June 30, 1964 W. E. BUCHANAN 3,139,119

FOURDRINIER FABRIC

Filed May 18, 1960 3 Sheets-Sheet 1

Fig. 1

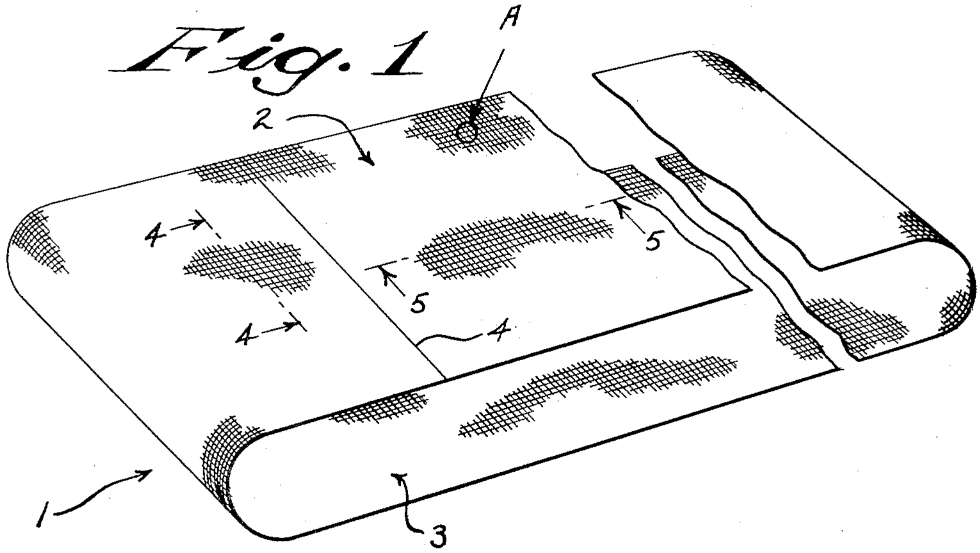



Fig. 2

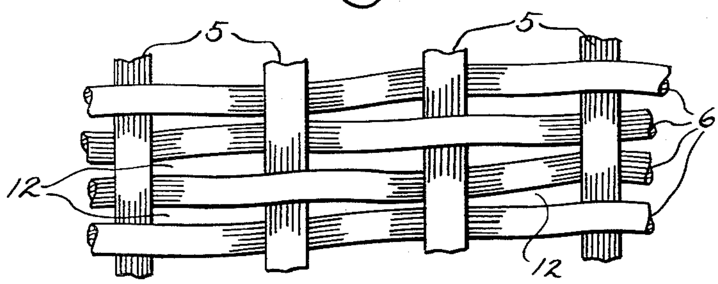
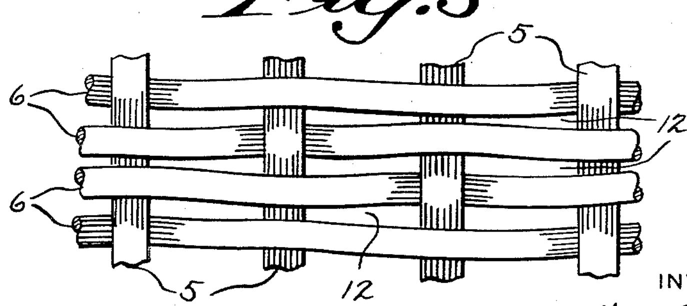



