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**PROTECTIVE BELT FOR A DRUM FORMED BY A TRANSPORT BAG  
FOR POWDERY MATERIALS**

The present invention relates to belts used to protect drums formed by bags intended for the transport of powders, granules or other powdery materials from tearing.

The invention relates in particular to a belt designed to protect the drum formed by a bag intended for transporting materials placed in the body of said bag, to prevent it from tearing as a result of an external force, and being characterised in that it is cylindrical in shape, at least the top edge of its top and bottom edges being provided with an elastic retaining band.

**10 State of the art**

Different transport bags are currently used to transport agricultural product, industrial materials and other powder or grain materials (the "materials to be transported") of a similar nature.

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Such a transport bag is used by binding an opening made in its upper part using a closure cord, closing a bottom closure, by opening an opening made in its upper part, placing the material to be transported in its body using this opening, by binding the upper opening using a closure cord and by closing an upper closure. The bag is then hoisted, for example, by a crane, placed on a specialised palette as illustrated in diagram 2, then lifted and transported by a fork-lift truck to a pre-determined place.

**Problem to be solved by the present invention:**

25 Nevertheless it may happen that the extremity in front of the fork of a truck of this type or one of the corners of the palette strikes the lower part of the bag during the transportation described above, or that an overhanging part of a building comes into contact with the periphery of the body of the bag when it is hoisted by the crane.

30 If such a situation occurs, the body of a traditional transport bag will be at risk of tearing, thus allowing the material transported to scatter.

Although it is possible in theory to increase the thickness of the walls of such a bag, and consequently to improve the resistance of the body of the bag to tearing, 35 problems are nonetheless encountered in practice. For example, such a transport bag not only becomes expensive to produce but also heavier and more difficult to handle.

The invention concerned has been conceived with the aim of providing a solution to the situation described hereinabove, by providing a belt intended to protect the drum made from a transport bag, such a belt being able to prevent tearing of the body of the bag as a result of an external force, and being able to be produced in an economic manner without involving a substantial increase in the weight of the bag.

Means used to resolve such a problem:

10 In order to achieve the object described above, the present invention provides, in a first embodiment, a belt designed to protect the drum made from a bag intended for transporting materials placed in its body, said protective belt fitting the body of the bag to prevent it tearing as a result of an external force, and being characterised in that it is cylindrical in shape, at least the top edge of its top and bottom edges being  
15 provided with an elastic retaining band.

Similarly, still with a view to achieving the object described above, a second embodiment of the present invention incorporates the first embodiment, which is then characterised in that the elastic band is sewn along the edge or edges of the belt.

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Similarly, still with a view to achieving the object described above, a third embodiment of the present invention incorporates the first embodiment, which is then characterised in that the elastic band is housed in a passage formed at the level of the edge or edges of the belt.

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Still in order to achieve the object described above, a fourth embodiment of the present invention takes the form of a belt intended to protect the drum made from a bag intended for transporting materials placed in the body of said bag, said protective belt attaching around said body of the bag to prevent it from tearing as a result of an external force and being characterised in that it is cylindrical in shape, and at least the top edge of the top and bottom edges are provided with a tie cord.

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Similarly, still with a view to achieving the object described above, a fifth embodiment of the present invention incorporates the fourth embodiment, which is then characterised in that the cord is sewn along the edge or the edges of the belt.

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Similarly, still with a view to achieving the object described above, a sixth embodiment of the present invention incorporates the fourth embodiment, which is then characterised in that the cord is housed in a passage formed at the level of the edge or edges of the belt.

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Still in order to achieve the object described above, a seventh embodiment of the present invention is a belt intended to protect the drum made from a bag intended for transporting materials placed in the body of said bag, said protective belt attaching around said body of the bag to prevent it from tearing as a result of an external force and being characterised in that it has the shape of a band, the longitudinal  
10 extremities of which are provided with "Velcro" pads (or a similar device) which will be joined one to the other once the belt is positioned around the body of the bag.

15 Still in order to achieve the object described above, an eighth embodiment of the present invention is a belt intended to protect the drum made from a bag intended for transporting materials placed in the body of said bag, said protective belt attaching around said body of the bag to prevent it from tearing as a result of an external force and being characterised in that it has the shape of a band, the longitudinal  
20 extremities of which are provided with "Velcro" pads or the like which will face one another and will be united by their respective "Velcro" pads (or the like) situated on the periphery of the body of the bag.

