

(19) **DANMARK**

(10) **DK/EP 3762308 T3**



Patent- og
Varemærkestyrelsen

(12) Oversættelse af
europæisk patentskrift

-
- (51) Int.Cl.: **B 65 D 65/38 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2024-10-21**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2024-07-17**
- (86) Europæisk ansøgning nr.: **19711439.0**
- (86) Europæisk indleveringsdag: **2019-02-26**
- (87) Den europæiske ansøgnings publiceringsdag: **2021-01-13**
- (86) International ansøgning nr.: **PT2019000002**
- (87) Internationalt publikationsnr.: **WO2019172791**
- (30) Prioritet: **2018-03-05 PT 2018110606**
- (84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**
- (73) Patenthaver: **Cotesi - Companhia de Têxteis Sintéticos, S.A., Avenida do Mosteiro, 486, 4415-493 Grijó, Portugal**
- (72) Opfinder: **VIOLAS DE OLIVEIRA E SÁ, Pedro Américo, Avenida do Mosteiro, 486, 4415-493 Grijó, Portugal**
- (74) Fuldmægtig i Danmark: **Holme Patent A/S, Valbygårdsvej 33, 2500 Valby, Danmark**
- (54) Benævnelse: **Landbrugsnet til ballepresning**
- (56) Fremdragne publikationer:
EP-A2- 0 919 655
WO-A1-2018/034220
DE-A1- 3 802 108
JP-A- 2015 151 635
US-A1- 2005 215 147
US-A1- 2008 147 198

DESCRIPTION

Description

[0001] The present invention relates to an agricultural mesh for baling.

Background of the Invention

[0002] In recent years there has been an increase demand on the balancing of different features existing in an agricultural mesh, for example, its mechanical ability and stability, as well as the ability to withstand high speeds during the baling process with the objective of producing round and geometrically perfect bales, as well as providing a response to the increase of pressure in the baling process, in view of the insertion of a larger amount of baled product in the same volume. This demand has been increasing and it is related to the need of obtaining a more resistant agricultural mesh that withstands higher pressures resulting from the increasing weight of bales stored in the same volume.

[0003] Patent application EP1786964 (2004) discloses a net with longitudinal crimping strips and transverse fastening strips zigzagging laterally between the adjacent longitudinal crimping strips, which form a series of triangular openings in which at least one reflective or luminescent indicator strip is woven or sewn in the net so as to extend over a part of the net length.

[0004] Patent application WO2015140657 (2015) discloses a package composed by a net for packaging a material (for example, hay, straw or any other perishable material) applied to the central zone of said material, and by two closure portions at the ends, as well as the corresponding method of packaging such materials.

[0005] Patent application EP891698 (1998) discloses a net made of an extensible plastic mesh film, in which the mesh openings have longitudinal yarns running in zigzag between the yarns of the neighboring openings.

[0006] Patent GB2348633 (B) discloses a material for agricultural bales, which is composed of a polymer sheet having a reinforcing mesh bonded or fused to at least one surface thereof, the reinforced sheet being able of adhering to itself when wound and overlapped over a bale. In use, the material is wound around a hay mass, or other such material intended to be transformed in a bale, in more than one turn, and thus overlapped over itself. The composite material may comprise such a net sandwiched between two polymer sheets or a single sheet sandwiched between two mesh layers.

[0007] Patent application DE3802108 (A1) discloses an agricultural mesh for baling having

yarns of web and yarns of weft (which are fed with two weft thread guide bars). The mesh is produced in a loom having two weft thread guide bars, resulting in a mesh having two wefts and presents a mesh interval of three meshes along the length of the agricultural mesh for baling (1).

[0008] There are other alternatives of agricultural mesh in the market, in which the weft has a cross configuration with the objective of improving the strength of the bales (Figure 5). However, this type of solution uses a larger amount of weft yarn, with higher production costs.

