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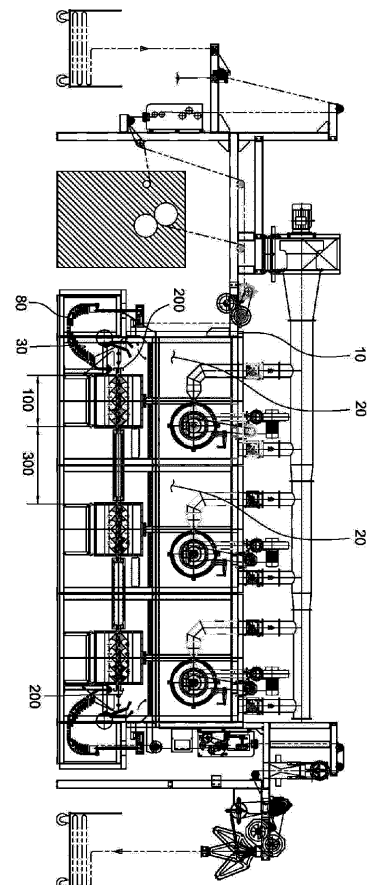
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(54) **CONTINUOUS TUMBLER APPARATUS WITH BUFFER ZONE**

(57) A continuous tumbler apparatus having a buffer zone with a reformed structure is proposed. The apparatus includes: a casing (10) having a plurality of chambers (20) therein in which a textile fabric (30) is conveyed from outside to inside; hot air supply units (200) disposed inside the casing (10) and serving as conveying passages of the textile fabric (30); a plurality of nozzle zones (100) disposed in each of the chambers (20) and provided with injection nozzles (110) which are respectively disposed on upper and lower sides of the hot air supply units (200) and inject hot air to enable conveying the textile fabric (30) in one or the other direction; and the buffer zones (300) provided between the nozzle zones (100) and having discharge holes (325) provided therein for discharging the hot air injected from the injection nozzles (110) upward and downward.

FIG. 1



Description

CROSS REFERENCE TO RELATED APPLICATION

5 **[0001]** The present application claims priority to Korean Patent Application No. 10-2018-122166, filed October 12, 2018, the entire contents of which is incorporated herein for all purposes by this reference.

BACKGROUND OF THE INVENTION

10 Field of the Invention

[0002] The present invention relates to a continuous tumbler apparatus having a buffer zone and, more particularly, to a continuous tumbler apparatus having a buffer zone with a reformed structure where the buffer zone is provided between nozzle zones of the tumbler and allows slowing down speed of conveying a textile fabric by means of generating a waveform on a conveying flow of the textile fabric conveyed by pressure while discharging pressure from nozzles upward and downward. Therefore, the continuous tumbler apparatus improves the touch of the textile fabric, prevents foreign matter in chambers from sticking to the textile fabric, and improves drying efficiency of the textile fabric. Furthermore, the continuous tumbler apparatus concentrates an air discharge portion of the buffer zone to the center thereof so as to minimize an occurrence of defects such as wrinkles and the like during conveying the textile fabric.

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Description of the Related Art

[0003] In general, a textile fabric needs to be pre-washed due to its contamination with fine dust, chemicals, and the like immediately after production. Also, a dyed textile fabric needs to be pre-washed to prevent bleaching, and so does the same for the textile fabric used for clothing to prevent deformation of the textile fabric caused by washing or by heat.

25 **[0004]** Therefore, when it is necessary to quickly dry a large amount of the textile fabric containing moisture by washing, a dryer is often used because natural drying is subject to time and place constraints in its processing.

[0005] A conventional textile fabric dryer includes a feed roller for conveying a washed textile fabric, a drying unit for drying the textile fabric, and a conveyer roller for conveying the textile fabric that has passed through the drying unit, to an adjacent end of the chamber. Then, by providing the above configuration in one chamber, a plurality of chambers is connected together to dry the textile fabric.

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[0006] However, the above-described textile fabric dryer has a problem in that the textile fabric is stretched by the load generated by repeated pulling of the lower portion of the textile fabric stacked in the process of conveying between the chambers. Also, when the textile fabric dryer moves to and from between the chambers, since the textile fabric is exposed to the outside while being conveyed by the rollers, heat loss occurs, there is a problem in that the textile fabric may not be dried effectively.

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[0007] As a related art of the conventional textile fabric dryer to improve these problems, there is a textile fabric dryer for drying the washed textile fabric with hot air as disclosed in Korean Patent No. 10-1161176 "Textile fabric Product Dryer" (Registration Date: June 25, 2012). The textile fabric dryer is configured of a drying unit for drying and improving the touch of the textile fabric with hot air injected in the longitudinal direction. Also, a plurality of drying units is configured in an upper portion of a dryer chamber. The drying units compress and inject the hot air circulating through a space portion communicating with a combustion unit, to a passage of a conveying unit for the textile fabric, and include left and right injection nozzles to enable conveying the textile fabric repeatedly passing through the passage from side to side. The hot air supplied to the left and right injection nozzles are configured to be blocked by a hot-air opening and closing means. Inside the dryer chamber, a second loading part and a third loading part for loading the textile fabric are positioned under the left and right injection nozzles. A third loading part is configured such that the textile fabric is loaded to a rear inclined portion so that the textile fabric is conveyed to a rear drying unit.

