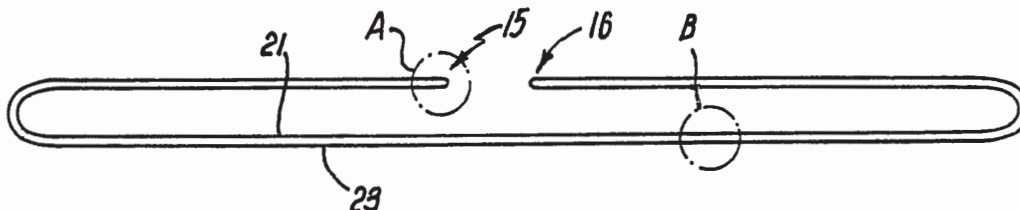


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(54) Title: PAPERMAKER'S FABRICS



(57) Abstract

A method for the manufacture of a papermaker's fabric is proposed which involves the provision of a multiply fabric having fold regions (15, 16) at its respective ends and the removal of cross-machine direction yarns (14) in such fold regions thereby to create seam-forming loops (17, 18). The loops (17, 18) may be interdigitated directly to receive a pintle wire into engagement therewith and thus form a seam, or may receive a spiral for seam-forming purposes. The method is of application to flat-woven or endless woven structures, and is of use in the manufacture not only of papermaker's fabrics *per se* but also in the manufacture of base materials for use therein.

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PAPERMAKER'S FABRICS

The invention concerns papermaker's fabrics and has more particular reference to a method for the manufacture of a seamed endless structure for use as papermachine clothing or as a base material therein.

There are two basic methods whereby papermakers' fabrics are produced, either the fabric is woven "flat", and the free ends joined, or the fabric is woven "endless".

10 In the case of the "flat-woven" fabric the warp yarns in the weaving loom extend in the machine direction of the eventual papermaker's fabric, and the fabric is made endless by, for example, weaving weft-free warp yarns at the respective fabric ends back into the fabric
15 to form warp loops thereat which extend in the machine direction and by introducing a pintle wire into the tunnel formed by the interdigitated loops of the respective fabric ends thereby to join such ends.

In the "endless-woven" fabric the warp yarns in the
20 loom are the cross-machine direction yarns of the papermaker's fabric.

According to the invention there is proposed a method for the manufacture of a papermaker's fabric or of a base material for use therein, the method comprising
25 the steps of providing a fabric of plural, superimposed layer configuration throughout substantially the full

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longitudinal extent thereof and having fold regions at the respective opposite ends thereof, and removing cross-machine direction yarns from said fold regions to leave machine-direction loops thereat.

5 According to a preferred feature, the superimposed fabric layers are two in number.

 According to a further preferred feature, the superimposed fabric layers are defined by a laid-flat fabric of endless-woven configuration.

10 According to a still further preferred feature, a textile batt is needled to at least one side of the endless base material.

 The loops of the respective fold regions may be brought into mutual interdigitated relationship directly
15 to receive a pintle wire in the tunnel formed thereby, thus to form a seam or may be engaged with a spiral coil itself intended to form the seam or a part thereof.

 The invention also includes a papermaker's fabric or base fabric therefor made in accordance with the method
20 as aforesaid.

 The invention will now be described further, by way of example only, with reference to the accompanying diagrammatic drawings illustrating two embodiments thereof, and in which:-

25 Figs. 1 to 3 respectively show successive stages in the production of an endless base material for use in a

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papermaker's fabric and comprising a flat-woven single layer structure;

Fig. 4 is a view corresponding to Fig. 3 and shows an endless-woven base structure having machine direction loops provided therein in accordance with the invention;

Figs. 4A and 4B are enlarged sections taken longitudinally of the structure shown in Fig. 4 at locations A and B, respectively; and

Fig. 5 shows the seam region of base fabrics of the kind shown in Figs. 1 to 3 and Fig. 4, a textile batt having been applied to each face thereof.

Referring now to the drawings, and particularly to Figs. 1 to 3 thereof, a base material for use in the manufacture of a papermaker's wet felt comprises a flat-woven fabric 11 of open weave construction having a length approximately equal to twice the length of the intended end product, that is to say of the papermachine clothing. The free ends 12, 13 are folded over to define a two-ply structure having fold regions 15, 16, the free ends being brought into substantial abutment as shown in Fig. 2.

Weft yarns 14 are removed from the fold regions 15, 16 either before or after folding, to give loops 17, 18 extending outwardly therefrom, the two-ply structure being brought into endless form by the interdigitation of such loops and the introduction of a pintle wire 19 into

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the tunnel 20 formed thereby as is shown in Fig. 3.

The free ends 12, 13 of the initial flat-woven fabric 11 are sewn to the adjacent fabric ply 21, as at 22 in Fig. 2, whilst the two fabric plies 21, 23 are
5 stitched together in fold regions 15, 16 in closely spaced disposition relative to the loops 17, 18, as is shown at 24.

