

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 724 940 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

04.06.2003 Bulletin 2003/23

(51) Int Cl.7: **B28C 5/14**

(21) Application number: **96101175.6**

(22) Date of filing: **29.01.1996**

(54) **A bucket mixer for mixing solid aggregates and delivering the mixture**

Einrichtung zum Mischen und Fördern von Schüttgütern

Dispositif pour mélanger et fournir des matériaux en vrac

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IT LI NL PT SE

(30) Priority: **03.02.1995 IT TO950024 U**

(43) Date of publication of application:
07.08.1996 Bulletin 1996/32

(73) Proprietor: **DITTA PORELLO G. BATTISTA**
12060 Pollenzo (CN) (IT)

(72) Inventor: **Battista, Porello G.**
I-12060 Pollenzo CN (IT)

(74) Representative: **Lotti, Giorgio et al**
c/o Ing. Barzanò & Zanardo Milano S.p.A.
Corso Vittorio Emanuele II, 61
10128 Torino (IT)

(56) References cited:

EP-A- 0 284 929	EP-A- 0 474 538
FR-A- 2 581 894	IT-A- 1 210 783
US-A- 4 223 996	US-A- 4 478 515
US-A- 4 660 987	

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 0 724 940 B1

Description

[0001] The present invention refers to a bucket mixer for mixing solid aggregates and delivering the mixture. More particularly, the invention relates to a bucket mixer for mixing solid aggregates such as concrete aggregates, of the kind comprising a vessel and an inner mixing screw rotating about an axis parallel to the longitudinal axis of the vessel.

[0002] Furthermore, the bucket mixer of this invention is of the kind providing a plurality of blades mounted to the peripheral part of the mixing screw so as to extend radially as far as near to the edge of the vessel, the blades being oriented at a winding direction opposite to that of the mixing screw so as to attain the double effect of cleaning or scraping the vessel walls and urge the material in the opposite direction of that imparted by the mixing screw during operation of the bucket mixer.

[0003] U.S. patent No. 4,223,996 discloses an apparatus of the above discussed kind and suggests that the blades can be welded or otherwise secured in a rigid manner, permanently or removably, to the peripheral part of the mixing screw. According to this document, fixing is accomplished by restraining the inner edge of the blade in a recess obtained in the mixing screw. This solution first of all weakens the mixing screw at the points where the recesses are. Further, it makes it difficult to provide a system for releasably securing the blade to the peripheral part of the mixing screw, as these two members are substantially at a right angle with respect to each other in a point where they undergo considerably high torsion stresses. Finally, for the same reasons also the blade tends to deform rapidly. Replacing the blade may become difficult or impossible due to the manner in which it is coupled to the mixing screw.

[0004] Italian patent No. 1,210,783 which is considered to represent the closest state of the art discloses a bucket mixer according to the preamble of the independent claim 1, wherein each blade is pivotally mounted to a support welded to the mixing screw, in order to rotate from a retracted position near the axis of the mixing screw to an extended position in proximity of the vessel.

[0005] Practice has shown that with time, if thorough and cleaning is not carried out continuously, concrete or any other material being mixed solidifies in the interstices between the blade and the support, thereby locking the blade in a position. This cancels any benefit that pivotal mounting of the blade could involve. Further, should locking occur when the blade is retracted, the bottom of the vessel can no longer be scraped and cleared. Finally, replacing the blades is an extremely difficult and complex operation.

[0006] It has also been found that it is not necessary that the blades rotate to contact the walls of the vessel to attain efficient and complete cleaning. As the blades wear out with time, some provision should instead be made to allow for replacing the blades rapidly in ab-

sence of binding systems to the mixing screw which weaken either members.

[0007] These and further objects which will be more apparent hereinafter are attained according to the present invention by the provision of a bucket mixer for mixing solid aggregates and delivering the mixture; according to claim 1.

[0008] For a better understanding of the present invention, reference is made to the following detailed description considered in combination with the accompanying drawings in which:

FIG. 1 is a substantially front view of a bucket mixer useful for the understanding of the invention, but not as part of the invention;

FIG. 2, is a view of a mixing blade according to the present invention; and

FIG. 3, is the view of the blade of the previous figure as seen in the direction of arrow A.

[0009] A bucket mixer of known kind provides a vessel 10 for containing the products to be mixed. Within vessel 10 there is mounted a mixing screw 11 rotating about a central longitudinal axle consisting of a shaft 12.

[0010] Still in known manner, along the peripheral part of mixing screw 11 there are mounted blades 13 forming preset angles therebetween. The blades 13 are oriented perpendicular to the mixing screw 11 and directed towards the inner wall of the vessel 10, so as to provide counter-current mixing with respect to mixing screw 11 and clear the inside of vessel 10 during mixing.

[0011] According to the present invention, the blades 13 are rigidly fixed, by means of bolts 14, to an intermediate bracket 16 which is itself rigidly fixed, by means of bolts 14 to a support 15 welded to the peripheral part of the mixing screw 11.

