, ein Stangenteil der Feststellschraube (28) in Gewindeverbindung mit dem Stützarm (24) steht, die Unterseite des Stützarms (24) mit einer Achse (25) versehen ist und das Führungsrad (26) und die Achse (25) drehbar verbunden und axial fixiert sind.

4. Verwendung des Kühlrollenwegs nach einem der vorhergehenden Ansprüche 1-3, wobei die Verwendung folgende Schritte umfasst: gemäß den Walzspezifikationen einer Spule (3) Einstellen des Abstands zwischen zwei benachbarten Führungsrädern (26) auf derselben Seite des Rollenwegkörpers (1) und/oder Einstellen der Länge der Führungsräder (26), die sich zur Mitte des Rollenwegkörpers (1) erstrecken, so dass das Führungsrad (26) in Kontakt mit der Spule (3) steht, um die Laufbahn der Spule (3) zu verändern, und schließlich die Laufbahn S-förmig ist, so dass die Überlappungspunkte (31) der Spule (3) nacheinander versetzt sind.

Revendications

1. Un chemin de roulement de refroidissement pour améliorer l'uniformité de refroidissement d'une bobine de filage, comprenant un corps de chemin de roulement (1) et plusieurs mécanismes de guidage (2) installés sur les deux côtés du corps de chemin de roulement (1), dans lequel les mécanismes de guidage (2) sur les deux côtés du corps de chemin de roulement (1) sont décalés, le corps de chemin de roulement (1) est utilisé pour transporter une bobine (3), et les mécanismes de guidage (2) sont utilisés pour modifier la trajectoire de déplacement de la bobine (3), de sorte que les points de chevauchement (31) de la bobine (3) soient uniformément répartis ; dans lequel le mécanisme de guidage (2) comprend un siège fixe (23) et une roue de guidage (26), la roue de guidage (26) est réglable en position et est installée sur le siège fixe (23), et la direction de réglage de position de la roue de guidage (26) est décalée par rapport à la direction de transmission du corps de chemin de roulement (1) ; et dans lequel des plaques de guidage (29) sont disposées sur les deux côtés du siège fixe (23).

2. Le chemin de roulement de refroidissement selon la revendication 1,
dans lequel un support (22) est fixé de manière connectée au siège fixe (23), le support (22) est érigé sur le corps de chemin de roulement (1), une base (21) est fixée de manière connectée au support (22), et la base (21) est située à l'extérieur du corps de chemin de roulement (1).

3. Le chemin de roulement de refroidissement selon la revendication 1,
dans lequel le siège fixe (23) est pourvu d'une encoche (231) pour le déplacement de la roue de guidage (26), la surface supérieure du siège fixe (23) est pourvue d'un bras de support (24) et de deux plaques de positionnement (27), le bras de support (24) et l'encoche (231) sont tous deux situés entre les deux plaques de positionnement (27), la plaque de

positionnement (27) est pourvue d'un trou de réglage (271) s'étendant jusqu'à la ligne centrale du corps de chemin de roulement (1), une vis de fixation (28) est disposée dans le trou de réglage (271), une partie tige de la vis de fixation (28) est en connexion filetée avec le bras de support (24), la surface inférieure du bras de support (24) est pourvue d'un axe (25), et la roue de guidage (26) et l'axe (25) sont connectés de manière rotative et fixés axialement.

4. Une utilisation du chemin de roulement de refroidissement selon l'une quelconque des revendications 1 à 3, dans laquelle l'utilisation comprend les étapes suivantes : selon les spécifications de roulement d'une bobine (3), régler la distance entre deux roues de guidage (26) adjacentes du même côté du corps de chemin de roulement (1) ou/et régler la longueur des roues de guidage (26) s'étendant vers le centre du corps de chemin de roulement (1), de sorte que la roue de guidage (26) soit en contact avec la bobine (3) afin de modifier la trajectoire de déplacement de la bobine (3), et finalement la trajectoire de déplacement est en forme de S, de sorte que les points de chevauchement (31) de la bobine (3) soient décalés en ordre.

