A method and an apparatus for strengthening a textile web (8), especially a felt web, by needling parallel yarns (11) in the longitudinal direction are described. In order to provide an advantageous structure of the textile web (8) it is proposed that the yarns (11) are needled onto the textile web (8) at a lateral distance from one another and with a needling limited to the yarn zones.
FIG. 2
METHOD AND APPARATUS FOR STRENGTHENING A TEXTILE WEB

FIELD OF THE INVENTION

[0001] The invention relates to a method for strengthening a textile web, especially a felt web, by needling parallel yarns in the longitudinal direction.

DESCRIPTION OF THE PRIOR ART

[0002] In order to strengthen nonwoven fabric it is known to needle said nonwoven webs with a reinforcing fabric. This is connected to a condensing of the nonwoven caused by the needling, which occurs over the entire surface of the nonwoven because the nonwoven needs to be connected with the reinforcing fabric all over. An additional factor is that substantially only nonwovens can be strengthened which can provide respective fibers for needling with the reinforcing fabric.

[0003] In order to obtain a surface covering for wallpaper for example it is known (U.S. Pat. No. 3,783,479 A) to needle cut yarn sections in an entangled position onto a backing. Yarns positioned parallel adjacent to one another could also be needled onto a backing material (U.S. Pat. No. 4,595,438 A). There is a needling over the entire surface of the backing as in the needling of yarn sections, which thus consequently leads to a consistent strengthening of the backing.

SUMMARY OF THE INVENTION

[0004] The invention is thus based on the object of providing a method for strengthening a textile web, and especially a felt web, of the kind mentioned above in such a way that a planar condensing of the textile web to be strengthened is effectively prevented.

[0005] The invention achieves the object in such a way that the yarns are needled onto the textile web at a lateral distance from one another and a needling limited to the yarn zones.

[0006] By needling the yarns at a mutual distance from one another and as a result of limiting the needling zone to the yarns, the textile web can be strengthened substantially in the longitudinal direction without having to accept any consistent strengthening of the textile web over its width. The properties of the textile web are therefore maintained between the yarns irrespective of the needling of the yarns, which is relevant for a number of applications of said textile webs. The yarns which are needled onto the textile web at a lateral distance from one another and usually provide sufficient fiber material in order to ensure an effective anchoring of the yarns with the textile web to be strengthened also form a surface structure which cannot be easily achieved and represents advantageous preconditions for certain applications, e.g. in the use of such textile webs with individually needled yarns for filters.

[0007] In order to perform the needling of yarns onto the textile web it is possible to assume a conventional needling device with a drivable needle board reciprocating in the direction of the needle penetration and a stitch base opposite of the needle board which forms a guide surface for the textile web which can be drawn off in the direction of passage of the textile web. It is merely necessary to ensure a sufficient guidance of the yarns to be needled with the textile web, so that the needles disposed in respective rows cannot miss the yarns. For this purpose the stitch base can be provided in the guide surface for the textile web with parallel guide grooves for the yarns which are aligned in the direction of passage of the textile web, so that the needles of the needle board penetrate the guide grooves and draw fibers from the textile web and introduce the same into the yarn. If fibers of the yarns are to be drawn into the textile web, the yarns must be guided on the side of the textile web facing the needle board, which entails a more complex construction.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The method in accordance with the invention is explained in closer detail by reference to the enclosed drawings, wherein:

[0009] FIG. 1 shows an apparatus in accordance with the invention for strengthening a textile web in a simplified side view, and

[0010] FIG. 2 shows a sectional view along line II-II of FIG. 1 on an enlarged scale.

[0011] The apparatus according to the shown embodiment is provided with a needling device 1 consisting of a stitch base 2, a stripper 3 and a needle board 4 which is inserted in a needle beam 5. The needle beam 5 is driven in a reciprocating manner by way of an eccentric drive in the direction of penetration of the needles 6. In contrast to conventional needle boards, the needles 6 of the needle board 4 are disposed in parallel rows aligned in the direction of passage 7 of the textile web, which rows extend with a substantial lateral distance from one another.

[0012] The textile web 8 to be strengthened is drawn off from a supply roll 9 and supplied simultaneously with yarns 11 drawn off from supply coils 10 to the pair of input rollers 12 of the needling device 1 whose stitch base 2 forms a guide surface for the textile web 8. Guide grooves 13 for yarns 11 are provided in the guide surface. Since the rows of needles extend along the guide grooves 13, the textile web 8 which covers the guide grooves 13 with the yarns 11 is needled with yarns 11, with the needles 6 which penetrate the textile web 8 from above drawing fibers from the textile web 8 and needling them into yarns 11. The textile web 8 thus strengthened with the yarns 11 needled onto the lower side can then be drawn off by way of a pair of draw-off rollers 14 from the needling device 1.

[0013] If it is not intended to needle fibers from the textile web 8 into the yarns 11, which requires a textile web with a respective fiber structure, but instead fibers from the yarns 11 to the textile web 8, it is necessary that the yarns 11 of textile web 8 are supplied on the side opposite of the stitch base 2. The guidance of such yarns 11 facing the stripper 3 requires special measures. For this purpose finger-like spacer elements for the yarns 11 can be provided which reach into the needle zones, which yarns 11 are prevented from a lateral migration during the needling between said spacer elements which extend in the longitudinal direction through the guiding gap between stitch base 2 and stripper 3.

1. A method for strengthening a textile web, especially a felt web, by needling parallel yarns in the longitudinal
direction, wherein the yarns are needled onto the textile web at a lateral distance from one another and with a needling limited to the yarn zones.

2. An apparatus for performing the method as claimed in claim 1 with a drivable needle board equipped with needles and reciprocating in the direction of the needle penetration and with a stitch base opposite of the needle board which forms a guide surface for the textile web which can be drawn off in the direction of passage of the textile web, wherein the stitch base (2) is provided in the guide surface for the textile web (8) with parallel guide grooves (13) for the yarns (11) to be needled, which grooves are aligned in the direction of passage (7) of the textile web (8) and that the needles (6) of the needle board (4) penetrate the guide grooves (13).