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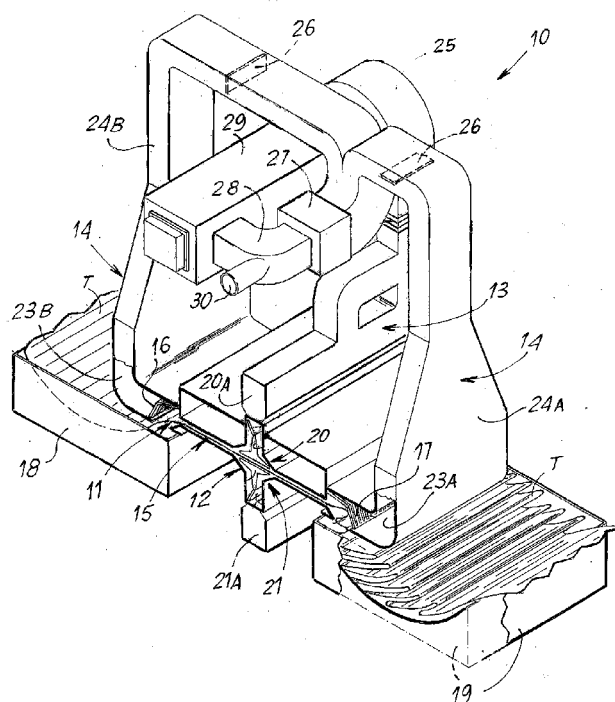
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(54) **Method for processing a fabric and related machine**

(57) Machine and method for softening and shrinking a fabric (T), preferably a knitted fabric, the method provides for pulling or pushing the fabric (T) in a pneumatic transport tunnel (15), through air flows below and/or above the fabric, alternatively towards opposite impact structures (16, 17), against which the fabric impacts; the directions of these air flows are inclined relative to the

horizontal, so as to create a resulting horizontal component of the air push or pull on the fabric (T) allowing to move it. The method characteristically provides for a step wherein the resulting horizontal component of the air push or pull on the fabric (T) is null, i.e. wherein the air invests the fabric without moving it towards a respective impact structure.

Fig.1



Description

Technical Field

[0001] The present invention relates to a machine for softening and shrinking a fabric.

[0002] An object of the present invention is also a method for softening and shrinking a fabric.

State of the Art

[0003] Machines have been marketing for many years now for continuous processing of a fabric; these machines improve the tactile characteristics thereof, in particular softness and shrinkage. Machines are known, for instance, that provide for impacting a wet fabric between two impact structures arranged at the ends of a pneumatic transport tunnel. This impact results in fabric softening, shrinking and settling. These machines are described, for instance, in the Italian patent applications FI2004A000183 and FI2008A000100 of the same applicant, and in the international patent applications WO2006/021978 and WO2009/14184 claiming respectively the priority of the aforesaid Italian applications.

[0004] In these examples the fabric is moved between two tanks upstream and downstream of the tunnel, inside which a bath may be provided. In the central area of the tunnel, both on the top and the bottom, two air ejection areas are provided, each presenting an air blowing device comprising two channels for conveying the air towards the tunnel; the channels extend from a compartment connected with an air circulation system. More in particular, each blowing device (lower device on the tunnel bottom and upper device on the tunnel top) has two channels diverging from the compartment towards the tunnel, i.e. inclined with respect to the direction in which the tunnel extends and the fabric is fed. The lower pair and the upper pair of channels are substantially arranged at the same longitudinal height as the tunnel. In correspondence of the area where the two respective channels bifurcate from the compartment, there is a baffle controlled by an actuator, which closes a channels maintaining the other open, and vice versa.

[0005] From an operational viewpoint, thanks to the push or pull exerted by the air investing the fabric in an inclined manner from the top and from the bottom, i.e. thanks to the horizontal component of the air push on the fabric, this latter moves inside the tunnel. The fabric moved by the air impacts against an impact structure and falls in the tank below. The baffles of the upper and lower blowing device are arranged so that all the air is conveyed in the tunnel in one direction or in the opposite direction. The fabric movement is periodically inverted by acting on the baffles, so that each fabric segment can impact many times against the impact structures. The fabric arrives to the tunnel overfed. A slow forwards movement of the fabric overlaps its reciprocating motion, so that anyway a fabric segment, after several impacting cycles,

is outside of the tunnel and ready for a new process on a new station.

[0006] The air pushing and pulling the fabric is recovered through a suction system; this latter may be provided, for instance, with suction areas at the tunnel ends (for example in front of the impact structures that are adequately holed) or/and with suction holes on the top and/or bottom of the tunnel. The air not only moves the fabric, but also allows the drying thereof.

[0007] It has been proved that these machines operate perfectly, but they can be improved as regards, for instance, the flexibility in use. In fact, some fabrics need a lower impact frequency and a stronger drying with respect to the known machines.

Object and summary of the invention

[0008] The object of the invention is to provide a machine for processing a fabric through impact, to soften and shrink it, as well as a related method, providing for an optimum flexibility in adjusting the air quantity and the tunnel transit time of the fabric, so that it can be suitable for different fabric types.

