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(54) A TEXTILE APPARATUS COMPRISING AT LEAST ONE SPINNING UNIT, AT LEAST ONE WINDING UNIT AND AT LEAST ONE TRAY FOR CONTAINING BOBBINS AND TUBES AND RELATIVE METHOD OF MANAGING A TEXTILE APPARATUS

(57) A textile apparatus (4) comprising
- at least one spinning unit (8), adapted to produce yarn and wrapping it around a tube (12), so as to form a bobbin (16),
- at least one tray (20) for containing bobbins (16) and tubes (12),
wherein
- the tray (20) comprises a plurality of plates (24) adapted to each support a bobbin (16) or a tube (12), said plates (24) being guided and moved within grooves (28) delimiting predefined paths within the tray (20),
- the tray (20) being configured to receive bobbins (16) from the spinning unit (8) and to send tubes (12) to the spinning unit (8) and vice versa.

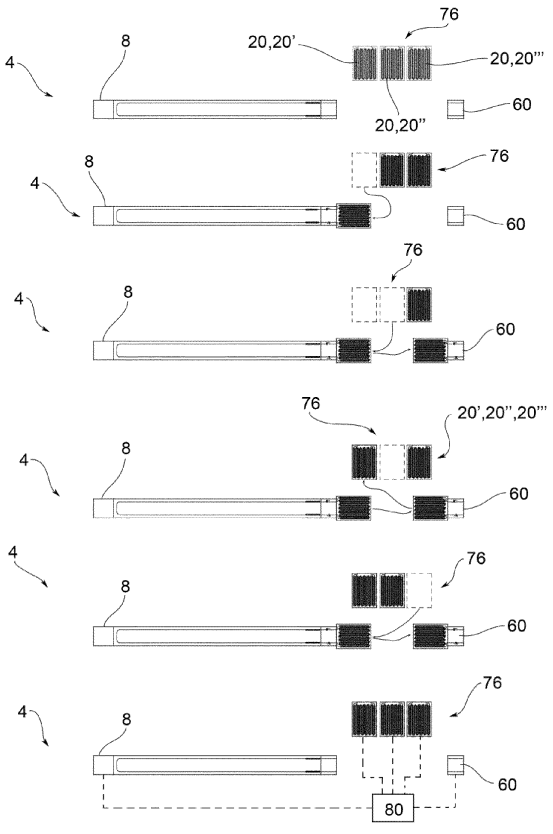

FIG.1

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Description

FIELD OF APPLICATION

[0001] The present invention relates to a textile apparatus comprising at least one spinning unit, at least one winding unit and at least one tray for containing bobbins and tubes and relative method of managing a textile apparatus.

BACKGROUND ART

[0002] As known, winding units process bobbins obtained from a spinning unit. Usually, several spinning units supply one same winding unit. Since the hourly production of bobbins, which can be obtained from several spinning units, is indeed greater than the hourly production of reels, which can be obtained from a winding unit, known solutions comprise the use of crates for containing the bobbins as they are gradually produced. Once the crates are filled up in bulk with the bobbins, they are overturned close to the winding unit for the relative supply, which can be both manual and at least partially automated by means of devices configured to opportunely align and orient the bobbins to be supplied to said winding unit.

PRESENTATION OF THE INVENTION

[0003] Such known solutions are not particularly effective because storage in bulk of the bobbins requires relatively long times for the successive gripping and orientation of the bobbins so that they can be supplied to the winding units.

[0004] Thus, the need is felt to overcome the drawbacks and limitations stated with reference to the prior art.

[0005] Such need is met by an apparatus according to claim 1 and by a method of supplying bobbins according to claim 17.

DESCRIPTION OF THE DRAWINGS

[0006] Further features and advantages of the present invention will become clearer from the description below of preferred non-limiting embodiments thereof, wherein:

figure 1 depicts a schematic plan view of an apparatus according to one embodiment of the present invention, according to various possible working steps;

figure 2 depicts a schematic plan view of a tray and a spinning unit according to one embodiment of the present invention;

figures 3-4 represent perspective views of the tray according to possible embodiment variations of the present invention.

[0007] The elements, or parts of elements, in common between the embodiments described below, will be indicated with the same reference numerals.

DETAILED DESCRIPTION

[0008] With reference to the aforesaid figures, an overall schematic view of a textile apparatus according to the present invention is globally indicated with 4.

