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(54) APPARATUS FOR CONVEYANCE CHAFF, WASTE SEED, SMALL GRAINS ETC. IN A HARVESTER

APPARAT ZUM FÖRDERN VON SPREU, ABFALLGETREIDE, KLEINKÖRNERN USW. IN EINER ERNTEMASCHINE

APPAREIL POUR LE TRANSPORT DE LA BALLE, DES GRAINS DE REBUT ET DES GRAINS DE PETITE TAILLE NOTAMMENT, DANS UNE MOISSONNEUSE

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(56) References cited:
EP-A- 0 181 500
DK-U- 9 300 526
US-A- 3 860 010

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Description

[0001] The present invention relates to an apparatus for conveyance chaff, waste seed, small grains etc. in a selfpropelled harvester and of the type described in the introductory part of claim 1.

[0002] By harvesting with a harvester the fact has hitherto not been realized that it may results in more disadvantages that chaff, waste seed, small grains etc. from the riddle system or screen system of the harvester are discharged directly on the ground. Firstly the material lost in this way has a relative large fodder value, and secondly the discharge of waste seed and small grains directly on the field later on may result in an additional consumption of spraying agents for the "weed-fighting".

[0003] DE-A-3 325 951 discloses a selfpropelled harvester of the type comprising a special transversely arranged separation drum in which the very first separation of the grains from the straw is worked out before the grains are discharged through a grating wall of the drum to the underlying screen or riddle system for further cleansing from waste material such as short straw pieces, chaff, waste seed, small grains etc. During the rotation the separation drum carries the straw towards opposite ends of the separation drum for discharge thereof on the ground under the screen or riddle system by means of two worm-conveyors - in such a manner that the straw is discharged on the ground in a position in front of the discharge end of the screen or riddle system. However, small selfpropelled harvesters of this type are not used any longer because such a cleansing system is certainly not able to meet the demand of high capacity as required in modern harvesting.

[0004] The invention has for its purpose to provide an apparatus by means of which it in a simple manner becomes possible to remedy the said disadvantages.

[0005] According to the invention the apparatus is characterized in that said apparatus comprising means adapted to discharge said waste material together with the straw on top of the straw string after the discharge thereof on the ground, and that said conveyance means consist of an endless conveyor, which is constructed from a number of generally box-shaped, straight channel sections and special arched corner sections, and which comprises a number of scraper elements projecting sideways from a chain, which is stretching along the inner walls of said channel and corner sections, and that said conveyance means comprise a drive station placed in one of the corner sections and being provided with a chain driving wheel, which is driven by a hydraulic motor, and which is arranged displaceable in such a manner that the chain driving wheel also acts as a tightening wheel. In a simple manner it is hereby obtained that it becomes possible to collect, to inter-conveyance said "waste materiale" so that this may be discharged together with the straw. By subsequent collecting and pressing of the straw there may be saved a very large part of said waste material, which has considerable fodder and thermal values.

[0006] It should be pointed out that it is considerable values which may be gained by means of the invention, since experiments have shown that between 18 - 26% of the corn weight which is harvested by means of a harvester is discharged on the ground from the riddle system in the form of chaff, waste seed and small grains. Subsequently it may be possible further to save considerable costs by the fact that the need for weed-fighting with spraying agents may be considerably reduced.

[0007] In a simple manner and in order to obtain sufficient strength and stiffness said scraper elements may consist of arched, shell-shaped elements, which by way of example being made from cutting outs of hard plastic tubes with large diameter.

[0008] Alternatively, the apparatus according to the invention may be such provided that said conveyance means consist of a combined air and blowing conveyor being supplied with air from a separate take-off from the existing blower of the harvester, said air and blowing conveyor cooperating with a cyclone-like braking device, from which the waste material is discharged together with the straw on top of the straw string.

[0009] The invention is described in more details in the following, reference being made to the accompanying drawing, in which:

Fig. 1 shows a harvester, which is provided with an apparatus according to the invention,

Fig. 2 shows an embodiment for an apparatus according to the invention - seen from above,

Fig. 3 shows the apparatus cf. Fig. 2 - seen from the riddle system of the harvester, and

Fig. 4 shows an embodiment for a conveyance element for the apparatus according to the invention.

[0010] The harvester 2 shown in Fig. 1 is behind a so-called riddle box (screen and riddle system) provided with an embodiment for an apparatus 6 (Figs. 2 and 3) according to the invention, which apparatus 6 comprises an endless scraper conveyor 8 constructed from two mainly straight box-shaped side sections 10 and 12, two also straight end sections 14 and 16 and of four corner sections 18, 20, 22 and 24, of which the corner section 24 furthermore comprises a drive station 26, which is driven by a hydraulic motor 28.

[0011] The scraper conveyor 8 comprises an endless roller chain 30 (Fig. 4), to which sideways projecting, arched scraper elements 32 are secured, which - in order to obtain in a particular simple manner sufficient stiffness - are cut from hard plastic tubes (for instance PEL-tubes) with large diameter.
An apparatus (6) for conveyance of chaff, waste material may be discharged on or on the straw string (38) (Fig. 1), as the discharge of the straw from the harvester 2 takes place through the marked central zone 40 of the scraper conveyor 8 (Fig. 2).

The corner section 24, which comprises the driving station 26, has a little larger width towards the left side section 10, which towards the central zone 40 has inclined side, which is due to the fact that the driving station 26 comprises tightening function for the endless conveyor chain 30.

An other alternative possibility of arranging the conveyance means consists of an endless conveyor (8), which is constructed from a number of generally box-shaped, straight channel sections (10, 12, 14, 16) and special arched corner sections (18, 20, 22, 24), and which comprises a number of scraper elements (32) projecting sideways from a chain (30), which is stretching along the inner walls of said channel and corner sections, that said conveyor (8) comprises a drive station (26) placed in one of the corner sections (24) and being provided with a chain drive wheel, which is driven by a hydraulic motor (28), and which is arranged replaceable in such a manner that the chain driving wheel also acts as a tightening wheel.

