(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 206 656 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
**14.07.2010 Bulletin 2010/28**

(21) Application number: **09150426.6**

(22) Date of filing: **13.01.2009**

(51) Int Cl.:
***B65D 71/00*** *(2006.01)* ***B65D 85/16*** *(2006.01)*
***B65B 25/14*** *(2006.01)* ***B65B 63/02*** *(2006.01)*

(84) Designated Contracting States:
**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 SE SI SK TR**
Designated Extension States:
**AL BA RS**

(71) Applicant: **URSA Insulation, S.A.**
**28004 Madrid (ES)**

(72) Inventors:
- **Hillen, Frank, Dr.**
**41836 Hückelhoven (DE)**
- **Coll, Carlos**
**43002 Tarragona (ES)**

(74) Representative: **HOFFMANN EITLE**
**Patent- und Rechtsanwälte**
**Arabellastrasse 4**
**81925 München (DE)**

Remarks:
Amended claims in accordance with Rule 137(2) EPC.

# (54) Package for mineral wool products, modules to form such package and process to manufacture such a package

(57) A package (10) comprises a multitude of rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) of mineral wool, especially fibre glass insulating material, wherein each roll (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or package of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h)is held in a compressed state and a plurality of rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) are grouped into one module (6), respectively and a plurality of modules (6a, 6b, c) are arranged on a support surface (9) of the package (10), the modules (6; 6a, 6b, 6c) being in a compressed state and packed in a wrapping (3) of plastic film. The package is **characterized in that** each module (6; 6a, 6b, 6c) is formed by at least two rows (13) of rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h), at least two such rows (13) being arranged on top of each other and the modules (6a, 6b, 6c) being arranged next to each other on the support surface (8) and being held together on the support surface (8), preferably packed in a further plastic film wrapping (9).

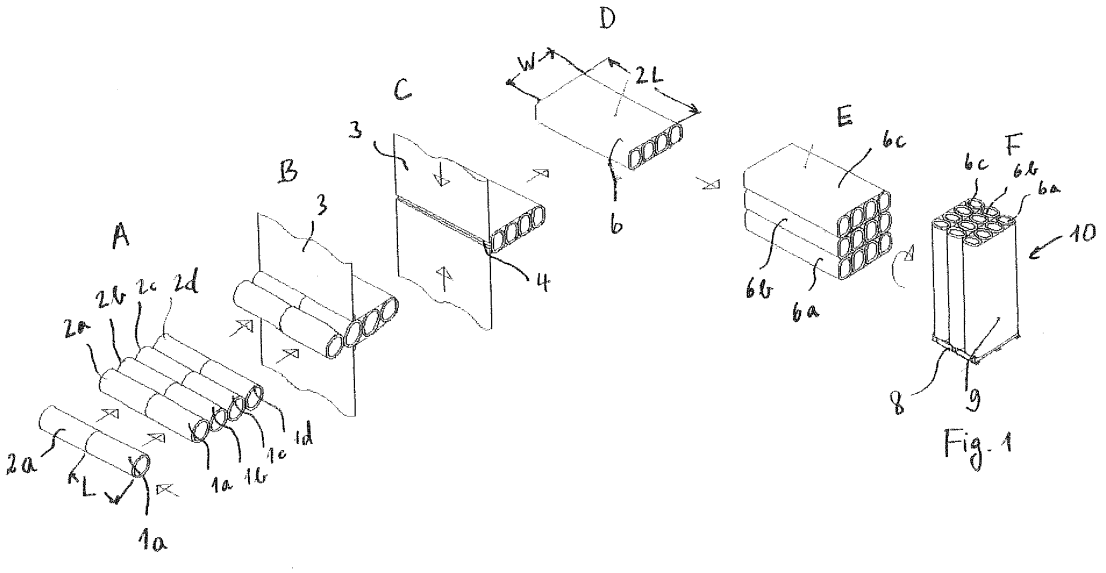


Fig. 1

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## Description

### Field of the Invention

**[0001]** The invention relates to a package comprising a multitude of rolls or panels of mineral wool, especially fibre glass insulating material with the pre-characterizing features of claim 1. The invention further relates to a packaged module and a process to manufacture such a package.

### Prior Art

**[0002]** Mineral wool products used for insulating purposes have a relatively low density. This is the reason why such products generate relatively high transport costs per weight unit. Therefore, attempts have been made to package mineral wool products such that the existing volume within trucks or other means of transport can be used in an optimum way. This leads to the formation of big packages combining a multitude of rolls or panels of mineral wool, which are packaged in such a way as to handle together larger units.

**[0003]** Further, attempts have been made to form packages of mineral wool products in such a way as to compress the products. However, when compressing mineral wool products, care has to be taken not to damage the products. Thus, any compression has to be made such that the individual products can be transported in a compressed state but, on the construction side, spring back again to their original size and density once they have been released from their package.

**[0004]** EP 0 220 980 B1 describes a package comprising a multitude of rolls where each individual roll of fibre glass is compressed during winding up the product to a roll and followed by a second compression step when a plurality of rolls is packed together as to form a so-called module. Then, a plurality of modules are stacked in two layers on top of each other to form a package which is finally wrapped in a plastic film. By using such two individual compression steps, high overall compression rates can be achieved. However, additional equipment is needed to form the individual modules and to stack the modules on top of each other on a suitable standing area like a pallet.

### Disclosure of the Invention

**[0005]** It is the object of the invention to suggest a package comprising a multitude of rolls or panels of mineral wool which can be formed with a high throughput and with good aesthetics.

