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(54) Cover structure for a wood storage area for drying stacked wood and method for drying wood.

(57) The present invention relates to a cover structure (1) for a wood storage area for drying stacked wood (13), comprising a roof (3) having a length dimension greater than the width dimension, which roof (3) is supported on a supporting structure comprising two or more vertical supports (5) arranged parallel to the longitudinal direction of the roof (3) with respect to each other, which supports are positioned closer to the centre of the roof, seen in transverse direction, than to a side edge of the roof extending in the longitudinal direction of the roof, wherein said vertical supports (5) form an open spatial structure. The present invention further relates to a method wherein stacked wood (13) stored on a floor (17) under an elongated cover structure (1) that provides protection from the sun is dried under controlled conditions, characterised by arranging at least two rows of stacked wood (13) some distance apart under a cover structure (1), so that a ventilation channel (8) is formed between the at least two rows of wood (13), the cover structure (1) and the floor (17).

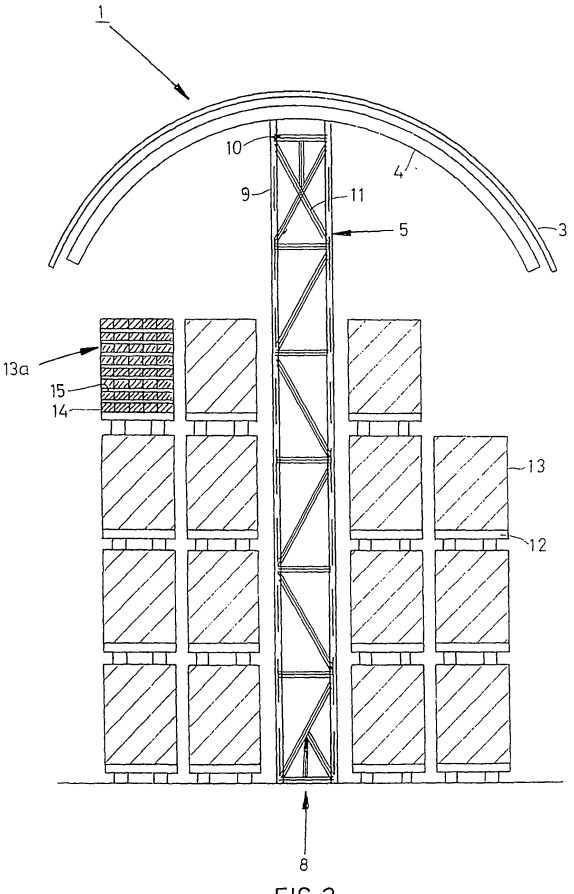

FIG. 3

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Description

[0001] The present invention relates to a cover structure for a wood storage area for drying stacked wood, comprising a roof having a length dimension greater than the width dimension, which roof is supported on a supporting structure comprising two or more vertical supports arranged parallel to the longitudinal direction of the roof with respect to each other, which supports are positioned closer to the centre of the roof, seen in transverse direction, than to a side edge of the roof extending in the longitudinal direction of the roof.

[0002] Such a cover structure is known for covering an area that is used for storing wood for the purpose of allowing the wood to dry, wherein the vertical supports support a roof, or at least partially so, in the centre of the wood storage area, seen in transverse direction, under the ridge of said roof. The cover structure in particular functions to protect the wood set out for drying from the sun and from splitting due as a result of being dried too quickly by the sun. The cover structure also provides protection from the rain, of course. As a rule wood is supplied and removed from one long side and stored on either side of the vertical supports under the cover structure, with the vertical supports forming objectionable obstacles. A solution to this problem is to provide an alternative supporting structure which requires fewer vertical supports, which increases the cost of the supporting structure, however. In another known arrangement, access to the stock of wood is possible from two long sides so as to realise better logistics during the supply and removal of wood. To use the available space as efficiently as possible, the wood is stacked as compactly as possible in the two known embodiments. On the other hand, wood must not be stacked too compactly, because this will have an adverse effect on the conditions for drying the wood, and the wood that is present in the centre will dry (too) slowly. A number of areas may be covered in the aforesaid manner, thus forming a succession of roofs which may form one integrated cover structure. In this document such a succession is regarded as a number of individual cover structures according to the present invention.

