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(54) **Packing for netwrap rolls for roundbalers and corresponding packed roll**

(57) A new packing for rolls (10) of netwrap for roundbalers, i.e. for rolls obtained by wrapping a netwrap (R), made of plastic, intended to be used in an agricultural packing machine, typically a roundbaler, for the formation of bales (B), for example of hay, rolled and pressed, comprising:

- an outer wrapper (11), consisting of a film (12) of plastic material, in particular polyethylene, wrapped around the outer surface of the netwrap roll (10) for roundbalers; wherein this wrapper (11) of plastic material in turn exhibits:
- a bonding, substantially continuous, that is made with a film of glue (13) applied, substantially along a generatrix of the cylindrical surface of the roll, on one or both flaps of the film (12) of plastic material wrapped around the

roll, so as to close the wrapper (11) on the outer cylindrical surface of the roll, preferably while leaving an exceeding strip (14) of the film of the plastic material in order to facilitate the removal of the packing;

- one or more welding or gluing areas, that are carried out, along a direction substantially parallel to the diameter of the two sides forming the bases of the cylindrical roll, on the lateral and surplus portions (12') of the film of plastic material folded on these two sides, so as to ensure a complete seal of the roll with respect to the external environment; and
- one or more handles (16), consisting of bands, ribbons or strapping preferably of polypropylene, that are fixed, on the outside of the wrapper (11), in a suitable position in order to facilitate the handling of the roll.

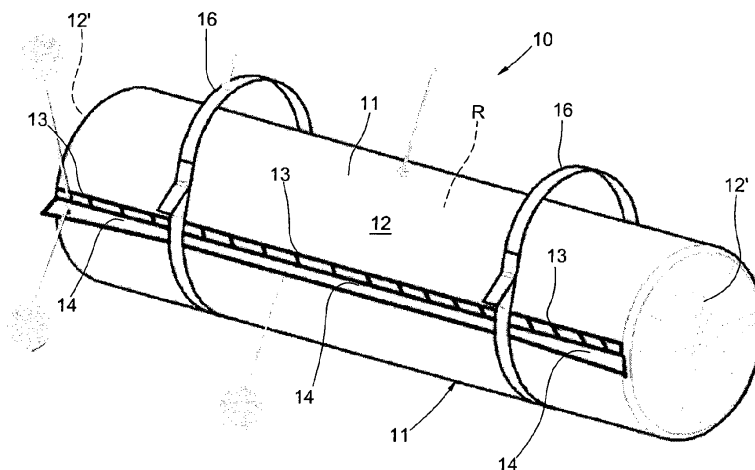


Fig. 1

Description

Technical Field

[0001] The present invention relates in general to the sector of packing of articles used in agriculture, and in particular it relates to a new and useful packing for rolls of a netwrap intended to be used on an agricultural packing machine, called roundbaler, for forming round bales, in particular of hay, straw or any other crop.

[0002] The present invention relates also to a practical and advantageous process for the packing of netwrap rolls intended to be used in a roundbaler for forming bales, rolled and pressed, in particular of hay, straw or any other crop.

Background Art

[0003] Roundbalers are machines widely used in agriculture to form and pack round bales, for instance of hay, and in general of any grass and forage or other crops to be processed by these machines.

[0004] In particular, these roundbalers are equipped with specific mechanisms adapted to collect from the ground a certain quantity of hay or other crop and for wrapping around it, after it has been compressed, a netwrap, so as to form a bale, generally cylindrical, in which the hay is pressed and held together by the netwrap that is wrapped around the outer cylindrical surface of the bale.

[0005] This netwrap is in turn constituted by a product in HDPE (polyethylene) extruded and then woven so as to form a netwrap, wound in a roll, which is arranged in the round baler, in order to be wrapped on the bale of hay, straw, or other forage or corn stalks collected from the ground.

[0006] In the known art currently in use, these rolls, consisting of the rolled netwrap and provided to be positioned in the roundbaler, where, as before illustrated, they will be used to wrap the final bale at the end of the pressing operation, are packed by using a tubular film of polyethylene or cardboard boxes.

