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(54) **Drying chamber for wood**

(57) The present invention relates to a travelling timber dryer (40). The dryer includes a drying chamber (1) that has a first end wall and an opposite second end wall (4), wherein the drying chamber (1) forms a passage-

way that has at least one zone for drying timber with the aid of a drying atmosphere. The invention is characterized in that the dryer includes a conditioning chamber (70) which is disposed in connection with the drying chamber (1) and delimited therefrom.

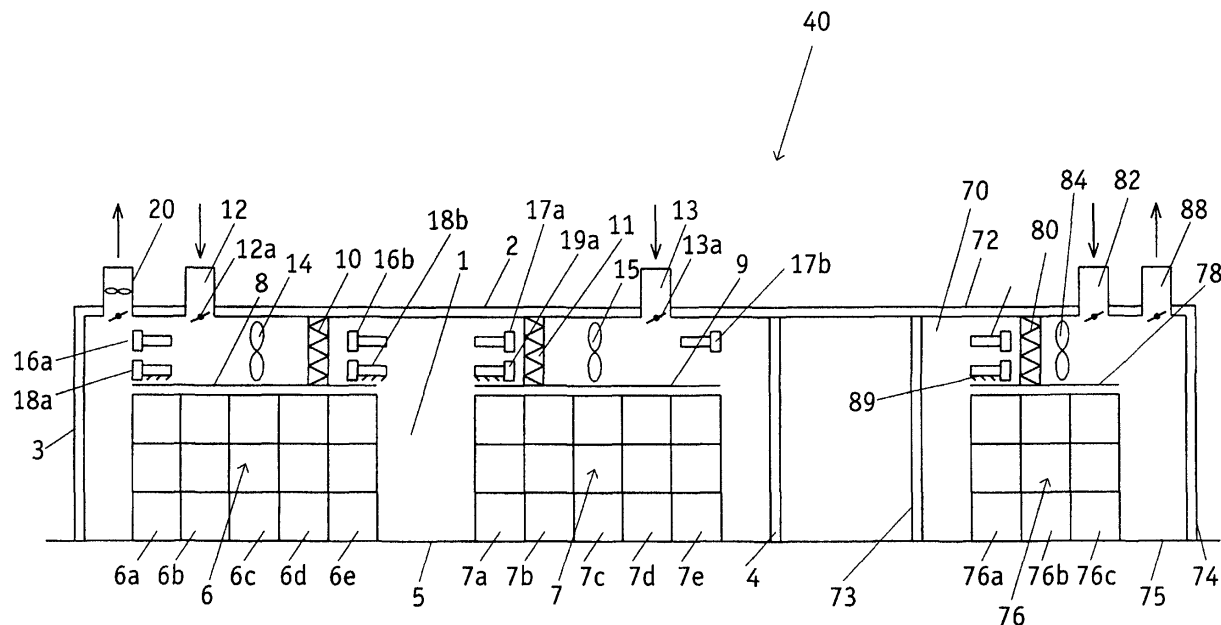


Fig. 2

Description

Technical field

[0001] The present invention relates to a travelling timber dryer that includes a drying chamber which is delimited by a first end wall and an opposite second end wall and which forms a passageway that has at least one timber drying zone in which timber, or wood, is dried with the aid of a drying atmosphere, wherein timber stacks consisting of at least one timber pack on a conveyor path are fed into the drying chamber through a first port in the first end wall, thereafter moved through the drying chamber and then exited through a second port in said opposing end wall.

Standpoint of techniques

[0002] Travelling dryers of this kind are known to the art and used generally at present. A conditioning zone is sometimes integrated in the drying chamber. This conditioning zone is not sufficiently effective in equalising the moisture quotient and in reducing mechanical stresses in the timber, owing to the fact that the control of the air humidity has technical limitations when this conditioning zone is not delimited to the drying climate in the remaining part of the chamber. The temperature in the conditioning zone is also influenced by the temperature in the drying zone.

Object of the invention

[0003] The present invention relates to a travelling dryer in which timber conditioning is effected in connection with the timber drying process and in which the drying atmosphere and the conditioning atmosphere can be controlled independently of one another.

[0004] An object of the invention is to enable the dried timber to be conditioned in direct connection with the drying process, with or without intermediate storage of the timber in a buffer zone.

[0005] Yet another object of the invention is to provide a travelling dryer in which the timber on a conveyor path can be readily moved through both drying chamber and conditioning chamber through the medium of a conveyor path.