[0009] In particular, the textile apparatus 4 comprises at least one spinning unit 8, adapted to produce the yarn and wrap it around a tube 12, so as to form a bobbin 16. For the purposes of the present invention, it does not detect the specific type of spinning unit 8.

[0010] The textile apparatus 4 further comprises at least one tray 20 for containing bobbins 16 and tubes 12.

[0011] According to one embodiment, the tray 20 comprises a plurality of plates 24 adapted to each support a bobbin 16 or a tube 12.

[0012] The plates 24 are guided and moved within grooves 28 delimiting predefined paths within the tray 20.

[0013] According to one embodiment, the plates 24 comprise a base 32 provided with an upper peg 36; the base 32 having a larger extension than the groove 28 so as to create an undercut for the removal of the base 32 through the groove 28.

[0014] The base 32 is positioned on a lower side 40 of the tray 20, not facing the associable bobbins 16; the upper peg 36, arranged on the side opposite the lower side 40, has a smaller width than the groove 28 so as to cross it at an upper side 44 of the tray 20 and create a support for an end 48 of the tube 12 or bobbin 16.

[0015] In particular, the upper peg 36 is configured so as to be coupled, preferably by shape coupling, to at least one end 48 of the tube 12 or bobbin 16; typically, the upper peg 36 is cylindrical with a circular section and the end 48 of the tube is hollow cylindrical, with a circular section. Thus, the shape coupling between the upper peg 36 and the end 48 of the tube 12 is of the male-female type.

[0016] According to one embodiment of the present invention, said groove 28 defines a continuous coil path, which extends from an inlet point 52, adapted to receive bobbins 16 in input, or tubes 12, 16 to be contained in the tray 20, to an outlet point 56 adapted to expel tubes 12 or bobbins 16 from the tray 20.

[0017] Preferably, the tray 20 faces the spinning unit 8 so as to receive bobbins 16 from the spinning unit 8 and send tubes 12 to the spinning unit 8.

[0018] In other words, the tray 20 can be positioned close to the spinning unit 8 so as to receive the bobbins 16, as they are gradually formed, from the spinning unit 8 and to reintegrate the tubes 12 with the same spinning unit 8, so as to allow the wrapping around the tube 12 of new yarn for forming a new bobbin 16.

[0019] In this way, the tray is able to fill up with bobbins 16 formed by a spinning unit 8 and then supply them to at least one winding unit 60, adapted to wind the bobbins, transforming them into reels, which will be better described below.

[0020] To facilitate the exchange of bobbins 16 and tubes 12, preferably, the inlet points 52 and the outlet points 56 of the tray 20 are arranged on one same exchange side 64 of said tray 20 so as to interface directly with the spinning unit 8.

[0021] In the same way, it is possible to interface the tray 20 with the winding unit 60. In this case, the tray 20 can supply bobbins 16 to the winding unit 60, which processes them, turning them into reels.

[0022] In the groove 28, the bobbins 16 and tubes 12 are arranged in series within the continuous path.

[0023] According to one possible embodiment (figure 3), the groove 28 is a single continuous groove, which unravels according to a coil inside which the bobbins 16 and tubes 12 are arranged, in series, from the inlet point 52 to the outlet point 56.

[0024] According to a further embodiment (figure 4) the tray 20 comprises a plurality of grooves 28, which define as many paths for receiving bobbins 16 and expelling tubes 12 and vice versa.

[0025] Preferably, said grooves 28 converge into an inlet branch 68, which flows into an inlet point 52, adapted to receive in input bobbins 16 to be contained in the tray 20, and in an outlet branch 72, which flows into an outlet point 56 adapted to expel tubes 12 from the tray 20.

[0026] For example, said grooves 28 are substantially perpendicular to said inlet branch 68 and/or outlet branch 72.

[0027] The groove, or grooves 28, communicate with each other and with an inlet point 52 and an outlet point 56 of the tray 20; furthermore, the plates 24, with the relative upper pegs 36, completely fill the grooves 28, so that the insertion of a plate 24' through an inlet point 52 results in the expulsion of another plate 24" from an outlet point 56.

[0028] A textile apparatus 4 according to the present invention can comprise a magazine 76 for bobbins 16 having at least one tray 20 filled, at least partially, with bobbins 16 to be fed, if necessary, to at least one winding unit 60. The magazine 76 can comprise a plurality of trays 20',20",20"' adapted to interface both with the spinning unit 8 and with the winding unit 60.