[0009] In accordance with the foregoing, there is a need to develop a robust agricultural mesh, which allows to produce round, geometrically perfect and mechanically stable bales, allowing to pack more forage mass in each bale without jeopardizing its robustness.

Summary of the Invention

[0010] The present invention relates to an agricultural mesh for baling according to claim 1.

[0011] More particularly, the present invention provides a solution, which aims to reduce the dimensions of the longitudinal openings - weft (2) - during the baling process, resulting in well-preserved bales, unlike damaged or unusable bales produced with known agricultural meshes, due to accidental cutting or breaking of the mesh and consequent bursting when terminating each bale, as well as additional efforts of pressure caused by poor dispersion and lack of uniformity of the bale within the chamber of the baling machine.

[0012] In this way, we wish to respond to the increasing pressure increase in the act of baling, in view of the insertion - in the same volume - of a larger amount of baled product (same volume and more weight implies increase of pressure, and thus higher requirements of the agricultural mesh for baling (1)), said product being straw, hay, grass, *Miscanthus* or any other product that can potentially be baled.

[0013] Another advantage of the use of the present invention relates to the greater ease and efficiency of transport of the bales covered with the agricultural mesh for baling (1).

[0014] The present invention will also be useful for a better bale cover during the baling by reducing or eliminating the uncovered side fringes, which makes difficult the application of stretchable film for fermentation of green herbs or hay. With the reinforcement of the weft (2) an increase in the cover density is also achieved, thus contributing to improve the waterproofing of the bale against humidity, increasing the quality of the forage.

Description

[0015] The present invention relates to an agricultural mesh for baling (1) comprising a plurality of columns of chains or pillars (3) interconnected with each other by means of the weft (2) and wherein each column of chain or pillar (3) comprises a plurality of meshes (4).

[0016] The columns of chains or pillars (3) that form the agricultural mesh for baling (1) have a distance between them enough to ensure the strength and cohesion of the agricultural mesh for baling (1), during and after the baling.

[0017] In one embodiment, the distance between the columns of chains or pillars (3) that form the agricultural mesh for baling (1) is X, wherein X represents the minimum allowable distance between two columns of chains or pillars (3).

[0018] In another embodiment, the distance between the columns of chains or pillars (3) that form the agricultural mesh for baling (1) is 2X, wherein 2X represents twice the minimum allowable distance between two columns of chains or pillars (3).

[0019] The materials that compose the agricultural mesh for baling (1), subject of the present invention, are selected from the following: high density polyethylene (homopolymer or metallocene), or polypropylene copolymers in a mass fraction up to 20%, or copolymers of polyethylene in a mass fraction up to 20%, or high-density polyethylene with polypropylene homopolymer in a mass fraction up to 20%.

[0020] As used herein, the term "columns of chains or pillars (3)" is to be understood as the columns of chains or pillars (3) that form the agricultural mesh for baling (1) of the present invention.

Brief Description of the Drawings

[0021]

Figure 1 shows, in a front view of the invention, an agricultural mesh for baling (1) comprising a plurality of meshes (4) interconnected with each other and associated with the columns of chains or pillars (3) by means of the weft (2) that provide the reinforcement of the agricultural mesh for baling (1).

Figure 2 shows the same perspective of the agricultural mesh for baling (1) shown in Figure 1, where it can be seen, by way of example, the first column of chain or pillar (3a), the second column of chain or pillar (3b) and the third column of chain or pillar (3c) of the agricultural mesh for baling (1), wherein the distances between each two columns of chains or pillars (3) is X or 2X.

Figure 3 shows a front view of a known common agricultural weft.

Figure 4 shows another front view of a known common agricultural mesh.

Figure 5 shows yet another front view of a known common agricultural mesh having a cross-configuration.

Detailed Description of the Invention

[0022] The present invention relates to an agricultural mesh for baling (1) comprising a plurality of columns of chains or pillars (3) interconnected with each other by means of the weft (2) and wherein each column of chain or pillar (3) comprises a plurality of meshes (4).

