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(54) PAPERMACHINE FABRIC

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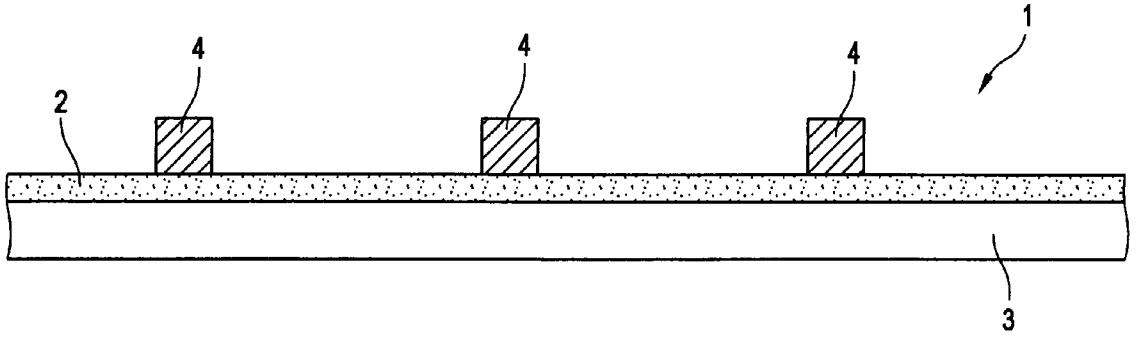
(57) **ABSTRACT**

The invention relates to a fabric for a machine for the production and/or further processing of a material web, in particular a fibrous web, which has a thread structure that comprises at least one layer comprising longitudinal threads and at least one layer comprising transverse threads, the transverse threads being arranged crossing the longitudinal threads, and in which the longitudinal threads and the transverse threads are arranged on a two-dimensionally extended carrier structure along their longitudinal extent, at least in sections, and are firmly joined to the said structure.