**[0006]** This object is solved by a package with the features of claim 1 or a packaged module with the features of claim 15. The process to manufacture such a package is given in claim 17.

**[0007]** In the inventive package comprising a multitude of rolls or panels packets of mineral wool and especially fibre glass insulating material, each roll or panel package is held in a compressed state. A plurality of rolls or panel packages are grouped into one module, respectively, and a plurality of modules are arranged on a support surface of the package. The modules are in a compressed state and packed in a wrapping of plastic film. The package is **characterized in that** each module is formed by at least two rows of rolls or packages of panels, at least two such rows being arranged on top of each other. The modules being arranged next to each other on the support surface are packed by a palletizer in a further plastic film wrapping or by strap retainer. In other words, each module is formed such that at least two rows of rolls or packages of panels are arranged on top of each other. This allows the use of a packing machine having a double capacity as compared to the prior art as described. Same applies for a palletizer, which also has a double capacity and therefore, can be operated using half cycles, because it is no longer necessary to stack a plurality of modules on top of each other. The modules now being formed by at least two rows of rolls or packages of panels arranged on top of each other make it no longer necessary to form separate layers of modules within the package. Besides the possibility to operate the packing machine and the palletizer with double capacity, the aesthetics of the package can be improved because, within each module, a highly accurate alignment of the rows of rolls or packages of panels being arranged on top of each other can be achieved.

**[0008]** Depending of whether the modules are completely closed by a plastic film so as to protect them against the ingress of water, the final packaging of the package can either be strap retainers in case the modules are completely closed, or a plastic film wrapping in order to protect the whole package against the undesired ingress of water.

**[0009]** The inventive packaged module for a multitude of rolls or packages of panels of mineral wool, especially fibre glass insulating material, comprises compressed rolls of mineral wool which are individually packaged within a plastic film or, alternatively, compressed stacks of mineral wool panels which are packaged in a plastic film to from a package of panels. The packaged module is formed by at least two rows of rolls or packages of panels, wherein at least two such rows are arranged on top of each other and surrounded by a further plastic film. Additionally, the rows of rolls or packages of panels are further compressed within the packaged module. In other words, the overall compression takes place in two distinct steps, a first compression of the rolls or the stacks of panels before surrounding them by a plastic film, and a second compression of the rows of rolls or packages before the modules formed are also packaged by a further plastic film.

**[0010]** The process to manufacture such a package is **characterized in that** the modules are formed by arranging at least two rows of rolls or packages of panels next to each other, compressing this arrangement and

wrapping a plastic film around the at least two rows of rolls or packages of panels.

**[0011]** This makes it possible to manufacture the individual rows of rolls or packages of panels in different production lines and combine two or more production lines together in the above-described step of arranging rows next to each other and wrapping a plastic film around the at least two rows. In other words, one packing machine forming modules as well as one palletizer to form the final package can be used for two or more parallel production lines which largely reduce the investment for the packaging of the modules and the forming of the final package.

**[0012]** Preferred embodiments of the invention follow from the other claims.

**[0013]** According to a preferred embodiment of the invention, the package further comprises means for dividing the modules into sub-units with the sub-units consisting of one row of rolls or packages of panels, respectively. By dividing the modules into sub-units, such sub-units become easier to handle. For persons on the construction site, the easy option is given either to transport the modules or, where space requirements should make this disadvantageous, to subdivide a module into sub-units and to handle these smaller units only.

**[0014]** In this respect, it is preferred that the means for dividing the modules is a running chord around the center line of the plastic film running in circumferential direction around the wrapping of the modules, the running chord preferably being arranged in an undulating way in sections inside and outside the wrapping. This specific type of a means for dividing the modules into sub-units is advantageous in that it still maintains a relatively waterproof wrapping around the modules and minimizes the undesired ingress of water and moisture.

**[0015]** According to an alternative embodiment of the invention, the means for dividing the modules into sub-units is a perforation in the wrapping which is arranged in a circumferential direction around the modules. A perforation is the easiest and most cost-effective way to provide such a dividing line. No matter how the dividing line is formed, it is preferably covered by a waterproof tape so that no water can penetrate the dividing line.

**[0016]** According to an alternative embodiment of the invention, the individual modules of the package are completely sealed by the wrapping of plastic film. The term "completely sealed" means that the wrapping around the modules provides a waterproof enclosure so that the package as well as the individual modules are not subject to any damages because of a high water absorption which can be detrimental to the quality of the fibres because of traces of undesired substances in the water. Alternatively, the individual rolls or the individual packages of panels are completely sealed.

**[0017]** According to preferred embodiment of the invention, the package has an overall height between 2.3m and 2.5m and more particularly of about 2.4m. Such an overall height makes it possible to store a high transport volume in conventional trucks or train wagons.

**[0018]** Preferably, the support surface of the package is a pallet, especially a standard pallet with a standing area of 1.2 x 1.2m. Usually, the size of the pallets is between 1.2 x 1.5m to 1.2 x 1.45m. Especially standard pallets with a standing area of 1.2 x 1.2m are used. The use of a standard pallet is advantageous because many transport means are dimensioned such that their transport volume is adapted to receive a maximum number of goods stored on standard pallets of this given size.

**[0019]** According to a preferred embodiment of the invention, the individual modules have at least one handle which helps to transport the modules to and within the construction site. Such handles are preferably formed by the same plastic material as the wrapping around the modules.

**[0020]** The modules can have either one or two different types of handles. A first type of handle is placed in the middle of the module and can be used to carry the whole module with a forklift or crane at the construction site. This handle can be used e.g. to lift the module to a floor of a house. In order to carry a module which can weigh up to 80kg, such a single handle is not suitable. For this purpose additional handles, e.g. four handles, can be placed at the sides of the modules so that they can be used to carry the whole module by four workers. Alternatively, the modules can be divided into sub-modules which can be carried by two persons.