Summary of the invention

[0006] The present invention relates to a travelling timber dryer. The dryer includes a drying chamber that has a first end wall and an opposite second end wall, wherein the drying chamber forms a passageway that includes at least one zone for drying said timber with the aid of a drying atmosphere. The invention is characterized by a conditioning chamber which is delimited from the drying chamber and which is located in connection therewith. The conditioning chamber will preferably

have installed therein steaming equipment, circulation fans, an air-exchange arrangement and heating batteries. Because the conditioning zone is delimited, it can be used freely over mutually different conditioning phase durations without being dependent on the infeed cycle of the travelling dryer.

[0007] Preferred embodiments of the invention will be apparent from the dependent claims.

Brief description of the drawings

[0008]

Figure 1 is a diagrammatic longitudinally sectioned view of a known travelling dryer; and Figure 2 is a diagrammatic longitudinally sectioned view of a travelling dryer that is modified in accordance with the present invention and that includes a conditioning chamber.

Detailed description of the invention

[0009] Figure 1 is a diagrammatic longitudinally sectioned view of a known travelling dryer. The illustrated dryer includes a drying chamber 1 in the form of a passageway that is delimited by a ceiling 2, two side walls situated respectively in front of and behind the plane of the sectioned view in figure 1, a first end wall 3 to the left of the figure, said wall including a first port through which timber, or wood is fed into the drying chamber 1, a second end wall 4 at the opposite end of the drying chamber, said second wall including a second port through which dried timber is exited from the drying chamber 1, and a floor 5 which forms or is a means for supporting a conveyor path (not shown). The conveyor path also continues beyond the end walls. The conveyor path functions to move the timber so as to pass it through the first port, stepwise through the drying chamber 1, and out through the second port. The timber is usually loaded on transport carriages in the form of timber stacks of mutually the same height. The first and the second ports are open solely during the infeed and outfeed of timber respectively.

[0010] Two groups of timber 6 and 7 respectively are located in the drying chamber 1. Each timber group 6, 7 consists of a number of stacks of timber, for instance five stacks 6a-6e and five stacks 7a-7e respectively, as shown in fig. 1. The timber groups 6, 7 may have mutually different lengths (in the longitudinal directions of the chamber) and thus do not consist of the same number of stacks. A timber stack consists of at least one timber pack, often three timber packs, as shown in figure 1. The timber stacks within a timber group 6, 7 are disposed at a short distance apart, in practice next to one another. The timber groups 6, 7 are spaced relatively wide apart and also relatively far from the end walls 3, 4. All timber packs, and therewith all timber stacks, have mutually the same width, by width being meant the extension of the

packs at right angles to the direction in which the timber moves through the drying chamber 1. The width of the packs is such as to enable them to move through the drying chamber I with a small clearance to the side walls.

[0011] The drying chamber 1 also includes a respective first and second horizontal delimitation 8 and 9. These delimitations 8, 9 are located at a small distance above respective timber groups 6, 7 and have essentially the same length as the timber groups in the transporting direction of the timber and essentially the same width extension between the side walls.

[0012] Between the ceiling 2 of the drying chamber 1 and the first horizontal delimitation 8 above the first timber group 6 are provided first heating batteries 10 for heating of the timber drying atmosphere. Similarly, second heating batteries 11 are provided above the second timber group 7, between the ceiling 2 of the drying chamber 1 and the second horizontal delimitation 9.

[0013] The drying chamber I includes in the ceiling 2 two inlet ports 12 and 13 for fresh drying atmosphere, between the first heating batteries 10 and the first end wall 3 and between the second heating batteries 11 and the second end wall 4 respectively, these ports being provided with a butterfly valve. Also provided is an outlet port 20 for spent drying atmosphere between the first end wall 3 and the first inlet port 12.

[0014] A first group of fans or blowers 14 are mounted above the first delimitation 8, between the first inlet port 12 and the first heating batteries 10. A second group of fans or blowers 15 are disposed above the second delimitation 9, between the second inlet port 13 and the second heating batteries 11.

[0015] Also provided in the drying chamber 1 are sensors 16a, 16b and 17a, 17b for measuring the dry temperature of the drying atmosphere above the first delimitation 8 and the second delimitation 9, and also with sensors 18a, 18b and 19a, 19b for measuring the wet temperature of the drying atmosphere above the first delimitation 8 and the second delimitation 9 respectively.