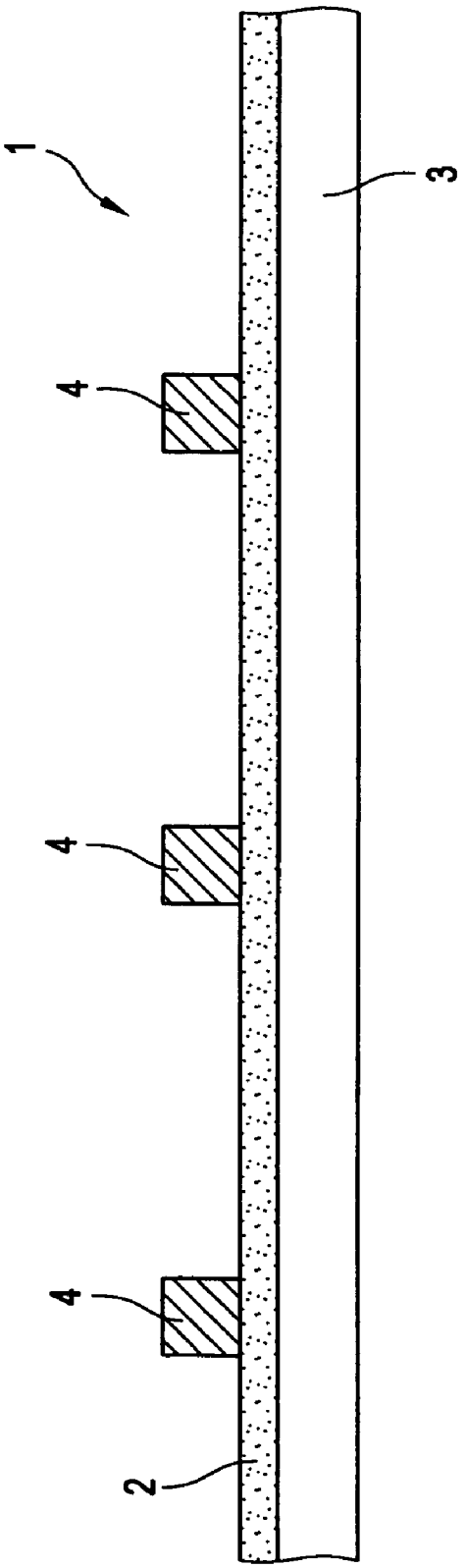


Fig.1

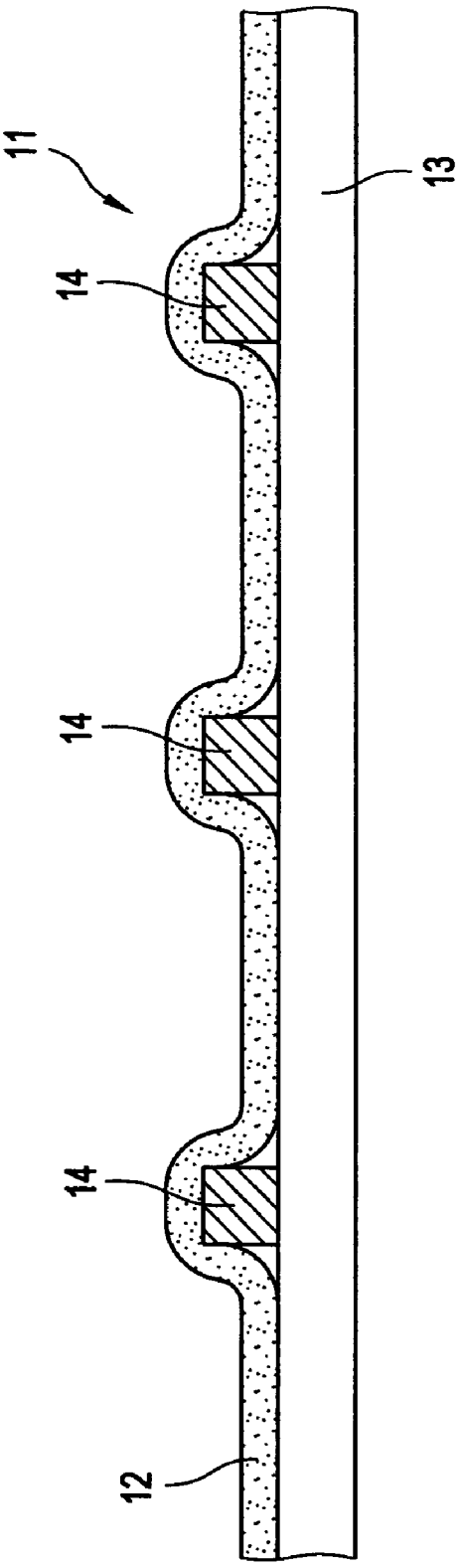


Fig.2

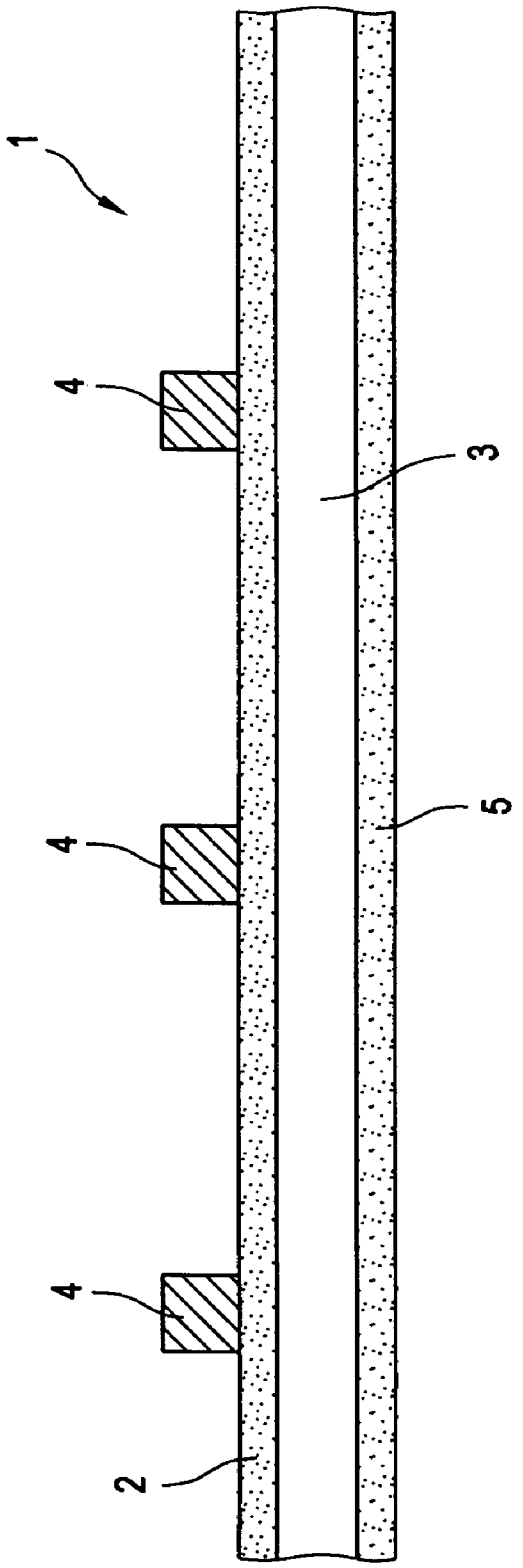


Fig.3

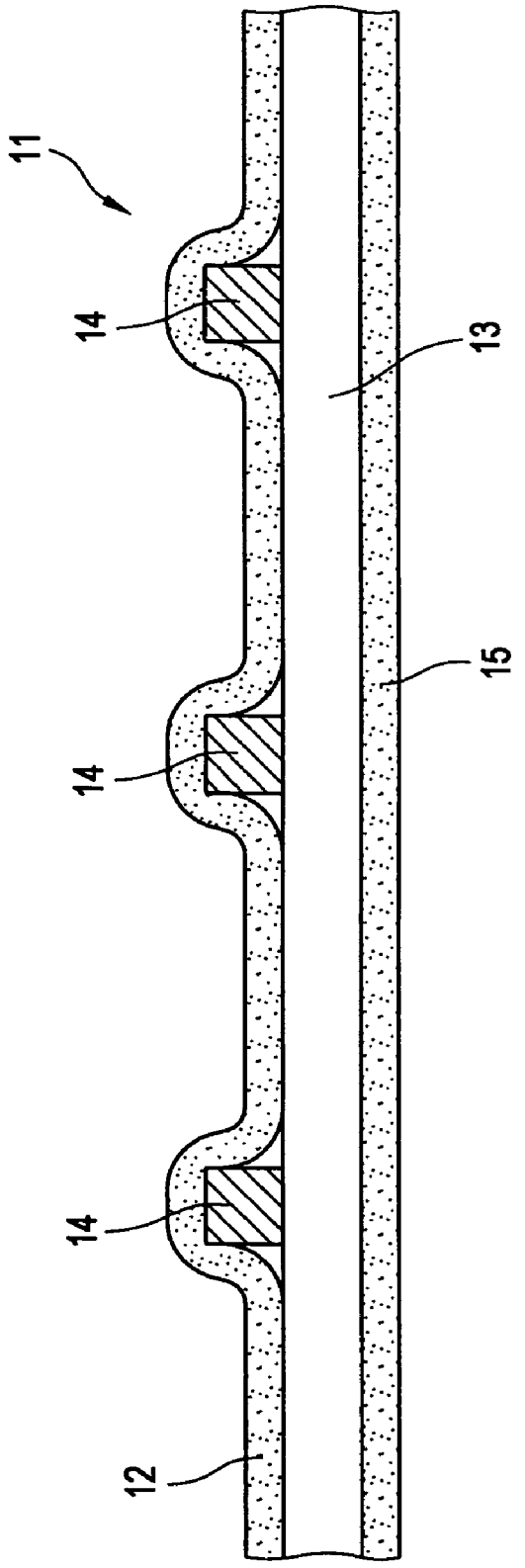


Fig.4

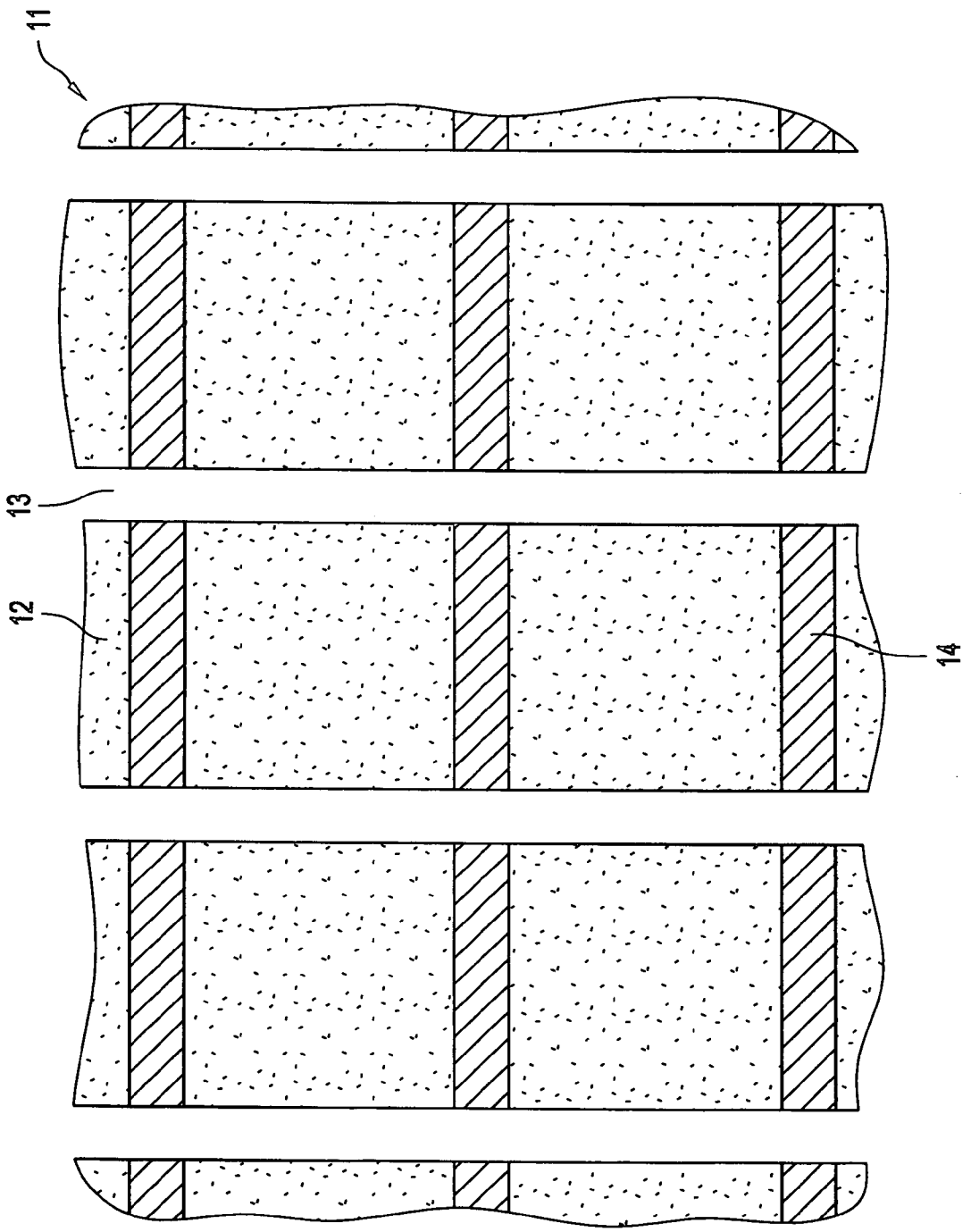


Fig.5

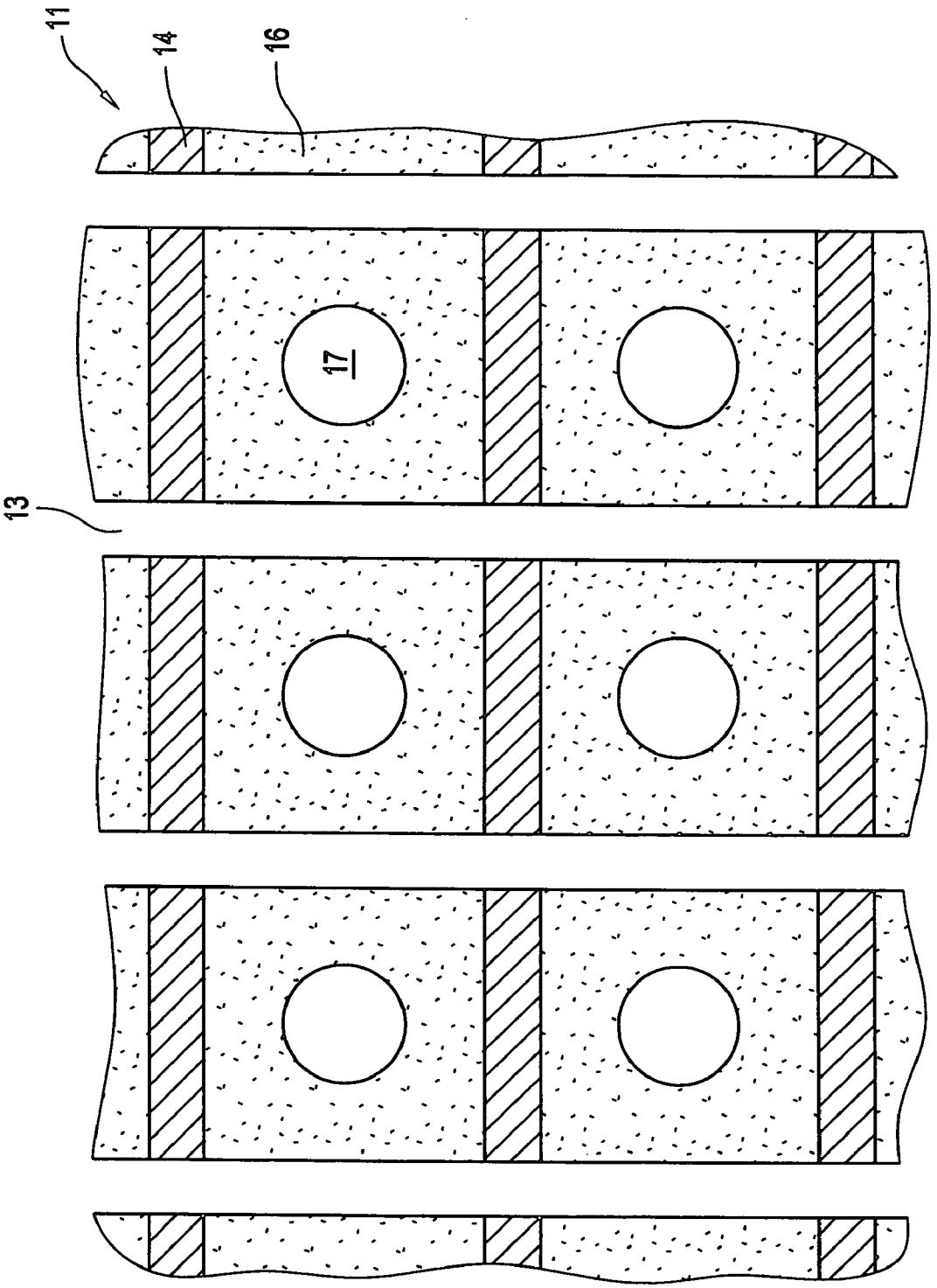


Fig.6

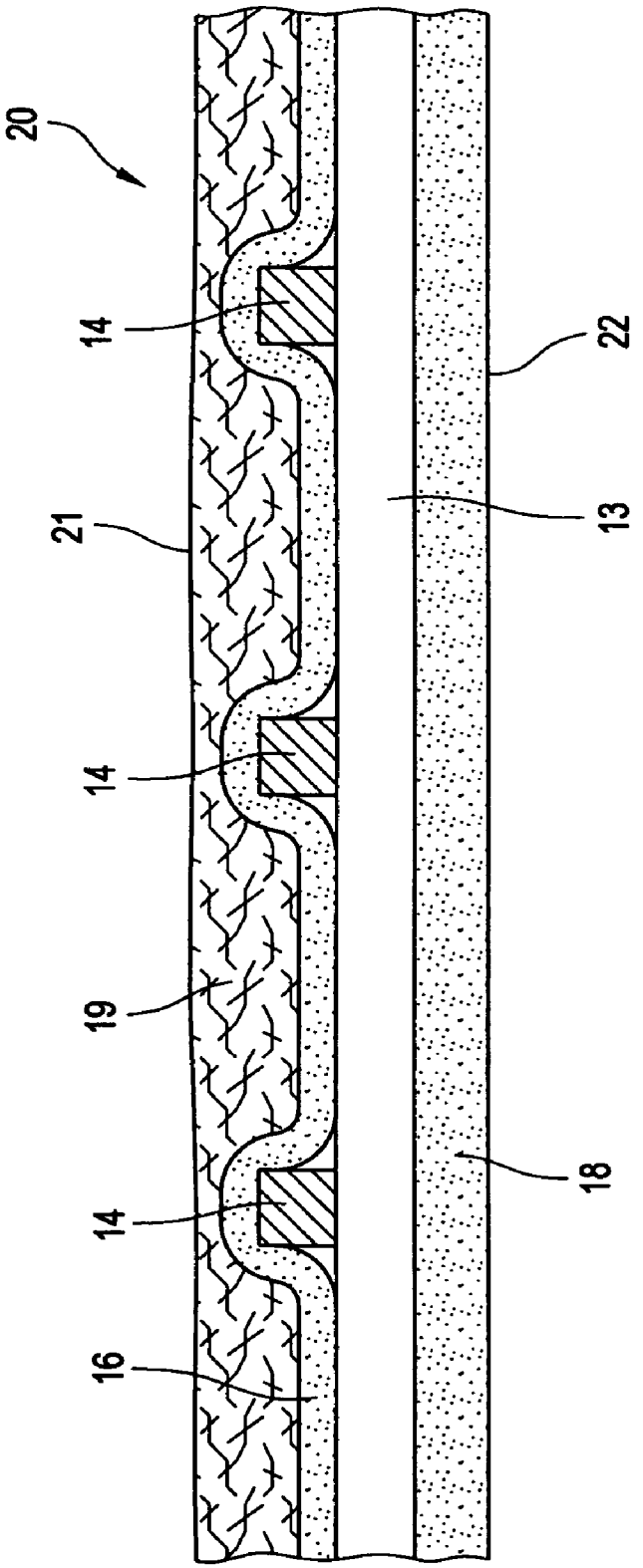


Fig.7

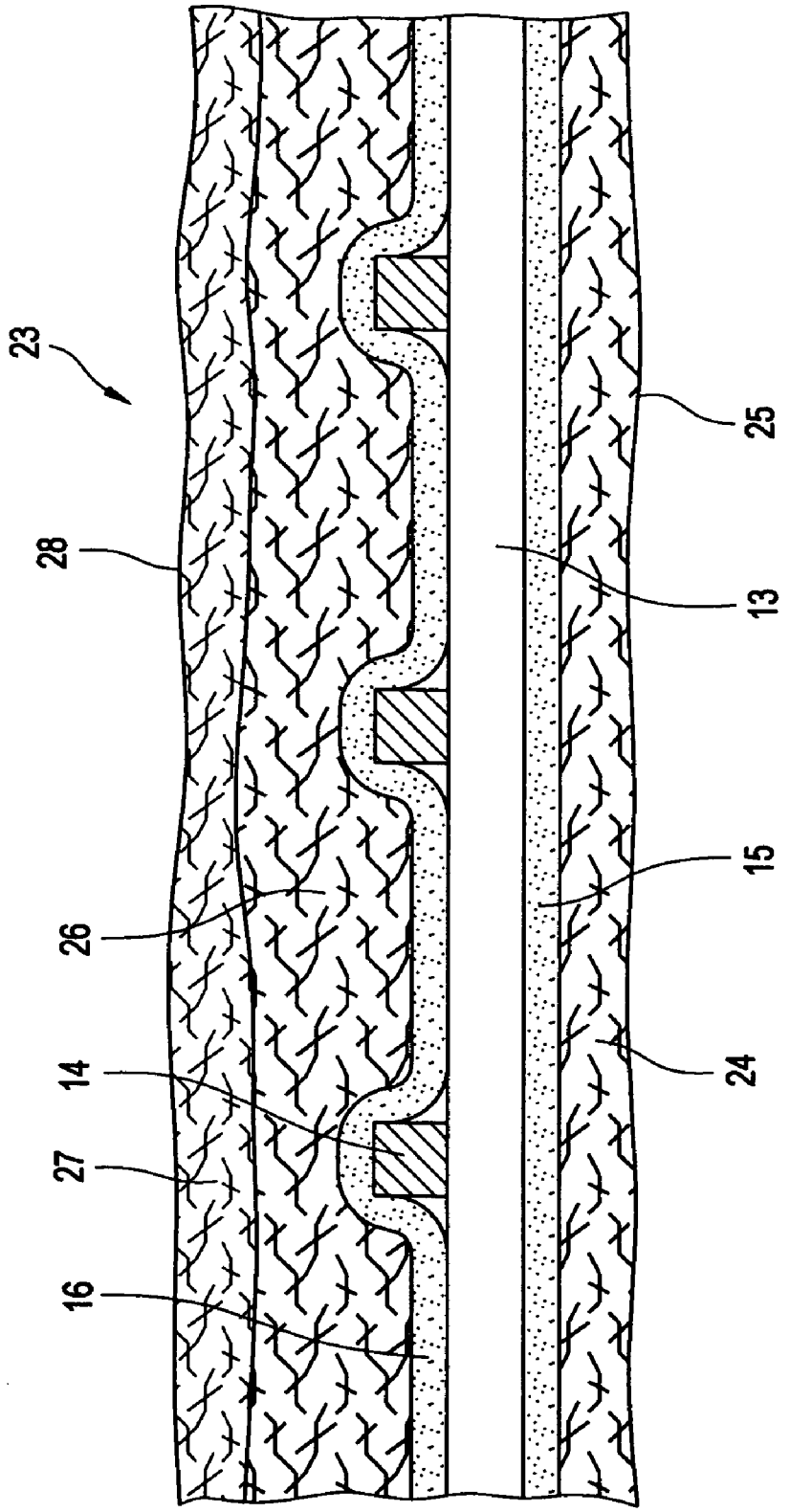


Fig.8

PAPERMACHINE FABRIC

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priority under 35 U.S.C. §119 of German Patent Application No. 10 2005 021 026.0 filed on May 6, 2005, the disclosure of which is expressly incorporated by reference herein in its entirety.

BACKGROUND OF INVENTION

[0002] 1. Field of the Invention

[0003] The invention relates to a fabric for a web-processing machine, in particular a machine for the production and/or further processing of a fibrous web. Furthermore, the invention relates to a method for the production of such a fabric.

[0004] 2. Discussion of Background Information

[0005] In order to reduce the production costs for fabrics of web-processing machines, such as paper machines for example, the aim of current developments is often to provide modularly constructed fabrics.

[0006] One possibility for the modular construction of papermachine fabrics consists in the provision of thread structures as reinforcing structures which consist of longitudinal threads arranged in layers in relation to one another and transverse threads running transversely with respect thereto.

[0007] In EP 1 357 223, EP 1 359 251 and EP 1 359 252, thread structures mentioned above are described which, at the crossing points of the transverse and longitudinal threads, are joined to one another by a very wide range of joining techniques.

[0008] The disadvantage of all the aforementioned thread structures for use in web-processing machines is their unsatisfactory dimensional stability.