**[0021]** According to a preferred embodiment of the invention, the mineral wool product of the package consists of rolls, wherein each row consists of three or four rolls and two layers of rows are arranged within one module. In other words, each module of the package consists of two rows of compressed mineral wool rolls and the two rows are arranged on top of each other so that the rolls resembling upright standing circular cylinders are standing on top of each other within one module.

**[0022]** The rows of mineral wool are pre-compressed when forming the rolls out of a web of mineral wool and the individual rolls can be packed in a plastic wrapping forming a skirt around the rolls or a type of bag in order to keep the individual rolls in the compressed state. For compressing the rolls, a device as described in EP 0 220 980 B1 can be used.

**[0023]** Preferably, the mineral wool product has a thickness of between 60mm and 240mm and is compressed within each roll such that the thickness of the product is considerably reduced, preferably by a factor ranging between 1 and 8 and most preferably between 3.5 and 5.5

**[0024]** According to a preferred embodiment, the mineral wool product of a package has a high spring back elasticity to be clamped between support elements like rafters of a roof construction, which mineral wool product is called a "wedging felt".

**[0025]** The process to manufacture an inventive package is **characterized in that** the modules are formed by arranging at least two rows of rolls or packages of panels

next to each other such that the rolls are brought together to make them touch one another at one of their front surfaces. Thereafter, a plastic film is wrapped around the at least two rows of rolls or panels. In other words, when forming the modules, the rolls or packages of panels are arranged such as to form parallel rows.

**[0026]** According to a preferred embodiment of the inventive process, the modules are made up by two rows and the rows are produced on different production lines and combined together in the step of arranging the two rows next to each other. This specific, preferred embodiment of the process makes it possible to produce the rolls or packages of panels on parallel production lines, and combining together the rolls or packages of panels produced when forming the modules and packaging the modules to form the final package. By using this specific process, different advantages can be achieved. The device for packaging the modules having double capacity as compared to the prior art can simultaneously package the products which are produced in two parallel production lines. The same applies for the palletizer forming the final package which also has a double capacity because it is no longer necessary to stack modules on top of each other before finally combining the modules to the inventive package.

**[0027]** The last production step of the so-called palletizer is preferably carried out by putting a plurality of modules onto a pallet and fixing the modules on the pallet, preferably by wrapping a further plastic film around the package. Such palletizer can be made more simple because no high requirements have to be met as regards the exact positioning of different modules in top of each other. The inventive method leads to modules in which the rows of rolls or packages of panels are already exactly aligned and good aesthetics of the final package can be achieved.

**[0028]** A further advantage of commonly using one packaging machine forming modules and one palletizer for two production lines resides in a reduction of space required on the production site and a reduction in investment costs.

Brief Description of the Drawings

**[0029]** In the following, the invention will be discussed by way of one specific embodiment, in which

Fig. 1 schematically shows the process of forming the inventive package starting from rows of mineral wool;

Fig. 2 schematically shows an inventive module made up of mineral wool panels;

Fig. 3 shows an embodiment of a module made up of mineral wool rolls; and

Figs. 4 and 5 show schematically the dividing lines of modules with chords.

Description of a Preferred Embodiment

**[0030]** In the following, specific embodiments of the invention will be described in more detail. The first embodiment as shown in Fig. 1 relates to rolls of mineral wool. However, it should be understood that the same basic principles also apply to the formation of a package made up of packages of panels of insulation material.

**[0031]** Fig. 1 gives one specific example of a package 10 and the way it is produced. The example package 10 in Fig. 1 consists of 24 rolls of insulation material, the thickness of the insulation material being in a range between 60mm and 240mm. The individual rolls may be produced with a standard length L, which preferably is 1200mm. The individual rolls are pre-compressed which means that, during the winding up of each roll, the above-mentioned thickness of the insulation material between 60mm and 240mm is considerably reduced. The reduction of the thickness is selected in accordance with the specific structure of the insulation material because the fibre structure of the insulation material must not be destroyed so that the insulation material springs back to essentially the initial thickness after having been unwound from the roll. The degree of compression corresponding to the volume reduction of the wound up material is between 1 and 8 and preferably between 3.5 and 5.5.

**[0032]** After having compressed the web when coiling the individual rolls, care has to be taken to maintain the desired compression and to avoid the elastic return of the material into the uncompressed condition. To this end, a suitable wrapping is used which can either be a skirt around the circumferential surface of the rolls, a bag also closing one front surface of the cylindrical roll or even a package closing the circumferential surface and both front surfaces of the roll. The packaging around the individual rolls can be best made by a plastic film wrapping of heat sealable plastic material which preferably has additional heat-shrinking behaviour. Preferentially, the individual rolls or the individual packages of panels are completely sealed. A suitable material for the plastic film wrapping as well as for the other wrappings described below to be used for the modules and the package itself are PVC or PE.

**[0033]** As can be seen in Fig. 1, two rolls 1a and 2a are brought together such that they touch one another at one of their front surfaces, respectively. The two rolls 1a, 2a can either be produced sequentially on one production line or can be produced simultaneously at two or more different production lines (not shown) both producing and packaging individual rolls of insulation materials which are brought to the packaging device as shown in Fig. 1.

**[0034]** Fig. 1 only schematically depicts the important process steps without giving a detailed description of the devices used because devices for coiling rolls in a com-

pressed state, devices for packaging rolls, devices for packaging compressed modules and so-called palletizers to put modules onto a pallet and packaging the resulting package are known in the art.