[0016] Drying atmosphere is introduced through the inlet ports 12 and 13 during the timber drying process. The drying atmosphere is driven by the fans or blowers 14 and 15 through the respective heating units 10 and 11, so as to form an overpressure in the space located between the timber groups 6, 7. As a result of this overpressure, the atmosphere will flow through the timber stacks of the timber groups 6, 7 towards respective end walls 3 and 4, wherewith drying of the timber takes place. The temperature and relative humidity of the atmosphere are controlled as a function of the values indicated by the means for measuring the wet and the dry temperatures. The drying atmosphere that has flowed through the first timber group 6 leaves the drying chamber 1 through the outlet port 20. As a result of the placement of the blowers or fans and the forced passage of the drying atmosphere, the pressure between the timber groups in the central part of the drying chamber 1 will be higher than the pressure at its ends.

[0017] By changing the direction of flow of said atmosphere in the drying chamber, it is also possible to create in said chamber conditions whereby a higher pressure is obtained at the ends of said chamber and whereby the lowest chamber pressure is obtained of the central part of said chamber. This will require changing the feed direction of the fans or blowers, in other words the flow direction of the atmosphere, the placement of the heating batteries and the placement of the drying atmosphere ports. The measures necessary to this end will be obvious to one of average skill in this art.

[0018] In a steady state, a carriage loaded with stacks of timber is fed into the drying chamber through the port provided in the end wall 3 and takes the position referenced 6a. Prior to this, all timber stacks have been moved one step towards the second end wall 4, to the right in the figure, and the timber stack 7E nearest the end wall 4 has been exited through the port in the second end wall 4. Drying of this timber stack has been completed and the stack shall now be conditioned for equalising stresses in the timber. All positions in the drying chamber are fixed.

[0019] Figure 2 is a diagrammatic illustration of a preferred embodiment of an inventive travelling dryer 40 that includes the drying chamber I of the figure 1 embodiment, a conditioning chamber 70 and a temporary storage chamber or buffer chamber 60 located between the drying chamber 1 and the conditioning chamber 70. The drying chamber 1, the buffer chamber 60 and the conditioning chamber 70 will all preferably have mutually the same width and height and therewith form a continuous passage delimited by walls, such as end walls in respect of the drying chamber 1 and the conditioning chamber 70. On the other hand, the three chambers will normally have mutually different lengths. A conveyor path moves through said three chambers.

[0020] The conditioning chamber 70 includes a ceiling 72, two side walls, one in front and one behind the sectioned view of figure 2, a third end wall 73 to the left of the figure, said third end wall including a third port through which timber is fed into the conditioning chamber 70, a fourth end wall 74 located at the opposite end of the conditioning chamber 70 and including a fourth port through which conditioned timber is exited from the conditioning chamber 70 into a closed buffer zone, or exited directly from the dryer, and a floor 75 which forms or is means for supporting a conveyor path (not shown). This conveyor path is an extension of the conveyor path from the drying chamber 1 and also continues through the buffer chamber 60.

[0021] Shown in the conditioning chamber 70 is a timber group 76 consisting, e.g., of three timber stacks 76a-c. Located at a small height above the timber group 76 is a third horizontal delimitation 78. This delimitation has generally the same length as the timber group 76 in the direction of transportation, and extends inwardly of the side walls.

[0022] Provided between the ceiling 72 of the condi-

tioning chamber and the horizontal delimitation 78 are heating batteries 80, for heating the conditioning atmosphere. Although not shown, the conditioning chamber includes means for increasing the humidity of the atmosphere. The conditioning chamber 70 also includes a third inlet port 82 for fresh conditioning atmosphere, and a second outlet port 88 for spent conditioning atmosphere. A third group of fans or blowers 84 is disposed above the horizontal delimitation 78, between the third inlet port 82 and the heating batteries 80.

[0023] Also provided in the conditioning chamber 80 is a sensor 86 for measuring the dry temperature of the conditioning atmosphere, and a sensor 89 for measuring the wet temperature of said atmosphere. It is also possible, of course, to measure the relative humidity of the atmosphere or some other known parameter that will provide information necessary for controlling conditioning of the timber.

[0024] The buffer chamber 60 is located between the drying chamber 1 and the conditioning chamber 70. The ends of the buffer chamber 60 are delimited respectively by the second end wall 4 of the drying chamber and the end wall 73 of the conditioning chamber. The buffer chamber is used for the intermediate storage of dried timber stacks prior to passing said stacks into the conditioning chamber 70.