[0023] For a better understanding of the present invention, it should be understood that the first column of chain or pillar (3a) relates to a first column of the agricultural mesh for baling (1). The second column of chain or pillar (3b) relates to the column of chain or pillar just after the first column of chain or pillar (3a) of the agricultural mesh for baling (1). The third column of chain or pillar (3c) relates to the column of chain or pillar just after the second column of chain or pillar (3b) of the agricultural mesh for baling (1). This configuration is repeated several times along the length of the agricultural mesh for baling (1) .

[0024] The agricultural mesh for baling (1) has a triangular configuration, resulting from the interlacing of the weft (2) in a first column of chain or pillar (3a), passage through a second column of chain or pillar (3b), interlacing in a third column of chain or pillar (3c) and return to the first column of chain or pillar (3a) through the reverse longitudinal zigzag path with passage through the second column of chain or pillar (3b) and return to the first column of chain or pillar (3a), at intervals of six meshes (4), along the length of the agricultural mesh for baling (1).

[0025] Additionally, each weft (2) is initially interlaced in the columns of chains or pillars (3) at intervals of six meshes (4) along the length of the agricultural mesh for baling (1).

[0026] In addition, the weft (2) has a triangular shape resulting from the interlacing in the first column of chain or pillar (3a), passage through a second column of chain or pillar (3b), interlacing again in a third column of chain or pillar (3c) and return to the first column of chain or pillar (3a) through the reverse longitudinal zigzag path with passage through the second column of chain or pillar (3b), and return to the first column of chain or pillar (3a), at intervals of six meshes (4), along the length of the agricultural mesh for baling (1).

[0027] This process is repeated as many times as the sets of six meshes (4) existing along the length of the agricultural mesh for baling (1), resulting in a triangular configuration between the connection of weft (2) with each two columns of chains or pillars (3). This configuration takes the form of an equilateral triangle.

[0028] The columns of chains or pillars (3) that form the agricultural mesh for baling (1) have a distance between them enough to ensure the strength and cohesion of the agricultural mesh

for baling (1) in the bales.

[0029] More particularly, the distance between columns of chains or pillars (3) that form the agricultural mesh for baling (1) is X , wherein X represents the minimum allowable distance between two columns of chains or pillars (3).

[0030] The minimum allowable distance between two columns of chains or pillars (3), X , can be defined as the ratio between the width of the roller of the agricultural mesh for baling (1) and the number of spacings between each two columns of chains or pillars (3) plus 1. Considering that the agricultural mesh for baling (1) has L columns of chains or pillars (3), we known that L corresponds to the number of spacings between two columns of chains or pillars (3) plus 1, referred to as R . To the number of spacings between two columns of chains or pillars (3) plus 1, R , correspond R spacings in the roller of the agricultural mesh for baling (1), due to the back-and-forth movement occurring in the winding phase of said agricultural mesh for baling (1).

[0031] In one embodiment, the distance between the columns of chains or pillars (3) that form the agricultural mesh for baling (1) is X .

[0032] In another embodiment of the present invention, the distance between columns of chains or pillars (3) that form the agricultural mesh for baling (1) is $2X$, wherein $2X$ represents twice the minimum allowable distance between two columns of chains or pillars (3).

[0033] In the case where the distance between the columns of chains or pillars (3) that form the agricultural mesh for baling (1) is $2X$, the distance between the columns of chains or pillars (3) is 100% higher when compared to the distance of columns of chains or pillars (3) in the case where the distance between the columns of chains or pillars (3) that form the agricultural mesh for baling (1), have a distance between them of X . In this latter case, although the distance between the columns of chains or pillars (3) is higher, it is ensured that the agricultural mesh for baling (1) remains intact and cohesive, without any breaking of the weft (2), which allows to produce even stronger bales, with a higher retention grade of the wrapped material.