Still in order to achieve the object described above, a ninth embodiment of the  
25 present invention is a belt intended to protect the drum made from a bag intended for transporting materials placed in the body of said bag, said protective belt attaching around said body of the bag to prevent it from tearing as a result of an external force and being characterised in that it has the shape of a band, the longitudinal extremities of which are provided with a pin and a buckle which engage one with the  
30 other once the belt is positioned around the body of the bag.

Operating principle:

Firstly, with respect to the first three embodiments of the model, the cylindrical  
35 protective belt, the top edge or both the top and bottom edges of which are provided with an elastic retaining band, is fitted around a transport bag intended for

transporting materials placed in the body of said bag, and is held in place by virtue of the elastic band with a view to preventing the body of the bag from tearing as a result of an external force.

- 5 Then, with respect to the fourth, fifth and sixth embodiments of the invention, the cylindrical protective belt, the top edge or both the top and bottom edges of which are provided with a tie cord, is fitted around a transport bag intended for transporting materials placed in the body of said bag, and is held in place by virtue of the tie cord with a view to preventing the body of the bag from tearing as a result of an external  
10 force.

With respect to the seventh embodiment of the invention, the protective belt is fitted around a transport bag intended for transporting materials placed in the body of said bag to prevent the body of the bag from tearing as a result of an external force has  
15 the shape of a band, the longitudinal extremities of which are provided with "Velcro" pads which will be joined one to the other once the belt is positioned around the body of the bag.

With respect to the eighth embodiment of the invention, "Velcro" pads or the like are  
20 present on the periphery of the body of a bag intended for transporting materials placed in the body of said bag, the protective belt surrounding the bag itself being fitted with "Velcro" pads (or an equivalent device) facing or uniting with the "Velcro" pads on the sac (or an equivalent system) which will keep it in place on the body of said bag, thus preventing the body of the bag from tearing as a result of an  
25 external force.

Lastly, with respect to the ninth embodiment of the invention, the protective belt to be fitted around the body of a bag intended for transporting materials placed in the body of said bag takes the shape of a band, the longitudinal extremities of which are  
30 provided with a pin and a buckle which engage one with the other once the belt is positioned around the body of the bag thus preventing the body of the bag from tearing as a result of an external force.

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Examples:

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Brief description of Diagrams or Figures 1 to 5

Diagram 1 is a perspective view of the first example.

Diagram 2 illustrates the embodiment as it will be transported by a fork-lift truck.

10 Diagram 3 is a perspective view of the second example.

Diagram 4 is a perspective view of the third example.

Diagram 5 is a perspective view of the fourth example.

Description of the symbols used

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- |             |                        |
|-------------|------------------------|
| 1           | body of the bag        |
| 2a, 2b      | opening portion        |
| 3a, 3b      | opening cord           |
| 10, 10a     | protective belt        |
| 20 11a, 11b | elastic retaining belt |
| 11c, 11d    | cord                   |
| 12a, 12b    | opening                |
| 12c, 12d    | passage                |
| 20a, 20b    | "Velcro" band          |
| 25 21a      | pin                    |
| 21b         | buckle                 |

The description of the first embodiment of the present invention is made with reference to diagrams 1 and 2.

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Diagram 1 is a perspective view of the present embodiment, while diagram 2 illustrates the present embodiment as it will be transported by a fork-lift truck.

According to this embodiment, a protective belt (10) of a relatively cylindrical  
35 shape, produced from synthetic resin, is provided with elastic retaining bands (11a and 11b) which are sewn along edges defining the top and bottom openings (12a and

12b) respectively, and is intended, as illustrated in diagram 1, to protect the body of a transport bag.

The protective belt (10) thus composed is positioned around the transport bag to be  
5 used by inserting the bottom part of the bag into the opening (12a) or (12b) and will be retained in place on the body of the bag using elastic retaining bands (11a and 11b).

In this state, an opening made in the top part of the bag is open and an opening made  
10 in the bottom part of said bag is closed using a closure cord, complementary to the closure of traditional transport bags. The material to be transported is placed in the body (1) of the bag by means of the top opening, which has the effect of enlarging the body (1) of the bag axially and radially and of stretching the elastic retaining bands (11a and 11b) with a view to positioning the protective belt (10) in close  
15 contact with the periphery of the body (1) of the bag.