[0003] It is therefore an object of the present invention to provide a cover structure according to the introductory paragraph, in which an improved ratio between the efficiency of utilisation of the storage area and the drying capacity is realised. This object is achieved by the present invention in that the vertical supports form an open spatial structure. The open spatial structure formed by the vertical supports provides ventilation columns for wood that is stacked near the vertical supports, as a result of which the wood can dry more quickly. When air moves past a ventilation column transversely to the longitudinal direction, for example as a result of wind blowing past the column, an underpressure is generated at the respective end of the ventilation column. As a result, air that is present in the ventilation column, where a relative overpressure prevails in relation to the underpressure at the end of the ventilation column, will flow towards the end of the ventilation column. Thus a relative underpressure, in relation to the ambient air of the ventilation column, is generated in the ventilation column in the wood that is stored around the ventilation column, as a result of which said air is drawn towards the ventilation column. The relative underpressure that is thus generated in the stacked wood is compensated by air present on the side of the stacked wood opposite the ventilation column. Thus an air flow is generated from the ambient air, through the stacked wood, to the ventilation column and subsequently, via the end thereof, to the surrounding atmosphere. Said flow will be stronger as air present near the end of the ventilation column is displaced more rapidly, in any case stronger than in the situation in which there is no ventilation column. The air that thus flows past the stored wood causes the drying process to be accelerated.

[0004] The presence of the vertical supports prevents workers from storing wood within the ventilation column, and as such the supports form a useful boundary of the storage area.

[0005] In a preferred embodiment of the invention, the vertical supports are disposed at a position halfway the width of the roof. This leads to a symmetric arrangement, which is advantageous both with regard to the structure of supports and the roof supported thereon and with regard to a uniform distribution of wood under the cover structure.

[0006] The vertical supports preferably comprise girders and uprights. Using girders and uprights, a relatively open vertical support can be created in a simple and inexpensive manner, with the air channel extending at least between the supports and the uprights.

[0007] The vertical supports preferably extend at least 50 cm in the transverse direction of the roof. This dimension is important with a view to realising an effective ventilation column.

[0008] In a preferred embodiment of the invention, the supports are interconnected substantially along the width thereof, forming a ventilation channel that extends in the longitudinal direction of the roof. This ensures that the space between the columns is kept clear (no wood can be stored therein), so that an air flow can develop in the ventilation channel, which air flow further contributes towards the drying of the stored wood. In this situation the underpressure will not be generated near the ends of the ventilation columns (which are interconnected to form a ventilation channel) formed in the vertical supports but rather near the ends of the ventilation channel. The principle that has been discussed above in relation to a ventilation column leads to a more horizontal air flow in this case than the vertical air flow at the ventilation columns, but it provides the same effect.

[0009] The cover structure preferably comprises at least one end wall, which essentially extends downwards from a short side of the roof. The end wall protects the wood from the action of the sun and rain at the end side.

[0010] Preferably an end wall is provided at both short sides of the roof. In this way both end sides are protected.

[0011] In a preferred embodiment of the invention, said at least one end wall comprises an opening which at least substantially corresponds to a projection of the vertical supports on said at least one end wall. This makes it possible to store wood on either side of the vertical supports, at least in transverse direction, so that additional ventilation is provided. This is advantageous in particular in the embodiment in which a ventilation channel extends from said at least one end wall up to the opposite end of the roof. In that case an air flow that is generated in the ventilation channel will hardly be obstructed by an end wall, if at all, on the contrary, the end wall will enhance said air flow in the right wind conditions.

[0012] In a preferred embodiment of the invention, a vertical support is incorporated in said at least one end wall. In this way the vertical support provides a bearing point near said at least one end wall, and the open spatial structure of the support ensures that the ventilation channel will remain open near said at least one end wall.

[0013] Preferably, said at least one end wall is provided with further ventilation openings. This leads to an improved ventilation of wood stored under the cover structure. Since said at least one end wall functions as protection from the sun and rain, a louvre-like construction may be provided, with the louvres overlapping like Venetian blinds in the closed condition both to provide protection and to form ventilation openings.