2. An apparatus (6) according to claim 1, characterized in that said scraper elements consist of arched, shell-shaped elements (32), which by way of example are made from cutting outs of hard plastic tubes with large diameter.

3. An apparatus (6) for conveyance of chaff, waste seed, small grains etc. in a selfpropelled harvester (2), comprising conveyance means being adapted to collect said waste material from the screen or riddle system (4) of the harvester (2) and to convey it to a discharge position (36), characterized in that said conveyance means consist of a combined air and blowing conveyor, which is supplied with air from a separate take-off from the existing blower of the harvester (2), said air and blowing conveyor cooperating with a cyclone-like braking device, from which the waste material is discharged together with the straw on top of the straw string (38).

Claims

1. An apparatus (6) for conveyance of chaff, waste seed, small grains etc. in a selfpropelled harvester (2), comprising conveyance means being adapted to collect said waste material from the screen or riddle system (4) of the harvester (2) and to convey it to a discharge position (36), characterized in that said apparatus comprising means adapted to discharge said waste material together with the straw on top of the straw string (38) after the discharge thereof on the ground, and that said conveyance means consist of an endless conveyor (8), which is constructed from a number of generally box-shaped, straight channel sections (10, 12, 14, 16) and special arched corner sections (18, 20, 22, 24), and which comprises a number of scraper elements (32) projecting sideways from a chain (30), which is stretching along the inner walls of said channel and corner sections, that said conveyor (8) comprises a drive station (26) placed in one of the corner sections (24) and being provided with a chain drive wheel, which is driven by a hydraulic motor (28), and which is arranged replaceable in such a manner that the chain driving wheel also acts as a tightening wheel.

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Claims

1. An apparatus (6) for conveyance of chaff, waste seed, small grains etc. in a selfpropelled harvester (2), comprising conveyance means being adapted to collect said waste material from the screen or riddle system (4) of the harvester (2) and to convey it to a discharge position (36), characterized in that said apparatus comprising means adapted to discharge said waste material together with the straw on top of the straw string (38) after the discharge thereof on the ground, and that said conveyance means consist of an endless conveyor (8), which is constructed from a number of generally box-shaped, straight channel sections (10, 12, 14, 16) and special arched corner sections (18, 20, 22, 24), and which comprises a number of scraper elements (32) projecting sideways from a chain (30), which is stretching along the inner walls of said channel and corner sections, that said conveyor (8) comprises a drive station (26) placed in one of the corner sections (24) and being provided with a chain drive wheel, which is driven by a hydraulic motor (28), and which is arranged replaceable in such a manner that the chain driving wheel also acts as a tightening wheel.
(8) eine in einer der Ecksektionen (24) angebrachte und mit einem Kettenrad versehene Zugstation (26) umfasst, welches Kettenrad von einem hydraulischen Motor (28) getrieben wird und verschiebbar in der Art angeordnet ist, daß das Kettenrad auch als Spannrad funktioniert.

2. Apparat (6) nach Anspruch 1, dadurch gekennzeichnet, daß die genannten Kratzerelementen aus gebogenen, schalengeformten Elementen (32) bestehen, die zum Beispiel durch Aufschneiden harter Plastikrohre mit großem Durchmesser hergestellt werden.


Revendications

1. Appareil (6) pour le transport de bale, de semence perdue, de petites graines etc. dans une moissonneuse-batteuse automobile (2) comprenant des moyens de transport étant destinés à collecter ladite matière perdue du système de trémie (4) de la moissonneuse-batteuse (2) et à la conduire à une position de déchargement (36), caractérisé en ce que ledit appareil comprenant des moyens destinés à décharger ladite matière perdue avec la paille audessus de l’andain de paille (38) après le déchargement de celui-ci sur le terrain, et que lesdits moyens de transport se composent d’un transporteur automatique à chaîne sans fin (8), qui est construit d’un nombre de sections de canalisation droites et surtout en forme de caisse (10, 12, 14, 16) et de sections spéciales angulaires en forme d’arc (18, 20, 22, 24) et qui comprend un nombre d’éléments de racloir (32) se projetant latéralement d’une chaîne (30) qui s’étend le long des parois intérieures desdites sections de canalisation et sections angulaires, que ledit transporteur automatique à double chaîne (8) comprend une station de traction (26) placée dans une des sections angulaires (24) et étant pourvu d’une roue à chaîne qui est tramée d’un moteur hydraulique (28) et qui est montée de manière déplaçable de sorte que la roue à chaîne aussi fonctionne en tant que roue de tension.

2. Appareil (6) selon la revendication 1, caractérisé en ce que lesdits éléments de racloir sont composés d’éléments conchoïdes en forme d’arc (32) qui par exemple sont formés en coupant des tuyaux plastiques durs à grand diamètre.

3. Appareil (6) pour le transport de bale, de semence perdue, de petites graines etc. dans une moissonneuse-batteuse automobile (2) comprenant des moyens de transport étant destinés à collecter ladite matière perdue du système de trémie (4) de la moissonneuse-batteuse (2) et à la conduire à une position de déchargement (36), caractérisé en ce que lesdits moyens de transport se composent d’un transporteur combiné d’air et de ventilateur qui est alimenté en air d’une sortie séparée du ventilateur existant de la moissonneuse-batteuse (2), ledit transporteur d’air et de ventilateur coopérant avec un organe de freinage semblable à cyclone, à partir duquel la matière perdue est déchargée avec la paille audessus de l’andain de paille (38).