SUMMARY OF THE INVENTION

[0009] An object of the present invention is a fabric which is simple to produce, in particular a papermachine fabric, having improved dimensional stability than that known from the prior art.

[0010] According to the invention, the object is achieved by a fabric, in particular a papermachine fabric, having the features of patent claim **1**.

[0011] According to the invention, a fabric for a machine for the production and/or further processing of a material web, in particular a fibrous web, has a thread structure having threads, the threads being arranged so as to form at least one layer and the fabric having a two-dimensionally extended carrier structure, on which the threads are arranged along their longitudinal extent, at least in sections, and are firmly joined to the said structure.

[0012] As a result of the provision of a two-dimensionally extended carrier structure and the arrangement of the threads of the thread layer on the carrier structure along their longitudinal extent and their joining to the carrier structure, a reinforcing structure is created which, as a result of the two-dimensionally extended carrier structure, has a significantly better dimensional stability than known thread structures, in particular with respect to lateral distortion.

[0013] Furthermore, the fabric according to the invention can be produced simply and cost-effectively in a modular design, since both the thread structure and the carrier structure can be produced independently of each other and merely have to be joined to each other in order to create the dimensionally stable structure.

[0014] Of course, the designation that the threads are arranged on the carrier structure is not to be understood in the sense of "on the top" but rather that the threads are not embedded completely in the carrier structure.

