(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 054 422**
A1

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **81305855.9**

(51) Int. Cl.³: **D 21 F 1/00**

(22) Date of filing: **14.12.81**

(30) Priority: **16.12.80 GB 8040265**

(43) Date of publication of application:
23.06.82 Bulletin 82/25

(84) Designated Contracting States:
DE FR GB IT SE

(71) Applicant: **United Wire Group Limited**
Granton Park Avenue
Edinburgh EH5 1HT(GB)

(72) Inventor: **Haworth, John Wesley**
21 Barnton Park View
Edinburgh(GB)

(74) Representative: **Wotherspoon, Graham et al,**
FITZPATRICKS 48 St. Vincent Street
Glasgow G2 5TT(GB)

(54) **Paper-making machine fabric.**

(57) A paper-making machine fabric used at the "wet end" of the machine is woven in a five shed pattern repeated over five wefts, the top face of the fabric comprising single weft knuckles and single and double warp knuckles and the bottom face of the fabric comprising single warp knuckles and single and double weft knuckles. The fabric may be made of a synthetic material, e.g. a polyester, which is stretched in the warp-wise direction while being heated so as to increase the crimping in the wefts and reduce the crimping in the warps.

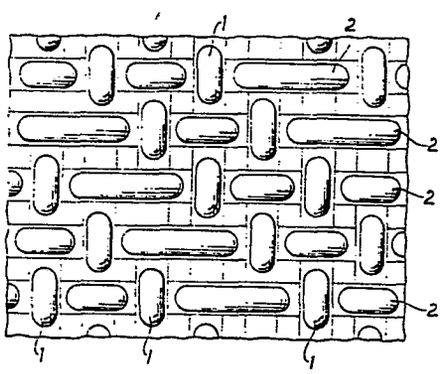

Fig. 1

EP 0 054 422 A1

"PAPER-MAKING MACHINE FABRIC"

DESCRIPTION

This invention relates to improvements in paper-making and particularly in the woven fabric from which is formed the endless belt onto which is applied a fibre/water slurry at the "wet end" of a paper-making machine.

It is known that problems occur in the manufacture of fine quality papers and that these problems are normally associated with two factors, one being wire marking and the other being a condition known as "linting" or "fluffing". Wire marking is the impression which the knuckles of the wire (or fabric) make in the sheet of paper and linting is the condition where fibres on the wire side of the sheet are loose and come off during the printing process, causing problems in printing quality.

The reason that linting problems are experienced with fabrics and not metal wires is due to the weave construction on the top surface of the wire. In a 3 shed metal wire the topside of the wire consists of cross direction weft floats, which provide support to the sheet and are positioned such that the longest distance to be bridged by the fibres is the length of one hole. In a standard 4 shed or 5 shed fabric the topside consists of machine direction warp floats which present a surface to the sheet which has long machine direction valleys, into which the fibres can fall. The longest distance to be bridged in this case is the length of three holes plus the diameter of two wefts. When the formed sheet of paper is removed from the fabric this disturbs those fibres which had fallen into the "valleys" thus causing them to become loose. This theory of fibre bridging is explained in more detail in the article by T Helle, entitled "How forming fabric design affects drainage and release", in the trade journal PULP &

PAPER CANADA, Volume 79, No. 11/November 1978 on pp. T 329-333.

An object of this invention is to obviate or mitigate these problems.

According to the invention there is provided a paper-making machine fabric woven in a five-shed pattern repeated over five wefts, one face of the fabric comprising single weft knuckles and single and double warp knuckles and the other face of the fabric comprising single warp knuckles and single and double weft knuckles.

An example of the weave is shown in the accompanying drawing, in which:

Fig. 1 shows warp and weft knuckles on the face of the fabric on to which it is intended to apply the fibre/water slurry; and

Fig. 2 is a cross-section through the fabric.

The fabric may be made of a synthetic material, e.g. a polyester. In order to increase the stability of the fabric in the warp-wise or machine direction the fabric is stretched in this direction while being heated. The resultant fabric has more crimping in the wefts 1 and less crimping in the warps 2. The face of the fabric on which it is intended to apply the fibre/water slurry comprises single weft knuckles and single and double warp knuckles in a broken twill pattern. The weft and warp knuckles are substantially monoplanar which gives a very acceptable mark to the paper produced. Furthermore, the longest valleys between adjacent warps is the length of two holes plus the diameter of one weft. This has the advantage of minimal disturbance of the fibres which have fallen into the valley, when the formed paper is removed from the fabric.

On the other hand, the opposite face of the fabric comprises single warp knuckles and prominent single and double weft knuckles which will take the wear in use.

One specification of the weave for producing high quality writing and printing papers consists of:-

30 warps/cm

22 wefts/cm

0.20 warp dia. mm

0.20 weft dia. mm.

Another specification of the weave for producing unbleached kraft papers of:-

23 warps/cm

18 wefts/cm

0.25 warp dia. mm

0.30 weft dia. mm.