**[0035]** Several pairs of rolls 1a to 1d and 2a to 2d are combined together such that the individual pairs of rolls 1a, 2a, 1b, 2b, 1c, 2c, 1d, 2d are not only placed such that front sides abut each other but also arranged in a side-to-side configuration as shown in Fig. 1. In the specific example, eight rolls of insulating material are combined in such a way as shown in step A in Fig. 1.

**[0036]** In the subsequent step B, the rolls are packaged to modules. To this end, a plastic film wrapping 3 is placed around the group of eight rolls. This packing step can also be carried out using compression as disclosed in EP 0 220 980 B1. The compression of the rolls leads to a reduction of the width W of the modules which can be seen from the deformed and compressed shape of the front sides of the individual rolls.

**[0037]** In step C it can be seen that the two overlapping ends of the plastic film wrapping 3 are welded or bonded onto each other to form a seam 4.

**[0038]** After having been arranged in step A and packed in a wrapping of plastic film 3 in steps B and C, a module 6 has been formed which is schematically shown in step D. Each module consists of at least two rows of coiled rolls with, in the specific example as shown in Fig. 1, two such rolls being arranged next to each other in a longitudinal direction of the module.

**[0039]** In the subsequent step E, a plurality of modules 6a, 6b, 6c are stacked such that the arrangement of the individual rolls extends in a third dimension. In a subsequent step F, the plurality of modules 6a, 6b, 6c as shown in step E is brought in an upright position, i.e. with the front surfaces of one layer of rolls standing on a pallet 8. In a final step, the package 10 as shown in Fig. 1 is additionally surrounded by a plastic film wrapping which can also include the pallet as part of the packaging so that, when lifting up the pallet, the stacked modules within their wrapping do not fall off the pallet.

**[0040]** The individual modules within each pallet can be separately handled once the wrapping around the package 10 has been removed. In order to make easier the handling of the individual modules, a handle 12 can be provided which, for sake of simplicity, was arbitrarily placed in the schematic drawing of Fig. 3. The handle 12 can likewise be arranged at one of the short sides of the module. The handle 12 preferably consists of the same material as the plastic film wrapping in order to simplify the recycling of the wrapping material. The handle 12 serves to carry a whole module with a forklift or crane at the construction site. It can be used to lift up the whole module to a certain floor or level within a construction site. In view of the fact that a big module can have a considerable weight up to e.g. 80kg, handle 12 should be provided with a sufficient tear-off strength so that the whole module can be safely lifted up by handle 12.

**[0041]** In order to further simplify the handling of the individual modules having a length 2L of 2.4m in the example case of Fig. 1, the wrapping around the modules can be provided with a suitable means to separate a module 6 into the individual layers of rolls which is, in the example cases of Figs. 2 and 3, a row of rolls or packages of panels. Such separated unit is no longer a module of the overall package but is still held together by the outer wrapping such that it can be transported within the construction side without having to hold together all individual rolls or packages of panels of a row 13. The means for dividing the modules into layers can be a perforation or can be a circumferentially running chord in the position of the plastic film surrounding the modules in a position where the individual rows abut each other. The running chord can run in undulating sections alternately inside and outside the plastic film as can be best seen from the schematic representation in Fig. 4 which shows a chord 14 which alternately runs inside the wrapping 3 and outside the wrapping 3. The sections of the chord 14 inside the wrapping 3 are sections 14a whereas the sections of the chord 14 outside the wrapping 3 are sections 14b.

**[0042]** A sealing tape 15 can be placed on top of the chord 14 along dividing line to prevent water and moisture to enter the module through openings formed along the dividing line. Such a sealing tape is schematically shown in Fig. 5 and could be partially or fully self-adhesive on the bottom side.

**[0043]** The module as shown in Fig. 3 is further provided with additional handles 11 situated at the short sides at the modules. In the example cases shown in Fig. 3, these are four handles 11 which can either be used to carry the whole module by four persons or, after the module has been divided into sub-modules, to carry each sub-modules by two persons.

**[0044]** Fig. 2 shows a module which, different to the module as shown in Fig. 1 is made up of compressed mineral wool panels 20. Several such panels are stacked and the resulting pile of stacked panels is wrapped in a plastic foil in order to obtain packages 22. In the example as shown in Fig. 2, four such packages can be seen in a first row and are referenced to by reference numerals 22a, 22b, 22c and 22d. On the other side of the module, packages 22e, 22f, 22g and 22h of a second row are indicated. In the example case as shown in Fig. 2, four such packages form a row 13. Within the module, at least two such rows 13 are placed on top of each other and after a compression in the longitudinal direction of the rows 13, the module 6 as shown in Fig. 2 is packaged in a plastic film wrapping.

**[0045]** In the embodiments according the Figs. 2 and 3,the modules are shown such that the front surfaces 7 of the modules 6 are not enclosed by the plastic film wrapping. However, when using a heat shrinking plastic material for the wrapping, it can be sized such that the length of the plastic film wrapping is slightly larger than the overall length 2L of the modules so that under the application of heat, the excess portions at both front ends 7 of the modules close onto the front ends which at least partially

closes the front ends of the modules as well.

**[0046]** According to an alternative embodiment, the module can be completely sealed with a plastic film. In that case, the additional plastic film 9 around the bulk package 10 is no longer necessary because the modules themselves have a sufficient resistance against the undesired ingress of moisture. In that case, the bulk package 10 can be held together by strap retainers (e.g. made from plastic or metal) and also fixed onto the pallet 8 by means of strap retainers only. This measure serves to safe the overall amount of plastic film material used for the inventive package.