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[0008] In this case, in order to compress and inject the hot air toward the passage of the conveying unit for the textile fabric, tapering of the left and right injection nozzles toward an end portion thereof is required. Therefore, a concern occurs that a structure for supplying hot air to the textile fabric becomes complicated and the textile fabric blocked by the ends portion of the left and right injection nozzles is unable to be conveyed.

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[0009] In other related art associated with conventional textile fabric dryers, there is a new continuous tumbler fabric processing apparatus as described in Korean Patent Application Publication No. 10-2012-0051214 "Continuous Tumbler fabric processing device" (Publication Date: May 22, 2012). The above apparatus includes a textile fabric input unit, a textile fabric processing and heat treatment unit, a cooling unit, a rolling member, and a control member unit to process the textile fabric to transform and process hairs formed on an upper surface of the textile fabric of pile woven. Therefore, the apparatus has the effect of reducing treatment cost due to heat efficiency of the heat treatment unit used in the textile fabric processing, removing tangling or twisting of the textile fabric and increasing processing speed and efficiency of

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the textile fabric due to eliminating post-processing that occurs in textile fabric processing.

[0010] In addition, as disclosed in Korean Patent No. 10-1758243 "Tumbler device" (Registration Date: July 10, 2017), another related art associated with the conventional tumbler apparatus is characterized by including a casing in which the textile fabric is conveyed from the outside to the inside; a plurality of hot air supply units disposed inside the casing and having openings provided at both left and right sides thereof to become conveying passages of the textile fabric; first, second, third, and fourth injection nozzles respectively disposed at upper and lower sides of the hot air supply unit, with injection angles of hot air opposite to each other on left and right sides of the hot air supply units; upper and lower hot air injection ducts for supplying hot air to the first, second, third, and fourth injection nozzles; a damper means disposed in the hot air supply duct and configured to alternately supply hot air into the upper and lower hot air injection ducts; a guide member spaced apart on both the left and right sides of the hot air supply unit to guide dropping direction of the textile fabric released from the hot air supply unit; and loading parts disposed on a lower side of the guide member for loading the textile fabric dropped by the guide member, wherein the upper and lower hot air injection duct has a plurality of through-holes provided thereon so that the distance width between the surfaces facing each other so as to communicate with the first, second, third, and fourth injection nozzle side is gradually reduced in the direction in which the hot air is supplied.

[0011] However, the conventional continuous tumbler apparatus conveys the textile fabric between hot air supply units adjacent to each other using a separate tension roll and a guide roll while the textile fabric passes between each chambers. However, there is a concern that the drying efficiency of the textile fabric is lowered and foreign matter suspended in the chamber may stick to the textile fabric.

Documents of Related Art

[0012]

(Patent Document 1) Korean Patent No. 10-1161176 "Textile fabric Product Dryer" (Registration Date: June 25, 2012)
 (Patent Document 2) Korean Patent Application Publication No. 10-2012-0051214 "Continuous tumbler fabric processing device" (Publication Date: May 22, 2012)
 (Patent Document 3) Korean Patent No. 10-1758243 "Tumbler Device" (Registration Date: July 10, 2017)

SUMMARY OF THE INVENTION

[0013] The present invention is created to solve this problem in consideration of the above-mentioned problems, and the objective is to provide a continuous tumbler apparatus having a buffer zone with a reformed structure. To this end, the buffer zone is provided between nozzle zones of the tumbler and the buffer zone allows slowing down the conveying speed of the textile fabric by generating a waveform on the conveying flow of the textile fabric. Therefore, the buffer zone improves the touch of the textile fabric, prevents foreign matter in chambers from sticking to the textile fabric being conveyed, and enhances drying efficiency of the textile fabric.

[0014] In addition, another objective of the present invention is to provide a continuous tumbler apparatus having a buffer zone with a reformed structure in order to avoid wrinkles in the textile fabric by preventing meandering and poor movements during conveying the textile fabric, by means of discharging the air from the buffer zone provided between the nozzle zones to the center portion and sealing the air not to be discharged to both the left and right sides thereof.

[0015] In order to achieve the above objective, the present invention includes: a casing having a plurality of chambers therein in which a textile fabric is conveyed from outside to inside; a plurality of hot air supply units disposed inside the casing and serving as conveying passages of the textile fabric; a plurality of nozzle zones disposed in each of the chambers and provided with a plurality of injection nozzles which is respectively disposed on upper and lower sides of the hot air supply unit and injects hot air to enable conveying the textile fabric in one or the other direction; and a plurality of buffer zones provided between the nozzle zones and having a plurality of discharge holes provided therein for discharging the hot air injected from the injection nozzles upward and downward, wherein each of the buffer zones includes: a buffer housing connecting the hot air supply units of the adjacent chambers in communication with each other and being provided to communicate with the inside of the chamber, and an upper buffer plate and a lower buffer plate arranged symmetrically on the upper and lower sides of the inside of the buffer housing and having the plurality of discharge holes for discharging the hot air injected from the injection nozzles.

[0016] The discharge holes may be provided at a center portion of the upper and lower buffer plates except for both left and right sides of the buffer plates, and a length L2 of one column of the injection nozzles may be longer than a length L1 of one column where the discharge holes are provided.