In a second embodiment, see now Figs. 4, 4A and 4B, in which like reference numerals to those of Figs. 1 to 3
10 are used for the same or similar parts, an endless-woven fabric is laid flat, and the fold regions 15, 16 between the resultant overlying plies thereof are brought together as shown in Fig. 4. Cross-machine direction
yarns, that is to say warp yarns in the loom, are removed
15 from the fold regions to give outwardly extending loops 17, 18 as before, the plies being sewn together in closely spaced disposition relative to the loops, as at 24. On interdigitation of loops 17, 18 and the insertion
of a pintle wire, the structure is brought back into
20 endless form.

In the event that the machine direction yarns are to form loops at the respective fabric ends for interdigitation and receipt of a pintle wire, such
machine direction yarns will ordinarily comprise
25 monofilament yarns. However, if spiral coils are to be applied to the weft free zones and the spirals at the

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respective fabric ends, rather than machine direction yarn loops, are interdigitated to receive a pintle wire, then such machine direction yarns may, for example, comprise cabled yarns or multifilament yarns.

- 5 The cross-machine direction yarns may take the form of, for example, monofilament, cabled monofilament or multifilament yarns.

 In producing a wet felt, see now Fig. 5, a textile batt 25 is needled to each face of the endless structure, be it a structure in accordance with the principles of Figs. 1 to 3 or of Figs. 4, 4A and 4B, the needled batt being slit in register with the seam at the paper side, as at 26, and cleared in relation to the seam at the machine side, as at 27, to provide access thereto. The needling operation brings the batt at each face into coherent and homogeneous form through the base structure, and serves also to secure the individual plies of such base structure together.

 Whilst the invention is concerned primarily with the production of a base structure for combination with a textile batt in the manufacture of a wet end fabric, it is to be understood that the invention is also of relevance to the production of a two-ply papermaker's fabric comprising a flat-woven or an endless-woven structure brought into endless form in accordance with the method herein disclosed. In the case of a flat-woven

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structure, the free ends may be secured together, and, if required, to the adjacent ply at the inner face of the eventual papermaker's fabric, by removing cross-machine direction yarns at such ends, interdigitating the fringed-out machine direction yarns and securing those yarns together by means of a thermosensitive adhesive film or tape interposed between the fringed-out ends and the adjacent ply and activated in appropriate manner. Alternatively, the ends may be secured to the fabric ply by employing a powder bonding technique or by sewing.

As will readily be appreciated, in the case of a flat-woven structure requisite lengths of base fabric woven in any desired weave pattern may be cut from a stock supply thereof, and a papermaker's fabric meeting the particular requirements of its intended end use as regards performance characteristics can be produced from that base fabric in a simple and ready manner.

In the embodiment herein illustrated the overlying fabric plies are said to be sewn together adjacent the loops and in the region of the abutting fabric ends. It is to be understood that such plies may also be sewn together at any other position or positions intermediate the loops.

The invention is not restricted to the specific structures herein set forth, since alternatives will readily present themselves to one skilled in the art.

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Thus, not only is the invention of relevance to different
weave structures, but in the case of flat woven
structures the ends thereof, for example ends 12, 13 in
Fig. 2, may be joined together as by a spiral beam or in
5 any other manner.

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Claims

1. A method for the manufacture of a papermaker's fabric or of a base material for use therein, comprising the steps of providing a fabric of plural, superimposed
5 layer configuration throughout substantially the full longitudinal extent thereof and having fold regions at the respective opposite ends thereof, and removing cross-machine direction yarns from said fold regions to leave machine-direction loops thereat.
- 10 2. The method as claimed in claim 1, including the further step of securing the superimposed layers together, at least at positions adjacent the loops.
3. The method as claimed in claim 1 or 2, wherein the superimposed layers are two in number.
- 15 4. The method as claimed in claim 3, which includes the steps of flattening an endless woven fabric and removing cross-machine direction yarns from the fold regions thereof to form loops thereat.
5. The method as claimed in claim 3, which includes the
20 steps of bringing a flat-woven structure into plural layer configuration to define fold regions at the respective opposite ends thereof and removing cross-machine direction yarns from said fold regions to form loops thereat.
- 25 6. The method as claimed in any one of the preceding claims, including the further step of securing a

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respective spiral coil to the loops at the fabric ends.