**[0047]** The package according to the invention not only shows better aesthetics because the rows 13 of rolls or panels can be accurately aligned within each module. The package has the additional advantage that both the packing machine forming the modules as well as the palletizer forming the final package can be either operated in half cycles as compared to the previously known machines or can be used to package the rolls or panels produced on two or more parallel production lines because the combination of plurality of rows within each product increases the capacity by a factor which corresponds to the number of rows per module.

## Claims

**1.** Package (10) comprising a multitude of rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) of mineral wool, especially fibre glass insulating material, wherein

- each roll (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or package (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) of panels is held in a compressed state;
- a plurality of rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) are grouped into one module (6), respectively;
- a plurality of modules (6a, 6b, c) are arranged on a support surface (9) of the package (10), and
- the modules (6; 6a, 6b, 6c) are in a compressed state and packed in a wrapping (3) of plastic film;

**characterized in that**

- each module (6; 6a, 6b, 6c) is formed by at least two rows (13) of rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h), at least two such rows (13) being arranged on top of each other; and
- the modules (6a, 6b, 6c) are arranged next to each other on the support surface (8) and being held together on the support surface (8), preferably packed in a further plastic film wrapping (9).

**2.** Package according to claim 1,
**characterized in that**
the individual modules (6a, 6b, 6c) of the package (10) are completely sealed by a wrapping of plastic film.

**3.** Package according to claim 1, further comprising means (14) for dividing the modules into subunits along a dividing line, the subunits consisting of one row (13) of rolls (1a, 1b, 1c, 1d; 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h), respectively.

**4.** Package according to claim 3, wherein the means for dividing the modules is a running chord (14) in the plastic film (3) arranged in circumferential direction around the wrapping (3) of the modules (6; a, 6b, 6c), the running chord (14) preferably being arranged in an undulating way in sections inside and outside the wrapping (3).

**5.** Package according to claim 3, wherein the means (14) for dividing the modules is a perforation in the wrapping (3) which is arranged in a circumferential direction around the wrapping (3) of the modules (6; 6a, 6b, 6c).

**6.** Package according to claim any of the claims 3 to 5
**characterized in that**
the dividing line is covered with self-adhesive, waterproof tape (15).

**7.** Package according to any of the claims 1 to 6,
**characterized in that**
the package (10) has an overall height between 2.3m and 2.5m and more particularly of about 2.4m.

**8.** Package according to any of the claims 1 to 7,
**characterized in that**
the support surface (8) is a pallet with a standing area of 1.2m x 1.2m.

**9.** Package according to any of the claims 1 to 8,
**characterized in that**
the individual modules (6; 6a, 6b, 6c) have a handle (12) arranged to lift up the individual module (6; 6a, 6b, 6c) in a balanced manner.

**10.** Package according to any of the claims 1 to 9, further comprising a plurality of handles arranged to carry the individual modules (6; 6a, 6b, 6c) by at least two persons or the sub-units (13) by at least one person.

**11.** Package according to any of the claim 1 to 10, the mineral wool product being rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) with each row (13) having three or four rolls and two layers of rows (13) being arranged within one module (6; 6a, 6b, 6c).

**12.** Package according to any of the claims 1 to 11, the mineral wool product having a thickness of between 60mm and 240mm and being compressed within each roll (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) such that the thickness of the product is considerably reduced, preferably by a factor of 1 to 8 and most preferably by a factor of 3.5 to 5.5.

**13.** Package according to any of the claims 1 to 12, the mineral wool product having a high spring back elasticity and being suitable to be clamped between rafters or beams.

**14.** Package according to any of the claim 1 to 10, the mineral wool product being panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) with each row (13) having three or four packages of panels and two layers of packages of panels being arranged within one module (6).

**15.** Packaged module for multitude of rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) of mineral wool, especially fibreglass insulating material, comprising:

- compressed rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or mineral wool which are individually packaged within a plastic film or compressed stacks of mineral wool panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) which are packed in a plastic film (3) to form a package of panels, wherein
- the packaged module (6; 6a, 6b, 6c) is formed by at least two rows (13) of rolls (1a, 1b, 1c, 1d; 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h), at least two such rows (13) being arranged on top of each other and surrounded by a further plastic film (9); and wherein
- the rows (13) or rolls or packages of panels are further compressed within the packaged module (6; 6a, 6b, 6c).

**16.** Packaged module according to claim 15, wherein the individual rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or the individual packages (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) of panels are completely sealed by the plastic film.

**17.** Process to manufacture a packaged module according to any of the preceding claims,
**characterized in that** the modules are formed by

(a) arranging at least two rows of rolls or packages of panels next to each other such that the rolls or packages of panels are brought together to make them tough one another at one of their front surfaces;
(b) compressing the at least two rows of rolls or packages of panels being arranged next to each other; and
(c) wrapping a plastic film around the at least two rows.

**18.** Process according to claim 17,
**characterized in that**
the modules are made up by two rows and each of the two rows is produced on a different production lines and combined with the other row in step (a).

**19.** Process to manufacture a package according to claim 17 or 18, further comprising the step

(d) putting a plurality of modules onto a pallet; and
(e) fixing the modules on the pallet, preferably by wrapping a further plastic film around the package.

**20.** Process according to any of the claims 17 to 19,
**characterized in that**
the package comprises rolls of insulation material and the individual rolls are wound up in a compressed state and individually packed in a plastic film wrapping.