[0009] This and other object are achieved through a machine providing for pushing or driving a fabric in a tunnel through air, according to a first direction towards a first impact structure, or according to an opposite direction towards a second impact structure, or for investing the fabric with air without it moving inside the tunnel, according to what claimed in the appended claim 1.

[0010] According to a first aspect, the invention relates to a machine for processing a fabric, comprising

- a feed path for moving the wet fabric between two processing areas,
- impact structures, which are arranged upstream and downstream of at least one segment of this path and against which the fabric impacts according to the feed direction to perform a softening and shrinking process through impact,
- a pneumatic transport system along this path for the wet fabric, comprising a tunnel and at least one blowing device arranged in the tunnel below the feed path of the wet fabric; the blowing device comprises at least one flow baffle, which can work in two positions, a first position wherein the blowing device conveys air according to an inclined direction converging in a first feed direction of the fabric towards a first impact barrier, and a second position wherein the lower blowing device conveys air according to an inclined direction converging in a second feed direction, opposite to the first direction, towards a second impact barrier, so as to push and move the fabric in the converging direction. In addition to, and alternative to said first and second working positions, the flow baffle characteristically provides an explicit third position to convey the air towards the tunnel, so that the overall horizontal component of the air flow ex-

iting from said blowing device is substantially null, keeping the fabric substantially stationary. Practically, according to the invention, this third working position does not correspond to a position taken by the flow baffle whilst it moves from the first to the second working position, in a processing phase during which the fabric has only to invert its movement, with the air conveyed according to inclined directions; this third position is actually a precise particular working position, wherein the flow baffle is stopped for a non-instantaneous given time, so as to stop the fabric for a given time.

[0011] In the machine means are therefore provided, designed to

- move the flow baffle through said third position without stopping it, or
- stop the flow baffle in the third position for a given, preferably adjustable time.

[0012] According to another aspect, the invention also relates to a method for softening and shrinking a fabric, preferably a knitted fabric; the method provides for pulling or pushing the fabric, through air flows below and/or above the fabric, alternatively towards opposite impact structures, against which the fabric impacts; the directions of these air flows are inclined relative to the horizontal, so as to create a resulting horizontal component of the air push or pull on the fabric allowing to move it. The method characteristically provides for a step, wherein the resulting horizontal component of the air push or pull on the fabric is null, i.e. wherein the air invests the fabric without moving it towards a respective impact structure.

[0013] The method practically provides for a step wherein the resulting horizontal component of the air push on the fabric is inverted, so as to invert the fabric movement, or alternatively a distinct step of making this resulting horizontal component of the air push null, so as to stop the fabric movement.

Brief description of the drawings

[0014] Further characteristics and advantages of the invention shall be more apparent from the description of a preferred, although not exclusive, embodiment, illustrated by way of non limiting example in the attached drawings, wherein:

figure 1 is an overall perspective view of a machine according to the invention;
figure 2 is a side schematic view of a pneumatic tunnel moving the fabric in a first direction, in a machine according to the invention, for instance that of figure 1;
figure 3 is a side schematic view of the tunnel of figure 2 with the fabric moving in the opposite direc-

tion;

figure 4 is a side schematic view of the tunnel of the previous figures, wherein the fabric is invested by air without moving in any directions;

figures 5a, 5b, and 5c show the three positions of an air baffle for a blowing device for blowing air into the tunnel, highlighting the corresponding arrangements of the baffle actuator.

Detailed description of an embodiment of the invention

[0015] With reference to the aforesaid figures, a machine according to the invention is indicated as a whole with number 10. Only the fundamental components thereof will be described below. The figures show a machine configured for processing a (preferably wet) fabric in open width, i.e. laying according to its transverse direction. The machine according to the invention can be also designed for processing a fabric in rope form. The machine substantially comprises a preferably horizontal path 11, which is at least partially pressurized and along which an open-width fabric T, such as preferably a knitted fabric, moves, and a bidirectional pneumatic transport system 12 fed by a pneumatic circuit 13, as well as a further pneumatic circuit 14 for air suction and recirculation. The transport system provides for a tunnel 15 defining at least one part of the fabric path. In this example, this path 11 is horizontal, at least as regards the inner extension of the tunnel. In other embodiments the tunnel may obviously be inclined or slightly inclined.

[0016] Two impact structures 16 and 17 are arranged upstream and downstream of the tunnel 15; in this example these structures are in the form of grilles, against which the fabric impacts, as better explained below.

[0017] In the preferred embodiment, the machine according to the invention advantageously includes, at the ends of the path 11, below the impact structures 16 and 17, respectively a first treatment tank 18 and a second treatment tank 19, in which a stock of fabric forms alternatively. In the arrangement of figure 1, the stock formed by the wet open-width fabric T is accumulating in the tank 19 and the pneumatic transport system 12 is configured so as to take the fabric T from the tank 18 and transfer it in the tank 19 to form said stock.

[0018] In the preferred embodiment of the invention, the pneumatic transport system 12 directs pressurized air, through two blowing devices 20 and 21, arranged respectively above and below, substantially in the same longitudinal position along the tunnel 15 in which the fabric is pneumatically transported. Each blowing device 20-21 has an air supply duct 20A-21A or compartment ending with two diverging channels 20B'-21B' and 20B"-21B" oriented inclined with respect to the direction of longitudinal extension of the tunnel 15, i.e. the fabric feed direction. The channels 20B-21B extend preferably along all the tunnel transverse width so as to blow air on all the fabric width.