[0025] In a further embodiment of the invention, the conditioning chamber 70 is in direct connection with the drying chamber 1. In this case, the end wall 73 of the conditioning chamber 1 consists of the end wall 4 of the drying chamber. It is essential that the treatment atmosphere of the conditioning chamber is not influenced by the atmosphere in and the conditions concerning the drying chamber.

Claims

1. A travelling timber dryer (40) comprising a drying chamber (1) that includes a first end wall (3) and an opposite second end wall (4), wherein the drying chamber (1) forms a passageway that has at least one zone in which timber is dried with the aid of a drying atmosphere, wherein timber stacks (6a - 6e; 7a - 7e) consisting of one or more timber packs located on a conveyor path are fed into the drying chamber (1) through a first port in the first end wall (3), thereafter moved through the drying chamber (1) and exited through a second port in said opposite end wall (4), **characterized by** a conditioning chamber (70) arranged in connection with the drying chamber (1) and delimited from said drying chamber.
2. A travelling dryer according to claim 1, **characterized in that** the atmosphere in the conditioning chamber (70) is separated from the atmosphere in the drying chamber (1).
3. A travelling dryer according to claim 1 or 2, **characterized in that** the conveyor path continues from the drying chamber up to and through the conditioning chamber (70).
4. A travelling dryer according to one or more of claims 1-3, **characterized in that** the conditioning chamber (70) is constructed together with the drying chamber (1); and **in that** the second end wall (4) of the drying chamber is common to both the drying chamber (1) and the conditioning chamber (70).
5. A travelling dryer according to one or more of claims 1-3, **characterized in that** the conditioning chamber (70) is separate from the drying chamber (1).
6. A travelling dryer according to claim 5, **characterized by** a buffer chamber (60) disposed between the drying chamber (1) and the conditioning chamber (70).
7. A travelling dryer according to claim 5, **characterized in that** the conditioning chamber (70) has its own ports that delimit the conditioning chamber from the drying chamber atmosphere and the outdoor atmosphere respectively.
8. A travelling dryer according to claim 6, **characterized in that** the conditioning chamber (70) has its own ports that delimit the conditioning chamber from the buffer chamber atmosphere and the outdoor atmosphere respectively.
9. A travelling dryer according to one or more of claims 1-6, **characterized in that** the drying chamber (1) forms two drying zones.
10. A travelling dryer according to claim 7, **characterized in that** the total pressure of the drying atmosphere is highest in the centre part of the drying chamber (1) and lowest at the ends of said chamber (1).
11. A travelling dryer according to claim 7, **characterized in that** the total pressure of the drying atmosphere is lowest at the centre of the drying chamber (1) and highest at the ends of said chamber (1).