[0014] The cover structure is substantially open under the long sides of the roof so as to provide access for a transport unit for storing wood. In this way the wood can readily be stored on either side of the series of vertical supports.

[0015] Preferably, a moisturizing installation is provided for moisturizing wood that is stored under the cover structure. When wood is stored under a cover structure there is a risk that the wood will dry too quickly, possibly resulting in warping and even splitting of the wood. If the wood should dry (too) quickly, it may be moisturized by the moisturizing means so as to prevent warping and splitting of the wood.

[0016] In a preferred embodiment of the invention, the roof extends over a distance ranging from 3 to 10 metres in transverse direction. If a smaller dimension is used, the roof will provide no protection, or at least insufficient protection, and if a larger dimension is used, wood must be stored over too wide an area to provide adequate ventilation in order to realise an efficient utilisation of the space under the cover structure. If a number of storage areas for wood extend parallel to each other, the aforesaid dimension of the roof applies to each individual storage area.

[0017] The present invention further relates to a method wherein stacked wood stored on a floor under an elongated cover structure that provides protection from the sun is dried under controlled conditions. Such a method is known, it is used to prevent wood that is stored for drying from warping or even splitting as a result of drying too quickly under the influence of the sun. In a number of cases the wood is stored in a shed whose walls are provided with ventilation openings. The wood may also be stored under a cover structure which only has walls at the end sides of the cover structure, or no walls at all. A typical feature of these known methods, however, is the fact that the wood is stacked in a compact manner so as to be able to utilise the storage area as efficiently as possible. The width of the cover structure is limited in those cases, as the drying capacity decreases strongly when wood is stored over a (too) wide area, which obtains in particular with regard to the wood that is stacked in the centre. It is therefore an object of the present invention to provide a method as described above by which an improved ratio between the efficiency of utilisation of the storage space and the drying capacity can be realised in comparison with the known methods. This object is realised by the present invention by arranging at least two rows of stacked wood some distance apart under a cover structure, so that a ventilation channel is formed between the at least two rows of wood, the cover structure and the floor. A better drying result is already achieved by admitting more air between the stored wood. However, since a channel is formed by the supporting surface, the cover structure and the wood when using the method according to the present invention, the required conditions for generating an air draught are created, as a result of which the drying process of the wood is accelerated even further. It is noted in this connection that according to the prior art a number of blocks of stacked wood may be stored under one cover structure. The blocks are in that case separated by vehicle passageways between the blocks. Because of its large dimension, such a vehicle passageway is not sufficiently suitable for realising the air draught required for accelerating the drying process of the wood in said blocks.

[0018] Preferably, a ventilation channel is formed which extends along substantially the entire length of the elongated cover structure. As a result, a ventilation channel is realised along the entire length of the wood storage area.

[0019] A ventilation channel that is formed preferably extends over a distance of at least 50 cm in transverse direction. With such a width an adequate ventilation is realised.

[0020] It is furthermore preferable to stack or arrange the wood on a support in such a manner that ventilation channels are formed in the stack of wood. By stacking wood on a support it is ensured that the wood will be relatively easy to handle by means of a transport unit, such as a forklift truck. By ensuring that ventilation channels are provided in the wood on the support, an air flow resulting from the draught in the ventilation channel can pass between the wood and thus provide an adequate ventilation. The ventilation channels in the stacks of wood are small in comparison with the ventilation channel that is realised by the specific arrangement of the wood under

the cover structure, of course.

[0021] Preferably a number of supports carrying wood are stacked on top of each other. In this way not only the storage capacity per square metre is increased, but in addition an enhanced air draught is realised in comparison with an arrangement comprising only one layer.

[0022] Preferably maximally three rows, more preferably maximally two rows, are arranged close together, one behind another, seen from the ventilation channel. Such an arrangement provides an adequate balance between an efficient utilisation of the available space on the one hand and an adequate ventilation and drying of the stored wood on the other hand. In the latter situation air can flow freely along one side of each of the two rows.