[0019] In this example, each blowing device 20-21 has

a flow baffle 20C-21C; this baffle is preferably in the form of a plate, hinged for instance in correspondence of the area where the air supply duct 20A-21A bifurcates into the two channels 20B'-21B' and 20B"-21B", and is designed selectively to close, through an actuator described below, one of the channels, thus cooperating in forcing all the air flow to move towards the opposite diverging channel. In this way the upper and lower blowing devices 20 and 21 convey air, in coordination with each other, according to inclined directions converging in a first feed direction (see figure 2) towards the second impact structure 17 and a second position, wherein the upper and lower blowing devices 20 and 21 convey air, in coordination with each other, according to inclined directions converging in a second feed direction (see figure 3), opposite to the first feed direction, towards the first impact structure 16.

[0020] The air flows coming from the channels 20B'-21B' or 20B"-21B" converge inclined on the fabric from the top and from the bottom, and impact the fabric. These flows are substantially balanced as regards both flow rate and incidence; therefore, the vertical components of the air push onto the fabric reciprocally cancel out, whilst the horizontal components add to one another, pushing/pulling the fabric along the path 11 towards the tunnel exit, until it impacts against a corresponding impact structure.

[0021] In this embodiment, the pressurized air from the channels 20B'-21B' or 20B"-21B" is preferably sucked by respective inlets 23A and 23B, each connected to a branch of the further suction and recirculation circuit 14, so as to give the fabric T a further push. This further suction and recirculation circuit 14 comprises two channels 24A and 24B connecting the inlets 23A and 23B with a compressor or fan 25 through gates 26 that can be opened alternatively according to the air suction direction, i.e. to the fabric feed direction in the tunnel. The two channels 24A and 24B join together at a filter 27, from which a further channel 28 extends, crossing a heat exchanger 29 and achieving the compressor/fan 25. An outlet 30 to eject part of the exhausted air is arranged between the filter 27 and the heat exchanger 29. The compartments 20A and 21A are operatively connected with the outlet of the compressor/fan 25.

[0022] From an operational viewpoint, the fabric is driven by the air, exiting from the first channels 20B'-21B' of the blowing devices (and coming from the compressor/fan 25 through the ducts 20A, 20B), and moved from a first tank 18 towards the second tank 19, impacting against a respective impact structure 17. After some time, the air flow is conveyed towards the second channels 20B"-21B" of the blowing devices 20-21, thus inverting the push direction, and consequently the feed direction of the fabric, which is pulled from the second tank 19 towards the first tank 18 impacting on the opposite structure 16. In any case, there is a whole movement forwards of the fabric along the path (i.e. towards the second tank 19) so that all the fabric can be processed.

[0023] The machine described above is substantially

known, for instance from the Italian patent application FI2004A000183 (or the international application W02006/021978 claiming the priority of this Italian application), to which complete reference should be made and which is intended as incorporated in the present description. The example of figure 1 relates to a version with open-width fabric. Obviously, also the corresponding cases of processing fabrics in rope form, described in the aforesaid application, are intended as incorporated as reference, and this description can be also applied to these cases.

[0024] According to the invention, the flow baffle 20C-21C of each blowing device 20 or 21 can characteristically take a third position, in addition to the two positions of closing the respective diverging channels 20B'-21B' and 20B"-21B". In this intermediate third position the baffle is neutral, i.e. it does not close any respective diverging channels 20B'-21B' and 20B"-21B" (figures 4 and 5b). In this way, the pressurized air from the compartment enters both the channels substantially at the same flow rate, and invests the fabric T, giving it a push with null horizontal component (i.e. the component, parallel to the tunnel inner extension, null), so that it remains stationary 11 and does not impact against the impact structures. In the example with upper and lower blowing devices 20-21, the machine is configured so that the baffles of both the devices can move to the third position so that also the vertical resultant of the push on the fabric is null. In this step, the air exerts only a drying action on the fabric, without moving it towards the tanks.

[0025] Practically, the alternation of the impact between the grille-like impact structures 16 and 17 may be overlapped by a step of stopping the fabric (in addition to the step wherein the fabric inverts its motion), during which the fabric is invested by air for drying. The frequency and duration of this stop depends upon the desired degree of dryness and/or the desired smaller number of impacts for the fabric; this allows an optimum flexibility of the machine, that therefore can be used with the broadest range of fabrics.

[0026] Practically, it can be said that, according to the invention, the machine is provided with moving means, for moving the flow baffle between the first and the second working position, and vice versa, passing through the third position but without stopping there, thus obtaining the reciprocating of the fabric motion, as well as with stopping means for stopping the flow baffle in this third working position for a given time, thus allowing to stop the fabric for drying it; whilst the moving means operate, the stopping means are deactivated, and vice versa.

[0027] As better explained below, the moving means and the stopping means preferably comprise the actuator 31, allowing the flow baffle to move; moreover, the moving means and the stopping means preferably comprise common electronic means designed to manage alternatively the stop of the flow baffle in, or its movement through, the third working position.

[0028] The electronic means may comprise adjusting

means, not shown in the figure and controllable by an operator, for adjusting the length of time the flow baffle remains in this third position.

