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(54) **Device for cleaning concrete mixers**

Vorrichtung zum Reinigen von Betonmischern

Dispositif de nettoyage de bétonnières

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(56) References cited:
EP-A- 0 608 191 DE-A1- 3 114 307
US-A- 4 246 041

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192420 A (TAIHEIYO KIKO KK), 30 July 1996
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Description

[0001] The present invention refers to a device for vigorous cleaning of the inside of concrete mixers, and in particular, for cleaning the paddle, the element which does the mixing.

[0002] Devices for cleaning concrete mixers do exist and consist in an array of fixed pipes containing orifices for spraying a cleaning fluid onto the elements of the mixer most likely to get dirty. This solution has the drawback that the fluid is always sprayed onto the same parts and the cleaning process is therefore never complete, and there is also the problem that even though the paddle is moving, several nozzles are always needed, at least 3 or 4, and more nozzles are required if the area to be cleaned increases, incurring an additional cost of installing and maintaining several nozzles and distributors for the operation thereof.

[0003] An object of the present invention is to provide a device for cleaning concrete mixers which is a permanent and integral part thereof, producing a vigorous projection of cleaning fluid that reaches all parts of the inside of the mixer using a single nozzle.

[0004] To achieve the proposed object, a device has been developed which can be incorporated in the lid sealing the upper part of the drum, which is the outer container of the mixer, and which basically consists in a hollow main axle whose rotating action is driven by a motor, the lower part of the axle extending out at a right-angle into an arm with a nozzle holder at the end and a nozzle which can accommodate a plurality of spray orifices, which spins freely in the nozzle holder. Document EP0608191 discloses a similar device, when however the nozzle does not spin relatively to the nozzle holder.

[0005] A first pipe runs along the inside of the main axle, whose upper part connects to the external supply of cleaning fluid via a rotary connector, while a cleaning fluid supply tube leads out from its lower part, which is inside the mixer, and ends in a mobile chamber in the nozzle holder. The spray orifices on the nozzle are connected to a second internal pipe, which leads to the mobile chamber in the nozzle holder, enabling the cleaning fluid to be projected through the nozzle spray orifices, with the fluid entering the hollow axle via the rotary connector.

[0006] As already explained, the rotating arm with the nozzle holder on the end is moved by a motor and, in turn, the nozzle is forced to spin around its longitudinal axis, by sufficient mobilization which is automatically produced using the circular movement of the rotating arm. This means of mobilization may, preferably, consist of a single chain engaging with a fixed cog, which forms part of the mixer lid, and with a mobile cog, which is an integral part of the nozzle.

[0007] To complement the above description and provide a better understanding of the characteristics of the invention, a detailed description is given of a preferred embodiment, using a set of drawings attached to this

specification in which the following figures are represented (given as a guide only and are in no way restrictive).

Figure 1 shows a schematic ground view of the device being the object of this invention.

Figure 2 shows a schematic elevational cross-section view of the invention device, showing in detail the rotary cleaning-fluid supply connector unit and the nozzle situated on the end of the rotating arm.

[0008] In these figures, the numerical references correspond to the following parts and elements:

1. Mixer
2. Paddle
3. Drum
4. Motor
5. Hollow main axle
6. Rotating arm
8. Mobile cog
9. Chain
10. Fixed cog
11. Rotary connector
12. Supply tube
13. Nozzle holder
14. Nozzle
15. Fluid projection
16. Paddle mechanism
17. Lid
18. Drive gear
19. Driven gear
20. Spray orifices
21. Fixed chamber
22. Mobile chamber
23. Watertight joints
24. First pipe
25. Second pipe
26. Bearings

[0009] As can be seen in Figures 1 and 2, the mixer cleaning device (1) is situated on the lid (17) covering the drum (3), which is the external container of the mixer. A freely rotating, hollow main axle (5), passes through the lid (17), guided on bearings (26), producing a first pipe (24) which is connected to a fixed chamber (21) situated on a rotary connector (11) to which the external supply of cleaning fluid is connected. The hollow main axle (5) extends out at a right-angle from its lower part into a rotating arm (6) which moves with the hollow main axle (5), when the latter is powered by a motor (4) via a drive gear (18) and a driven gear (19).

[0010] The end of the rotating arm (6) extends into a nozzle holder (13) containing a freely-spinning nozzle (14) with a plurality of spray orifices (20), whose upper part ends in a mobile cog (8) with which a chain engages (9), the chain being coupled to a fixed cog (10) which forms part of the lid (17).

[0011] A supply tube (12) connects the first pipe (24) of the hollow main axle (5) to the mobile chamber (22) in the nozzle holder (13).

[0012] Both the hollow main axle (5) and the nozzle (14) are fitted with watertight joints (23).