[0023] Preferably, the wood arranged in rows is accessible for transport units on both sides of the ventilation channel that has been formed or that is to be formed, on the side of the stored wood opposite the ventilation channel, for the purpose of placing new wood or removing stored wood. In this way access to the wood can be gained from two sides, whilst in addition the ventilation channel is not blocked by transport units or by wood that is "temporarily" placed on the floor in the ventilation channel.

[0024] Furthermore it is preferable to keep a passageway of at least 150 cm clear for transport units on the side of the stored wood or the wood to be stored opposite the ventilation channel. This dimension provides sufficient manoeuvring space for example for a forklift truck used for storing or removing a support with wood present thereon.

[0025] Preferably the wood is stored under a cover structure as discussed in the foregoing. The advantages thus achieved correspond to the advantages described in relation to such a cover structure.

[0026] The present invention will now be explained in more detail, purely by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a side view of two cover structures according to the present invention;

Figure 2 is a plan view of the cover structures of figure 1; and

Figure 3 is a sectional view of a cover structure according to figure 1 under which wood is stored for drying.

[0027] Figure 1 is a side view of two cover structures 1 according to the present invention, each cover structure comprising a side wall 2 with a roof 3 thereabove, which roof is supported by arcuate carriers 4 that rest on a column 5 having an open spatial structure. An opening 6, whose width corresponds to the width of the column 5, extends over practically the entire effective storage height in the centre of the side wall 2.

[0028] Figure 2 is a plan view of the cover structures 1 of figure 1, in which the part of the structure that is disposed under the roof 3 is consistently illustrated in dotted lines. Each cover structure comprises six arcuate carriers 4, which rest on a column 5 having an open spatial structure at the centre of the arcuate carrier 4. Dotted lines indicate sections 7 in which wood (not shown) can be stacked. Eight sections 7 are present in each of the areas between two arcuate carriers 4, and a free space 8 functioning as a ventilation channel extends the width of a column 5.

[0029] Figure 3 is a cross-sectional view along the dotted line III-III in figure 2 of the cover structure 1 with the roof 3 on an arcuate carrier 4 that rests on a column 5 configured as an open spatial structure consisting of uprights 8, girders 10 and diagonal beams 11. Two rows of pallets 12 with wood 13 are arranged on either side of the column 5 under the cover structure 1.

[0030] From the figures it is clear that a column 5 will hardly interfere with an air flow that flows through a ventilation channel 8 as a result of a draught between openings 6 of two end walls. Numeral 13a indicates a pallet of wood, wherein the manner in which the wood is stacked on the pallet is schematically indicated in more detail than for the other pallets 13. This manner of stacking, or a comparable manner of stacking, is also used with the other pallets that are shown in the figure. The figure shows the end sides of wooden planks 14 which are arranged side by side on the pallet 13a, with slats 15 extending perpendicularly to the longitudinal direction of the planks 14 being provided between the various layers thereof. Ventilation channels are formed as such between two respective slats 15 arranged beside each other (behind each other in figure 3) between the layers of wood to be dried. The air flow that can be built up in the air channel 8 effects an underpressure in the air channel 8, thereby drawing air between the stored planks, as a result of which the drying process is accelerated. As figures 1 and 2 show, a passageway 16 is kept clear between two adjacent cover structures 1, which passage is used for supplying and removing pallets of wood to and from the storage areas under the cover structures 1.

[0031] The above description and the appended drawings are merely meant by way of illustration and by way of example and are by no means intended to limit the scope of the present invention as defined in the appended claims. Several variants are available to those skilled in the art, which variants are all considered to fall within the scope of he present invention. Thus a spraying installation is provided under the cover structure in many cases for moisturising the wood so as to prevent the wood from drying too quickly in spite of the presence of the cover structure, as a result of which the wood may warp or even split. The pillars shown in the drawing may be interconnected, so that a so-called wall having an open structure extends along part of the length, or even along the entire length, of the cover structure. The air draught will hardly be affected, if at all, by the open structure.

Claims

1. A cover structure for a wood storage area for drying stacked wood, comprising a roof having a length dimension greater than the width dimension, which roof is supported on a supporting structure comprising two or more vertical supports arranged parallel to the longitudinal direction of the roof with respect to each other, which supports are positioned closer to the centre of the roof, seen in transverse direction, than to a side edge of the roof extending in the longitudinal direction of the roof, **characterised in that** said vertical supports form an open spatial structure.