[0029] The electronic means may analogously comprise adjusting means, not shown in the figures, for adjusting the periodicity at which the flow baffle is stopped in this third position.

[0030] The adjusting means, both those for adjusting the periodicity and those for adjusting the length of time of the stop, may comprise an electronic control associated with the actuator of the flow baffle, allowing the operator to set preset or desired values for periodicity and time of the stop. Analogously, the electronic control can be managed automatically by means of an electronic program that, based upon detected values (such as the fabric moisture level) can adjust the length of time and the periodicity of the stop of the baffle according to specific requirements.

[0031] In the floating step, the length of time the fabric is stationary is not instantaneous, and is preferably greater than 0.1 seconds, more preferably greater than 1 second, and more preferably greater than 2 seconds.

[0032] Moreover, this time is preferably comprised between 0.1 and 20 seconds, more preferably between 2 and 20 seconds, more preferably between 2 and 7 seconds, and more preferably equal to nearly 5 seconds. In this example, each flow baffle 20C-21C can be moved for instance through an actuator 31, like a translation cylinder (see figures 5), preferably of the pneumatic type, hinged at one end to the machine body and at the opposite end to the plate forming the same baffle 20C-21C, in particular in a position opposite to the closing portion of the diverging channels with respect to the axis of horizontal hinging of the plate to the machine structure. More in particular, in this example the pneumatic cylinder is of the "tandem" type, i.e. formed by a cylinder with a sleeve 31A defining two coaxial chambers 31B and 31C, each of which is divided into two parts of variable geometry by means of a piston 31D-31E, to which a corresponding stem 31F-31G is fixed, exiting from an end base of the sleeve. Each part has an inlet/outlet for the moving air of the piston 31D-31E. The free end of the first stem 31F is hinged to the machine structure, whilst the free end of the other stem 31G is hinged to the respective plate-flow baffle 20C-21C. In figures 5 an actuator 31 is shown related to the upper blowing device 20, the actuator and the connection to the corresponding baffle being analogous also for the lower blowing device 21 (the operation of the lower blowing device is synchronized with that of the upper device so that the air flows in the corresponding directions at the same instant and with equal flow rate).

[0033] The operation of the actuator 31 is as follows. In figure 5a the case is shown, wherein both the stems are completely retracted in the respective chambers (i.e. at start of stroke, from an operational viewpoint), and the pistons are against the wall separating the two coaxial chambers. In this first configuration, the plate 20C is inclined to close the diverging channel 20B' and the device

can therefore supply air towards the tank 18, so that the air flows in the diverging channel 20B" towards the tank 19 (the fabric moves towards this tank and the impact structure above).

[0034] In figure 5b the case is shown, wherein the stem 31G for hinging to the plate is completely extracted from the respective chamber 31B (i.e. end of stroke), whilst the whole opposite stem 31F is still inside (start of stroke). In this second configuration the plate baffle is in neutral position, i.e. an intermediate position between the two diverging channels 20B' and 20B"; the air therefore flows in both the channels at equal flow rate; the fabric is not therefore moved in any directions.

[0035] In figure 5c the case is shown, wherein both the stems are completely extracted (i.e. at end of stroke) in the respective chambers. In this third configuration, the plate 20C is inclined to close the diverging channel 20B" and the device can therefore supply air towards the tank 19, so that the air flows in the diverging channel 20B' towards the tank 18 (the fabric moves towards this tank and the impact structure above).

[0036] Practically, the method according to the invention provides for pulling or pushing the fabric, through air flows at least below, but preferably also above the fabric, alternatively towards opposite impact structures 16 and 17, against which the fabric impacts. The directions of these air flows are inclined relative to the horizontal, so as to create a resulting horizontal component of the air push or pull on the fabric that allows to move this latter. According to the method, these steps of alternating motion are alternated, according to a given periodicity, with a step of blowing, also called stop or floating step, wherein the resulting horizontal component of air push or pull on the fabric is null, wherein the air invests the fabric without moving it towards a respective impact structure. This stop or floating step is distinct from and alternative to the step of inverting the direction of the air flows to invert the fabric motion.

[0037] More specifically, the method may provide for: conveying air from below and above the fabric T according to two first inclined directions converging on the fabric, thus moving it against the second impact structure 17; stopping the air flow according to these two first converging inclined directions and conveying air from above and below according to two opposite second inclined directions converging on the fabric, thus moving it in opposite direction towards the first impact structure 16; the method then provides for stopping, under request, the movement of the fabric towards the first or the second impact structure 16, 17, conveying air from above and below contemporaneously according to the first and second inclined converging directions, thus making the push or pull on the fabric substantially null.

[0038] The stop or floating step may be provided after a certain number of reciprocating movements of the fabric between the two impact structures, or at each inversion, or also according to preset time intervals.

[0039] In the floating step, the length of time the fabric

is stationary is not instantaneous, and is preferably greater than 0.1 seconds, more preferably greater than 1 second, and more preferably greater than 2 seconds.

[0040] Moreover, this time is preferably comprised between 0.1 and 20 seconds, more preferably between 2 and 20 seconds, more preferably between 2 and 7 seconds, and more preferably equal to nearly 5 seconds.