[0007] In this respect, Figure 4 shows in a schematic way one of these rolls, indicated in the whole with ROT and containing in a wound form a netwrap R for use in a roundbaler, which netwrap roll is packed in accordance with the conventional technique.

[0008] In particular, in this conventional packing, the roll ROT is inserted into a tubular bag S, of polyethylene, with the ends in excess of this tubular bag S of polyethylene that are folded and inserted inside the tube or core of cardboard, on which the netwrap R is wound, and that are fixed on the ends of this tube by using for example caps T of plastic material, or by other means.

[0009] In some embodiments, designed to respond to commercial needs, the netwrap roll ROT may be provided externally with real handles M, also of plastic material, which are applied externally to the tubular bag S of polyethylene, in order to facilitate the handling of the same roll ROT.

yethylene, in order to facilitate the handling of the same roll ROT.

[0010] Now it is observed how this type of packing, at present widely adopted, often does not guarantee the sealing of the roll.

[0011] In fact, this packing, whereas the roll ROT is stored in an external environment, can be at the origin of serious problems and drawbacks, particularly related to the penetration of water or in any case of moisture, that can compromise the use of the same roll, and for example of problems related to the deformation of the tube of cardboard on which the netwrap R is wound, also due to the poor water resistance of the cardboard tube.

[0012] Moreover, at the moment of the effective use of the roll, the user must remove the handles M, the caps T and the bag S before being able to place the roll ROT in the roundbaler, and this involves operations that are not always easy, on account of the characteristics of the construction of the handles and also of the fact that the tubular bag S of polyethylene must be pulled from the roll.

Summary of Invention

[0013] Therefore a primary object the present invention is to provide a new and useful packing, for rolls of netwrap provided to be used on an agricultural machine of the type of a roundbaler, which packing exhibits significant improvements with respect to the packing that are already known and presently adopted in this field, and in particular involves an easy, quick and easy removal of it in the phase of the unpacking of the roll, and also it is such as to ensure effective protection of the roll over time from atmospheric agents, such as humidity.

[0014] A further object of the present invention is to provide a process, for packing netwrap rolls for round balers, which is associated with tangible advantages, in particular by making more practical and faster the stage of the unpacking of the roll, by giving an effective protection over time of the same roll from pollution and environmental factors, and by producing a single waste item, so as to limit the dispersion of wastes into the environment.

[0015] The above objects can be considered as fully achieved by the packing for netwrap rolls for roundbalers having the characteristics defined by the independent claims 1 or 4, and by the corresponding method of packing netwrap rolls for roundbalers having the characteristics defined by the independent claims 8 or 9.

[0016] Particular embodiments of the new packing for netwrap rolls for a roundbaler are also defined by the dependent claims.

Advantages of Invention

[0017] As will appear better in the following description, the new packing, in accordance with the present invention, for netwrap rolls for a roundbaler, is associated with numerous and important advantages, at least in part al-

ready implicitly previously announced, among which there are cited purely by way of the following :

- a fast and easy unpacking of the netwrap roll at the time of its actual use, i.e. when the netwrap roll has to be installed and located in the roundbaler;
- capability of effectively protecting over time, even in the case of storage in external and critical environments, the roll of netwrap from pollution and environmental factors, such as moisture;
- a manufacturing cost of the packing which is reduced and however remains competitive as compared to conventional packing;
- the new packing, since being constituted by a single object, composed of several elements which remain joined together even after unpacking, implies also relevant advantages in connection with the management of the waste produced by the packing itself. In fact, this new packing avoids the dispersion in the environment of view of individual objects and components, like occurring in the traditional packing, and also reduces the overall volume of the waste that is generated. Moreover these results are obtained while maintaining the functionality, assured by the presence of the handles, of the packing for handling the roll.