**Amended claims in accordance with Rule 137(2) EPC.**

**1.** Package (10) comprising a multitude of rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) of mineral wool, especially fibre glass insulating material, wherein

- each roll (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or package (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) of panels is held in a compressed state;
- a plurality of rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) are grouped into one module (6), respectively;
- a plurality of modules (6a, 6b, c) are arranged on a support surface (9) of the package (10) such that the modules are in an upright position with the front surfaces of the rolls of one row standing on the support surface, and
- the modules (6; 6a, 6b, 6c) are in a compressed state and packed in a wrapping (3) of plastic film;
**characterized in that**
- each module (6; 6a, 6b, 6c) is formed by at least two rows (13) of rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h), at least two such rows (13) being arranged on top of each other such that the rolls touch one another at one of their

front surfaces; and
- the modules (6a, 6b, 6c) are arranged next to each other on the support surface (8) and being held together on the support surface (8), preferably packed in a further plastic film wrapping (9).

**2.** Package according to claim 1,
**characterized in that**
the individual modules (6a, 6b, 6c) of the package (10) are completely sealed by a wrapping of plastic film.

**3.** Package according to claim 1, further comprising means (14) for dividing the modules into subunits along a dividing line, the subunits consisting of one row (13) of rolls (1a, 1b, 1c, 1d; 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h), respectively.

**4.** Package according to claim 3, wherein the means for dividing the modules is a running chord (14) in the plastic film (3) arranged in circumferential direction around the wrapping (3) of the modules (6; a, 6b, 6c), the running chord (14) preferably being arranged in an undulating way in sections inside and outside the wrapping (3).

**5.** Package according to claim 3, wherein the means (14) for dividing the modules is a perforation in the wrapping (3) which is arranged in a circumferential direction around the wrapping (3) of the modules (6; 6a, 6b, 6c).

**6.** Package according to claim any of the claims 3 to 5
**characterized in that**
the dividing line is covered with self-adhesive, waterproof tape (15).

**7.** Package according to any of the claims 1 to 6,
**characterized in that**
the package (10) has an overall height between 2.3m and 2.5m and more particularly of about 2.4m.

**8.** Package according to any of the claims 1 to 7,
**characterized in that**
the support surface (8) is a pallet with a standing area of 1.2m x 1.2m.

**9.** Package according to any of the claims 1 to 8,
**characterized in that**
the individual modules (6; 6a, 6b, 6c) have a handle (12) arranged to lift up the individual module (6; 6a, 6b, 6c) in a balanced manner.

**10.** Package according to any of the claims 1 to 9, further comprising a plurality of handles arranged to carry the individual modules (6; 6a, 6b, 6c) by at least two persons or the sub-units (13) by at least one person.

**11.** Package according to any of the claim 1 to 10, the mineral wool product being rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) with each row (13) having three or four rolls and two layers of rows (13) being arranged within one module (6; 6a, 6b, 6c).

**12.** Package according to any of the claims 1 to 11, the mineral wool product having a thickness of between 60mm and 240mm and being compressed within each roll (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) such that the thickness of the product is considerably reduced, preferably by a factor of 1 to 8 and most preferably by a factor of 3.5 to 5.5.

**13.** Package according to any of the claims 1 to 12, the mineral wool product having a high spring back elasticity and being suitable to be clamped between rafters or beams.

**14.** Package according to any of the claim 1 to 10, the mineral wool product being panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) with each row (13) having three or four packages of panels and two layers of packages of panels being arranged within one module (6).

**15.** Packaged module for multitude of rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h)of mineral wool, especially fibreglass insulating material, comprising:

- compressed rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or mineral wool which are individually packaged within a plastic film or compressed stacks of mineral wool panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) which are packed in a plastic film (3) to form a package of panels, wherein
- the rows (13) or rolls or packages of panels are further compressed within the packaged module (6; 6a, 6b, 6c),
**characterized in that**
- the packaged module (6; 6a, 6b, 6c) is formed by at least two rows (13) of rolls (1a, 1b, 1c, 1d; 2a, 2b, 2c, 2d) or packages of panels (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h), at least two such rows (13) being arranged on top of each other such that the rolls touch one another at one of their front surfaces, and being surrounded by a further plastic film (9).

**16.** Packaged module according to claim 15, wherein the individual rolls (1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d) or the individual packages (22a, 22b, 22c, 22d, 22e, 22f, 22g, 22h) of panels are completely sealed by the plastic film.

**17.** Process to manufacture a packaged module according to any of the preceding claims,
**characterized in that** the modules are formed by

