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(54) **Dehydrating screw press with two or more helical elements with intermeshing profiles**

Entwässerungsschneckenpresse mit zwei oder mehr schraubenförmigen Elementen mit
ineinandergreifenden Profilen

Presse de déshydratation à vis à deux ou plusieurs éléments hélicoïdaux à profils s'emboîtant

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DE-C- 883 338 **GB-A- 677 794**
GB-A- 904 328 **GB-A- 1 140 237**
US-A- 2 567 219

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EP 0 358 837 B2

Description

[0001] The invention refers to a deshydrating screw press with two helical elements, which avoids partial interference zones of the spirals on the product to treat. By using the above mentioned elements side by side, a combined effect of complete conical interference is obtained, in the interspace between their shafts, with a push of the two intersecting spirals, with movement in opposition, which compels the axial advancement of the product.

[0002] The screw presses are used to deshydrate fibrous materials containing liquid; they are particularly used in the sugar beat treatment, in fodder deshydratation, to extract oils and produce meals for fodders from food stuff recovers such as fish and other. The said presses use two or more helical elements which let the product advance from an end, pressing it inside a filtering cage from which the liquid gets out steadily, while the anhydrous residue is discharged from the other end. This causes a bicylindrical interference space of the spiral filtering cage, which gives rise to non-interference zones, as well as other zones with limited interference of the spirals. This intervention difformity and even of non-intervention of the spiral does not grant a uniformity of pressure of the product and causes losses of delivery. In particularly, when the helical elements are used side by side, zones of limited and even of no interference of the spirals occur, where difficulties can be noted in letting the product advance. Consequently, this one tends to stagnate and in particular, owing to the lateral over-stressing caused by the spirals in these zones, heaping may occur with relevant heavy problems. Moreover the difform advancement of the product causes void spaces which crush and damage the anhydrous residue. Therefore, one can affirm that the speed allowed by the installation cannot be completely made most of, because it must be steadily in conformity with the product to treat and production must steadily be checked to enable timely intervention. In fact, GB-A-677 794 discloses a deshydrating screw press with two helical elements with constant profile as defined in the pre-characterising part of claim 1.

[0003] These inconveniences are obviated by a deshydrating screw press with two helical elements with constant profile, working in a filtering cage according to their interference space, as defined in claim 1, which ensures uniformity in the pressing action of the helical element spiral that is steadily operating with space interference to wall limit. In the interspace between the shafts of the helical elements fitted side by side, the system allows the combined effect of complete interference with push of the intersecting parts of the in opposition turning spirals which compels the axial forward move of the product. In connection, since there are no zones without or with limited interference, the system enables to adjust the delivery to the speed of the propellers. In particular, the smaller space existing in the central intermediate

part between the two helical elements, carried out according to the invention, in comparison with the one existing in the already mentioned union with truncated-cone interference, avoids heap-of product; on the contrary, since the two intersecting spirals operate with complete interference up to the wall limit of the two shafts, the gradual axial move of the product is ensured.

[0004] Substantially, the product to deshydrate in advancing movement is pressed by the rotating motion of two screw elements with conical shaft 1 and also conical spiral 2 - total and regular - to operate in a correspondence space to wall limit of the filtering cage 3. If the helical elements with regular total conical interference are used side by side, since the lifting upwards of the spiral 2 is in them in accordance with a like section reduction 4 of its shaft 1, each spiral is allowed to work with profile continuity up to wall limit of the shaft of the other helical element, thus avoiding zones of either no or limited interference on the treated product in the intermediate space between the shafts. Moreover, the movement in opposition of the two or more pressing elements causes a combined effect of complete interference given by the two reciprocally intersecting spirals which compels the axial advancing motion of the product. The filtering cage used for the press with two helical elements consists of two components 5 and 6 connected on slanting converging lines 7 and 8 fitted on interference limit of the two intersected spirals.

[0005] An execution version of a deshydrating press, with two helical elements fitted side by side, is illustrated in the schematic drawings of table 1. With reference to this table, fig. 1 is the vertical longitudinal section of the press with side view of a helical element to point out the conical interference spiral which operates up to wall limit of the filtering cage. Fig. 2 is a partial view of horizontal longitudinal section of the press, with view from above of the two flanked helical elements to show the intermediate zone between the two shafts where the interference of the two spirals can be noted, each one of which is working up to wall limit of the other one's shaft. Fig 3 is a view of the press transversal section to show the interference fields of the two spirals.