Diagram 2 illustrates the transport bag (C) placed on a palette (15). The body (1) of the bag is filled with the material to be transported and equipped with the protective belt (10), its top opening being bound and closed according to the traditional  
20 method. When the palette (15) transporting the bag (C) is lifted and moved, in the present case by the forks (17) of a fork-lift truck (16), it may happen that one of the corners of the palette (15) or the front extremity of the fork (17) strikes the transport bag (C) at the moment when the palette or the fork approaches said bag, in which case the belt (10) protects the body (1) of the bag from tearing, thus preventing the  
25 material transported from escaping from said bag. The belt (10) protects the body (1) of the transport bag (C) against the palette (15) or the fork (17) but also from possible contact of the bag with an overhanging part of a wall when, for example, the bag (C) is transported by a lifting truck.

30 As a result, the present embodiment can easily be fitted onto the transport bag (C) before use of said bag, being kept in place by the clamping applied by the elastic retaining bands (11a and 11b) and thus preventing the body (1) of the bag filled with the material to be transported from tearing as a result of an external force exerted, for example, by the fork (17) of the lifting truck (16) at the time when the bag (C) is  
35 transported.

Although according to the embodiment illustrated, the elastic retaining bands (11a and 11b) are sewn along the top and bottom edges of the protective belt (10), said belt could be provided with a single elastic retaining band fixed at the level of its top edge alone, when it is unlikely that the bottom part of the belt can be rolled up from  
5 the bottom.

Example 2:

The description of the second embodiment of the present invention is made with  
10 reference to diagram 3.

Diagram 3 is a perspective view of the present embodiment.

According to this embodiment, the cords (11c and 11d) are housed in passages (12c  
15 and 12d) formed along the peripheral opening edges of a protective belt, as illustrated in diagram 3, in contrast to the first embodiment in which elastic retaining bands (11a and 11b) are sewn along the top and bottom edges of such a protective belt. Nevertheless, the field of application of the two first embodiments and the effect produced are similar. When the belt is used in a manner in which it cannot be  
20 rolled up from the bottom, a single cord could be used in the passage made in the top edge, as in the preceding embodiment.

Although according to the first embodiment described, the elastic retaining band is sewn onto the protective belt, said band could be housed in a passage formed along  
25 the peripheral opening edge as in the second embodiment. On the other hand, with this second embodiment, the cords could be sewn on the top and bottom edges respectively as in the first embodiment.

Example 3:

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The description of the third embodiment of the present invention is made with reference to diagram 4.

Diagram 4 is a perspective view of the present embodiment.

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As indicated in diagram 4, the protective belt (10A) according to this embodiment takes the form of a band made from synthetic resin fibres, the respective longitudinal extremities of said belt are provided with "Velcro" pads (20a and 20b) which can be attached one to the other. Furthermore, still in accordance with the present  
5 embodiment, the band is also provided with "Velcro" pads (20c) situated locally on the surface of said band, which come into contact with the body (1) of the bag, said "Velcro" pads facing corresponding "Velcro" pads situated on the periphery of the body (1) of the bag, to which they will be attached.

10 The protective belt (10A) thus constituted according to the present embodiment surrounds the transport bag to be used and is kept in place by joining the "Velcro" pads (20c) to the corresponding "Velcro" pads on the bag and by fixing the terminal "Velcro" pads (20a and 20b) to one another.

15 In this state, an opening made in the top part of the bag is open and an opening made in the bottom part of said bag is closed using a closure cord, in addition to the closure used for traditional transport bags. The material to be transported is then placed in the body (1) of the bag by means of the top opening, which has the effect of enlarging the body (1) of the bag axially and radially and allowing the protective  
20 belt (10A) to cover practically the whole circumference of the body (1) of the bag and to be kept in place on said bag by the "Velcro" pads (20a and 20b) joined to one another.

As described previously within the framework of the first embodiment, the  
25 protective belt (10a) used in this way prevents the body (1) of the bag from tearing as a result of an external force.

