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(54) **Stirring apparatus**
Rührvorrichtung
Dispositif remueur

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- **ANALYTICAL CHEMISTRY, 19 October 1950, Columbus, OH (US); MIXCO, p. 39A**

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EP 0 572 092 B1

Description

The invention relates to a stirring apparatus comprising a standing guide element having a vertically oriented guide path axis, a carriage being slidable and fixable along said guide element and rotatable only in a horizontal plane around said axis, a support for a rotatably driven stirring shaft, said shaft having an axis, said support being arranged for pivoting relative to said carriage only in a vertical plane around a pivot axis passing through said carriage.

Such a stirring apparatus of the type described in the preamble is mainly used for mixing or stirring a mass stored in an open vessel, which vessel is transportable to and away from the stirring apparatus. See for instance ANALYTICAL CHEMISTRY, 19 October 1950, Columbus, USA, pages 39 A, MIXCO "LIGHTNIN MIXERS". To this end it must be possible to retract the stirring apparatus easily from the vessel and the stirring apparatus must also be able to assume the optimum position in relation to the vessel, which requires a great freedom of movement of the stirring apparatus relative to the standing guide. The known stirring apparatuses have drawbacks in respect of this great freedom of movement, which also makes handling of the stirring apparatus difficult.

The invention has for its object to obviate the above stated drawbacks and provides for this purpose a stirring apparatus wherein the pivot axis of said support about said carriage is distanced from said guide path axis of said guide element, whereas the axis of the stirring shaft intersects said pivot axis.

This ensures that the stirring apparatus shaft comes to lie at a greater distance from the guide path, whereby the rotation axis of the stirring apparatus can be set practically vertical, which is favourable for the stirring action in the displaceable vessel.

According to a further feature of the invention the carriage is provided with a bore for receiving a therein fitting sleeve with conically widening head end portion, wherein between the sleeve and the carriage a pulling member is arranged to enable immobilizing of the sleeve relative to the carriage. Thus is achieved so that the fixing of the stirring apparatus shaft in relation to the guide can be sufficiently robust, in order that vibrations and the like are avoided and rotation of the stirring apparatus is prevented during operation.

In this embodiment the stirring apparatus preferably intersects the pivot axis of the support, which also results automatically in a vertical position of the stirring apparatus shaft when the support is released.

Above mentioned and other features of the invention will be further elucidated in the figure description of an embodiment hereinbelow. In the drawing:

fig. 1 shows a perspective standing view of a stirring apparatus according to the invention applied with a vessel movable on wheels,

fig. 2 shows a perspective schematic view of the diverse pivot axes disposed according to the invention,

fig. 3 shows a horizontal cross section through the carriage applied in the stirring apparatus according to the invention.

Designated in the drawings with the numeral 1 is the vertical guide element, here in the form of a smooth pillar, which is provided with a foot 2 so that the guide can be placed as an independent unit on a shop floor. A carriage 3 is slidable up and downward and fixable along the vertical guide 1, which is further elucidated hereinbelow. The carriage is provided with a support 4 which is pivotable on an axis B relative to the carriage and which support 4 carries a flange of an electric motor 8 for the stirring apparatus shaft 6. The stirring apparatus shaft 6 is the screw shaft of the stirring member, which member is shown here in the form of two blades 7. The stirring apparatus can of course have any other construction within the scope of the invention. The stirring shaft 6 is driven here for instance by the electric motor 8 supplied by a voltage source (not shown), which can however be replaced by any drive.

Such a device is suitable for mixing or stirring the contents of a vessel V, wherein the stirring apparatus shaft can assume any random spatial position depending on the position of the carriage 3 in relation to the guide 1, the angular position of stirring apparatus support 4 and the height of carriage 3 along the guide 1.

Fig. 2 shows schematically the position of the different axes. The dashed line A-A corresponds with the axis of the vertical guide 1, the dashed line B-B with the tilt axis B in fig. 1 and the dashed line C-C with the axis of the stirring apparatus shaft 6. According to a feature of the invention the axis B-B crosses the axis A-A at a distance D while the axis C-C intersects the axis B-B. Because the axis C-C comes to lie at a distance from axis A-A when this is situated in the vertical position, it is possible to place the stirring apparatus shaft 6 practically vertically in vessel V. Owing to the intersecting position of axes C-C and B-B the stirring apparatus shaft will always move into the vertical position when the support 4 is not fixed onto the carriage.