[0029] According to one embodiment, said trays 20 are provided with movement means, i.e. motor means, adapted to move the trays 20 and bring them close to the spinning unit 8 and/or the winding unit 60.

[0030] According to one possible embodiment, the textile apparatus 4 is equipped with at least one processing and control unit 80, programmed to manage the movements of the trays 20 according to the needs and operation of the spinning unit 8 and/or the winding unit 60.

[0031] In this way, it is possible to optimize the operation of all spinning 8 and winding 60 units of the textile apparatus 4 according to the contingent operating conditions thereof, optimizing the waiting times according to the productivity of the individual spinning 8 and winding 60 units, also due to the use of the magazine 76.

[0032] According to one possible embodiment, the textile apparatus 4 is provided with at least one processing and control unit 80 programmed so as to trace the source of the bobbins 16, i.e. the spinning unit 8 from which a bobbin 16 is made so as to reconstruct the source of each bobbin 16 processed in a winding unit 60. In this way, it is also possible to identify potential lots of bobbins 16 having specific flaws and carry out preventive maintenance on a spinning unit 8, but also on a winding unit 60.

[0033] The operation of a textile apparatus according to the present invention will now be described.

[0034] In particular, the present invention also relates to the method of managing a textile apparatus 4 comprising the steps of:

- providing at least one spinning unit 8, adapted to produce yarn and wrapping it around a tube 12, so as to form a bobbin 16,
- providing at least one tray 20 for the containment of bobbins 16 and tubes 12, wherein the tray 20 comprises a plurality of plates 24 adapted to each support a bobbin 16 or a tube 12, said plates 24 being guided and moved within grooves 28 delimiting predefined tray paths 20,
- providing or moving the tray 20 so as to be facing the spinning unit 8, to receive bobbins 16 from the spinning unit 8 and send tubes 12 to the spinning unit 8,
- the tray 20 creating a buffer for the bobbins 16 produced by the spinning unit 8.

[0035] According to one possible embodiment, the method of managing a textile apparatus 4 comprises the steps of:

- providing at least one winding unit 60, adapted to wind the bobbins 16 transforming them into reels,
- interfacing the tray 20 with the at least one winding unit 60, to receive the bobbins 16 from the tray 20 and send the tubes 12 to the tray 60.

[0036] As can be appreciated from the above description, the textile apparatus according to the invention allows the drawbacks presented in the prior art to be overcome.

[0037] Advantageously, it is possible to load all the bobbins inside the trays so that they are directly and correctly oriented for the successive gripping and feeding to the winding unit.

[0038] In this way, the step of loading onto the winder is considerably accelerated; furthermore, the step of producing the bobbins is optimized since buffers or magazines are created without ever having to interrupt the production of yarn and consequently of bobbins.

[0039] Furthermore, it is possible to optimize the operation of all the spinning and winding units of the textile apparatus according to the contingent operating conditions thereof, optimizing the waiting times according to the productivity of the individual spinning and winding

units, also due to the use of the magazine.

[0040] Furthermore, by tracing the source of the bobbins, it is possible to determine the spinning unit where each individual bobbin is made so as to reconstruct the source of each bobbin processed in a winding unit. In this way, it is also possible to identify potential lots of bobbins having specific flaws and carry out preventive maintenance on a spinning unit, but also on a winding unit.

[0041] It is also possible to manage and optimize the spaces available of the textile apparatus according to the logistics of the apparatus, of the positioning and of the dimensions of the individual spinning and winding units, due to the extreme versatility conferred by the presence of the movable trays, which opportunely interface with the spinning and winding units.

[0042] An expert in the art, with the object of satisfying specific, contingent needs, can make numerous modifications and variations to the textile apparatus and to the trays of the present invention, all contained within the scope of the invention as defined by the following claims.

Claims

1. Textile apparatus (4) comprising

- at least one spinning unit (8), suitable for producing yarn and wrapping it around a tube (12), so as to form a bobbin (16),
- at least one tray (20) for containing bobbins (16) and tubes (12),

wherein

- the tray (20) comprises a plurality of plates (24) suitable to each support a bobbin (16) or a tube (12), said plates (24) being guided and moved within grooves (28) delimiting predefined paths within the tray (20),
- the tray (20) being configured to receive bobbins (16) from the spinning unit (8) and to send tubes (12) to the spinning unit (8) and vice versa.