[0013] The device functions as follows: when the paddle (2) is to be cleaned, as it has become clogged up as it turns, during the concrete mixing process driven by the paddle mechanism (16), the motor (4) is activated at the same time the rotary connector (11) is fed with cleaning fluid. The fluid enters the fixed chamber (21) passing to the first pipe (24) of the hollow main axle (5) and, via the supply tube (12) to the mobile chamber (22) in the nozzle holder (13), reaching the spray orifices (20) connected to the second pipe (24).

[0014] A vigorous projection of fluid (15) thus reaches all parts of the inside of the mixer (1), caused by the spinning movement of the nozzle (14) (around the hollow main axle (5) and around its own axis). The projections from the nozzle (14) are infinite and always spray in different directions.

[0015] It will be obvious to those skilled in the art, that determined variants and modifications, allowing the device to be adapted to different manufacturing methods and paddle design, will comply with the claim. For example, in the specification of preferred embodiment, a means of mobilizing the nozzle (14) has been given in the form of a chain (9), but any equivalent mechanism such as a gear pair or a flat or toothed belt on pulleys, could have been used.

[0016] Similarly, the rotary connector (11), the hydraulic part of the nozzle holder (13) and, the whole circuit in general through which the cleaning fluid flows, can be produced in a variety of ways that do not affect the essential nature of the invention.

Claims

1. Device for cleaning concrete mixers, **characterized in that** it comprises:

- a lid (17) which forms part of the external container of the mixer (1),
- a hollow main axle (5) which, passing through the lid (17), is forced to rotate on its axis by a motor (4), with a first pipe (24) inside, which is fed with cleaning fluid via a rotary connector (11), and an extension at a right-angle in the form of a rotating arm (6) with a nozzle holder (13) situated on the end, **characterized in that** the device further comprises a nozzle (14), which spins freely in the nozzle holder (13), with a second pipe (25) inside, connected to a plurality of spray orifices (20) and connected to a mobile chamber (22) in the nozzle holder (13),
- a supply tube (12) which connects the first pipe (24) of the hollow main axle (5) to the mobile

chamber (22) in the nozzle holder (13),

- means of mobilizing the nozzle (14) on its axis, when making a circular movement, driven by the rotating arm (6).

2. Device for cleaning concrete mixers, according to claim 1, **characterized in that** the rotary connector (11) includes a fixed chamber (21) connected to the cleaning fluid supply, which connects to the first pipe (24) of the hollow main axle (5).

3. Device for cleaning concrete mixers, according to claim 1, **characterized in that** the means of mobilizing the nozzle (14) on its axis comprises a chain (9) which engages with a fixed cog (10) which forms part of the lid (17), and with a mobile cog (8), which is an integral part of the nozzle (14).

Patentansprüche

1. Vorrichtung zum Reinigen von Betonmischern, **dadurch gekennzeichnet, dass** sie Folgendes umfasst:

- einen Deckel (17), der Teil eines externen Containers des Mixers (1) ist,
- eine hohle Hauptwelle (5), die durch den Deckel (17) verläuft und durch einen Motor (4) gezwungen wird, um ihre Achse zu drehen, mit einem ersten Rohr (24) innen, das mit Reinigungsflüssigkeit versorgt wird durch eine rotierende Verbindung (11) und eine Verlängerung im rechten Winkel in Form eines rotierenden Arms (6) mit einem Düsenhalter (13), der sich an dem Ende befindet, **dadurch**, dass die Vorrichtung ausserdem Folgendes umfasst:
- eine Düse (14), die frei in dem Düsenhalter (13) dreht, mit einem zweiten Rohr (25) Innen, das an viele Sprayöffnungen (20) angeschlossen ist und an eine bewegliche Kammer (22) in dem Düsenhalter (13) angeschlossen ist,
- ein Versorgungsrohr (12), das das erste Rohr (24) der hohlen Hauptwelle (5) mit der beweglichen Kammer (22) in dem Düsenhalter (13) verbindet.
- Mittel, um die Düse (14) auf ihrer Achse in Bewegung zu setzen, wenn eine vom rotierenden Arm (6) angetriebene kreisförmige Bewegung ausgeführt wird.

2. Vorrichtung zum Reinigen von Betonmischern gemäss Anspruch 1, **dadurch gekennzeichnet, dass** die rotierende Verbindung (11) eine feste Kammer (21) umfasst, die an die Reinigungsflüssigkeitsversorgung angeschlossen ist, die mit dem ersten Rohr (24) der hohlen Hauptwelle (5) verbunden ist.