Fig. 3

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FOURDRINIER FABRIC

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Fig. 4

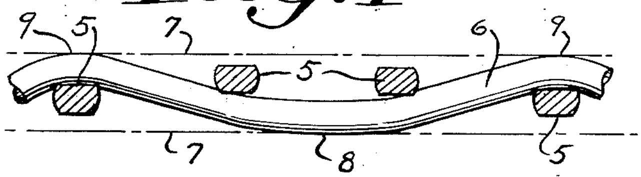


Fig. 5

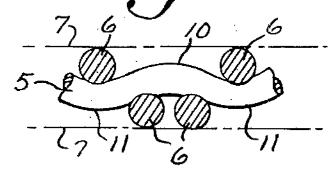


Fig. 6

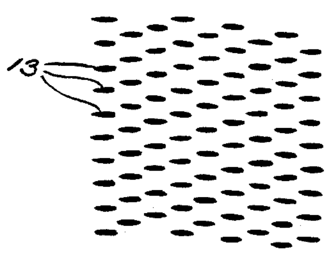


Fig. 7

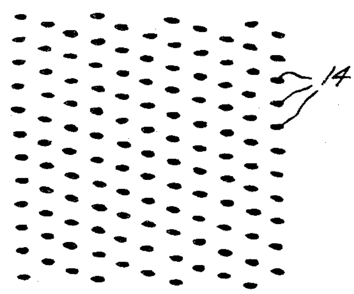


Fig. 8

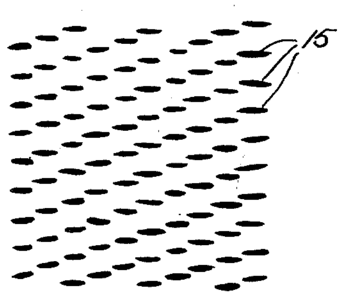


Fig. 9

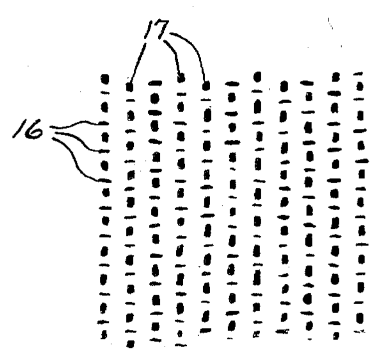


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Fig. 10

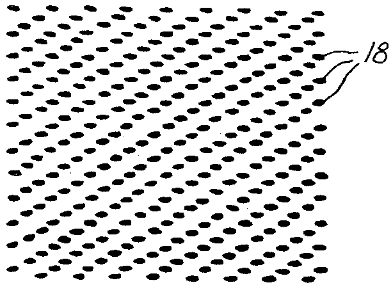



Fig. 11

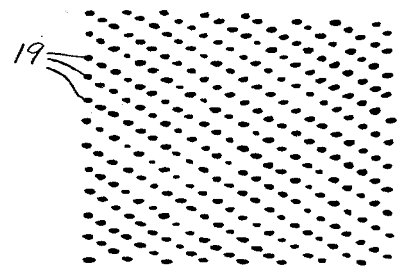



Fig. 12

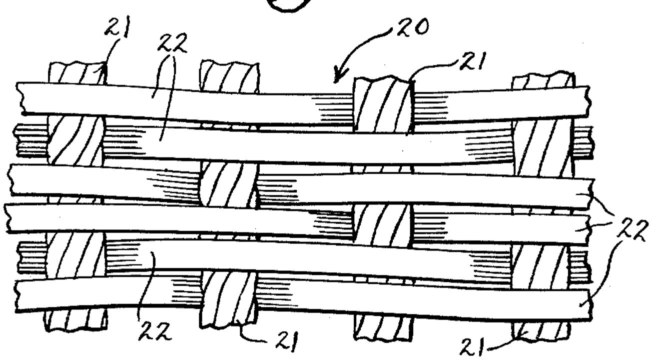
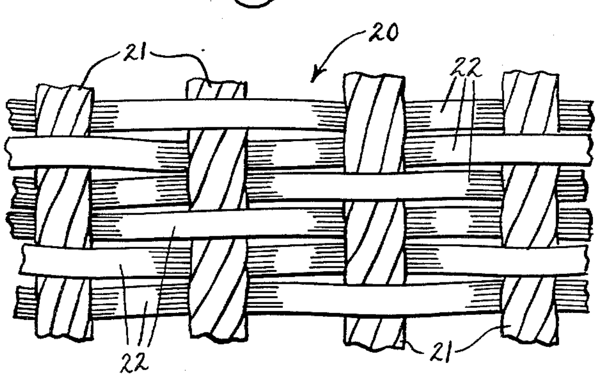



Fig. 13

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# 3,139,119
# FOURDRINIER FABRIC

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Filed May 18, 1960, Ser. No. 29,988
10 Claims. (Cl. 139—425)

This invention relates to Fourdrinier fabrics employed in paper making machines and it more specifically resides in a woven fabric having transverse weft threads with dominate knuckles deeper than those of the longitudinal warp threads, so that a surface of the fabric is composed of crests of the weft knuckles to enable the weft threads to sustain surface wear during use.