[0015] Furthermore, depending on the area of application of the fabric, the threads can be arranged in the machine direction or in the cross-machine direction or extend in a direction oblique with respect to the machine or cross-machine direction.

[0016] Advantageous developments and refinements of the invention are specified in the subclaims.

[0017] According to a particularly preferred embodiment, provision is made for the thread structure to have at least one layer comprising longitudinal threads and at least one layer comprising transverse threads, the transverse threads and the longitudinal threads being arranged crossing one another.

[0018] As a result of the arrangement of longitudinal and transverse threads along their longitudinal extent on the carrier structure and their joining to the carrier structure, a reinforcing structure for a fabric of a web-processing machine is created which has a considerably increased dimensional stability than the fabrics known from the prior art. This follows substantially from the fact that, in the case of the known reinforcing structures having longitudinal and transverse threads, the dimensional stability is brought about substantially only by the joining of the longitudinal and transverse threads at their crossing point and the flexural rigidity of the longitudinal and transverse threads, whereas, in the case of the reinforcing structure according to the invention, the dimensional stability, in particular with respect to lateral distortion, is brought about by the carrier structure, whereas the longitudinal and transverse threads firmly joined thereto are substantially assigned a function of absorbing force, for example of absorbing tension.

[0019] In the case of the fabric according to the invention, the longitudinal and transverse threads do not have to be joined to one another at their crossing points in order to achieve adequate dimensional stability.