CLAIMS

1. A paper making machine fabric woven in a five-shed pattern repeated over five wefts, one face of the fabric comprising single weft knuckles and single and double warp knuckles and the other face of the fabric comprising single warp knuckles and single and double weft knuckles.

2. A paper-making machine fabric according to claim 1, wherein the fabric is made of a synthetic material and is stretched in the warp-wise direction while being heated so as to increase the crimping in the wefts and reduce the crimping in the warps.

3. A paper-making machine fabric according to claim 2, wherein the synthetic material is a polyester.

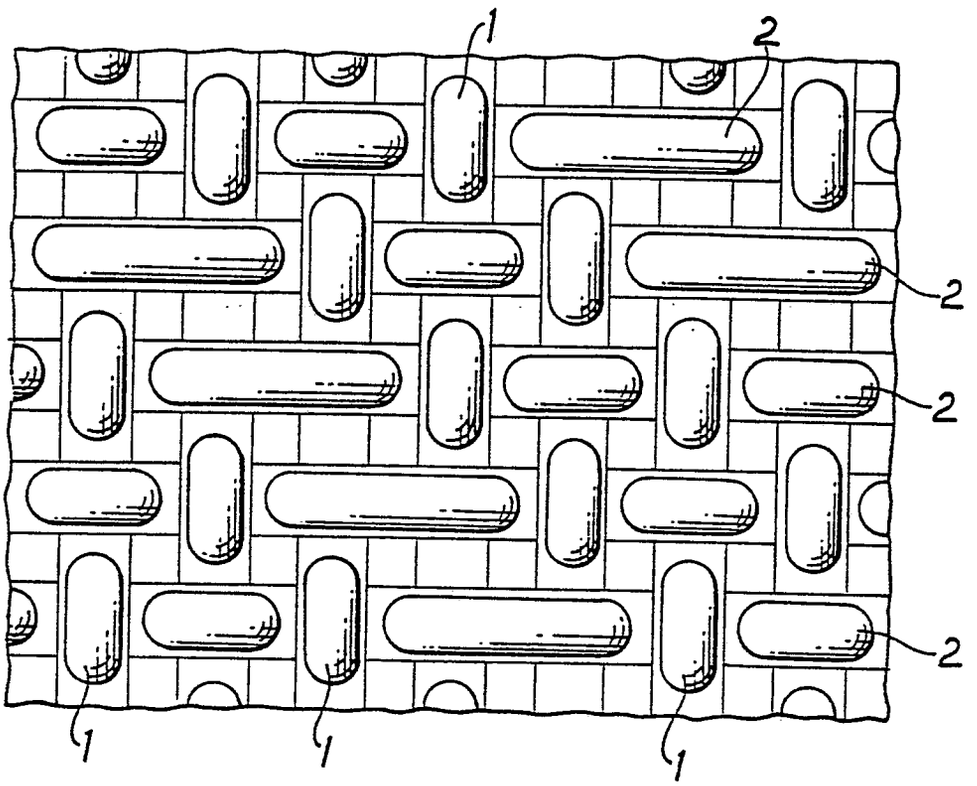

Fig. 1

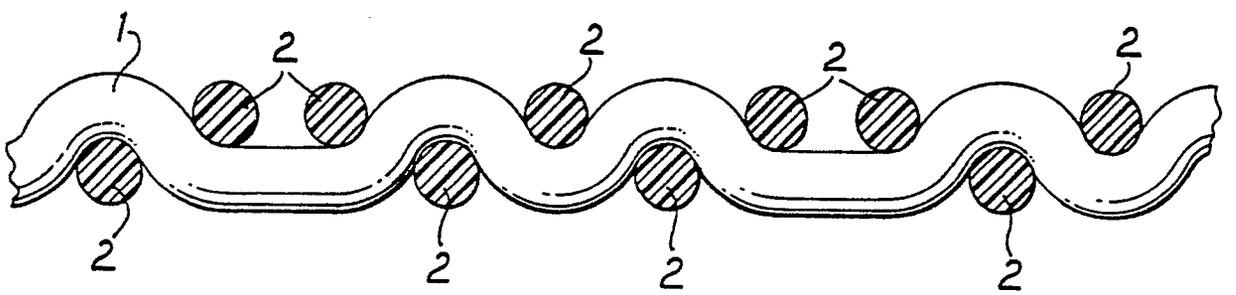

Fig. 2

0054422

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 81 30 5855

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
A	US - A - 1 733 116 (COUPS)	
A	GB - A - 370 309 (ROSS)	
A	US - A - 4 161 195 (KHAN)	
A	FR - A - 2 198 012 (NORDISKA MASKINFILT)	

CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)

D 21 F 1/00

TECHNICAL FIELDS SEARCHED (Int.Cl. 3)

D 21 F
D 03 D

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
Y: particularly relevant if combined with another document of the same category
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: earlier patent document, but published on, or after the filing date
D: document cited in the application
L: document cited for other reasons

&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11-03-1982	DE RIJCK