[0017] A ratio of the length L1 of the one column of the discharge holes to the length L2 of the one column of the injection nozzles 110 may satisfy 0.6 to 0.88 : 1.0.

[0018] A height interval between the upper and lower buffer plates may be 40 to 65mm.

[0019] The injection nozzles in each of the nozzle zones may include: first and second injection nozzles which are arranged in two columns for injecting the hot air to enable conveying the textile fabric from one side to the other side, and third and fourth injection nozzles which are arranged in two columns at positions spaced apart from the first and second injection nozzles for injecting the hot air to enable conveying the textile fabric from the other side to the one side.

[0020] A part of the hot air discharged through the discharge holes of the buffer zones may be recycled through a filter and a burner in the chamber, and a remaining part thereof is discharged to the atmosphere.

[0021] The buffer housing further may include: an opening and closing means provided on an upper side of a left and right closed section where the discharge holes are not provided, in order to selectively open and close the discharge holes, and the opening and closing means may include: a drive motor driven by an external signal and an opening and closing plate which is coupled to a motor shaft of the drive motor to be able to open and close a part of the discharge holes by sliding to the left and right sides thereof when driving the drive motor.

[0022] The present invention may prevent foreign matter in a chamber from sticking to the textile fabric being conveyed by connecting a hot air supply unit of the chamber to a buffer housing of a buffer zone in a continuous tumbler apparatus where each chamber is disposed in sequence. In addition, the present invention eliminates propulsion force applied to the textile fabric by discharging a part of pressure of hot air supplied from an injection nozzle to the buffer housing through discharge holes provided in upper and lower buffer plates of the buffer zone. As a result, the textile fabric beats the surface of the textile fabric with strong hot air in the tensionless state and passes through the buffer zone, and the textile fabric is conveyed in a wave form by strong vibration caused by pressure drop at upper and lower discharge holes. Therefore, the present invention may improve quality of shrinkage, silky touch, softening, pile removal, pile pop-up, bulking, drape, and the touch of the textile fabric. Moreover, the present invention has an advantage that may further increase the drying efficiency of the textile fabric by using more time to dry the textile fabric due to the slowing down of conveying the textile fabric.

[0023] In addition, the present invention is provided with the closed section in which the discharge holes are not provided on both the left and right sides of the upper and lower buffer plates, so that relatively larger pressure compared to that of the center portion is applied on the closed section. Therefore, the present invention has the advantage of preventing meandering or shifting to one side for the textile fabric while the textile fabric is passing through the buffer housing to the hot air supply unit side of the other adjacent chamber.

[0024] In the present invention, the length of one column of the discharge holes provided in the upper and lower buffer plates has a length ratio of 0.6 to 0.88 : 1.0 with respect to length L2 of the injection nozzles, and a height interval between the upper and lower buffer plates is 40 to 65mm. Accordingly, the present invention has the advantage that may prevent poor conveyance of the textile fabric such as meandering or shifting to one side and the like during conveying the textile fabric in the buffer housing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025]

FIG. 1 is a configuration diagram schematically illustrating a configuration of a continuous tumbler apparatus having a buffer zone according to the present invention.

FIG. 2 is a side view of FIG. 1.

FIG. 3 is an enlarged view of a buffer housing of the present invention.

FIG. 4 is a view schematically illustrating injection nozzles of a nozzle zone and discharge holes of a buffer zone of the present invention.

FIG. 5 is a block diagram illustrating another embodiment of the continuous tumbler apparatus having a buffer zone according to the present invention.

FIG. 6 is a use state diagram illustrating a state in which discharge holes are opened by moving opening and closing plates of another embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0026] The present invention is provided with a buffer zone so as to slow speed of conveying a textile fabric between nozzle zones in a continuous tumbler apparatus for drying and setting the textile fabric.

[0027] Hereinafter, the continuous tumbler apparatus having a buffer zone according to the present invention will be described in detail with reference to the accompanying drawings.

[0028] In the following description of the present invention, detailed descriptions of known functions and components incorporated herein will be omitted when it may make the subject matter of the present invention unclear. Also, the terms particularly defined considering functions of the present invention may vary according to intentions or practices of users. Accordingly, the definitions of the terms will be given based on the content throughout the specification. In addition,

unless the context clearly indicates otherwise, it will be further understood that the terms "comprises", "comprising", "includes" and/or "including" specify the presence of other components, but do not preclude the presence or addition of one or more other components thereof.

[0029] Referring to FIGS. 1 to 4, one embodiment of the continuous tumbler apparatus having a buffer zone according to the present invention includes: a casing 10 having a plurality of chambers 20 therein in which the textile fabric 30 is conveyed from outside to inside thereof; a plurality of hot air supply unit 200 disposed inside the casing 10 and serving as conveying passages of the textile fabric 30; a plurality of nozzle zones 100 disposed in each chamber 20 and provided with a plurality of injection nozzles 110 which is respectively disposed on upper and lower sides of the hot air supply units 200 and inject shot air to enable conveying the textile fabric 30 in one or the other direction; and a plurality of buffer zone 300 provided between the nozzle zones 100 and having a plurality of discharge holes 325 provided therein for discharging the hot air injected from the injection nozzles 110 upward and downward.