[0020] In this case, longitudinal threads can extend in the machine direction, in the cross-machine direction or obliquely with respect to machine direction and cross-machine direction.

[0021] There are various possible ways of arranging the carrier structure relative to the longitudinal and transverse threads. According to one preferred embodiment, provision is made for the carrier structure to be arranged between the layer of longitudinal threads and the layer of transverse threads, that is to say the layer of longitudinal threads is separated from the layer of transverse threads by the carrier structure. In this case, both the longitudinal and transverse threads can be arranged on the carrier structure over their entire longitudinal extent overlapping the latter and joined thereto.

[0022] According to a refinement of the invention building on this, provision is made for the layer of longitudinal threads and/or the layer of transverse threads to be arranged between an upper and a lower carrier structure in each case and to be joined thereto.

[0023] One practical refinement of this embodiment could appear in such a way that the fabric has a carrier structure after which a longitudinal thread layer follows, after which once more a carrier structure is arranged and which, on its side opposite the longitudinal thread layer, is joined to a transverse thread layer.

[0024] According to a further preferred embodiment, alternative to the previous embodiment, provision is made for the layer of longitudinal threads and the layer of transverse threads to be arranged to follow each other directly, so that the carrier structure is not arranged between the two thread layers but is arranged in such a way that either the longitudinal thread layer or the transverse thread layer is arranged on the carrier structure and joined thereto over their entire overlapping longitudinal extent, whereas the other thread layer is not joined to the carrier layer at the crossing points.