2. Textile apparatus (4) according to claim 1, wherein the plates (24) comprise a base (32) provided with an upper peg (36), the base (32) having a larger extension than the groove (28), so as to create an undercut, and the upper peg (36) having a width less than the groove (28) so as to cross it at an upper side (44) of the tray (20) and to create a support for an end (48) of the tube (12) or bobbin (16).

3. Textile apparatus (4) according to claim 1 or 2, wherein said groove (28) defines a continuous coil path that extends from an inlet point (52), suitable for receiving bobbins (16) in input to be contained in the tray (20), to an outlet point (56) suitable for ejecting tubes (12) from the tray (20).

4. Textile apparatus (4) according to claim 3, wherein the inlet (52) and outlet points (56) are arranged on the same exchange side (64) of said tray (20) so as to interface directly with the spinning unit (8).

5. Textile apparatus (4) according to claim 3 or 4, wherein the bobbins (16) and the tubes (12) are arranged in series within the continuous path.

6. Textile apparatus (4) according to claim 1 or 2, wherein the tray (20) comprises a plurality of grooves (28) that define as many paths for receiving bobbins (16) and ejecting tubes (12).

7. Textile apparatus (4) according to claim 6, wherein said grooves (28) converge into an inlet branch (68), which flows into an inlet point (52), suitable for receiving in input bobbins (16) to be contained in the tray (20), and an outlet branch (72) which flows into an outlet point (56) suitable for expelling tubes (12) from the tray (20).

8. Textile apparatus (4) according to claim 7, wherein said grooves (28) are substantially perpendicular to said inlet branch (68) and/or outlet branch (72).

9. Textile apparatus (4) according to claim 7 or 8, wherein the inlet (52) and outlet points (56) are arranged on the same side of said tray (20) so as to interface directly with the spinning unit(8).

10. Textile apparatus (4) according to any one of the preceding claims, wherein the apparatus (4) comprises at least one winding unit (60), suitable for winding the bobbins (16) transforming them into reels, the winding unit (60) being configured to interface with the tray (20) to receive the bobbins (16) from the tray (20) and send the tubes (12) to the tray (20).

11. Textile apparatus (4) according to claim 10, comprising a magazine (76) of bobbins (16) having at least one tray (20) filled at least partially with bobbins (16) to be fed, if necessary, to a winding unit (60) .

12. Textile apparatus (4) according to any one of the preceding claims, wherein the groove (28) or the grooves (28) communicate with each other and with an inlet point (52) and an outlet point (56) of the tray (20), and wherein the plates (24), with their upper pegs (36), completely fill the grooves (28) so that the insertion of a plate (24) through an inlet point (52) results in the ejection of a plate (24) from an outlet point (56).

13. Textile apparatus (4) according to any one of the preceding claims, wherein said trays (20) are provided with motor means suitable for moving the trays

(20) and bringing them close to the spinning unit (8) and/or the winding unit (60).

14. Textile apparatus (4) according to any one of the preceding claims, wherein the textile apparatus (4) is provided with at least one processing and control unit (80) programmed to manage the movements of the trays (20) according to the needs and operation of the spinning unit (8) and/or the winding unit (60).

15. Textile apparatus (4) according to any one of the preceding claims, wherein the apparatus (4) is equipped with a processing and control unit (80) programmed to optimize the operation of all spinning (8) and winding (60) units of the textile apparatus (4) according to the contingent operating conditions thereof, optimizing the waiting times according to the productivity of the individual spinning (8) and winding (60) units.

16. Textile apparatus (4) according to any one of the preceding claims, wherein the textile apparatus (4) is provided with at least one processing and control unit (80) programmed so as to trace the source of the bobbins (16), i.e. the spinning unit (8) from which each bobbin (16) is made so as to reconstruct the source of each bobbin (16) processed in a winding unit (60).