[0012] As depicted in the drawings, in the solution of FIGS. 2 and 3 the support 15 is a flat base. Interposed between the flat support 15 and the flat blade 13 there is an L-shaped bracket 16 connected by bolts 14 to either members 13 and 15 (as shown in FIGS. 2 and 3).

[0013] The blade is rigidly fixed to the bracket 16 which is connected by bolts 14 to the support 15 itself welded to the mixing screw but in such way as not to cause deformation in either bodies and be easily replaced when worn or in case of failure. In addition, no blades maintenance (washing) is required as there are no parts reciprocally moving during operation.

Claims

1. A bucket mixer for mixing solid aggregates and delivering the mixture, comprising:

- a vessel (10);
- counter-current mixing means in turn comprising a mixing screw (11) mounted inside the ves-

sel (10) and extending substantially throughout the whole bucket mixer, and a number of blades (13) carried by the peripheral part of the mixing screw (11) and radially extending from the edge thereof to near the inner wall of the vessel (10), the blades (15) being oriented at a winding direction opposite to that of the mixing screw (11) so as to provide counter-current mixing with respect to the mixing screw (11); and

- a support (15) for each blade (13) to fix the relevant blade (13) to the mixing screw (11), each support (15) being welded to the peripheral part of the mixing screw (11);

the bucket mixer being **characterised in that** it further comprises an intermediate bracket (16) between the blade and the support (15) and releasable fixing members (14) to fix rigidly and entirely in a releasable manner each blade (13) to the relevant intermediate bracket (16) and in turn each bracket (16) to the relevant support (15), the releasable fixing members (14) being bolts.

2. A bucket mixer as claimed in claim 1, **characterised in that** the intermediate bracket (16) is L-shaped.

Patentansprüche

1. Bechermischer zum Mischen fester Aggregate und Abgeben des Gemisches, umfassend:

- ein Gefäß (10);
- Gegenstrommischmittel, welche ihrerseits eine Mischschnecke (11), die innerhalb des Gefäßes (10) angebracht ist und sich im Wesentlichen durch den gesamten Bechermischer erstreckt, und eine Reihe von Schaufeln (13), die durch den Umfangsteil der Mischschnecke (11) getragen werden und sich radial von der Kante davon bis in die Nähe der Innenwand des Gefäßes (10) erstrecken, umfassen, wobei die Schaufeln (15) in eine Windungsrichtung ausgerichtet sind, welche jener der Mischschnecke (11) entgegengesetzt ist, um Gegenstrommischen in Bezug auf die Mischschnecke (11) vorzusehen; und
- einen Träger (15) für jede Schaufel (13), um die betreffende Schaufel (13) an der Mischschnecke (11) zu befestigen, wobei jeder Träger (15) an den Umfangsteil der Mischschnecke (11) geschweißt ist;

wobei der Bechermischer **dadurch gekennzeichnet ist, dass** er weiterhin eine Zwischenklammer (16) zwischen der Schaufel und dem Träger (15) und lösbare Befestigungsglieder (14), um jede

Schaufel (13) auf eine starre und zur Gänze lösbare Weise an der betreffenden Zwischenklammer (16) und jede Klammer (16) ihrerseits am betreffenden Träger (15) zu befestigen, umfasst, wobei die lösbaren Befestigungsglieder (14) Bolzen sind.

2. Bechermischer nach Anspruch 1, **dadurch gekennzeichnet, dass** die Zwischenklammer (16) L-förmig ist.

Revendications

1. Mélangeur à auget permettant de mélanger des agrégats solides et de décharger le mélange, comprenant :

- une cuve (10) ;
- un moyen de mélange à contre-courant comprenant, à son tour, une vis mélangeuse (11) montée à l'intérieur de la cuve (10) et s'étendant sensiblement à travers l'intégralité du mélangeur à auget, et un certain nombre de pales (13) portées par la partie périphérique de la vis mélangeuse (11) et s'étendant radialement à partir du bord de celle-ci, jusqu'à une position proche de la paroi interne de la cuve (10), les pales (13) étant orientées suivant un sens d'enroulement opposé à celui de la vis mélangeuse (11) de façon à fournir un mélange à contre-courant par rapport à la vis mélangeuse (11) ; et
- un support (15) pour chaque pale (13) afin de fixer la pale concernée (13) à la vis mélangeuse (11), chaque support (15) étant soudé à la partie périphérique de la vis mélangeuse (11) ;

le mélangeur à auget étant **caractérisé en ce qu'il** comprend en outre une plaque de fixation intermédiaire (16) située entre la pale (13) et le support (15), et des éléments de fixation détachables (14) permettant de fixer, intégralement et de manière rigide, chaque pale (13) à la plaque intermédiaire (16) concernée et, à son tour, chaque plaque de fixation (16) au support (15) concerné, les éléments de fixation détachables (14) étant des boulons.

2. Mélangeur à auget selon la revendication 1, **caractérisé en ce que** la plaque de fixation intermédiaire (16) a une forme de L.