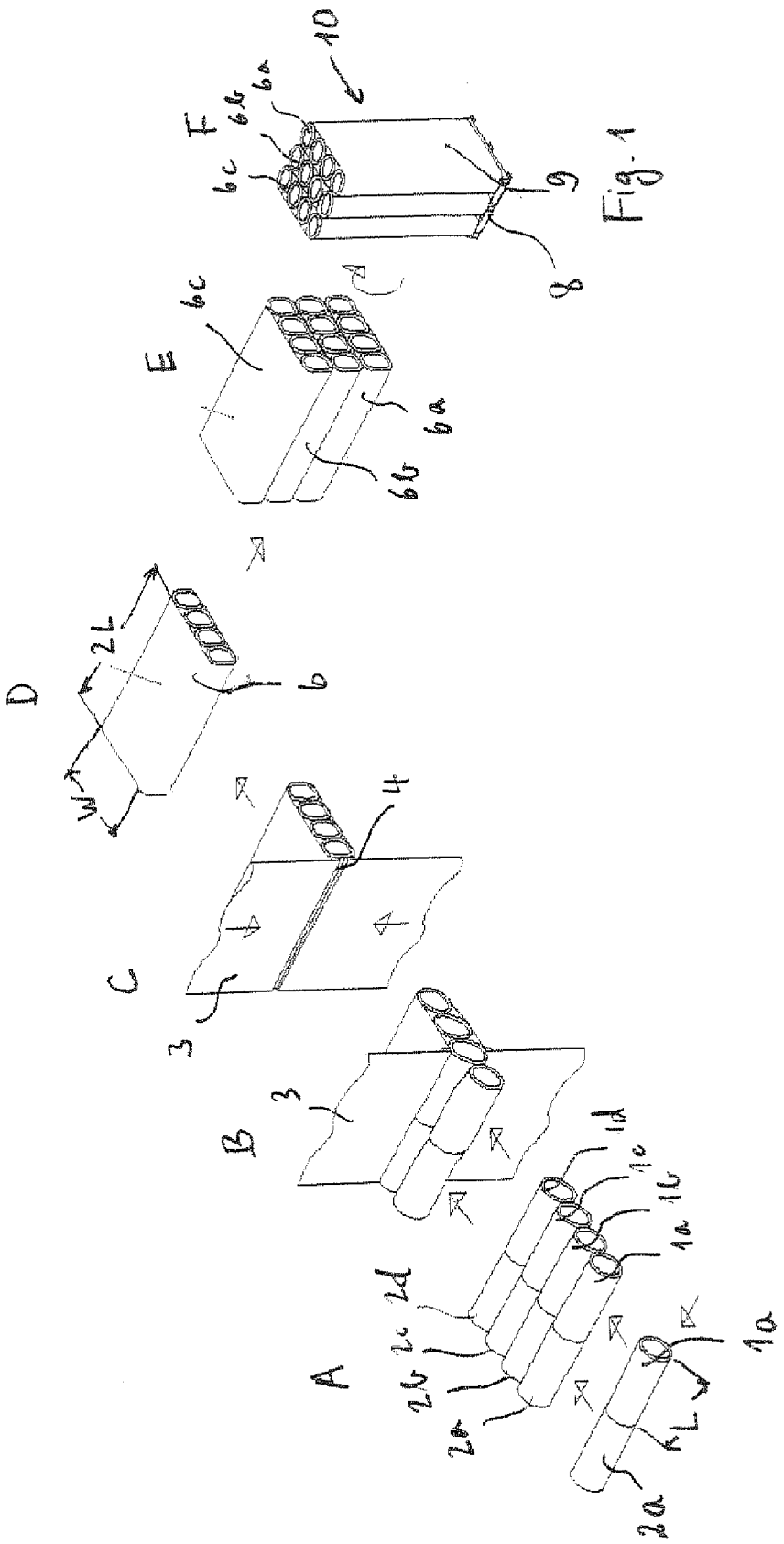
(a) arranging at least two rows of rolls or packages of panels next to each other such that the rolls or packages of panels are brought together to make them touch one another at one of their front surfaces;
(b) compressing the at least two rows of rolls or packages of panels being arranged next to each other; and
(c) wrapping a plastic film around the at least two rows.

**18.** Process according to claim 17,
**characterized in that**
the modules are made up by two rows and each of the two rows is produced on a different production lines and combined with the other row in step (a).

**19.** Process to manufacture a package according to claim 17 or 18, further comprising the step

(d) putting a plurality of modules onto a pallet; and
(e) fixing the modules on the pallet, preferably by wrapping a further plastic film around the package.

**20.** Process according to any of the claims 17 to 19,
**characterized in that**
the package comprises rolls of insulation material and the individual rolls are wound up in a compressed state and individually packed in a plastic film wrapping.


10
F
6c
6b
6a
9
8
E
6c
6a
6b
D
2L
W
b
C
4
3
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1a
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2d
2c
2b
2a
L
1a
2a