Fig. 3 shows a cross section of carriage 3 with the support 4 according to the invention arranged for rotation therein. This shown construction is extremely easy to operate and provides a great stability and robustness of the total device, certainly with respect to the vibrations occurring during stirring.

The components corresponding with those of fig. 1 are designated with the same reference numerals. As can be seen, carriage 3 is embodied with a continuous bore in which the vertical pillar 1 is received close-fittingly. Received in a threaded hole 10 is a lock screw 11, the end surface of which can be placed into contact with the outer periphery of pillar 1. The lock screw 11 can be operated by means of a hand-grip 12, by rotation of

which the lock screw 11 can be moved a further or less far into the threaded hole 10 so that the end surface thereof can be placed in contact with pillar 1. In this manner the carriage 3 can be immobilized in relation to pillar 1 and, vice-versa, when lock screw 11 is loosened the carriage 3 can slide up and downward in vertical sense along pillar 1 and also be rotated on the axis, see also the axis A-A in fig. 2.

Carriage 3 is also embodied with a blind bore 13, the axis B-B of which lies perpendicularly of pillar 1. Received close-fittingly in the blind bore 13 is a sleeve 14, wherein it is noted that the bore widens at 15 at the left-hand end in fig. 3. The sleeve 14 is for the greater part cylindrical and is likewise embodied widening in conical form at the position of the widening 15. Sleeve 14 is close-fitting in the bore 13 such that when the sleeve 14 is pulled to the right in fig. 3 the outer periphery of the conical portion thereof comes into close contact with the inner surface of the widened portion of bore 13. Sleeve 14 can herewith be immobilized in relation to carriage 3. This is effected by means of a pulling element in the form of a screw bolt 16 which is placed centrally with the threaded end thereof in a threaded hole 17 of sleeve 14. The bolt 16 is embodied on the end remote from the sleeve 14 with a thickened cylindrical portion 18 onto which connects a hexagonal head with hand-grip. The thickened cylindrical portion 18 is carried through a cylindrical hole recessed centrally in the bottom of the blind bore 13 and coupled rotatably relative to the carriage 3 by means of washers 19. An axial movement of the bolt relative to the carriage 3 is hereby prevented.

By turning the hand-grip the screw bolt 16 can be turned further or less far into the threaded hole 17, whereby sleeve 14 can be pushed respectively to the right or to the left in the bore 13. The sleeve 14 can similarly be immobilized, as described above, by firmly tightening the bolt 16.

Sleeve 14 serves as connecting element for the screw shaft support 4, which can be formed in random manner and adapted to the form of screw shaft 6. The screw shaft support 4 is embodied with a threaded hole 21 which fits onto a threaded end part 20 of sleeve 14 which lies co-axially of bore hole 17. The fixing between support 4 and sleeve 14 is hereby effected.

The above described angular settings are possible simply by manipulating the hand-grip 12, respectively the hand-grip of the bolt 16.

As stated above, the carriage 3 is placed to height and in the correct angular position with the hand-grip 12, while by manipulating the bolt 16 the sleeve 14 can be released, the support 4 can be rotated relative to the carriage, so that the stirring apparatus shaft 6 can be placed in the correct spatial angular position. By tightening the hexagonal head of bolt 16 the device is immobilized.

Claims

1. Stirring apparatus comprising a standing guide element having a vertically oriented guide path axis (A-A), a carriage (3) being slidable and fixable along said guide element (1) and rotatable only in a horizontal plane around said axis (A-A), a support (4) for a rotatably driven stirring shaft, said shaft having an axis (C-C), said support (4) being arranged for pivoting relative to said carriage (3) only in a vertical plane around a pivot axis (B-B) passing through said carriage, **characterized in that** the pivot axis (B-B) of said support (4) about said carriage is distanced from said guide path axis (A-A) of said guide element (1), whereas the axis (C-C) of the stirring shaft intersects said pivot axis (B-B).

2. Stirring apparatus as claimed in claim 1, **characterized in that** said carriage (3) is provided with a bore (13) for receiving a sleeve (14) having a conically widening head end portion (15), and in that a pulling member (16) is arranged between said sleeve and said carriage.