2. A cover structure according to claim 1, **characterised in that** the vertical supports are disposed at a position halfway the width of the roof.

3. A cover structure according to claim 1 or 2, **characterised in that** the vertical supports comprise girders and uprights.

4. A cover according to any one or more of the preceding claims, **characterised in that** the vertical supports preferably extend at least 50 cm in the transverse direction of the roof.

5. A cover according to any one or more of the preceding claims, **characterised in that** the supports are interconnected substantially along the width thereof, forming a ventilation channel that extends in the longitudinal direction of the roof.

6. A cover according to any one or more of the preceding claims, **characterised in that** the cover structure comprises at least one end wall, which essentially extends downwards from a short side of the roof.

7. A cover structure according to claim 6, **characterised in that** an end wall is provided at both short sides of the roof.

8. A cover structure according to claim 6 or 7, **characterised in that** said at least one end wall comprises an opening which at least substantially corresponds to a projection of the vertical supports on said at least one end wall.

9. A cover structure according to claim 6 or 7, **characterised in that** a vertical support is incorporated in said at least one end wall.

10. A cover structure according to any one or more of the claims 6-9, **characterised in that** said at least one end wall is provided with further ventilation openings.

11. A cover according to any one or more of the preceding claims, **characterised in that** the cover structure is substantially open under the long sides of the roof so as to provide access for a transport unit for storing wood.

12. A cover according to any one or more of the preceding claims, **characterised in that** a moisturizing installation is provided for moisturizing wood that is stored under the cover structure.

13. A cover according to any one or more of the preceding claims, **characterised in that** the roof extends over a distance ranging from 3 to 10 metres in transverse direction.

14. A cover according to any one or more of the preceding claims, **characterised in that** the roof has a curved cross-section.

15. A method for drying wood, wherein stacked wood stored on a floor under an elongated cover structure that provides protection from the sun is dried under controlled conditions, **characterised by** arranging at least two rows of stacked wood some distance apart under a cover structure, so that a ventilation channel is formed between the at least two rows of wood, the cover structure and the floor.

16. A method according to claim 14, **characterised in that** a ventilation channel is formed which extends along substantially the entire length of the elongated cover structure.

17. A method according to claim 14 or 15, **characterised in that** ventilation channel is formed over a distance of at least 50 cm in transverse direction.

18. A method according to any one or more of the claims 14-16, **characterised in that** the wood is stack or arranged on a support in such a manner that ventilation channels are formed in the stack of wood.

19. A method according to any one or more of the claims 14-17, **characterised in that** a number of supports carrying wood are stacked on top of each other.

20. A method according to any one or more of the claims 14-18, **characterised in that** maximally three rows are arranged close together, one behind another, seen from the ventilation channel.

21. A method according to claim 19, **characterised in that** maximally two rows are arranged close together, one behind another.

22. A method according to any one or more of the claims 14-20, **characterised in that** the wood arranged in rows is accessible for transport units on both sides

of the ventilation channel that has been formed or that is to be formed, on the side of the stored wood opposite the ventilation channel, for the purpose of placing new wood or removing stored wood.

23. A method according to claim 21, **characterised in that** a passageway of at least 150 cm is kept clear for transport units on the side of the stored wood or the wood to be stored opposite the ventilation channel.

24. A method according to any one or more of the claims 14-22, **characterised in that** the wood is stored under a cover structure according to any one or more of the claims 1-13.