[0030] Referring to FIG. 1, the casing 10 has a passage through which each of the chambers 20 is disposed in sequence and the textile fabric 30 is conveyed.

[0031] The nozzle zones 100 are provided in each of the chambers 20 and the injection nozzles 110 are provided in a symmetrical structure on the upper and lower sides.

[0032] The hot air supply unit 200 has a structure in which the nozzle zone 100 and the buffer zone 300 communicate with each other so that the textile fabric 30 may be conveyed through each chamber 20.

[0033] In the nozzle zones 100 as shown in FIG. 2, the injection nozzles 110 of each of the nozzle zones 100 are configured of first and second injection nozzles 110-1 and 110-2 that are arranged in two rows for injecting the hot air to enable conveying the textile fabric 30 from one side to the other side. Also, the injection nozzles 110 are configured of third and fourth injection nozzles 110-3 and 110-4 that are arranged in two rows at positions spaced apart from the first and second injection nozzles 110-1 and 110-2, and inject the hot air to enable conveying the textile fabric 30 from the other side to the one side.

[0034] In the nozzle zones 100, when the hot air is injected from each of the first and second injection nozzles 110-1 and 110-2, the textile fabric 30 is conveyed from one side to the other side and loaded on one of loading parts 80 provided on the other side. Also, when the hot air is injected from each of the third and fourth injection nozzles 110-3 and 110-4, the textile fabric 30 is conveyed from the other side to the one side and loaded on the other of loading parts 80 provided on the one side.

[0035] The nozzle zones 100 are arranged symmetrically with each other such that the injection nozzles 110 are positioned at the upper side and lower side of the hot air supply unit 200. Also, the nozzle zone 100 has a structure provided at an inclined angle with respect to the conveying direction.

[0036] Upper and lower hot air injecting ducts 60 and 70 are provided on upper and lower sides of the hot air supply unit 200 to supply the hot air toward the injection nozzle 110.

[0037] As shown in FIGS. 1 and 3, the buffer zone 300 includes a buffer housing 310 which connects one hot air supply unit 200 in one adjacent chamber 20 to the other hot air supply unit 200 in the other adjacent chamber 20 so as to allow the units 200 to communicate with each other, and is provided to communicate with the inside of the chamber 20. Also, the buffer zone 300 includes an upper buffer plate 320A and a lower buffer plate 320B which are arranged symmetrically on the upper and lower sides of the inside of the buffer housing 310, and has a plurality of the discharge holes 325 for discharging the hot air injected from the injection nozzle 110.

[0038] The buffer housing 310 connects the hot air supply units 200 of the adjacent chambers 20 to each other so as to communicate the adjacent chambers 20 with each other, and includes a conveying passage therein, through which the textile fabric 30 is conveyed.

[0039] The upper buffer plate 320A and lower buffer plate 320B are configured to have the discharge holes 325 provided at the center portion except for the left and right sides thereof, and a closed section 322 having no discharge hole 325 is provided at both the left and right sides thereof.

[0040] The discharge holes 325 have a plurality of columns at the center portions of the upper buffer plate 320A and lower buffer plate 320B, and have a structure in which a length L2 of one column of the injection nozzles 110 is longer than a length L1 of one column in which the discharge holes 325 are provided.

[0041] A ratio of the length L1 of the one column provided with the discharge holes 325 to the length L2 of the one column of the injection nozzle 110 satisfies 0.6 to 0.88 : 1.0.

[0042] When a length ratio of L1 to L2 is less than 0.6, the difference in pressure between the center portion of the upper buffer plate 320A and lower buffer plate 320B and the left and right portions thereof becomes too large. Accordingly, a concern of having defects wherein wrinkles are formed on surfaces of the textile fabric 30 during conveying thereof may be raised. Also, when the length ratio of L1 to L2 exceeds 0.88, there is a possibility that meandering or shifting to one side may occur when the textile fabric 30 is conveyed.

[0043] The height interval between the upper buffer plate 320A and lower buffer plate 320B is preferably 40 to 65mm. Also, when the height interval of the upper buffer plate 320A and lower buffer plate 320B is less than 40 mm, the textile fabric 30 may be agglomerated and dropped when conveying a thick textile fabric 30. Whereas when the height interval

between the upper buffer plate 320A and lower buffer plate 320B exceeds 65 mm, the textile fabric 30 may have meandering from the center to left and right sides or shifting to one side when conveying a thin textile fabric 30.

[0044] It is preferable that a ratio of the total cross-sectional area of the injection nozzle 110 to the total cross-sectional area of the discharge holes 325 perforated in the upper buffer plate 320A and lower buffer plate 320B satisfies 1.0 : 1.05 to 1.2.

[0045] By maintaining the ratio of the total cross-sectional area of the injection nozzle 110 to the total cross-sectional area of the discharge hole 325 to at a ratio of 1.0 : 1.05 to 1.2, the back pressure of the hot air may be kept constant.

[0046] In the present invention having such a configuration of the continuous tumbler apparatus in which the chambers 20 are disposed in sequence, the textile fabric 30 is dried by the hot air while being conveyed from one side to the other side or from the other side to the one side depending on the injecting direction of the hot air from the injection nozzles 110 of the nozzle zones 100.