[0041] In a particularly simplified embodiment, the method of the invention may provide that the air flows, moving or floating the fabric, are arranged only below the fabric and not above. Consequently, in a simplified embodiment of the machine according to the invention, only the lower blowing device may be present.

[0042] Obviously, the invention can provide an embodiment of this lower blowing device (but of the upper too) different than that proposed above. For instance, instead of a hinged plate baffle, a sliding or guillotine gate may be provided for each diverging channel. Furthermore, according to other embodiments, instead of the "static" diverging channels, one or more channels may be present with variable inclination, for instance as described in some embodiments of the patent application FI2008A000100, with these channels able to take a vertical orientation to obtain an air flow on the fabric with substantially null push horizontal component.

[0043] It is understood that what illustrated above purely represents possible nonlimiting embodiments of the invention, which may vary in forms and arrangements without departing from the scope of the concept on which the invention is based. Any reference numbers in the appended claims are provided for the sole purpose of facilitating the reading thereof in the light of the description hereinbefore and the accompanying drawings and do not in any way limit the scope of protection of the present invention.

Claims

1. A machine for processing a fabric, comprising

- a feed path (11) for moving the wet fabric (T) between two processing areas,
- impact structures (16, 17), which are arranged upstream and downstream of at least one segment of said path (11) and against which the fabric (T) impacts according to the feed direction to perform a softening and shrinking process through impact,
- a pneumatic transport system (12) along said path (11) for the wet fabric (T) comprising a tunnel (15), at least one blowing device (21) arranged in said tunnel (15) below the feed path (11) of the wet fabric (T), said blowing device (21) comprising at least one flow baffle (21C) which can work in two position, one position wherein said blowing device (21) conveys air according to an inclined direction converging in a first feed di-

rection of the path (T) towards a first impact barrier (16) and a further position wherein said lower blowing device conveys air according to an inclined direction converging in a second fabric feed direction opposite to said first direction towards a second impact barrier (17), so as to perform a thrust for moving the fabric (T) in the converging direction,

characterized in that said flow baffle (21C) provides a third working position to convey the air towards said tunnel (15) so that the overall horizontal component of the air flow exiting from said blowing device (21) when said flow baffle is in said third position, is substantially null, keeping the fabric substantially stationary.

2. A machine as claimed in claim 1, wherein at least two blowing devices (20, 21) are present, respectively at least one said blowing device (21) arranged in said tunnel (15) below the moving path (11) of the wet fabric (T) and at least one further blowing device (20) arranged in said tunnel (15) above said path (11), said blowing devices (20, 21) comprising flow baffles (20C, 21C) working in three positions,

- a first position wherein said lower and upper devices (21, 20) convey air in a coordinated manner according to inclined converging directions in a first feed direction of the fabric (T) towards a second impact barrier (17),
- a second position wherein said lower and upper devices (21, 20) convey air in a coordinated manner according to inclined converging directions in a second feed direction of the fabric opposite to said first direction towards a first impact barrier (16), to perform a thrust for moving the fabric in the converging direction,
- a third position to convey the air contemporaneously according to both said inclined opposite directions so as to perform to the fabric (T) such two equal and opposite thrusts to annul the component of the thrust of moving forward the fabric, keeping the fabric (T) substantially stationary and invested by more air flows, from both above and below, so as to dry the fabric.

3. A machine as claimed in claims 1 or 2, comprising

- means for moving the flow baffle between said first position and said second position and vice versa, passing through said third working position without stopping there, thus obtaining the reciprocating of the fabric motion, and
- means for stopping said flow baffle in said third working position for a given time, preferably adjustable, allowing the fabric to stop.

4. A machine as claimed in claims 2 or 3, in which said

blowing devices (20, 21) comprise each an air supply duct (20A, 21A) ending with at least two diverging channels (20B' - 20B'', 21B' - 21B'') oriented inclined with respect to the direction of longitudinal extension of the tunnel (15); said flow baffle (20C, 21C) comprising at least three working positions, a first position for closing one first of said channels (20B', 21B'), a second position to close the second of said channels (20B'', 21B''), in order to convey air towards the one or the other of the channels, and a third intermediate position to open both said channels (20B' - 20B'', 21B' - 21B'') to convey substantially the same air quantity on both said channels; preferably said channels (20B' - 20B'', 21B' - 21B'') of the two blowing devices (20, 21) being arranged symmetrically relative to the horizontal centerline plane of said tunnel.