Fig. 1

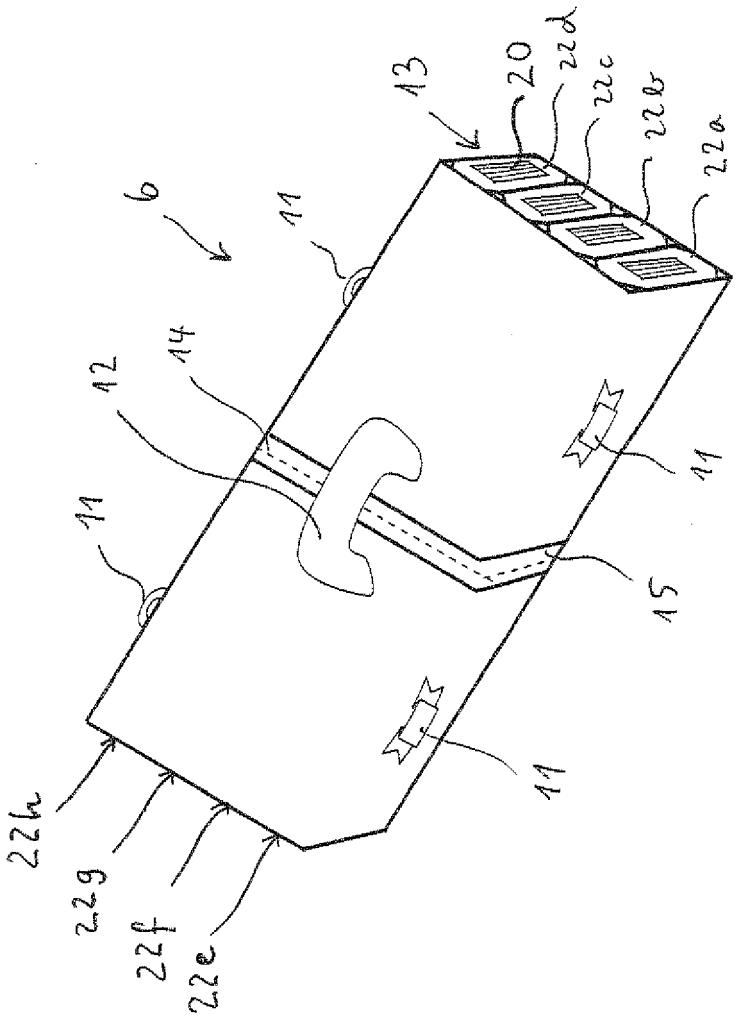


Fig. 2

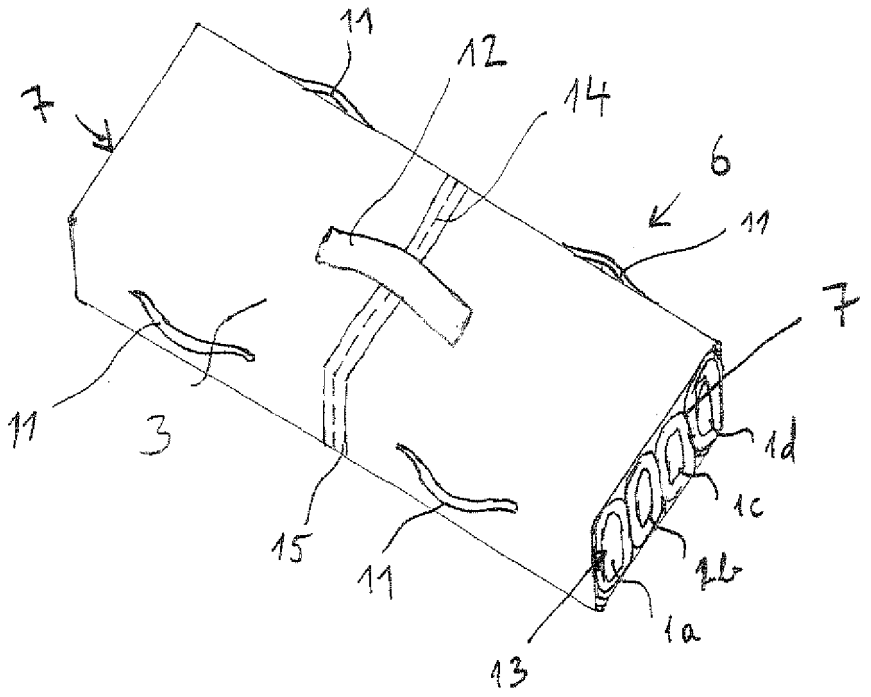


Fig. 3

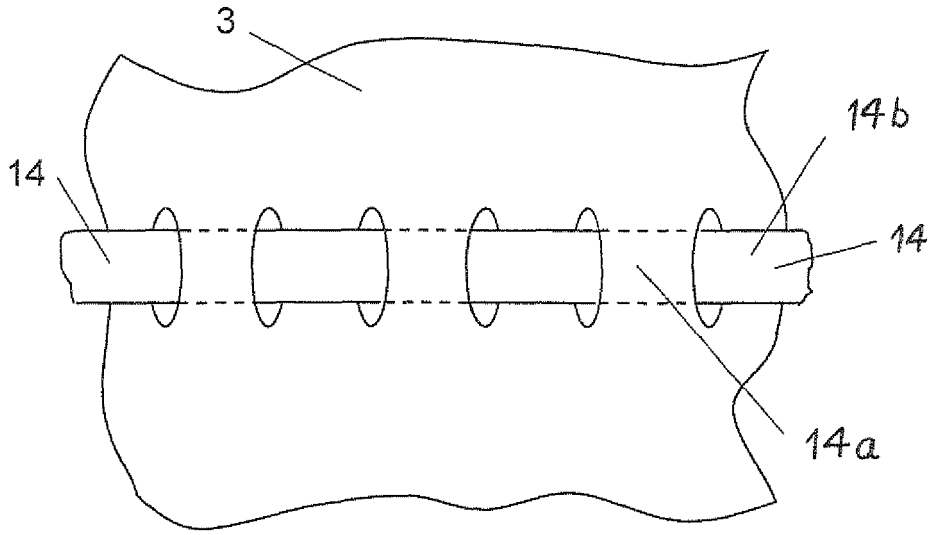


Fig. 4

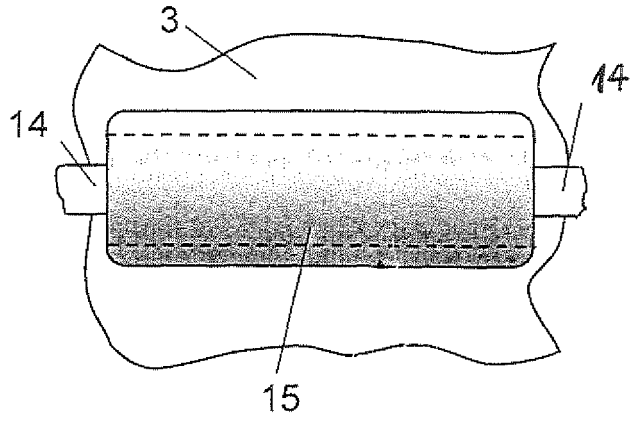


Fig. 5

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Application Number
EP 09 15 0426

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The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
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| The Hague | 23 March 2009 | Grentzius, Wim |

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