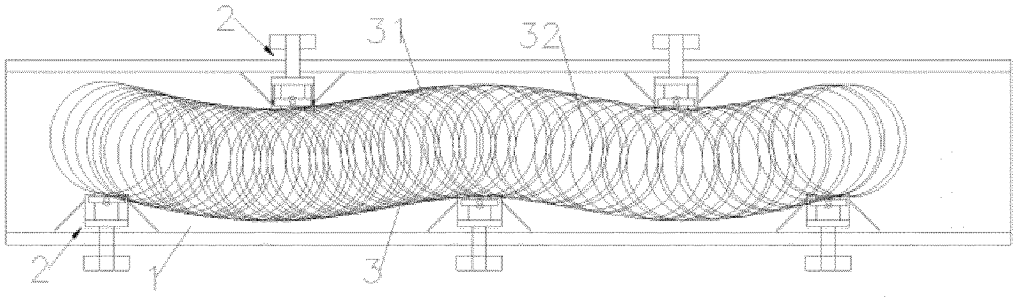

FIG. 1

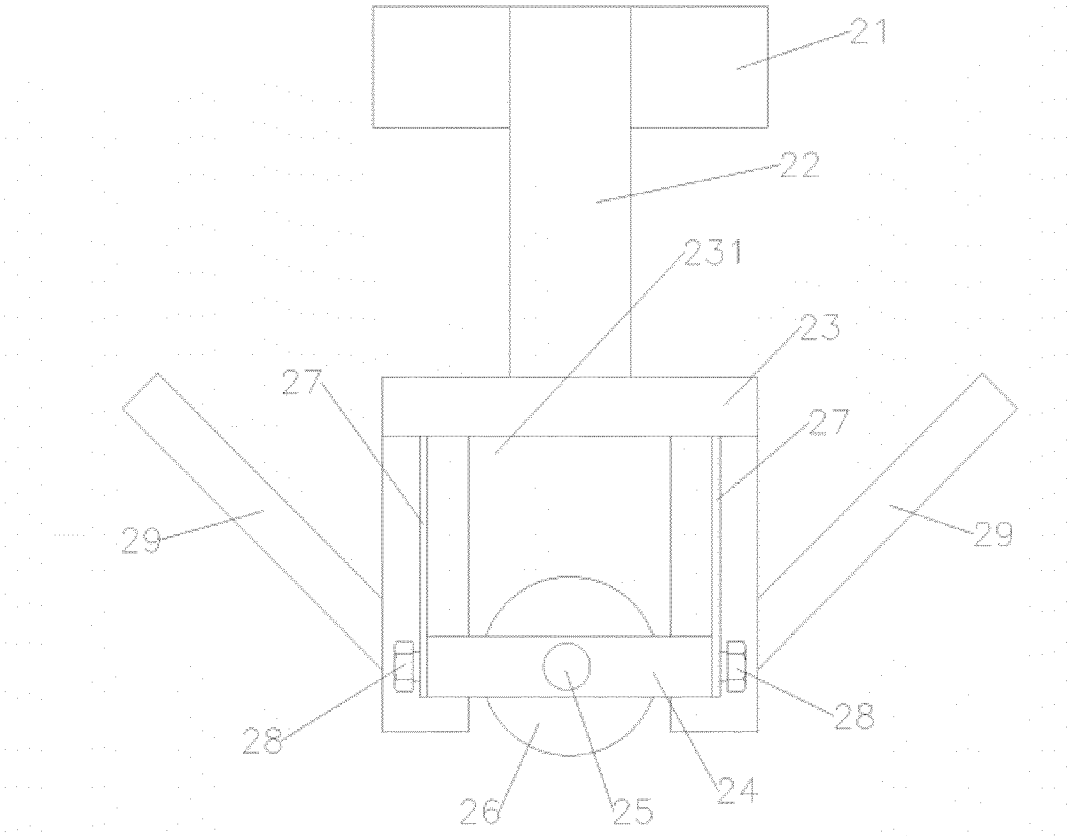

FIG. 2

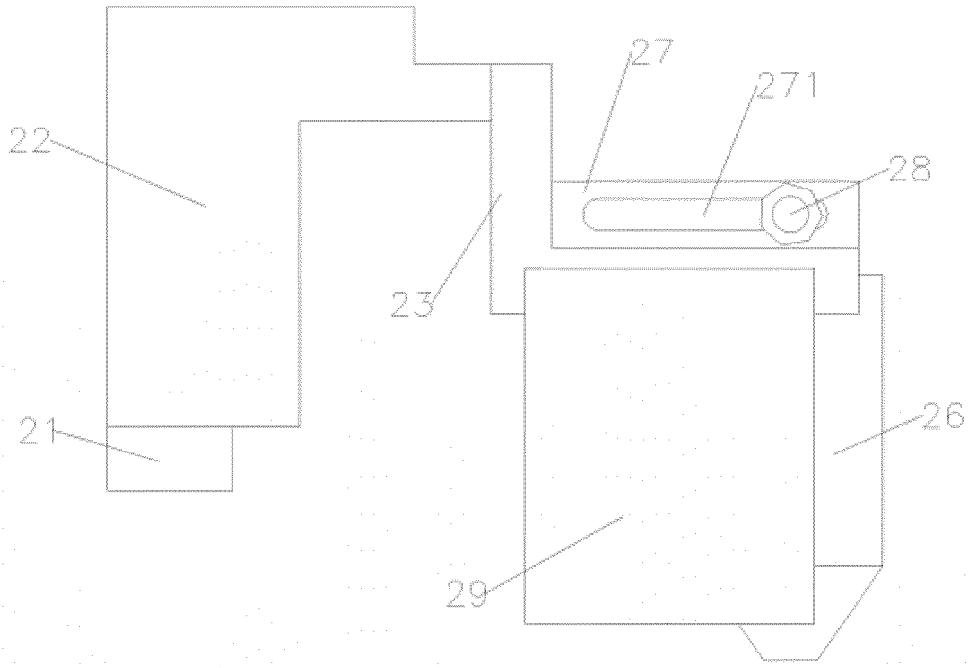

FIG. 3