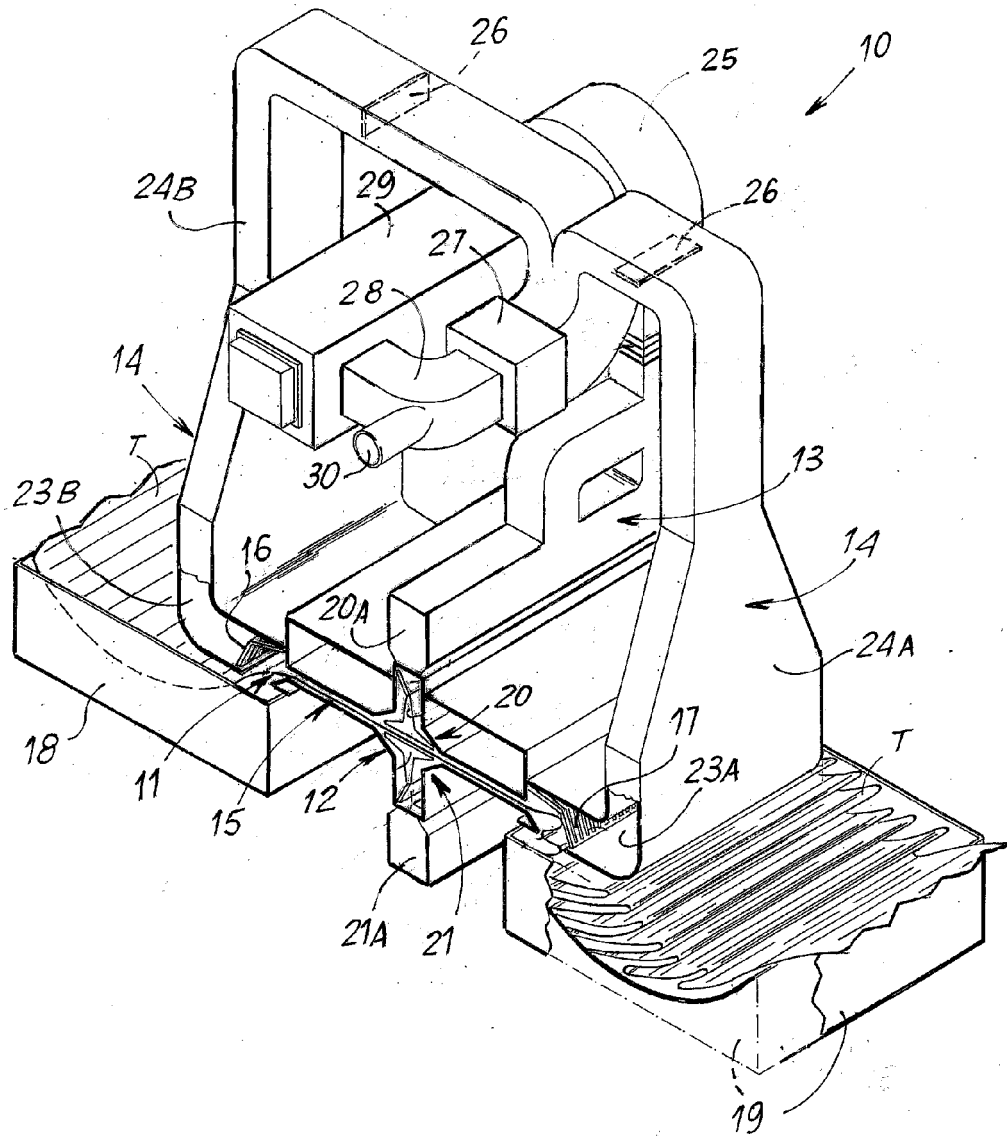
5. A machine as claimed in claim 4, wherein said flow baffle (20C, 21C) is arranged nearly in correspondence of the area where the supply duct (20A, 21A) bifurcates into said two channels (20B' - 20B'', 21B' - 21B'') and can rotate around an oscillation axis for the association with a movement actuator (31).
6. A machine as claimed in claim 5, wherein said movement actuator (31) comprises a translation cylinder; said translation cylinder being preferably of the tandem type, i.e. a cylinder with sleeve (31A) defining two coaxial chambers (31B, 31C) where two respective pistons (31D, 31E) are arranged, to which two respective stems (31F, 31G) are fixed, aligned to each other.
7. A machine as claimed in one or more of the previous claims, wherein said tunnel (15) extends substantially horizontally; preferably said feed path (11) being horizontal at least in said tunnel.
8. A method for softening and shrinking a fabric (T), preferably a knitted fabric, providing for pushing or pulling the fabric (T) through air flows below and/or above a fabric being processed, alternatively towards opposite impact structures (16, 17) against which the fabric impacts, the directions of said air flows being inclined relative to the horizontal so as to create a resulting horizontal component of the air push or pull on the fabric (T) allowing to move it, **characterized by** providing a step wherein the resulting horizontal component of the air push or pull on the fabric (T) is null wherein the air invests the fabric without moving it towards a respective impact structure.
9. A method as claimed in claim 7, providing
 - to convey air from below and above said fabric (T) according to two first inclined directions converging on the fabric, thus moving it against a

first impact structure,

- to stop the air flow according to said first two converging inclined directions
- to convey air from above and below according to two opposite second inclined directions converging on the fabric, thus moving it in opposite direction towards a second impact structure,
- to stop the movement of the fabric towards said first or second impact structure, conveying air from above and below contemporaneously according to said first and second inclined converging directions thus making the push or pull on the fabric substantially null.