[0006] For the press operation, motor 9 is started which, by means of transmission 10 with pulleys 11 and 12, transmits the movements, through reducer 13 on shafts 14, to the helical elements with conical shafts 1 and conical spirals 2. The biconical filtering cage is kept, by the modular grouping U-bolts 15 and 16, in the frame 17 on base 18 and is contained in carter 19 complete with inspection lids 20.

[0007] In the executions, the use of helical elements is foreseen with constant profile shafts and spirals. The components may fitted in different connections and replaced with other technically equivalent ones.

Claims

1. Dehydrating screw press, comprising a pair of rotatable helical elements rotating in opposite directions each of which comprises a conical shaft (1) and conical spiral (2), the conical spirals of the helical elements having opposite pitch angles, said pair of rotatable helical elements being fitted side by side such that each conical spiral operates throughout the entire operative longitudinal extension of the press with profile continuity up to the wall limit of the respective conical shaft of the opposite helical element, the press further comprising a filtering cage (3) arranged about said pair of helical elements, wherein said conical spirals have thin threads which have a small thickness as compared to the distance between two consecutive threads, **characterized in that** said filtering cage (3) consists of two structurally distinct constituent parts (5 and 6) connected on converging lines (7 and 8) at the interference limit of the two intersected spirals and arranged such that said spirals operate throughout the entire operative longitudinal extension of the press with profile continuity up to the wall limit of said filtering cage.

Patentansprüche

1. Entwässerungsschneckenpresse mit einem Paar von rotierbaren, schraubenförmigen Elementen, die in entgegengesetzter Richtung rotieren, von denen jedes einen konischen (kegelförmigen) Schaft (1) und eine konische Spirale (2) aufweist, wobei die konischen Spiralen der schraubenförmigen Elemente entgegengesetzte Steigungswinkel aufweisen, wobei das Paar der drehbaren, schraubenförmigen Elemente in der Weise nebeneinander angeordnet sind, daß jede der konischen Spiralen über die vollständige operative Längserstreckung der Presse mit einer Profilkontinuität zur Wand arbeitet, die von dem entsprechenden konischen Schaft des gegenüberliegenden schraubenförmigen Elementes gebildet ist und wobei die Presse darüber hinaus ein um das Paar der schraubenförmigen Elemente angeordnetes Filtergehäuse (3) aufweist, wobei die genannten konischen Spiralen dünne Gewinde aufweisen mit einer geringen Dicke verglichen zum Abstand zwischen zwei aufeinanderfolgenden Gewinde, **dadurch gekennzeichnet,** daß das genannte Filtergehäuse (3) aus zwei der Struktur nach verschiedenen Bestandteilen (5 und 6) besteht, die an einer konvergierenden Linie (7 und 8) an der Eingriffsgrenze der beiden sich schneidenden Spiralen verbunden und derart angeordnet sind, daß die Spiralen in gleicher Weise über die gesamte operative Längserstreckung der

Presse mit einer Profilstetigkeit bis zu den Begrenzungswänden des Filtergehäuses arbeiten.

Revendications

1. Presse de déshydratation à vis, comprenant une paire d'éléments tournants en hélice qui tournent dans des directions opposées, donc chacun comprend un arbre conique (1) et une spirale conique (2), les spirales coniques des éléments en hélice possédant des angles d'attaque opposés, ladite paire d'éléments tournants en hélice étant montée côte-à-côte de telle façon que chaque spirale conique agisse sur toute l'extension longitudinale de fonctionnement totale de la presse avec une continuité de profil jusqu'à la limite de paroi de l'arbre conique respectif de l'élément en hélice opposé, presse comprenant, de plus, une cage de filtration (3) placée autour de ladite paire d'éléments en hélice, dans laquelle lesdites spirales coniques possèdent des filets minces qui ont une petite épaisseur par rapport à la distance entre deux filets successifs, **caractérisée en ce que** ladite cage de filtration (3) est constituée de deux parties constituant structurellement distinctes (5 et 6) montées sur des lignes convergentes (7 et 8) à la limite d'interférence des deux spirales se coupant et disposées de telle façon que lesdites spirales agissent sur toute l'extension longitudinale de fonctionnement totale de la presse avec une continuité de profil jusqu'à la limite de paroi de ladite cage de filtration.