[0047] Here, after being conveyed through the hot air supply unit 200 in the chamber 20, the textile fabric 30 passes through the buffer zone 300 before being conveyed to the hot air supply unit 200 side of another adjacent chamber 20. Then, while the textile fabric 30 passes through the buffer zone 300, the hot air pressure is applied from the injection nozzles 110 of the nozzle zones 100 to be supplied into the buffer housing 310, and the hot air is discharged into the chamber 20 from the buffer housing 310 through the discharge holes 325 provided on the upper buffer plate 320A and lower buffer plate 320B.

[0048] After the hot air injected from the injection nozzles 110 flows into the buffer housing 310 of the buffer zone 300, since there are no discharge holes 325 provided at the left and right sides of the upper buffer plate 320A and lower buffer plate 320B, the pressure of the hot air is not discharged, and thus the pressure is maintained on both the left and right sides of the upper buffer plate 320A and lower buffer plate 320B. On the other hand, in the center portion where the discharge holes 325 are provided, in the process of discharging the hot air through the discharge holes 325, a waveform is generated on the conveying flow of the textile fabric by applying discharge suction force to the conveying flow of the textile fabric 30 conveyed in flat form by the injection nozzles 110. Therefore, the conveying speed of the textile fabric 30 in the buffer zone 300 is relatively slower than the speed of conveying thereof in the nozzle zone 100.

[0049] A part of the hot air discharged through the discharge holes 325 of the buffer zone 300 is recycled through a filter 40 and a burner 50 in the chamber 20, and a remaining part thereof is discharged to the atmosphere.

[0050] In this case, when the hot air is injected from the first and second injection nozzles 110-1 and 110-2, the textile fabric 30 is conveyed from one side to the other side, so that the textile fabric 30 is stacked so as to have a plurality of foldings inside one of the loading parts 80 provided on the other side passing through the each chamber 20 and the buffer zone 300. Subsequently, when the hot air is injected from each of the third and fourth injection nozzles 110-3 and 110-4, the textile fabric 30 is conveyed from the other side to the one side and passes through the chamber 20 and the buffer zone 300 again. Thus, the textile fabric 30 is stacked so as to have the plurality of folding inside the other of the loading parts 80 provided on the one side.

[0051] The textile fabric 30 in a state of containing moisture is dried and set by the hot air injected from the injection nozzles 110 while being conveyed from one side to the other side or from the other side to the one side. In addition, while passing through the buffer zones 300, the hot air is discharged into the chambers 20 through the discharge holes 325 to generate discharge pressure. Subsequently, the driving force generated from the injection nozzles 110 applied to the textile fabric 30 passing through the center portion of the upper buffer plate 320A and lower buffer plate 320B is eliminated at the discharge holes 325 side, and the textile fabric is conveyed in a flow of the wave form. Accordingly, the conveying speed of the textile fabric 30 passing through the buffer zone 300 is slower than the conveying speed thereof passing through the nozzle zone 100.

[0052] The present invention may prevent the foreign matter in the chamber from sticking to the textile fabric being conveyed by connecting the hot air supply unit 200 of the chamber 20 to the buffer housing 310 of the buffer zone 300 in a continuous tumbler apparatus in which each of the chambers 20 is disposed in sequence. In addition, the present invention eliminates the propulsion force applied to the textile fabric 30 by discharging a part of the air pressure of the hot air supplied from the injection nozzles 110 to the buffer housing 310 through the discharge holes 325 provided in the upper buffer plate 320A and lower buffer plate 320B of the buffer zone 300. As a result, the textile fabric beats the surface of the textile fabric 30 with strong hot air in the tensionless state and passes through the buffer zone 300, and the textile fabric is conveyed in a wave form by strong vibration caused by the pressure drop at upper and lower discharge holes 325. Therefore, the present invention may improve quality of the shrinkage, silky touch, softening, pile removal, pile pop-up, bulking, drape, and the touch of the textile fabric. Moreover, the present invention has an advantage wherein the drying efficiency of the textile fabric 30 is increased by using more time to dry the textile fabric 30 due to the slowed down speed of conveying the textile fabric 30.

[0053] In addition, the present invention is provided with the closed section 322 in which the discharge holes 325 are not provided on both the left and right sides of the upper buffer plate 320A and lower buffer plate 320B, so that a relatively large pressure acts on the closed section 322 compared to the center portion. Accordingly, the present invention has an advantage of preventing meandering or shifting to one side for the textile fabric 30 while the textile fabric 30 is passed

through the buffer housing 310 toward the hot air supply unit 200 of the adjacent chamber 20.

[0054] In the present invention, the length of one column of the discharge holes 325 provided in the upper buffer plate 320A and lower buffer plate 320B has the length ratio of 0.6 to 0.88 : 1.0 with respect to the length L2 of the injection nozzle 110, and the height interval of the upper buffer plate 320A and lower buffer plate 320B is provided to be 40 to 65 mm. Accordingly, the present invention has the advantage that poor conveying of the textile fabric 30 such as meandering or shifting to one side and the like during conveying the textile fabric 30 in the buffer housing 310 may be prevented

[0055] FIGS. 5 and 6 are views illustrating another embodiment of the present invention, and the buffer housing 310 further includes an opening and closing means 400 that selectively opens and closes the discharge holes 325, which is installed on an upper side of the left and right closed sections 322 where the discharge holes 325 are not provided. The opening and closing means 400 includes a drive motor 410 driven by an external signal and an opening and closing plate 420 which is coupled to a motor shaft 412 of the drive motor 410 to enable to open and close a part of the discharge holes 325 by sliding to the left and right side when driving the drive motor 410.