17. Operating method of a textile apparatus comprising the steps of:

- providing at least one spinning unit (8), suitable for producing yarn and wrapping it around a tube (12), so as to form a bobbin (16),
- providing at least one tray (20) for the containment of bobbins (16) and tubes (12), wherein the tray (20) comprises a plurality of plates (24) suitable to each support a bobbin (16) or a tube (12), said plates (24) being guided and moved within grooves (28) delimiting predefined tray paths (20),
- providing or moving the tray (20) so as to be facing the spinning unit (8), to receive bobbins (16) from the spinning unit (8) and send tubes to the spinning unit (8),
- the tray (20) creating a buffer for the bobbins (16) produced by the spinning unit (8).

18. Method of managing a textile apparatus (4) according to claim 17, comprising the steps of:

- providing at least one winding unit (60), suitable for winding the bobbins (16) transforming them into reels,
- interfacing the tray (20) with the winding unit (60) to receive the bobbins (16) from the tray (20) and send the tubes (12) to the tray (20).

19. Method of operating a textile apparatus (4) according to claim 17 or 18, comprising the steps of optimizing the operation of all the spinning (8) and winding (60) units of the textile apparatus (4) according to the contingent operating conditions thereof, optimizing the waiting times according to the productivity of the individual spinning (8) and winding (60)units.

20. Method of operating a textile apparatus according to claim 17, comprising the steps of tracing the source of the bobbins (16), i.e. the spinning unit (8) from which a bobbin (16) is made in order to reconstruct the origin of each bobbin (16) processed in a winding unit (60).

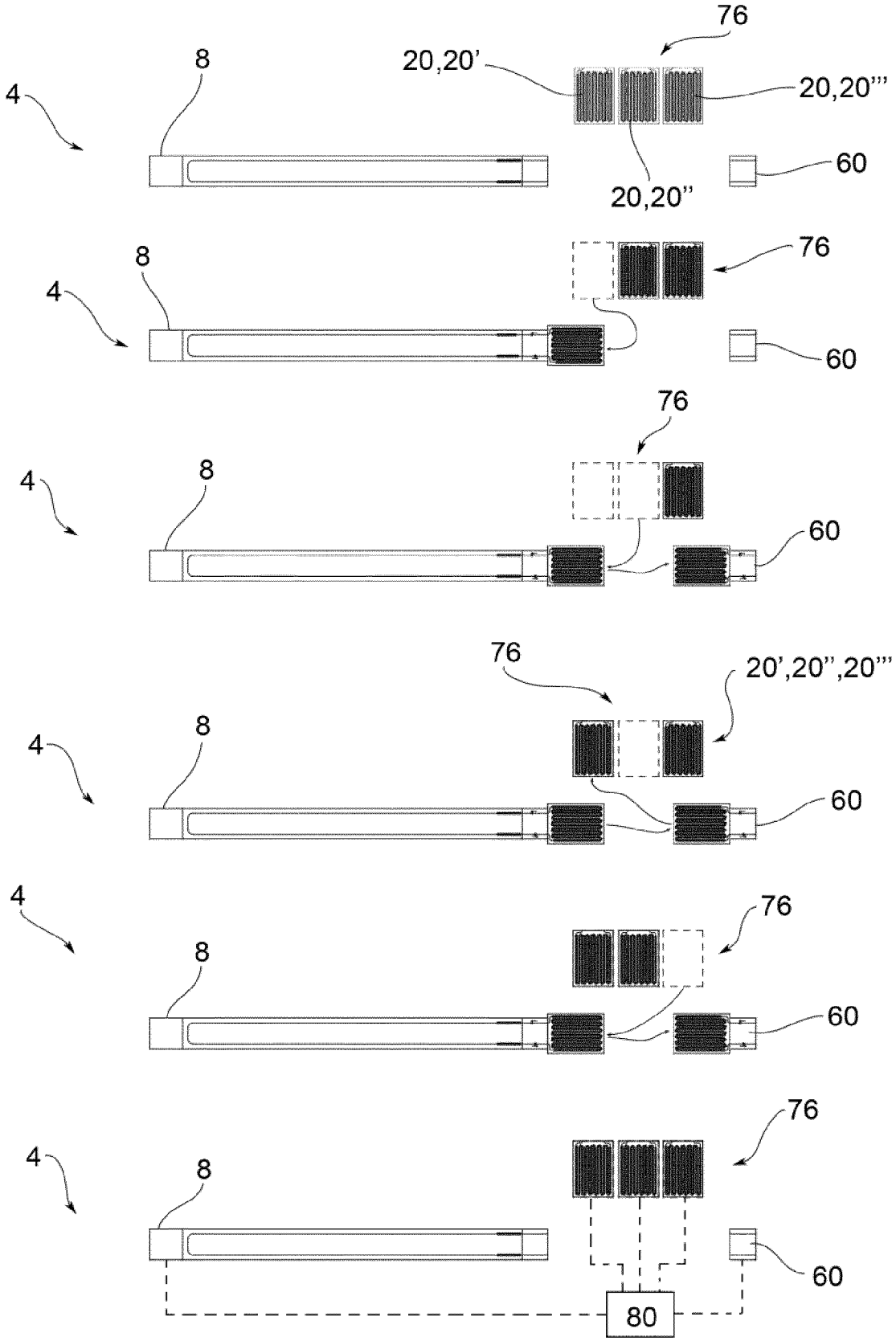
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FIG.1