[0034] The width of the agricultural mesh for baling (1) may have different values according to the type and dimensions of bale to be covered. The possible width values of the agricultural mesh for baling (1) are as follows: 50 cm, 66 cm, 80 cm, 90 cm, 99 cm, 100 cm, 105 cm, 123 cm, 125 cm, 130 cm, 163.5 cm, or 170 cm.

[0035] The materials that compose the agricultural mesh for baling (1) according to the present invention are selected from the following: high density polyethylene (homopolymer or metallocene), or polypropylene copolymers in a mass fraction up to 20%, or copolymers of polyethylene in a mass fraction up to 20%, or high-density polyethylene with polypropylene homopolymer in a mass fraction up to 20%.

REFERENCES CITED IN THE DESCRIPTION

Cited references

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- [EP1786964A \[0003\]](#)
- [WO2015140657A \[0004\]](#)
- [EP891698A \[0005\]](#)
- [GB2348633B \[0006\]](#)
- [DE3802108A1 \[0007\]](#)

Krav:

1. Landbrugsnet til ballepresning (1) omfattende en flerhed af kæde- eller søjlekolonner (3),
5 hvori hver kæde- eller søjlekolonne (3) omfatter en flerhed af netmasker (4), med
 nævnte kæde- eller søjlekolonner (3) indbyrdes forbundne og forenede ved hjælp af
 skudgarn (2), **kendetegnet** ved at det har en trekantet konfiguration, som er et resultat
 af sammenfletningen med skudgarnet (2) i en første kæde- eller søjlekolonne (3a),
 passage gennem en anden kæde- eller søjlekolonne (3b), sammenfletning i en tredje
10 kæde- eller søjlekolonne (3c) og tilbagevenden til den første kæde- eller søjlekolonne
 (3a) gennem den langsgående siksak tilbagevej med passage gennem den anden
 kæde- eller søjlekolonne (3b), og tilbagevenden til den første kæde- eller søjlekolonne
 (3a) med mellemrum på seks netmasker (4) langs længden af landbrugsnettet til
 ballepresning (1).
15
2. Landbrugsnet ifølge krav 1, **kendetegnet ved at** kæde- eller søjlekolonnerne (3), som
 danner landbrugsnettet til ballepresning (1), har en afstand mellem dem defineret som
 forholdet mellem bredden af rullen af landbrugsnet til ballepresning (1) og antallet af
 mellemrum mellem hver to kæde- eller søjlekolonner (3) plus 1.
20
3. Landbrugsnet ifølge krav 1, **kendetegnet ved at** materialerne, som omfatter
 landbrugsnettet til ballepresning (1) er valgt blandt følgende: højdensitetspolyethylen
 (homopolymer eller metallocen), eller polypropylencopolymerer i en massebrøk på op til
 20%, eller polyethylencopolymerer i en massebrøk op til 20%, eller
25 højdensitetspolyethylen med polypropylenhomopolymer i en massebrøk på op til 20%.