[0025] According to a further refinement of the invention, it is conceivable for the layers of longitudinal and transverse threads following one another directly to be arranged between an upper and a lower carrier structure.

[0026] In order to improve the dimensional stability of the fabric according to the invention further, it is expedient if the layer of longitudinal threads and the layer of transverse threads are joined to one another at the crossing points of the longitudinal threads with the transverse threads.

[0027] In order to improve the joint between the longitudinal and transverse threads and the carrier structure further, it is expedient if the contact area between the threads and the carrier structure is as large as possible. One preferred development of the invention therefore provides for the longitudinal and/or the transverse threads to be flat, at least in the joining region with the carrier structure.

[0028] In order to improve the joint between the longitudinal threads and the transverse elements, it is, moreover, expedient if the longitudinal and/or transverse threads are flat, at least in the region of the crossing points, that is to say are wider than high. The longitudinal and/or transverse threads are preferably wider than high over their entire longitudinal extent.

[0029] An advantageous refinement that is based on this provides for the longitudinal and/or the transverse threads to be formed as flat threads having a substantially rectangular cross section. In this way, the crossing points also become flatter, which means that the tendency to marking is reduced. A rectangular cross section can in this case comprise both pointed or rectangular edges and rounded edges.

[0030] A very wide range of possible ways for joining the longitudinal and/or transverse threads to the carrier structure is conceivable. According to one preferred refinement of the invention, provision is made for the longitudinal and/or the transverse threads to be joined to the carrier structure on their own or in combination with the following techniques: fusing, adhesive bonding, joining by a form fit.

[0031] The same joining techniques can be applied to joining the longitudinal and transverse threads at the crossing points.

[0032] Depending on the intended use, it may be expedient for the carrier structure to be impermeable. This is the case, for example, when the fabric is a transfer belt or the like.

[0033] If dewatering is to be carried out through the fabric according to the invention, it is necessary for the carrier structure to be permeable to air and water.

[0034] The permeable structure is preferably formed by openings in the carrier structure, it being possible for the permeability of the fabric to be set on the basis of the size, the horizontal and vertical course of the openings and their shape. Depending on the application and on the fabrication conditions, such as the spacing of the threads from one another, it may be expedient if the openings are introduced before the joining to the thread layers or after the joining to the two thread layers. Possible techniques that are conceivable for the introduction of the openings are, for example, mechanical machining processes, such as mechanical punching processes (e.g. also using a needling machine) and also thermal fusing processes or laser ablation processes.

[0035] For the precise setting of the permeability, it can also be expedient for the openings of the permeable carrier structure to be arranged in the region between the meshes formed by the longitudinal and transverse threads.

[0036] By means of the shaping of the openings, the permeability of the fabric over its width can also be set. One preferred refinement of the invention therefore provides for the openings to be formed in such a way that the fabric has a permeability that changes over the width.

[0037] In order to reduce the tendency of the fabric to marking and to improve the joining of the longitudinal and transverse threads to the carrier structure, it is expedient if the carrier structure is even in its two-dimensional extent.

[0038] Various possible ways in which the carrier structure can be formed are conceivable. According to a preferred refinement of the invention, the carrier structure comprises, on its own or in combination: a film, a fine woven fabric, a nonwoven.

[0039] The fine woven fabric preferably has a woven structure having 50 or more weft threads per cm and/or 50 or more warp threads per cm.

[0040] The threads used are preferably multifilament threads which, for example, are fabricated from polyethylene.

[0041] The nonwoven is preferably a consolidated nonwoven. In this case, the consolidation can be carried out thermally, for example by means of thermal bonding, and/or chemically, for example by means of spray consolidation, and/or mechanically, for example by means of needling.

[0042] The nonwoven used preferably has a weight per unit area of 50 g to 250 g per square meter in the case of fibers having a titer in the range from 20 to 70 dtex.

[0043] If the fabric according to the invention is to be used in the press section, for example, it is expedient if the fabric comprises at least one layer with a liquid storage volume.

According to practical refinements, such a layer comprises, on its own or in combination: a foamed layer, a fiber batt, whereas the fiber batt in turn comprises, on its own or in combination: fibers with a high and/or low melting point, electrically conductive and/or electrically nonconductive fibers, hydrophilic and/or hydrophobic fibers. By means of the use of the very wide range of types of fibers described, fabrics can be provided for a very wide range of intended applications.

[0044] According to a further preferred embodiment, provision is made for the longitudinal threads and/or the transverse threads preferably to have a width in the range between 0.5 mm and 10 mm and a height in the range between 0.01 mm and 1.5 mm. This ensures that no large elevations are formed at the crossing points.

[0045] A further preferred refinement of the invention provides for the carrier structure to have a thickness between 0.01 mm and 1.0 mm. Trials have shown that the carrier structures used with these thicknesses firstly exhibit adequate stability and secondly are still sufficiently thin for an adequate flexibility.

[0046] The fabric according to the invention is preferably a papermachine fabric, in particular a forming fabric, a press felt or a dryer fabric.

[0047] According to a further aspect of the invention, a method for the production of a fabric for a web-processing machine, in particular a paper machine, having the following steps:

[0048] providing threads which are arranged to form at least one layer,

[0049] providing a two-dimensionally extended carrier structure,

[0050] arranging the threads on the carrier structure along their longitudinal extent and

[0051] joining the longitudinal threads and the transverse threads to the carrier structure, at least in sections.

[0052] If the fabric is to have longitudinal and transverse threads, then the method comprises the following steps:

[0053] providing longitudinal threads arranged as at least one layer and transverse threads running transversely thereto and arranged as at least one layer,

[0054] providing the two-dimensionally extended carrier structure,

[0055] arranging the longitudinal threads and the transverse threads on the carrier structure along their longitudinal extent and

[0056] joining the longitudinal threads and the transverse threads to the carrier structure, at least in sections.