3. Vorrichtung zum Reinigen von Betonmischern gemäss Anspruch 1, **dadurch gekennzeichnet, dass** die Mittel, die die Düse (14) in Bewegung setzen auf ihrer Achse eine Kette (9) aufweisen, die in ein festes Zahnrad (10) eingreift, das Teil des Deckels (17) ist und mit einem beweglichen Zahnrad (8), das Bestandteil der Düse (14) ist. 5

Revendications

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1. Dispositif pour nettoyer des bétonnières, **caractérisé en ce qu'il comprend :**

- un couvercle (17) qui fait partie du récipient extérieur du malaxeur (1), 15
- un arbre principal creux (5) qui, en passant à travers le couvercle (12) est forcé de tourner sur son axe par un moteur (49, avec une première conduite (24) à l'intérieur, qui est alimenté en fluide de nettoyage, au moyen d'un connecteur rotatif (11), et une extension formant un angle droit sous la forme d'un bras rotatif (6) avec un porte-buse (13) situé à l'extrémité, **caractérisé en ce que** le dispositif, comprend en outre, 20
- une buse (14) qui tourne librement dans le porte-buse (13), avec une deuxième conduite (25) à l'intérieur, connectée à une pluralité d'orifice de pulvérisation (20) et connectée à une chambre mobile (22) dans le porte-buse (13). 25
- un tube d'alimentation (12) qui connecte la première conduite (24) de l'arbre principal creux (5) à la chambre mobile (22) dans le porte-buse (13). 30
- des moyens de mobilisation de la buse (14) sur l'axe, lorsqu'elle fait un mouvement circulaire, actionnée par le bras rotatif (6). 35

2. Dispositif pour nettoyer des bétonnières, selon la revendication 1, **caractérisé en ce que** le connecteur rotatif (11) comprend une chambre fixe (21) connectée à l'alimentation de fluide de nettoyage, qui se connecte à la première conduite (24) de l'arbre principal creux (5). 40

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3. Dispositif pour nettoyer des bétonnières, selon la revendication 1, **caractérisé en ce que** les moyens de mobilisation de la buse (14) sur son axe comprend une chaîne (9) qui s'accouple avec une dent fixe (10) qui fait partie du couvercle (17), et avec une dent mobile (8), qui est une partie intégrante de la buse (14). 50

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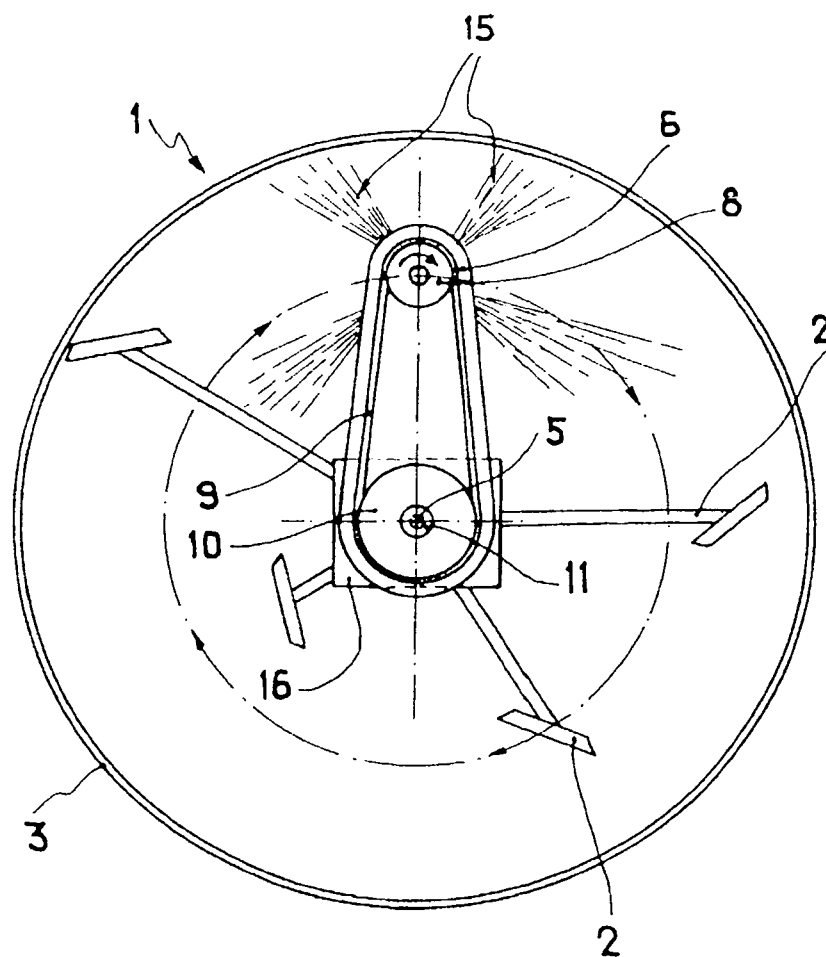


FIG. 1