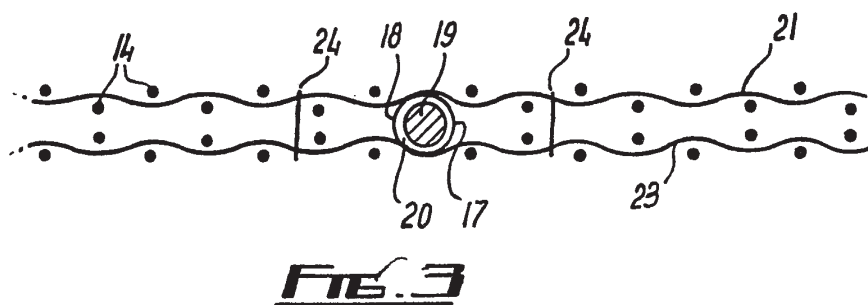
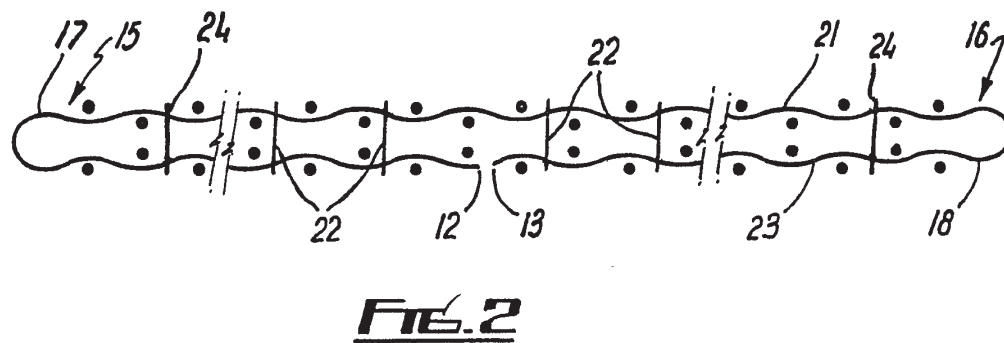
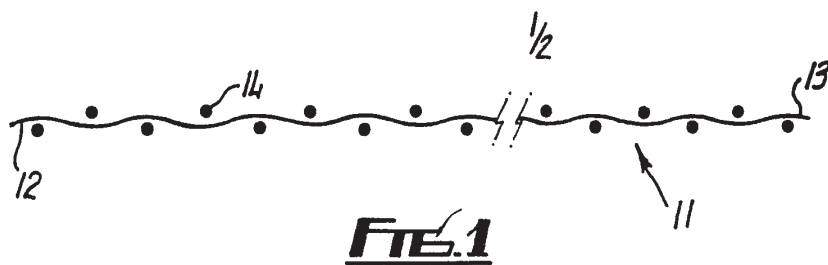
7. The method as claimed in any one of the preceding claims, including the further step of needling a textile batt to one face at least of the plural layer structure.

5 8. A papermaker's fabric produced in accordance with the method claimed in any one of the preceding claims.

9. A base material for use in a papermaker's fabric produced in accordance with the method claimed in any one of claims 1 to 6.

10 10. The method for the manufacture of a papermaker's fabric or a base material for use therein, substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

11. A papermaker's fabric or a base material for use
15 therein, substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.



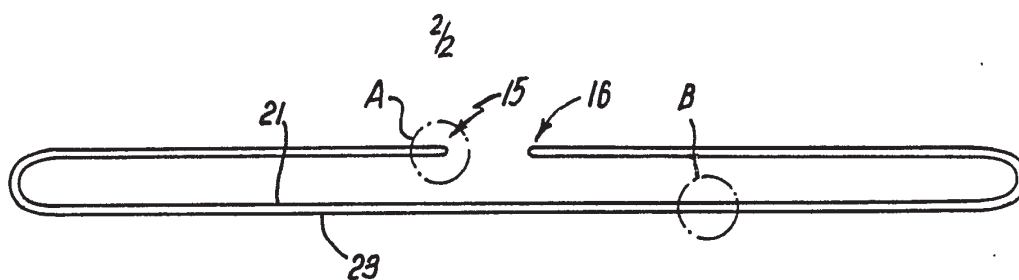


FIG. 4



FIG. 4A



FIG. 4B

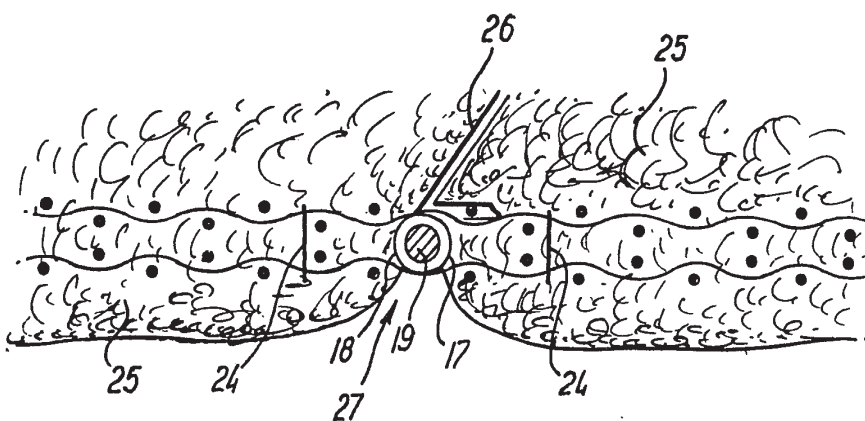
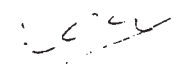


FIG. 5

INTERNATIONAL SEARCH REPORT

PCT/GB 89/00681

International Application No

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 4 D21F1/00		
II. FIELDS SEARCHED		
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III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
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