[0056] Although not shown in the figure, the opening and closing means 400 is provided with a guide rail for guiding the sliding operation of the opening and closing plate 420.

[0057] An opening and closing plate 420 may be provided inside the buffer housing 310 to partially open and close the discharge holes 325 of the upper buffer plate 320A and lower buffer plate 320B.

[0058] Because of this function, according to another embodiment of the present invention, the opening number of the discharge holes 325 may be arbitrarily adjusted by the opening and closing means 400 depending on input condition and information of the textile fabric 30 passing through the buffer housing 310. Therefore, regardless of a type of the textile fabric 30, there is the advantage that the drying efficiency may be improved.

[0059] As described above, in the detailed description of the present invention, specific embodiments have been described, but various modifications may be made without departing from the scope of the present invention. Therefore, the scope of the present invention should not be limited to the embodiment described above, but should be defined by the claims below and equivalents thereof.

[0060] That is, the present invention as described above is not limited to the specific preferred embodiments described above, and various modifications may be made by those skilled in the art without departing from the spirit of the invention as claimed in the claims, and such changes are within the scope of the claims.

<Description of the main numerals in the drawings>

10 :	Casing	20 :	Chamber
30 :	Textile fabric	40 :	Filter
50 :	Burner hot air injection duct	60,70 :	Upper and lower
80 :	Loading part	100 :	Nozzle zone
110 :	Injection nozzle		
110-1, 110-2, 110-3, 110-4 :	First, second, third and fourth injection nozzle		
200 :	Hot air supply unit	300 :	Buffer zone
310 :	Buffer housing plate	320A :	Upper buffer
320B :	Lower buffer plate section	322 :	Closed
325 :	Discharge hole closing means	400 :	Opening and
410 :	Drive motor	412 :	Motor shaft
420 :	Opening and closing plate		

Claims

1. A continuous tumbler dryer having a buffer zone, the continuous tumbler dryer comprising:

- a casing (10) having a plurality of chambers (20) therein in which a textile fabric (30) is conveyed from outside to inside;
- a plurality of hot air supply units (200) disposed inside the casing (10) and serving as conveying passages of the textile fabric (30);
- a plurality of nozzle zones (100) disposed in each of the chambers (20) and provided with a plurality of injection nozzles (110) which is respectively disposed on upper and lower sides of the hot air supply unit (200) and injects hot air to enable conveying the textile fabric (30) in one or the other direction; and
- a plurality of buffer zones (300) provided between the nozzle zones (100) and having a plurality of discharge

holes (325) provided therein for discharging the hot air injected from the injection nozzles (110) upward and downward, wherein each of the buffer zones (300) comprises:

a buffer housing (310) connecting the hot air supply units (200) of the adjacent chambers (20) in communication with each other and being provided to communicate with the inside of the chamber (20), and an upper buffer plate (320A) and a lower buffer plate (320B) arranged symmetrically on the upper and lower sides of the inside of the buffer housing (310) and having the plurality of discharge holes (325) for discharging the hot air injected from the injection nozzles (110).

2. The continuous tumbler dryer having a buffer zone of claim 1, wherein the discharge holes (325) are provided at a center portion of the upper and lower buffer plates (320A, 320B) except for both left and right sides of the buffer plates (320A, 320B).

3. The continuous tumbler dryer having a buffer zone of claim 1, wherein a length (L2) of one column of the injection nozzles (110) is longer than a length (L1) of one column where the discharge holes (325) are provided.

4. The continuous tumbler dryer having a buffer zone of claim 3, wherein a ratio of the length (L1) of the one column of the discharge holes (325) to the length (L2) of the one column of the injection nozzles (110) satisfies 0.6 to 0.88 : 1.0.

5. The continuous tumbler dryer having a buffer zone of claim 1, wherein a height interval between the upper and lower buffer plates (320A, 320B) is 40 to 65 mm.

6. The continuous tumbler dryer having a buffer zone of claim 1, wherein the injection nozzles (110) in each of the nozzle zones (100) comprises:

first and second injection nozzles (110-1, 110-2) which are arranged in two columns for injecting the hot air to enable conveying the textile fabric (30) from one side to the other side; and

third and fourth injection nozzles (110-3, 110-4) which are arranged in two columns at positions spaced apart from the first and second injection nozzles (110-1, 110-2) for injecting the hot air to enable conveying the textile fabric (30) from the other side to the one side.

7. The continuous tumbler dryer having a buffer zone of claim 1, wherein a part of the hot air discharged through the discharge holes (325) of the buffer zones (300) is recycled through a filter (40) and a burner (50) in the chamber (20), and a remaining part thereof is discharged to the atmosphere.