BRIEF DESCRIPTION OF THE DRAWINGS

[0057] The present invention is further described in the detailed description which follows, in reference to the noted plurality of drawings by way of non-limiting examples of exemplary embodiments of the present invention, in which like reference numerals represent similar parts throughout the several views of the drawings, and wherein:

[0058] **FIG. 1** shows in side view a first embodiment of the thread structure with carrier structure of a fabric according to the present invention,

[0059] **FIG. 2** shows in side view a second embodiment of the thread structure with carrier structure of a fabric according to the present invention,

[0060] **FIG. 3** shows in side view a third embodiment of the thread structure with carrier structure of a fabric according to the present invention,

[0061] **FIG. 4** shows in side view a third embodiment of the thread structure with carrier structure of a fabric according to the present invention,

[0062] **FIG. 5** shows a plan view from below of the thread structure with an impermeable carrier structure as in **FIG. 2**,

[0063] **FIG. 6** shows a plan view from below of the thread structure with a permeable carrier structure as in **FIG. 2**,

[0064] **FIG. 7** shows a fabric according to the present invention formed as a forming fabric,

[0065] **FIG. 8** shows a fabric according to the present invention formed as a press felt.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

[0066] The particulars shown herein are by way of example and for purposes of illustrative discussion of the embodiments of the present invention only and are presented in the cause of providing what is believed to be the most useful and readily understood description of the principles and conceptual aspects of the present invention. In this regard, no attempt is made to show structural details of the present invention in more detail than is necessary for the fundamental understanding of the present invention, the description taken with the drawings making apparent to those skilled in the art how the several forms of the present invention may be embodied in practice.

[0067] **FIG. 1** shows in side view a first embodiment of a thread structure **1** which is firmly joined to a carrier structure **2**. The thread structure **1** has longitudinal threads **3** arranged as a layer, of which one can be seen in the illustration of **FIG. 1**, and transverse threads **4** arranged as a layer crossing the longitudinal threads **3**. According to the invention, the longitudinal threads **3** and transverse threads **4** are arranged on the two-dimensionally extended carrier structure **2** along their longitudinal extent, at least in sections, and are firmly joined to said carrier structure. In the embodiment illustrated in **FIG. 1**, the carrier structure **2** is arranged between the layer of longitudinal threads **3** and the layer of transverse threads **4**.

[0068] Furthermore, the longitudinal threads **3** and the transverse threads **4** are formed as flat threads having a rectangular cross section. The longitudinal threads **3** and the transverse threads **4** preferably have a width in the range between 0.5 mm and 10 mm and a height in the range between 0.01 mm and 1.5 mm.

[0069] In the present embodiment, the longitudinal threads **3** and the transverse threads **4** are fused to the carrier structure **2**, by the carrier structure **2** and/or the longitudinal threads **3** and the transverse threads **4** having been melted to their melting temperature.

[0070] The longitudinal threads **3** and/or the transverse threads **4** and/or the carrier structure **2** preferably contain a polymer material which, on its own or in combination, consists of: PE, PA, PET, PEK, PEEK, PPS, elastic polymer, PU, PBT, PTT or PP or carbon fibers or glass fibers or the like.

[0071] The carrier structure **2** is even in its two-dimensional extent and, in the practical case, is formed as a film and preferably has a thickness between 0.01 mm and 1.0 mm.

[0072] **FIG. 2** shows in side view a second embodiment of a thread structure **11** which is firmly joined to a carrier structure **12**. The thread structure **11** has longitudinal threads **13** arranged as a layer, of which one can be seen in the illustration of **FIG. 2**, and transverse threads **14** arranged as a layer crossing the longitudinal threads **13**. According to the invention, the longitudinal threads **13** and transverse threads **14** are arranged on the two-dimensionally extended carrier structure **12** along their longitudinal extent, at least in sections, and firmly connected to said carrier structure. In the embodiment illustrated in **FIG. 2**, the layer of longitudinal threads **13** and the layer of transverse threads **14** are arranged to follow each another directly, so that, as opposed to **FIG. 1**, no carrier structure is arranged between longitudinal threads **13** and the transverse threads **14**.

[0073] Furthermore, the longitudinal threads **13** and the transverse threads **14** are joined to one another at their crossing points, for example by means of fusing or adhesive bonding or with a form fit or the like.

[0074] Furthermore, the longitudinal threads **13** and the transverse threads **14** are formed as flat threads having a rectangular cross section. The longitudinal threads **13** and the transverse threads **14** preferably have a width in the range between 0.5 mm and 10 mm and a height in the range between 0.01 mm and 1.5 mm.

[0075] In the present embodiment, the longitudinal threads **13** and the transverse threads **14** are adhesively bonded to the carrier structure **12**, for example by means of an adhesive.

[0076] The longitudinal threads **13** and/or the transverse threads **14** and/or the carrier structure **12** preferably contain a polymer material which, on its own or in combination, consists of: PE, PA, PET, PEK, PEEK, PPS, elastic polymer, PU, PBT, PTT or PP or carbon fibers or glass fibers or the like.

[0077] The carrier structure **12** is even in its two-dimensional extent and, in the practical case, is formed as a film and preferably has a thickness between 0.01 mm and 1.0 mm.

[0078] **FIG. 3** substantially shows the embodiment of **FIG. 1** with the addition that the layer of longitudinal threads **3** is arranged between an upper carrier structure **2** and a lower carrier structure **5** and is joined thereto.

[0079] **FIG. 4** substantially shows the embodiment of **FIG. 2** with the addition that the layers of longitudinal threads **3** and the transverse threads **3** following one another directly are arranged between an upper carrier structure **12** and a lower carrier structure **15**.

[0080] **FIG. 5** shows a plan view from below of the thread structure **11** with the impermeable carrier structure **12**, that is to say without the openings of **FIG. 2**.

[0081] In the embodiment illustrated in **FIG. 6**, the impermeable carrier structure **12** of **FIG. 1** has been replaced by a permeable carrier structure **16** having openings **17**. By configuring the openings in size and shape, the permeability of the fabric can be influenced.

[0082] **FIG. 7** shows a fabric according to the invention formed as a forming fabric **20**. The forming fabric substantially has the thread structure known from **FIG. 4** with the longitudinal threads **13** arranged in layers and the transverse threads **14** arranged in layers, which thread structure is arranged between carrier structures **16** and **18** and firmly joined thereto.

[0083] The two carrier structures **16** and **18** are permeable and have openings of different size and/or shape. Furthermore, the two carrier structures **16** and **18** are joined two-dimensionally to each other in regions outside the longitudinal threads **13** and the transverse threads **14**. Moreover, the two carrier structures **16** and **18** can comprise the same or different materials. In this case, on their own or in combination, the following are available for selection: PE, PA, PET, PEK, PEEK, PPS, elastic polymer, PU, PBT, PTT, PP, carbon fibers, glass fibers or polyimide. The side **22** of the carrier structure **18** pointing downward in **FIG. 7** forms the running side of the forming fabric **20** according to the invention in the present embodiment. In order to provide an adequate wearing volume, the carrier structure **18** is thicker than the carrier structure **16**, about twice as thick as the carrier structure **16** in the present example.