10. A method as claimed in claim 7 or 8, wherein in said step of stopping the fabric, the air flow rate investing the fabric from below and/or above respectively according to said first inclined direction and according to said second inclined direction is substantially equal.
11. A method as claimed in claim 7, 8 or 9, the length of time the fabric is stationary is not instantaneous, and is preferably greater than 0.1 seconds, more preferably greater than 1 second, and more preferably greater than 2 seconds.
12. A method as claimed in claim 7, 8, 9 or 10, wherein the time of stopping the fabric is preferably comprised between 0.1 and 20 seconds, and more preferably between 2 and 20 seconds and more preferably between 2 and 7 seconds and more preferably is equal to near 5 seconds.
13. A method as claimed in claim 7, 8, or 9, wherein the time of stopping the fabric is preferably comprised between 0.1 and 20 seconds, and more preferably between 2 and 7 seconds and more preferably is equal to near 5 seconds.
14. A method as claimed in one or more of claims 7 to 10, wherein the air quantity investing the fabric from below and from above is substantially equal.
15. A method as claimed in one or more of claims 7 to 11, wherein the step of stopping the fabric corresponds to a step of only drying the fabric due to the effect of the air investing the fabric.

Fig.1



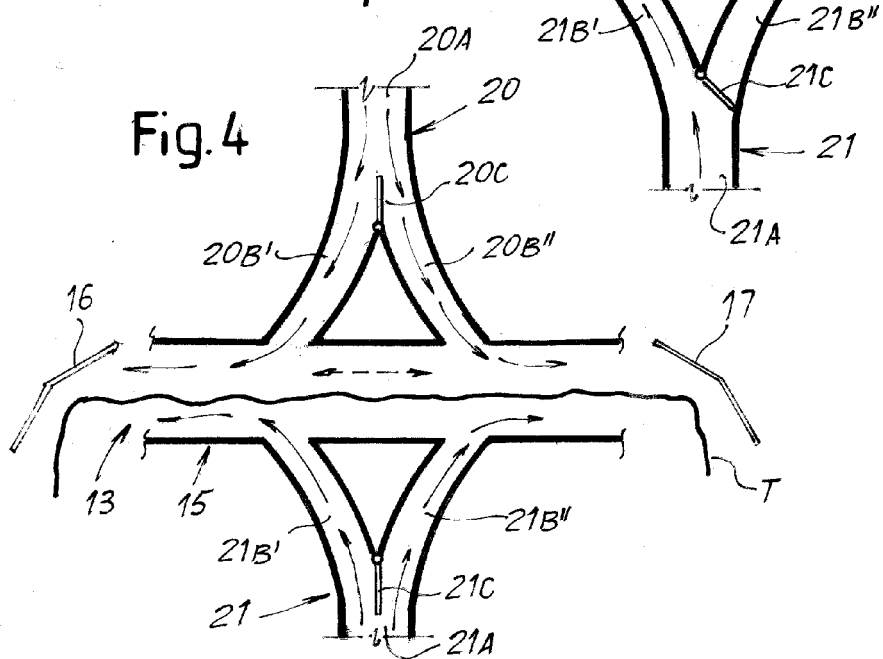
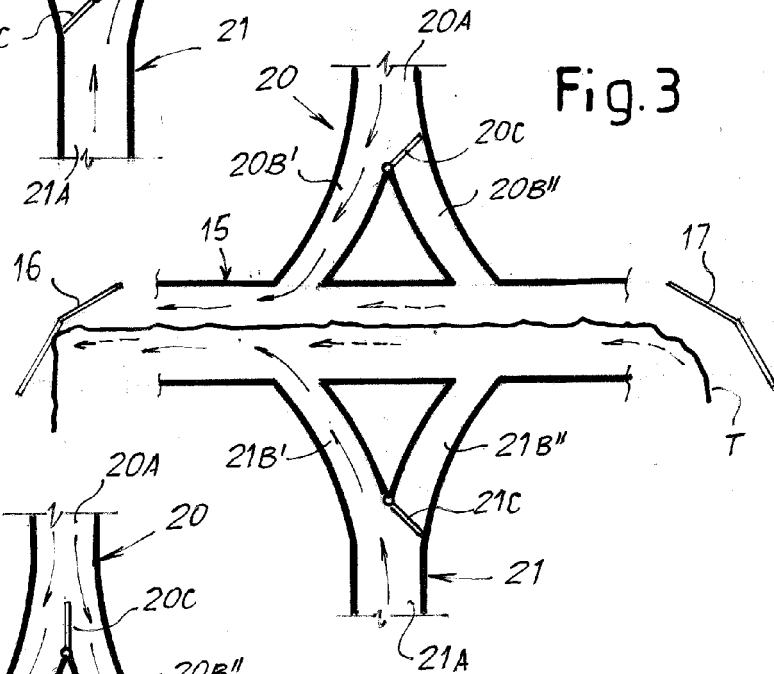
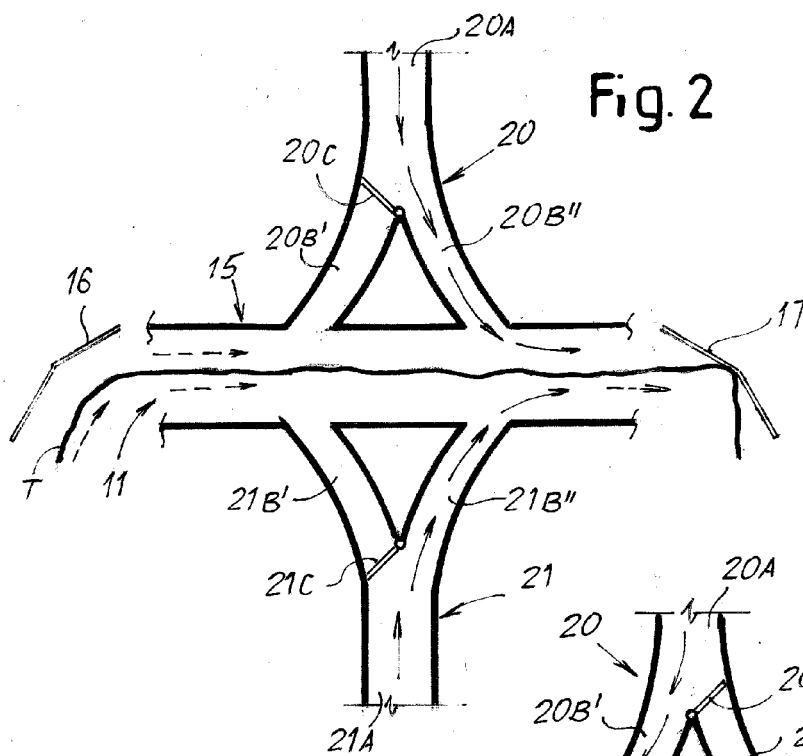
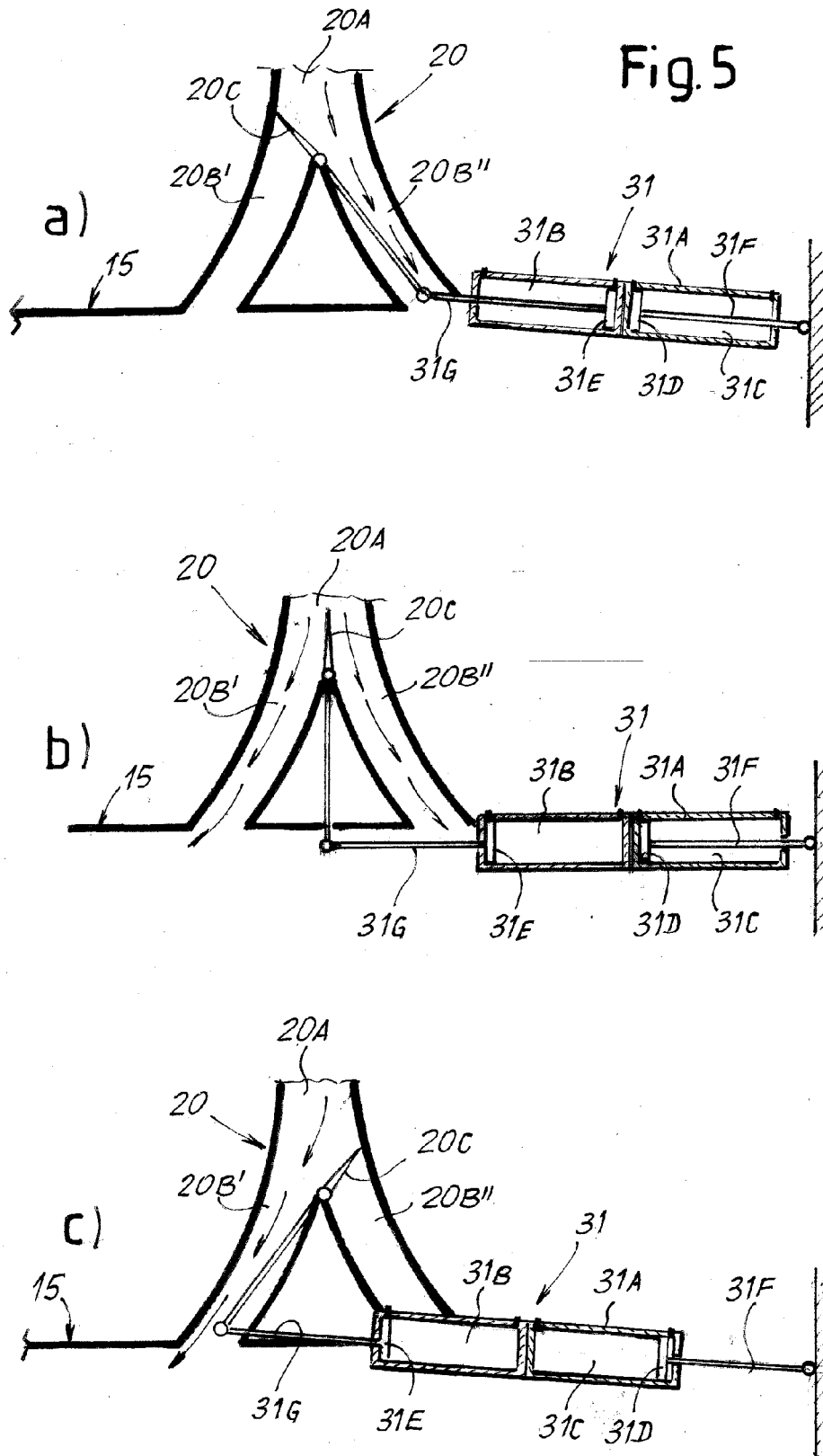


Fig. 5





EUROPEAN SEARCH REPORT

Application Number
EP 12 17 1128

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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