3. Stirring apparatus as claimed in claim 2, **characterized in that** the sleeve is provided with a screw bore (17) and the pulling member (16) is a screw co-acting therewith.

Patentansprüche

1. Rührvorrichtung mit einem stehenden Führungselement, das eine vertikal orientierte Führungspfadachse (A-A) besitzt, mit einem Schlitten (3), der längs des Führungselementes (1) gleitbar und nur in einer Horizontalebene um diese Achse (A-A) drehbar und am Führungselement festlegbar ist, und mit einem Träger (4) für eine drehbar angetriebene Rührwelle, die eine Achse (C-C) besitzt, wobei der Träger (4) relativ zum Schlitten (3) nur in einer Vertikalebene um eine Schwenkachse (B-B) schwenkbar ist, die durch den Schlitten hindurchläuft,
dadurch gekennzeichnet,
daß die Schwenkachse B-B des Trägers (4) um den Schlitten herum in einem Abstand von der Führungspfadachse (A-A) des Führungselements (1) verläuft, wobei die Achse (C-C) der Rührwelle die Schwenkachse (B-B) schneidet.

2. Rührvorrichtung nach Anspruch 1,
dadurch gekennzeichnet, daß der Schlitten (3) mit einer Bohrung (13) versehen ist, um eine Hülse (14) aufzunehmen, die einen konisch erweiterten Kopfabschnitt (15) besitzt, und daß ein Zugglied (16) zwischen Hülse und Schlitten angeordnet ist.

3. Rührvorrichtung nach Anspruch 2,

dadurch gekennzeichnet, daß die Hülse mit einer Gewindebohrung (17) versehen ist, und daß das Zugglied (16) eine hiermit zusammenwirkende Schraube ist.

Revendications

1. Appareil agitateur comprenant un élément de guidage vertical ayant un axe de chemin de guidage orienté à la verticale (A-A), un chariot (3) pouvant être coulissé et fixé le long dudit élément de guidage (1) et pouvant être tourné uniquement dans un plan horizontal autour dudit axe (A-A), un support (4) pour un arbre agitateur entraîné par rotation, ledit arbre ayant un axe (C-C), ledit support (4) étant agencé pour pivoter par rapport audit chariot (3) uniquement dans un plan vertical autour d'un axe pivot (B-B) passant par ledit chariot, caractérisé en ce que l'axe pivot (B-B) dudit support (4) autour dudit chariot est écarté dudit axe du chemin de guidage (A-A) dudit élément de guidage (1), tandis que l'axe (C-C) de l'arbre agitateur coupe ledit axe pivot (B-B).

2. Appareil agitateur selon la revendication 1, caractérisé en ce que ledit chariot (3) est pourvu d'un trou (13) pour recevoir un manchon (14) ayant une partie d'extrémité de tête s'élargissant de façon conique (15) et en ce qu'un membre de traction (16) est agencé entre ledit manchon et ledit chariot.

3. Appareil agitateur selon la revendication 2, caractérisé en ce que le manchon est pourvu d'un trou fileté (17) et en ce que le membre de traction (16) est une vis co-agissant avec celui-ci.