Brief Description of Drawings

[0018] These and other objects, features and advantages of the present invention will result clear and evident from the following description of some preferred embodiments thereof, given purely by way of non-limiting examples with reference to the accompanying drawings, wherein:

Fig. 1 is a schematic perspective view of a netwrap roll for roundbalers, which exhibits a packing, according to the present invention, in a first preferred embodiment;

Fig. 2 is a schematic perspective view of a net wrap roll for roundbalers, which exhibits a packing, in accordance with the present invention, in a second preferred embodiment;

Fig. 3 is a photographic view of bales of hay formed by a roundbaler using the netwrap roll of Fig. 1 or Fig. 2;

Fig. 4 is a schematic perspective view of a netwrap roll for roundbalers that has a packing of conventional type.

First preferred embodiment of the packing, object of the invention, for netwrap rolls for roundbalers

[0019] Figure 1 shows schematically a roll, indicated as a whole with 10, which has a packing according to a first embodiment of the present invention.

[0020] In particular, the roll 10 is formed by a net or

netwrap R that is intended to be used by an agricultural packing machine, consisting of a roundbaler, for the formation of bales B, for example of hay, such as shown in Fig 3, rolled and pressed, whereby this roll 10 is briefly also called in the following netwrap roll for roundbalers.

[0021] The netwrap R in turn is formed, preferably, by HDPE (High Density PolyEthylene), extruded and then knitted, to form a net consisting of a series of threads F having appropriate characteristics of strength and elasticity.

[0022] In practice, the bales B are formed and packed, by means of the roundbaler, picking up from the ground a certain mass of hay, or in general any other grass cut and dried, rolling up this mass to form a round bale, and finally wrapping on the cylindrical outer surface of the bale thus obtained the netwrap R, in turn picked up and unwound by a respective roll positioned and arranged in the same roundbaler.

[0023] Therefore, the final bale B, thus formed by the roundbaler, presents a good firmness and stability, since the mass of hay, in addition to be suitably pressed in the bale B, is also held together by the netwrap R wrapped on the outside of the same bale B.

[0024] Now, according to the present invention, the netwrap roll 10 for roundbalers is packed using a film 12 preferably of polyethylene, which is wrapped on the outside of a roll containing, in wound or rolled form, the netwrap R which will be subsequently unwound out and used, in the roundbaler, to form the bale B, as before explained.

[0025] In this way the polyethylene film 12 forms a wrapper or envelope or bag, indicated with 11, which surrounds the roll formed by the netwrap R.

[0026] At this point, a film of adhesive or glue 13 preferably of the type adapted to melt when hot, usually called with the expression "hot melt", is applied, using a suitable applicator, on one or both flaps or edges 14 of the polyethylene film 12, so as to close and seal the wrapper or envelope 11 on the cylindrical surface of the roll formed by the netwrap R, preferably while leaving the excess or surplus of film, in the form of a strip, that is necessary to facilitate the removal of the packing by grasping and pulling out such strip.

[0027] Preferably the edge 14 of the polyethylene film 12, on which it is applied the film of glue 13, extends linearly along the outer surface of the roll, parallel to the axis of the latter.

[0028] Such a mode of closure, with a gluing or bonding along the edge 14 of the polyethylene film 12, has the considerable advantage of making the opening of the wrapper 11 extremely easy, at the time of the unpacking of the roll 10.

[0029] Furthermore, the surplus lateral portions, indicated with 12', of the polyethylene film 12, folded on the sides of the roll 10, are in turn welded to obtain a complete sealing of the same roll 10.

[0030] Preferably, for reasons of aesthetic nature, these exceeding extremities 12' of the polyethylene film

12 may be thermo-retracted or inserted at the inside of the cardboard so as to line up and make them fully adhering to the sides of the roll 10.

[0031] Therefore, as a result of these operations, the netwrap roll 10, packed, for roundbalers is completely sealed and protected from the environment.

[0032] Finally, always during the packing phase, two bands or straps 16, preferably of polypropylene, which serve as handles, are suitably welded or fixed transversely to the roll 10, thereby each forming a ring about it, and placed in a suitable manner to the cylindrical surface of the wrapper 11 so as to ensure their proper placement.