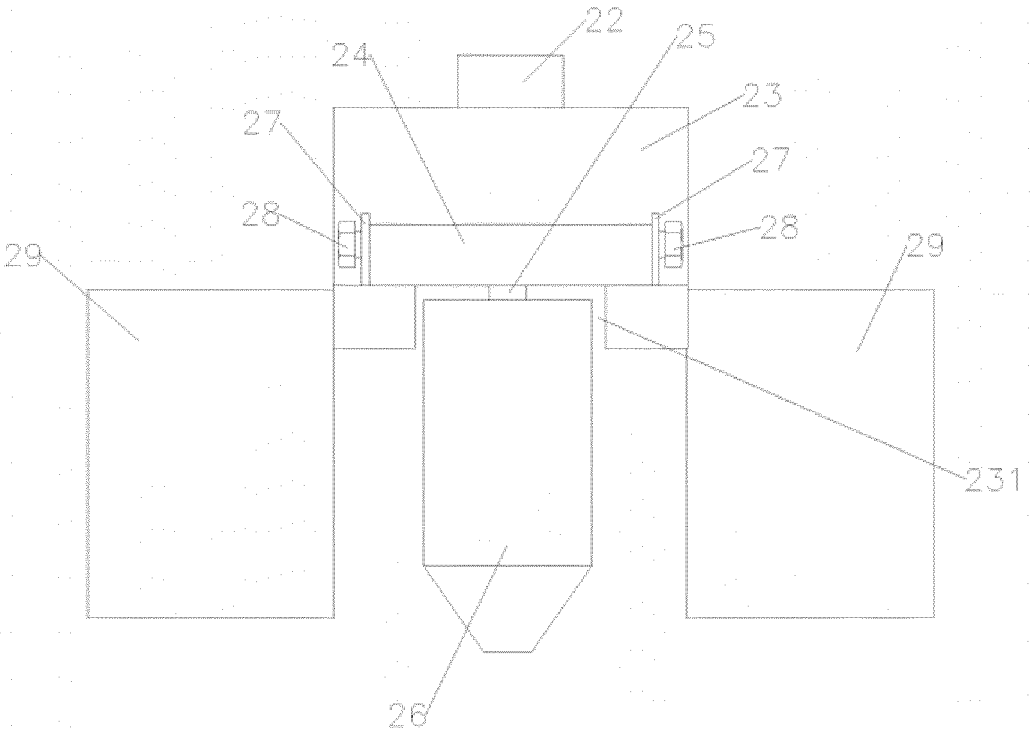

FIG. 4

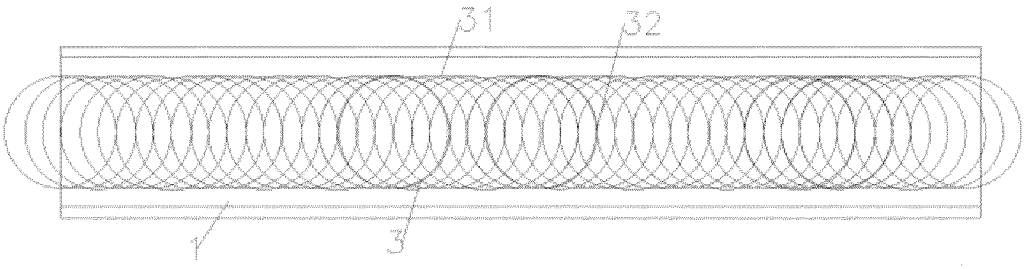

FIG. 5

REFERENCES CITED IN THE DESCRIPTION

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