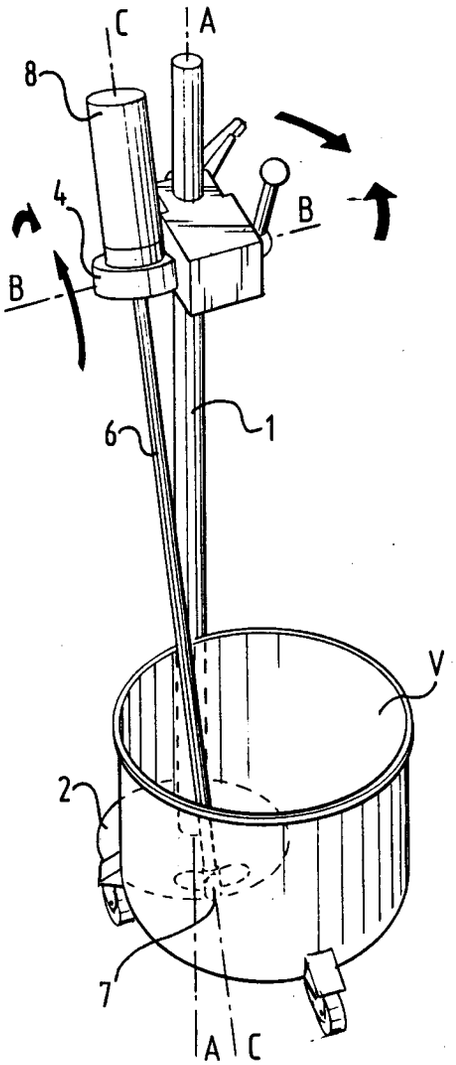


FIG. 1

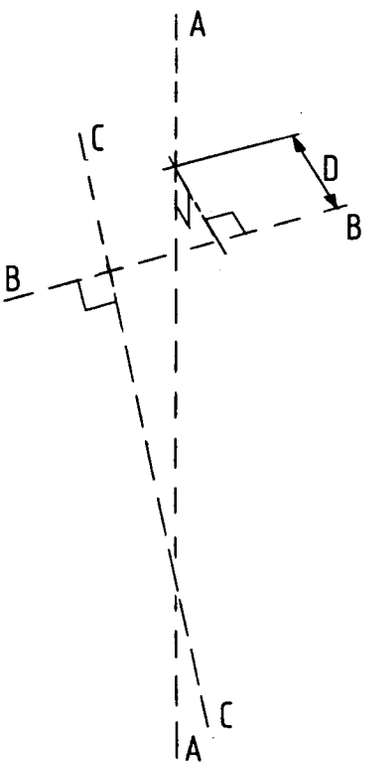


FIG. 2

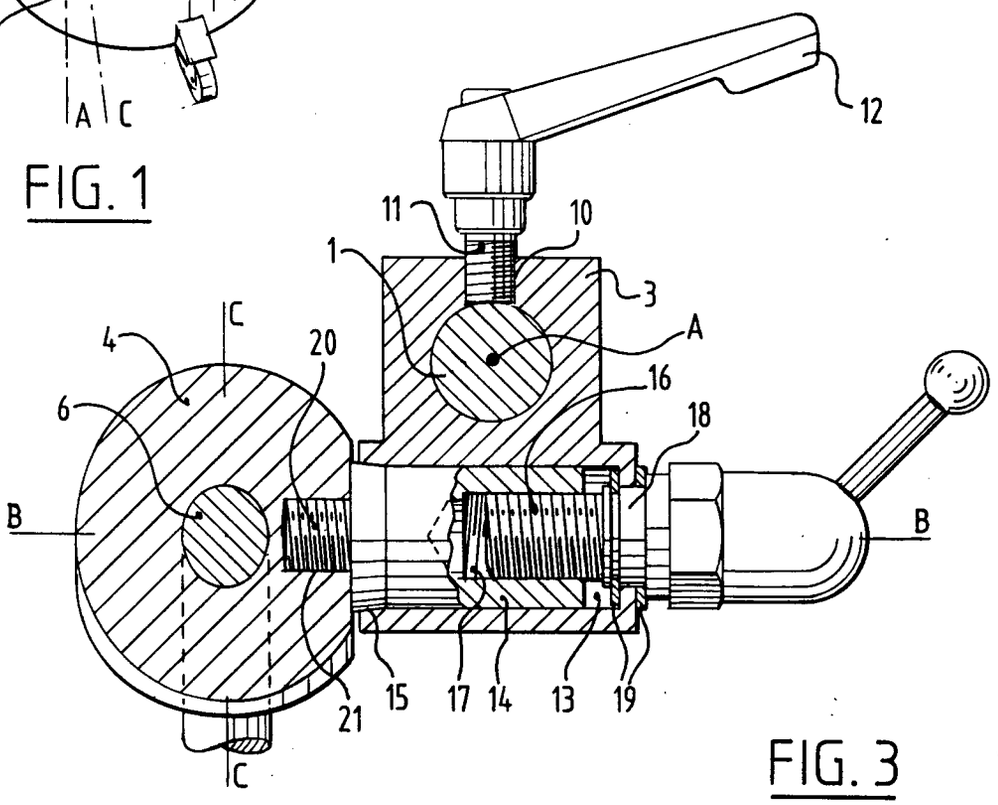


FIG. 3