[0033] Even the removal of these handles 16 is very easy when unpacking the roll 10, since the type of welding used for their formation is specifically optimized in order to allow such a subsequent easy removal, possibly with the aid of a surplus, that is left over, of such band or strap 16.

[0034] Furthermore, as already mentioned, at the time of the unpacking of the roll 10, for example when it has to be positioned and set up in a roundbaler, even the removal of the wrapper or bag 11 is greatly facilitated by the closure made preferably by glue "hot melt".

[0035] Again, advantageously, it is possible, according to the requirements, to control and optimize the resistance of gluing preferably "hot melt", by suitably varying the type of the adhesive used, in order to facilitate the separation of the two flaps.

Second preferred embodiment of the packing, object of the present invention, for netwrap rolls for roundbalers

[0036] Figure 2 shows in a schematic way a roll, indicated as a whole with 20, which has a packing in accordance with a second embodiment of the present invention.

[0037] The roll 20, packed, differs from the roll 10 of the first embodiment in that it has, in place and as an alternative to the bonding preferably of the type "hot melt", a continuous welding line 22, which is realized in a known manner by a welding operation on the polyethylene film 12 that surrounds the outer surface of the roll formed by the netwrap R, so as to close the wrapper or bag 21 on this roll.

[0038] Also, in this second embodiment of the packing, there are provided welding areas on the surplus lateral portions 12', of the polyethylene film 12, folded on the sides of the roll 20, so as to ensure a complete seal of the same roll from the external environment.

[0039] Furthermore, there is provided a pre-cut line, indicated with 23, extended longitudinally along the cylindrical surface of the roll 20 and also possibly along the respective sides, which has the function of favoring the cutting and opening of the wrapper 21 at the time of unpacking the roll 20.

[0040] It is therefore clear from the description of the above embodiments that the present invention fully achieves the purposes it had set, and in particular provides a new and useful packing for netwrap rolls for

roundbalers which, in addition to imply an easy and rapid removal of the same packing at the time of the actual usage of the netwrap roll, also ensures a complete sealing and effective protection over time of the netwrap roll for roundbalers from any pollution and environmental factor.

Claims

1. Packing for rolls of netwrap for roundbalers, or for a roll (10) formed by a netwrap (R) intended to be used in an agricultural machine, namely a roundbaler, for forming bales (B), as for instance of hay, rolled and pressed, the packing comprising:

- an outer wrapper (11), consisting of a film (12) of plastic material, in particular polyethylene, which is wrapped around the outer surface of said roll (10) of netwrap for roundbalers;

wherein said wrapper (11) of plastic material in turn exhibits:

- a bonding, substantially continuous, that is made with a film of glue (13) applied along at least one of the two flaps of the film (12) of plastic material wrapped around the roll, so as to close the wrapper (11) on the outer cylindrical surface of the roll (10); and
- one or more welding or gluing areas that are carried out on the exceeding portions and lateral ends (12'), folded on the two sides of the roll, of the film of plastic material, so as to ensure a complete sealing of the roll (10) from the external environment.

2. Packing for netwrap rolls for roundbalers according to claim 1, wherein said bonding is made, along said flap (14) of the film (12) of plastic material, with a film of glue (13) preferably of the type "hot melt".

3. Packing for netwrap rolls for roundbalers according to claim 1 or 2, wherein the flap (14) of the film of plastic material, along which said bonding (13) is made, preferably extends linearly parallel to the axis of the netwrap roll (10).

4. Packing for netwrap rolls (20) for roundbalers according to claim 1, wherein said wrapper (21) exhibits, as an alternative to said bonding made with a film of glue:

- a welding (22), that is preferably extended longitudinally along the cylindrical surface of the roll (20), and
- a pre-cut line (23), that is preferably extended in the longitudinal direction along the roll (20)

and is designed to aid the cutting and opening of the wrapper (21) of plastic material at the time of the unpacking of the roll (20).