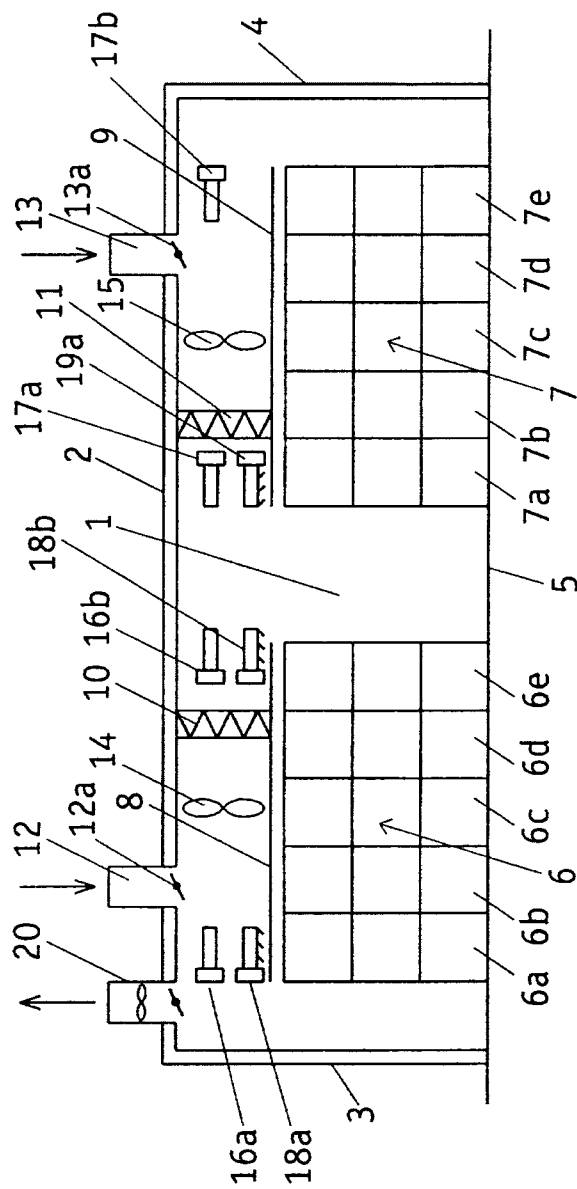


Fig. 1

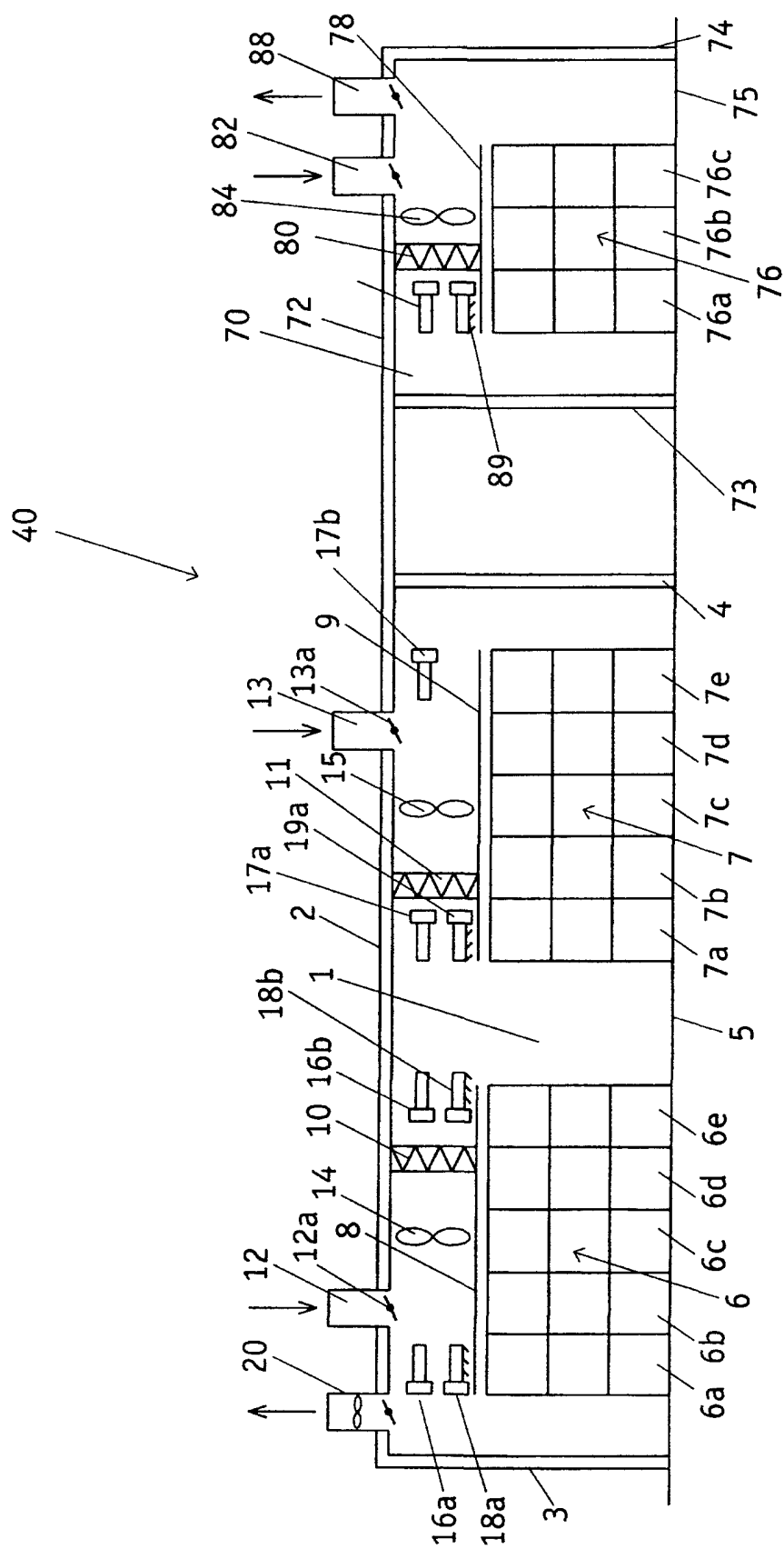


Fig. 2