As a result, according to the third embodiment, the protective belt (10A) can easily be fitted around the body (1) of the transport bag, and attached to said bag with the  
30 aid of "Velcro" pads (20a, 20b, and 20c) with a view to preventing the body (1) of the bag filled with the material to be transported from tearing as a result of an external force exerted, for example, by the fork (17) of the lifting truck (16) when the bag (C) is transported.

35 Example 4:

The description of the fourth embodiment of the present invention is made with reference to diagram 5.

Diagram 5 is a perspective view of the present embodiment.

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In contrast with the third embodiment, in which the protective belt has the form of a band made of synthetic resin fibres, the longitudinal extremities of which band are joined by means of "Velcro" pads (20a) and (20b), the protective belt (10A) according to the present embodiment takes the shape of a band, one of the  
10 longitudinal extremities of which is with provided with pins (21a) and the other longitudinal of which is provided with buckles (21b) as illustrated in diagram 5. The belt can easily be fitted around the body (1) of a transport bag by engaging the pins (21a) in the buckles (21b) to prevent the body (1) of the bag filled with the material to be transported from tearing as a result of an external force exerted, for example,  
15 by the fork (17) of the lifting truck (16) when the transport bag (C) is transported.

Advantages of the devices according to the invention:

The patent application provides a belt intended to protect the drum made from a bag  
20 intended for transporting materials placed in the body thereof, being a belt of a cylindrical shape with can easily be fitted around the periphery of the body of the bag and fixed thereon by means of elastic retaining bands or cords provided at the level of the top and bottom edges of said belt, such a belt thus being easy to fit, inexpensive to produce and intended to prevent the body of the bag from tearing as a  
25 result of an external force exerted during transport and without involving a substantial increase in the weight of the bag.

The devices according to the invention also provide a belt intended to protect the drum made of a bag intended for transporting materials placed in the body of the bag  
30 and being easily fixed to said bag by joining together "Velcro" pads or by engaging pins in buckles, such a belt thus being easy to fit, inexpensive to produce and intended to prevent the body of the bag from tearing as a result of an external force exerted during transport and without involving a substantial increase in the weight of the bag.

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### Claims

1. A belt designed to protect the drum formed by a bag intended for transporting materials placed in the body of said bag, to prevent it from tearing as a result of an external force, and being characterised in that it is cylindrical in shape, at least the top edge of its top and bottom edges being provided with an elastic retaining band.  
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2. A belt designed to protect the drum formed by a transport bag, such as defined in claim 1, characterised in that the elastic retaining band is sewn along the edge or edges.  
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3. A belt designed to protect the drum formed by a transport bag, such as defined in claim 1, characterised in that the elastic retaining band is housed in a passage formed at the level of the edge or edges.  
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4. A belt designed to protect the drum formed by a bag intended for transporting materials placed in the body of said bag, said protective belt being fitted around the body of the bag to prevent it from tearing as a result of an external force, and being characterised in that it is cylindrical in shape, at least the top edge of its top and bottom edges being provided with a tie cord.  
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5. A belt designed to protect the drum formed by a transport bag, such as defined in claim 4, characterised in that the tie cord is sewn along the edge or edges.  
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6. A belt designed to protect the drum formed by a transport bag, such as defined in claim 4, characterised in that the tie cord is housed in a passage formed at the level of the edge or edges.  
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7. A belt designed to protect the drum formed by a bag intended for transporting materials placed in the body of said bag, said protective belt being fitted around the body of the bag to prevent it from tearing as a result of an external force, and being characterised in that it takes the form of a band, the longitudinal extremities of which are provided with  
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"Velcro" pads which are joined to one another once the belt is positioned around the body of the bag.

- 5 8. A belt designed to protect the drum formed by a bag intended for transporting materials placed in the body of said bag, said protective belt being fitted around the body of the bag to prevent it from tearing as a result of an external force, and being characterised in that it takes the form of a band, the surface of which is provided with "Velcro" pads which face each other and unite with their respective "Velcro" pads  
10 situated on the periphery of the body of the bag.
- 15 9. A belt designed to protect the drum formed by a bag intended for transporting materials placed in the body of said bag, said protective belt being fitted around the body of the bag to prevent it from tearing as a result of an external force, and being characterised in that it takes the form of a band, the longitudinal extremities of which are provided with a pin and a buckle which engage one with the other once the belt has been positioned around the body of the bag.