5. Packing for netwrap rolls (10; 20) for roundbalers according to any one of the preceding claims, further comprising one or more handles (16), consisting of bands or straps preferably of polypropylene, which are suitably fixed on the outside of said wrapper in order to facilitate the handling of the roll. 5
6. Packing for netwrap rolls (10; 20) for roundbalers according to any one of the preceding claims, wherein said surplus portions and lateral ends (12') of the film of plastic material are heat-retracted or inserted within a carton core so as to adhere to the sides of the roll (10). 10
7. Netwrap roll (10; 20) for roundbalers **characterized in that** comprises a packing according to any one of the preceding claims. 20
8. A method for packing rolls of netwrap for roundbalers, comprising the following steps: 25
 - providing a film (12) of plastic material, in particular polyethylene;
 - wrapping said film (12) of plastic material around a roll formed by a netwrap (R) intended to be used in an agricultural machine or roundbaler, for the formation of bales (B), for example of hay, rolled and pressed, thereby forming an outer wrapper (11) wrapping said roll; 30
 - applying a film of glue (13) on a flap of the film (12) of plastic material wrapped around the roll (10), so as to close and seal said wrapper (11) on the outer cylindrical surface of the roll (10); 35
 - and
 - welding the surplus portions and side (12') of the film (12) of plastic material in the area of the sides of the roll, so as to ensure a complete sealing of the roll from the external environment. 40
9. A method for packing netwrap rolls for roundbalers according to claim 8, comprising, as an alternative to the step of applying a film of glue for bonding the film of plastic material, the following steps: 45
 - carrying out on the film (12) of plastic material, wrapped on said roll (20), a welding (22) extended longitudinally along the roll, so as to close and seal the wrapper (21) on the outer cylindrical surface of the roll ; and 50
 - carrying out on said film (12) of plastic material, wrapped on the roll, a pre-cut line (23), extended in the longitudinal, designed to aid the cutting and removal of the film of plastic material at the time of the unpacking of the roll. 55

10. The method for packing netwrap rolls for roundbalers according to claim 8 or 9, further comprising the following step:

- fixing on said film (12) of plastic material, wrapped on the roll (10; 20), one or more handles (16), consisting of bands or straps preferably of polypropylene, suitable to aid the handling of the roll.

11. Packing for netwrap rolls for roundbalers and corresponding method for packing a netwrap roll for roundbaler substantially as described and with reference to the accompanying drawings.

12. The use of the packing according to any one of the claims from 1 to 7 for packing a netwrap roll intended to be used in an agricultural machine, in particular of the type of a roundbaler, for wrapping round bales.