[0084] In **FIG. 7**, a fine fiber batt **19** having fibers with a titer of 20 dtex or less is arranged above the carrier structure **16**, its upper side **21** forming the paper side of the forming fabric **20**.

[0085] As can be seen from **FIG. 7**, the fiber batt **19** is compressed permanently more intensely at points at which the longitudinal threads **13** cross the transverse threads **14**, in order to compensate for the elevations formed at the crossing points, by which means a smooth and marking-free surface **21** is formed.

[0086] **FIG. 8** shows a fabric according to the invention formed as a press felt **23**. The press felt **23** substantially has the thread structure known from **FIG. 4** with the longitudinal threads **13** arranged in layers and the transverse threads **14** arranged in layers, which structure is arranged between the carrier structures **16** and **15** and firmly connected thereto.

[0087] The two carrier structures **16** and **15** are permeable and have openings of different size and/or shape. Furthermore, the two carrier structures **16** and **15** are joined two-dimensionally to each other in regions outside the longitudinal threads **13** and the transverse threads **14**. Moreover, the two carrier structures **16** and **15** can comprise the same or different materials, known from the embodiment of **FIG. 7**.

[0088] In **FIG. 8**, a fiber batt **24** having coarse fibers with a titer of 50 to 400 dtex is arranged underneath the carrier structure **15**. The side **25** of the fiber batt **24** pointing downward in **FIG. 8** forms the running side of the press felt **23** according to the invention in the present embodiment.

[0089] In **FIG. 18**, a coarse fiber batt **26** having fibers with a titer of 50 to 400 dtex is arranged above the carrier structure **16**, on which a fine fiber batt **27** having fibers with

a titer of 20 dtex or less is arranged. The side **28** pointing upward in **FIG. 8** forms the paper side of the press felt **23**.

[**0090**] It is noted that the foregoing examples have been provided merely for the purpose of explanation and are in no way to be construed as limiting of the present invention. While the present invention has been described with reference to an exemplary embodiment, it is understood that the words which have been used herein are words of description and illustration, rather than words of limitation. Changes may be made, within the purview of the appended claims, as presently stated and as amended, without departing from the scope and spirit of the present invention in its aspects. Although the present invention has been described herein with reference to particular means, materials and embodiments, the present invention is not intended to be limited to the particulars disclosed herein; rather, the present extends to all functionally equivalent structures, methods and uses, such as are within the scope of the appended claims.

1-26. (canceled)

27. A fabric, comprising:

a thread structure, the thread structure having threads which are arranged so as to form at least one layer;

wherein the fabric has a two-dimensionally extended carrier structure, on which the threads are arranged along their longitudinal extent, at least in sections, and are firmly joined to the said structure.

28. The fabric of claim 27, wherein the thread structure has at least one layer comprising longitudinal threads and at least one layer comprising transverse threads, the transverse threads being arranged crossing the longitudinal threads.

29. The fabric of claim 28, wherein the carrier structure is arranged between the at least one layer of longitudinal threads and the at least one layer of transverse threads.

30. The fabric of claim 29, wherein at least one of the at least one layer of longitudinal threads and the at least one layer of transverse threads are in each case arranged between an upper and a lower carrier structure and joined thereto.

31. The fabric of claim 28, wherein the at least one layer of longitudinal threads and the at least one layer of transverse threads are arranged to follow each another directly.

32. The fabric of claim 31, wherein the layers of longitudinal and transverse threads arranged to follow each other directly are arranged between an upper and a lower carrier structure.

33. The fabric of claim 31, wherein the at least one layer of longitudinal threads and the at least one layer of transverse threads are joined to one another at the crossing points of the longitudinal threads with the transverse threads.

34. The fabric of claim 33, wherein the longitudinal threads and the transverse threads are at least one of fused to one another, adhesively bonded to one another, and joined to one another by a form fit at the crossing points.

35. The fabric of claim 28, wherein at least one of the longitudinal threads and the transverse threads are flat, at least in the joining region with the carrier structure.

36. The fabric of claim 28, wherein at least one of the longitudinal and transverse threads are flat in the region of the crossing points.

37. The fabric of claim 28, wherein at least one of the longitudinal and the transverse threads are formed as flat threads with a substantially rectangular cross section.

38. The fabric of claim 28, wherein at least one of the longitudinal and the transverse threads are at least one of fused, adhesively bonded and joined to the carrier structure by a form fit.

39. The fabric of claim 27, wherein the carrier structure is impermeable.

40. The fabric of claim 28, wherein the carrier structure is permeable.

41. The fabric of claim 40, wherein the permeable carrier structure is formed by openings which are arranged in the region between meshes formed by the longitudinal and transverse threads.

42. The fabric of claim 41, wherein the openings are formed in such a way that the fabric has a permeability that varies over the width.

43. The fabric of claim 27, wherein the carrier structure is even in its two-dimensional extent.

44. The fabric of claim 27, wherein the carrier structure comprises at least one of a film, a fine woven fabric and a nonwoven.

45. The fabric of claim 27, wherein the fabric comprises at least one layer with a liquid storage volume.

46. The fabric of claim 45, wherein a layer with a liquid storage volume comprises at least one of a foamed layer and a fiber batt.

47. The fabric of claim 46, wherein the fiber batt comprises at least one of fibers with a high melting point, fibers with a low melting point, electrically conductive fibers, electrically nonconductive fibers, hydrophilic fibers and hydrophobic fibers.

48. The fabric of claim 27, wherein the fabric is one of a papermachine fabric, a forming fabric, a press felt and a dryer fabric.

49. The fabric of claim 28, wherein at least one of the longitudinal threads and the transverse threads have a width in the range between approximately 0.5 mm and approximately 10 mm and a height in the range between approximately 0.01 mm and approximately 1.5 mm.

50. The fabric of claim 27, wherein the carrier structure has a thickness between approximately 0.01 mm and approximately 1.0 mm.

51. A method for the production of a fabric for a web-processing machine, comprising the steps of:

providing threads which are arranged to form at least one layer;

providing a two-dimensionally extended carrier structure;

arranging the threads on the carrier structure along their longitudinal extent; and

joining the threads to the carrier structure.

52. The method of claim 51, wherein the threads are longitudinal threads arranged as a first layer and transverse threads running transversely thereto and arranged as a second layer;

wherein the longitudinal threads and the transverse threads are arranged on the carrier structure along their longitudinal extent; and

wherein the longitudinal threads and the transverse threads are joined to the carrier structure, at least in sections.

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