DRAWINGS

Drawing

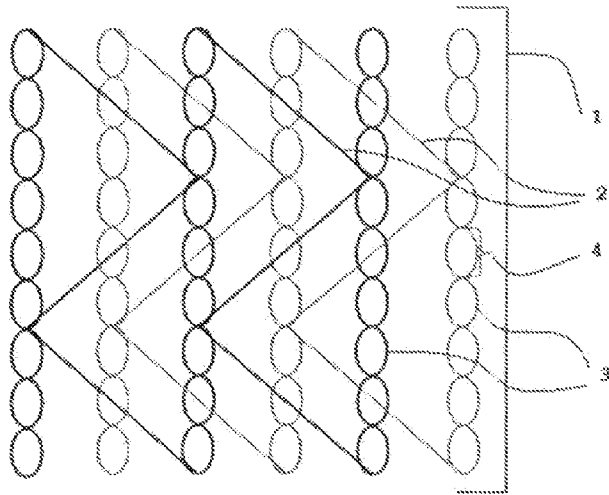


Figure 1

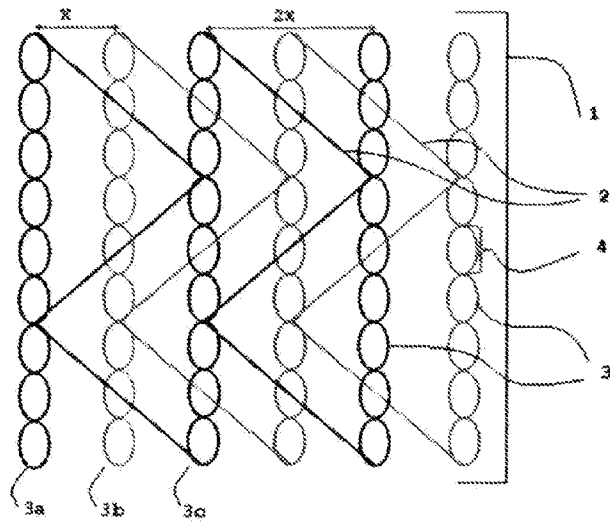


Figure 2

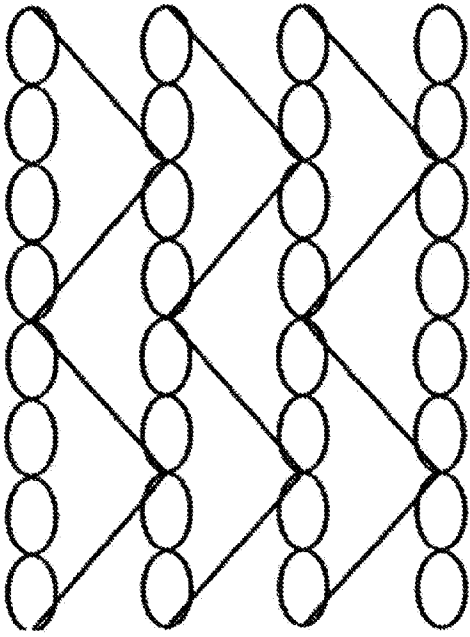


Figure 3

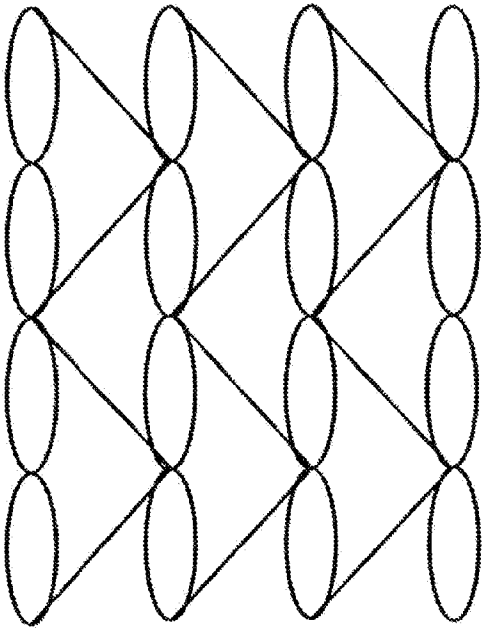


Figure 4

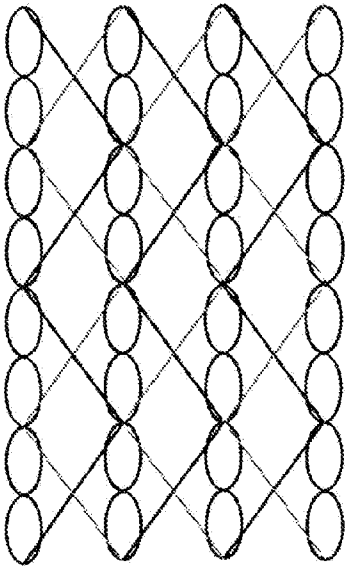


Figure 5