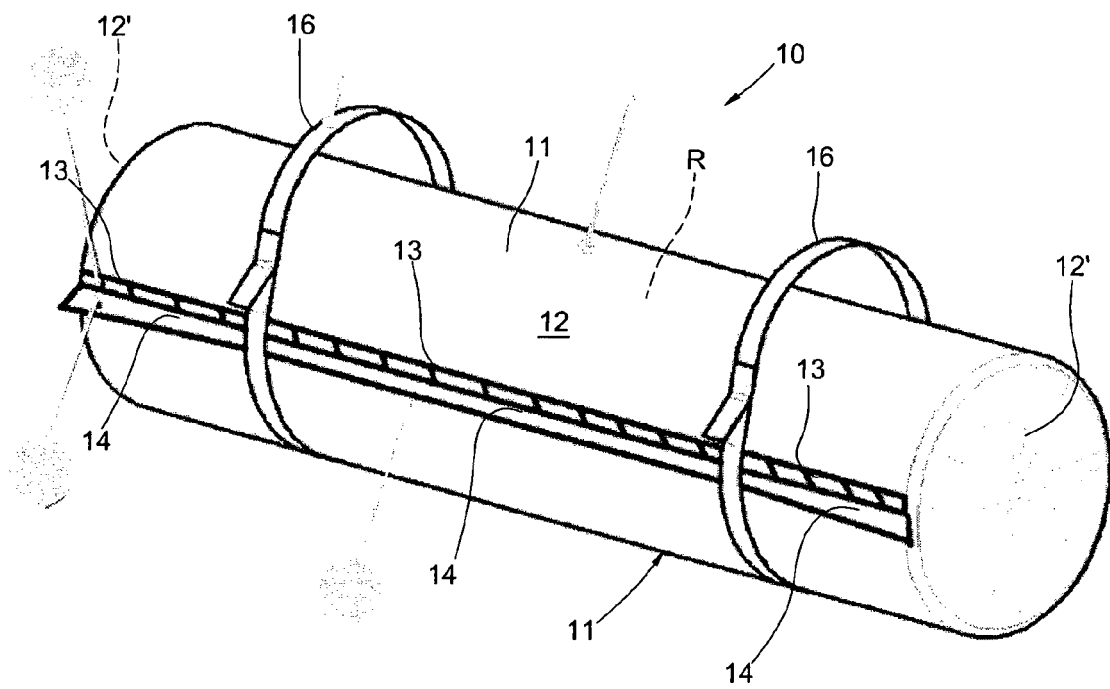


Fig. 1

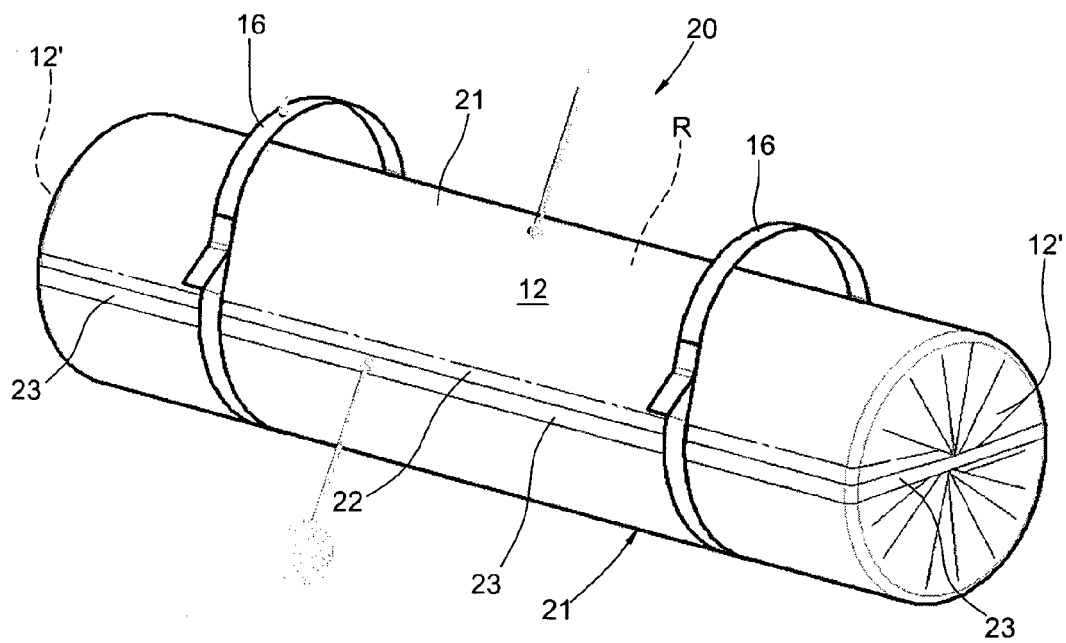


Fig. 2

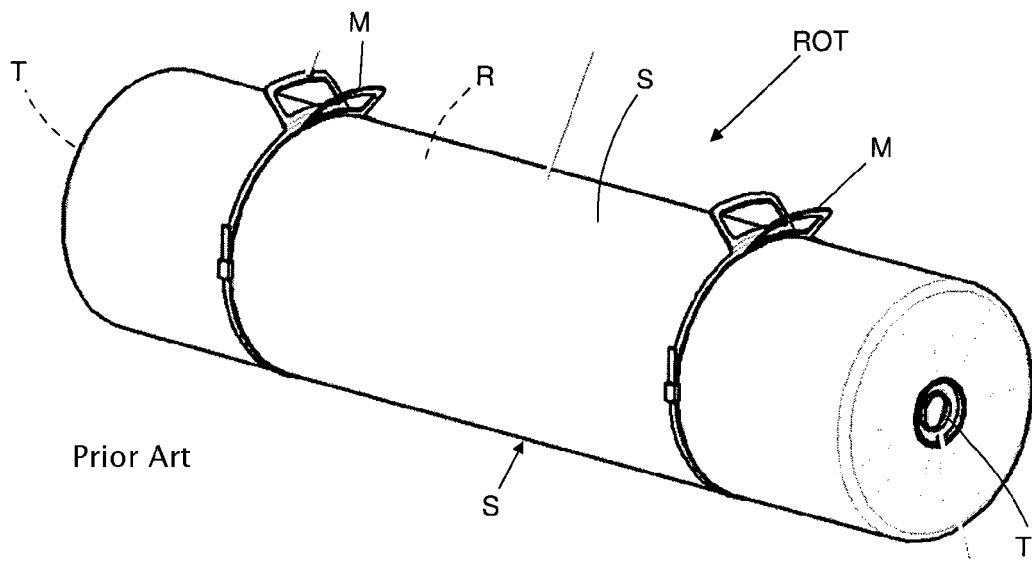


Fig. 4

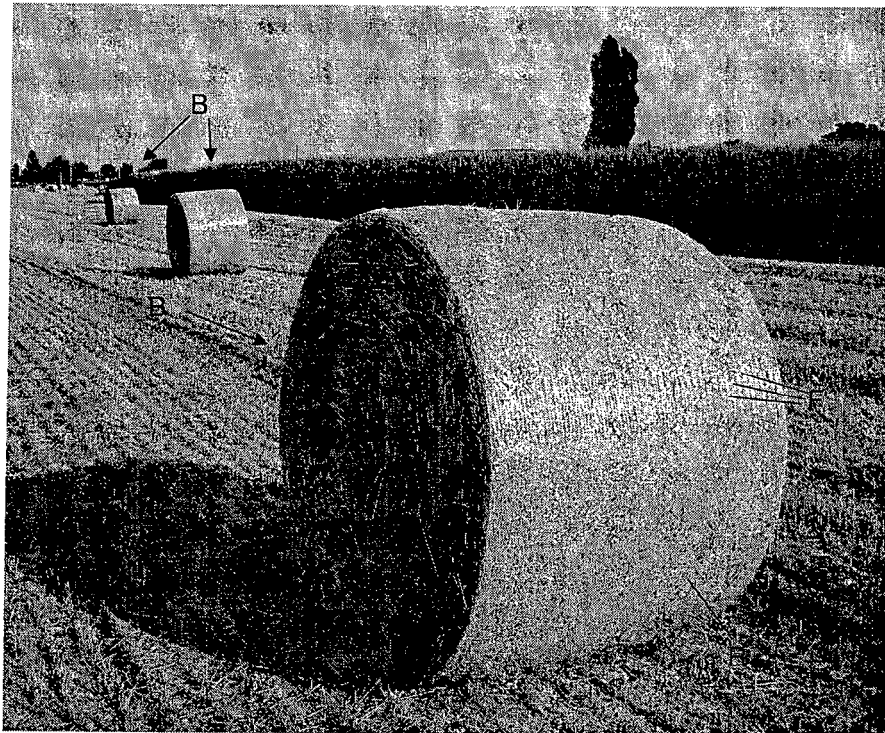


Fig. 3



EUROPEAN SEARCH REPORT

Application Number
EP 12 00 6823

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 4 003 469 A (FINDLAY ALLAN CAMERON) 18 January 1977 (1977-01-18) * column 7, line 1 - line 13; figure 2 * -----	1,4,8,9, 12	INV. B65D85/66
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 12 February 2013	Examiner Bridault, Alain
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 00 6823

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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