8. The continuous tumbler dryer having a buffer zone of claim 1, wherein the buffer housing (310) further comprises: an opening and closing means (400) provided on an upper side of a left and right closed section (322) where the discharge holes (325) are not provided, in order to selectively open and close the discharge holes (325), and the opening and closing means (400) comprises:

a drive motor (410) driven by an external signal; and

an opening and closing plate (420) which is coupled to a motor shaft (412) of the drive motor (410) to be able to open and close a part of the discharge holes (325) by sliding to the left and right sides thereof when driving the drive motor (410).

FIG. 1

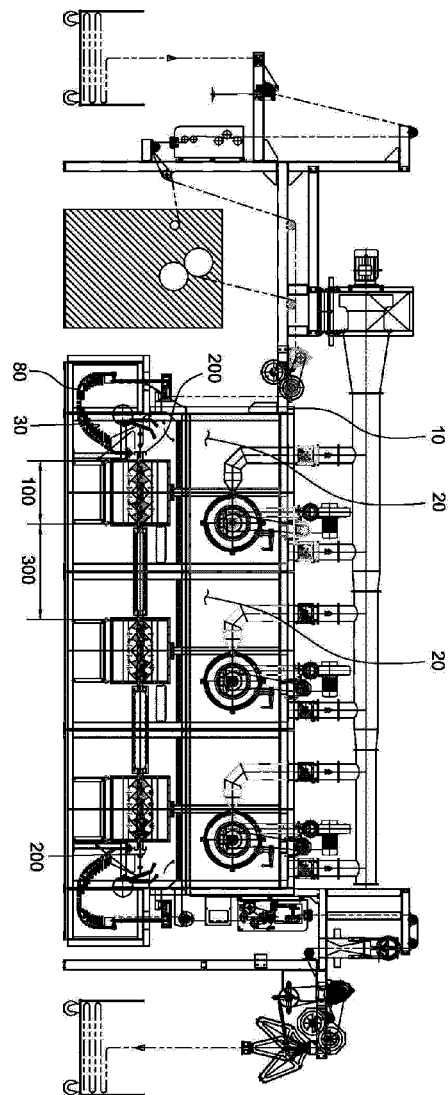


FIG. 2

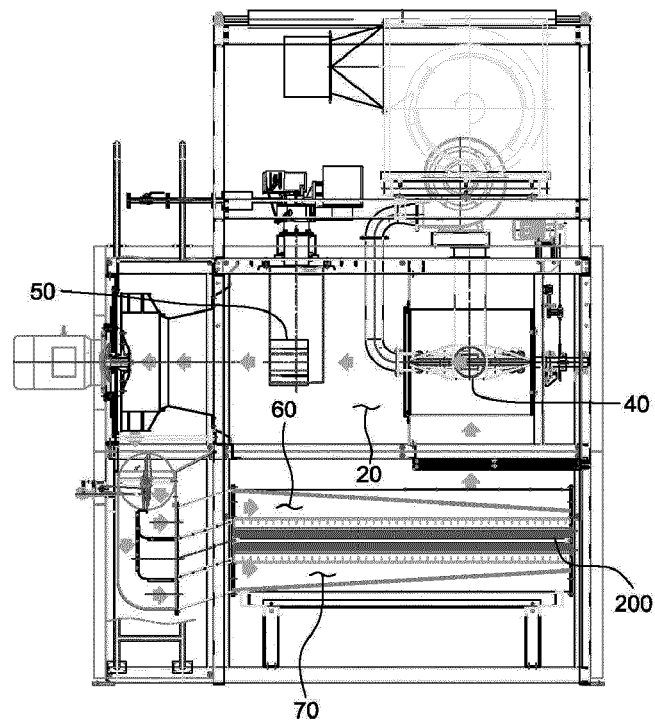


FIG. 3

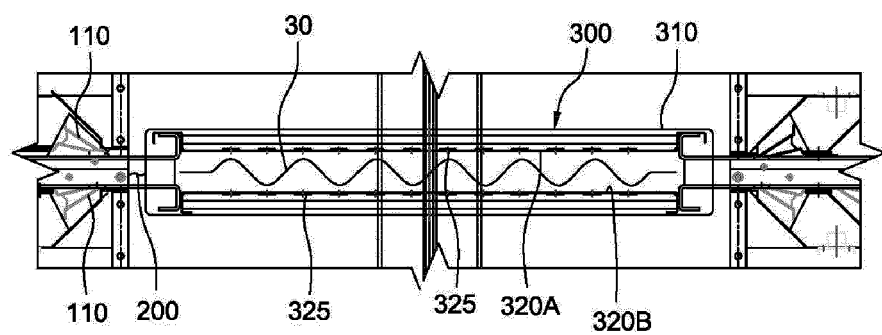


FIG. 4

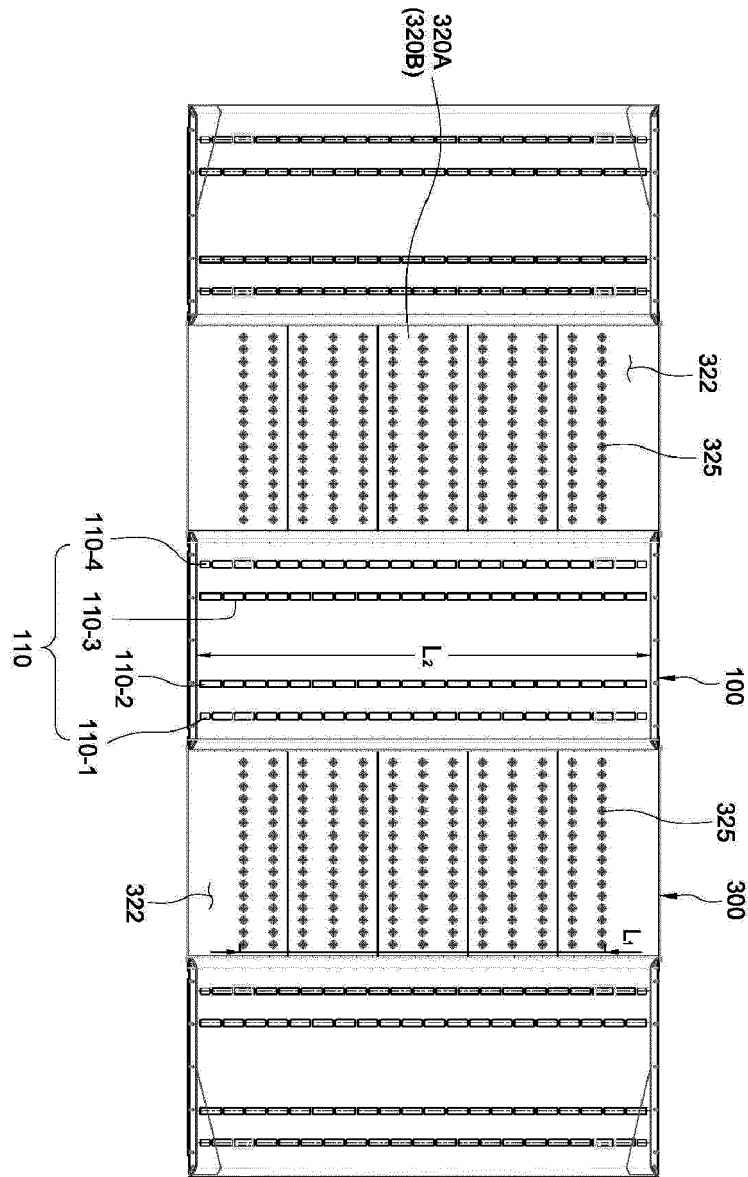


FIG. 5

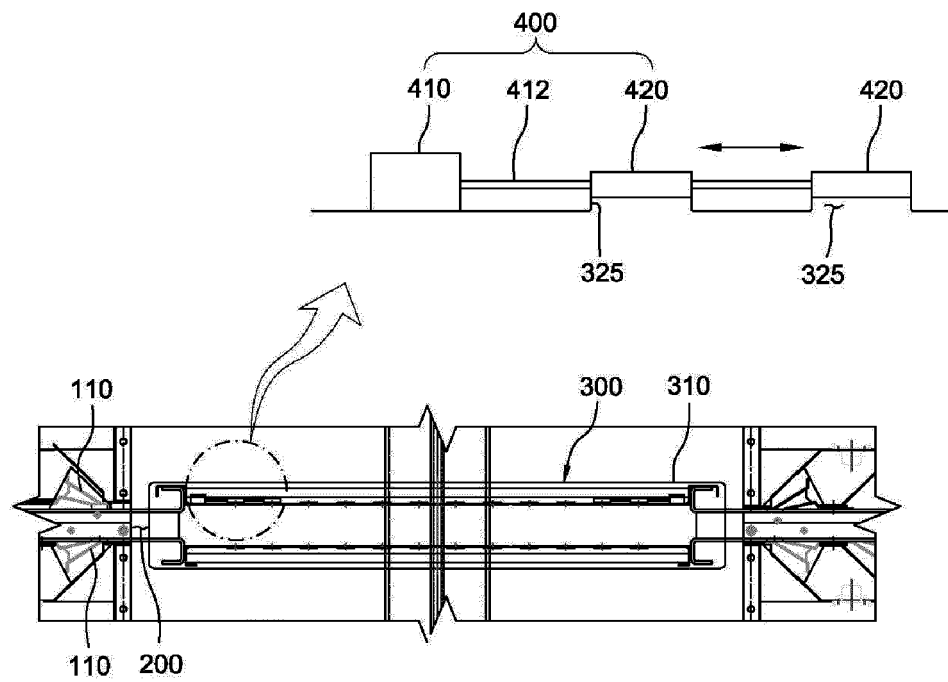
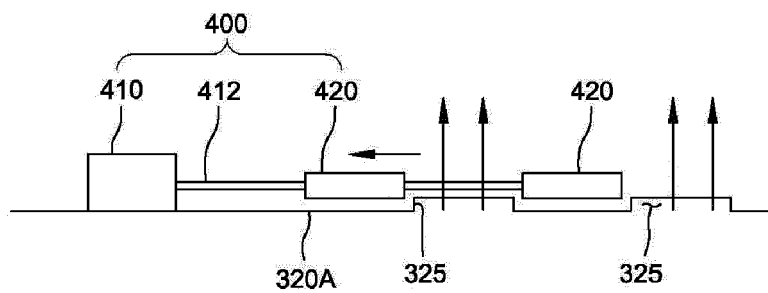


FIG. 6



REFERENCES CITED IN THE DESCRIPTION

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