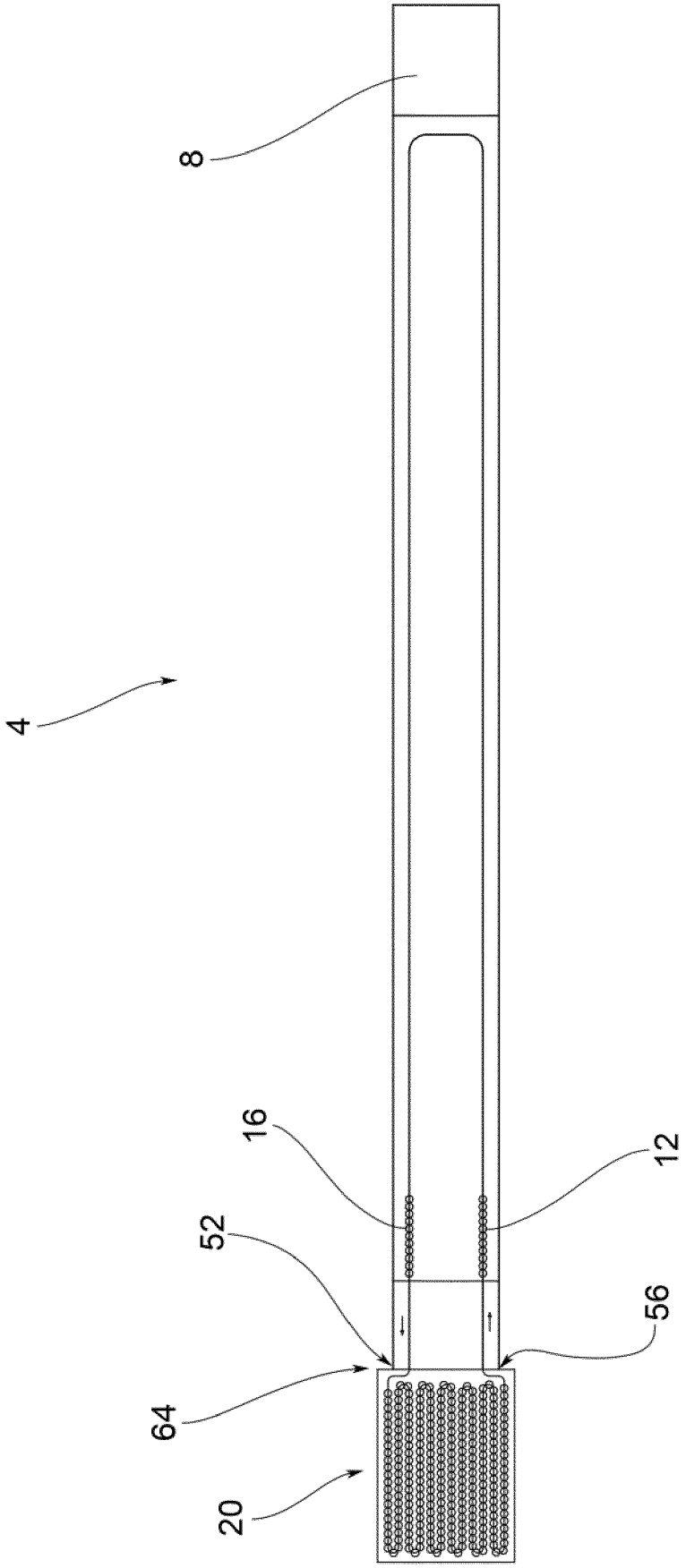

FIG.2

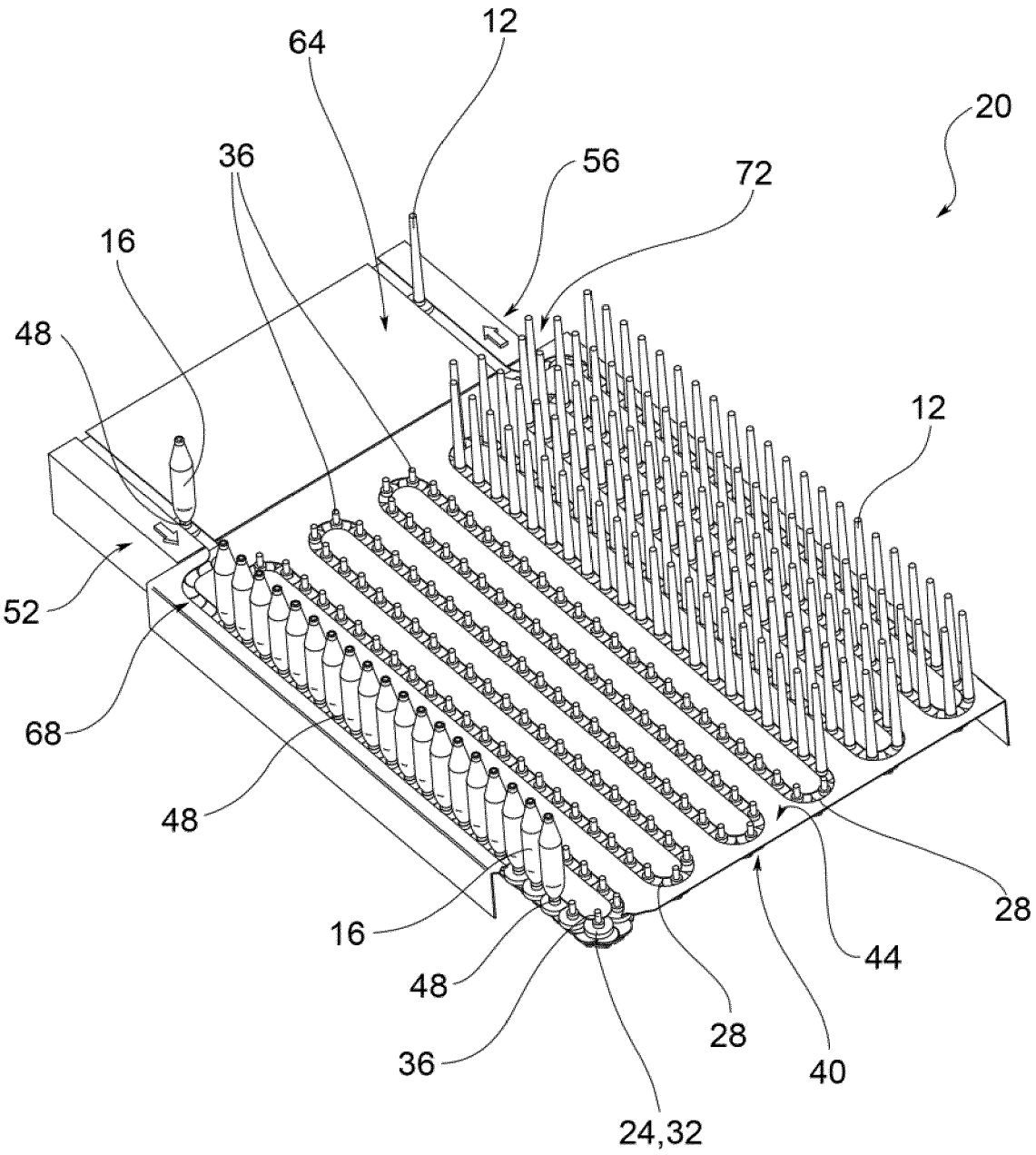

FIG.3

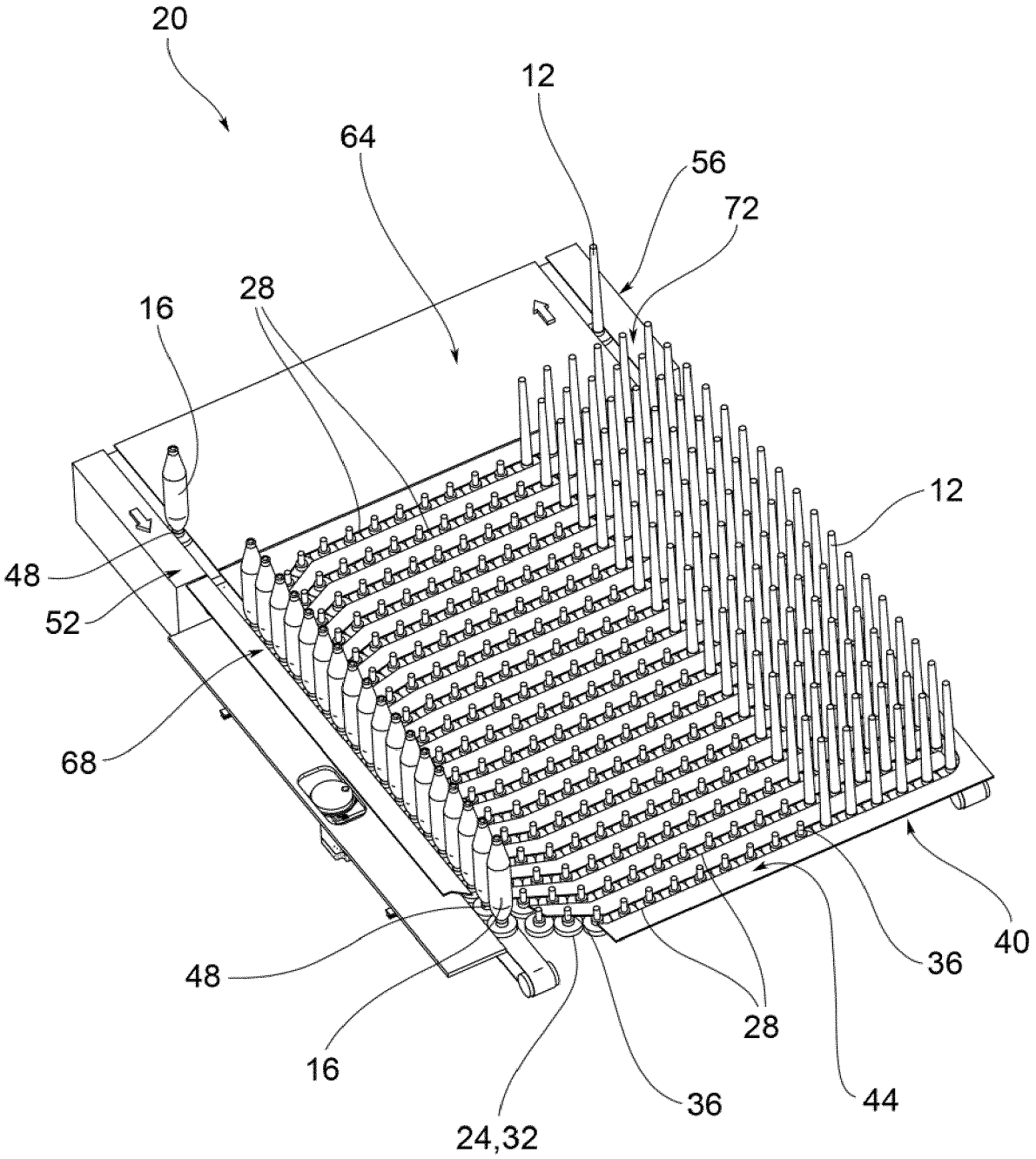

FIG.4

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EUROPEAN SEARCH REPORT

Application Number
EP 19 18 7600

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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X Y	EP 0 479 017 A1 (SCHLAFHORST & CO W [DE]) 8 April 1992 (1992-04-08) * column 4, line 24 - column 4, line 28; figures 1-3 * * column 5, line 38 - column 6, line 17 * * column 7, line 41 - column 8, line 36 * * column 10, line 35 - column 10, line 38 * -----	1-15, 17-19 16,20	
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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
Munich	17 September 2019	Todarello, Giovanni

CATEGORY OF CITED DOCUMENTS

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EUROPEAN SEARCH REPORT

Application Number
EP 19 18 7600

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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
Munich	17 September 2019	Todarello, Giovanni

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