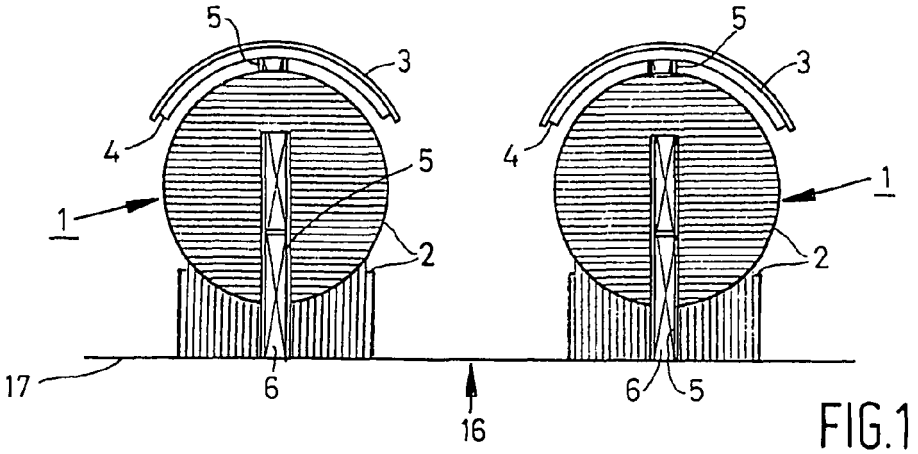

FIG.1

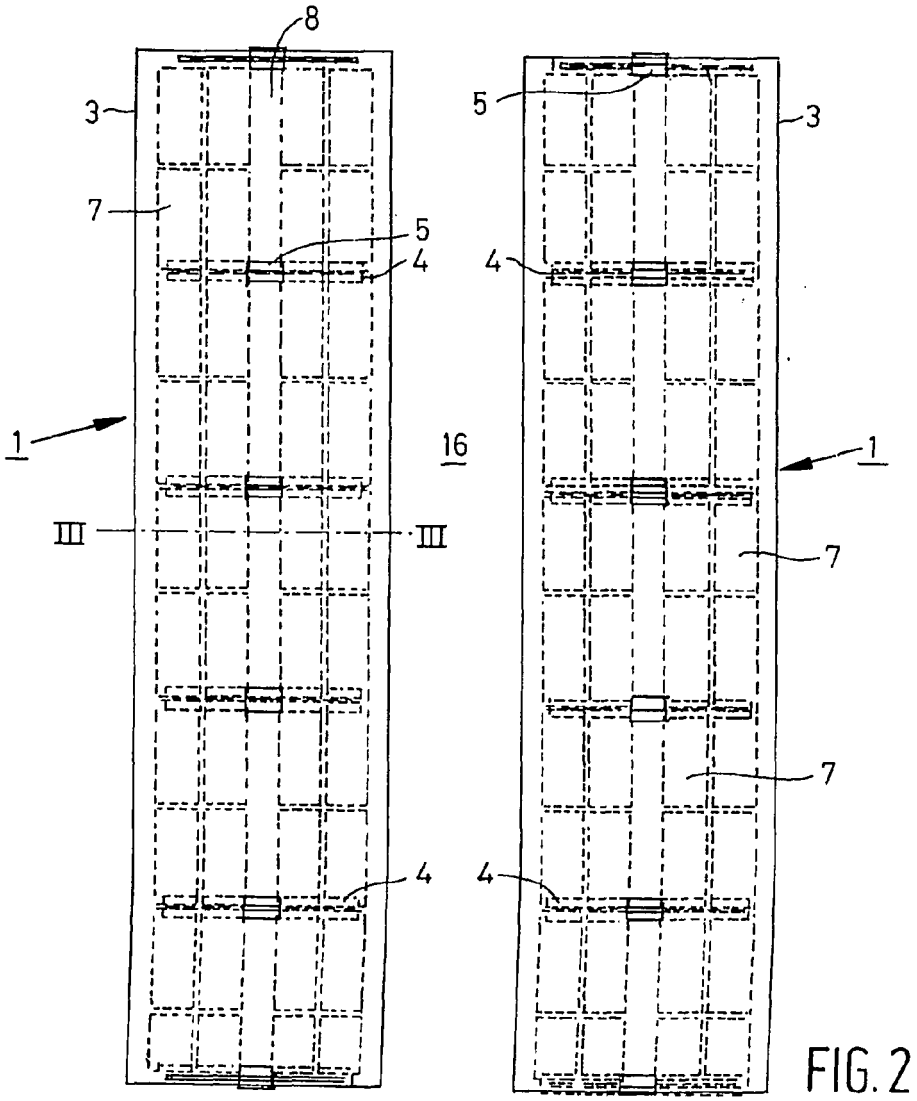

FIG. 2

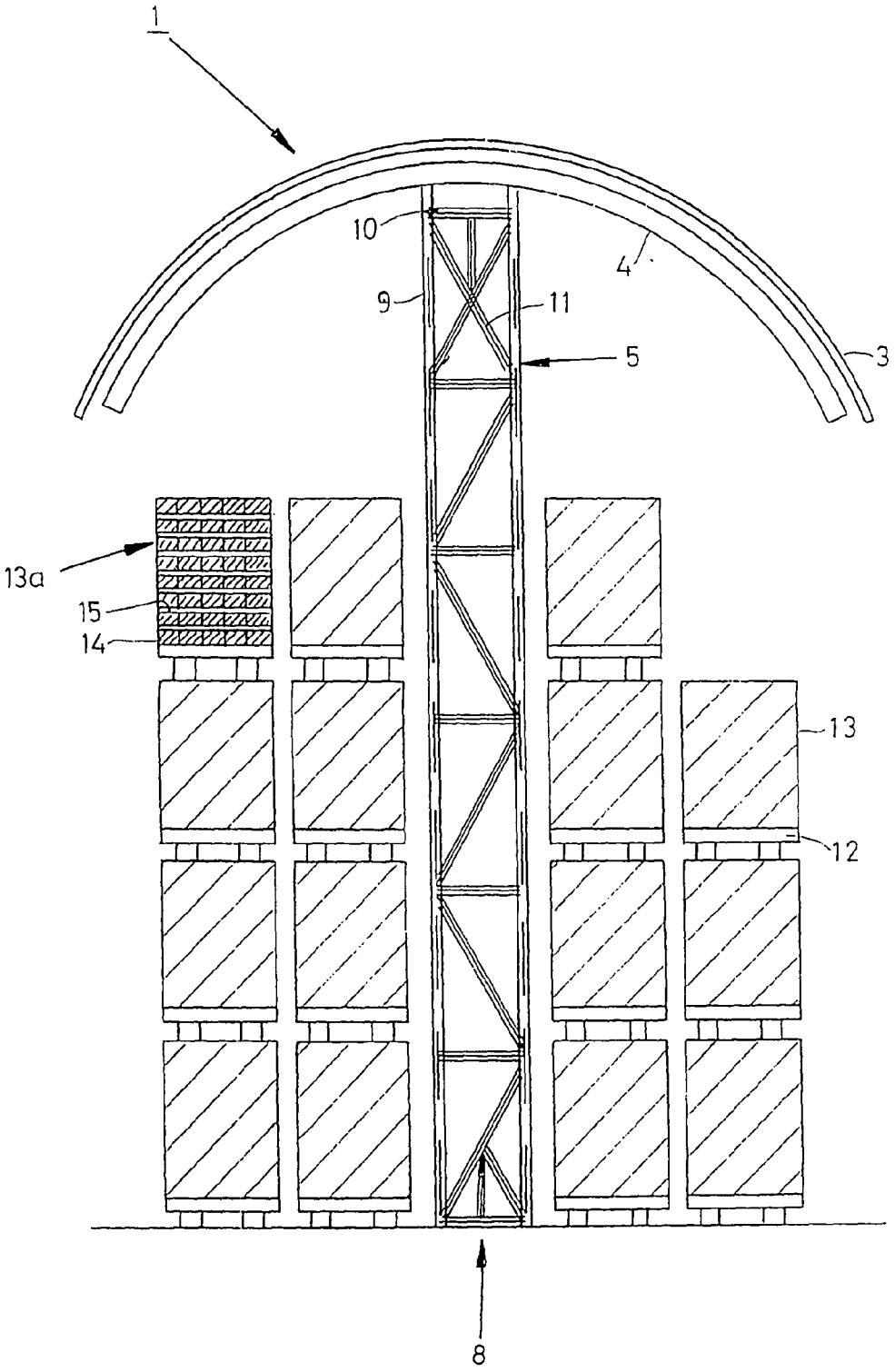

FIG. 3

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EUROPEAN SEARCH REPORT

Application Number
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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
The Hague	5 June 2007	Silvis, Henk

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EUROPEAN SEARCH REPORT

Application Number
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The present search report has been drawn up for all claims

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The Hague	5 June 2007	Silvis, Henk

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