In Fourdrinier fabrics as heretofore woven the warp has been formed with knuckles that protrude outwardly of the weft knuckles and as such fabrics travel through a Fourdrinier machine it is these predominant warp knuckles which bear upon and engage with the suction boxes and machine rolls. As a result, the abrasive wear upon the warp removes metal from the warp knuckles to the point where the warp can no longer sustain the load to which it is subject. It is recognized that this is a major factor in determining the life of the fabric, but nevertheless the most popular weaves used in the manufacture of Fourdrinier fabrics disposed the warp so that each is subject to this erosion.

The most widely used weave today is a semi-twill in which the pattern comprises a repetition of each warp thread passing over a single weft thread and then under a pair of weft threads. Different mesh counts of this weave are manufactured to cover the production of the various grades of paper and paperboard, and where wire mark on the paper must be minimal special semi-twill weaves are used in which the weft is crimped so as to place the elongated weft knuckle crests on the upper, or paper, side of the fabric in a nearly common plane with the warp knuckle crests on the paper side. A more uniform paper supporting surface that is comprised of both warp and weft threads is thus achieved, but the weave is still characterized by having the warp knuckles on the wear side of the fabric function as the bearing surface that travels over the suction boxes and machine rolls. These warp knuckles on the wear side of the semi-twill weave are elongated, by reason of passing under a pair of weft threads, and this prolongs the fabric life to some degree. Improvements have also been made in weaving techniques to produce a uniform depth for the warp knuckles of the wear side, so as to better distribute the wear, but abrasion of the warp still continues to be a major factor in fabric life.

Another weave for the Fourdrinier fabric, which is termed a plain weave, consists of warp threads passing alternately over and under single weft threads, with the knuckles of the warp being deeper than those of the weft. The dominant warp crests then form both the wear and paper supporting surfaces of the wire, and this weave only finds limited usage, having been generally replaced by the twill weaves.

For the manufacture of very light weight papers triple chain weaves are frequently employed. These are manufactured by having three very fine warp threads placed in each dent of the loom reed, so that they are in groups of three in the finished fabric. Each warp alternately passes over and under individual weft threads, and this very delicate fabric finds special use only. Double chain wires, where two warp threads are led through each reed dent have been manufactured, but are not in general use today.

It is a general characteristic of each of the foregoing weaves that the warp threads must perform the double function of providing a hard, wear resistant surface for traveling over the Fourdrinier machine, and of providing a high tensile strength with flexibility for turning about the machine rolls and withstanding the large tension stresses imposed not only during running but in accelerating and decelerating as the machine is started and stopped. In addition to these conflicting physical requirements the warp threads must also usually serve as a primary support for the paper web, and the warp threads have therefore been required to fulfill functions that are not entirely consistent, wherefore, some compromise has to be made in the physical thread characteristics in order to perform each of these functions.

The weft threads in the prior weaves have functioned only as a filler to hold the fabric together and as a support for the paper web in some of the weaves. Hence, it is not a principal contributor to the withstanding of the physical stresses and wear to which the fabric is subjected. The weft threads have been usually formed from brass, Phosphor bronze has been the primary material for the warp threads. Manganese bronze has a limited application, and for certain conditions Phosphor bronze weft is used in place of brass. The selection of bronze for the warp is a necessary compromise which gives flexibility, but not the resistance to abrasion exhibited by other metals. In some instances wire stranded into cable is employed, and flat as well as round wires are likewise in use.

The present invention is directed primarily toward provision of a new weave for a Fourdrinier fabric in which surface areas for the fabric are defined by dominant weft knuckles that are crimped deeper than the knuckles of the warp, so as to have crests of the weft exposed outwardly of crests of the warp. The warp having a shallower crimp has its knuckle crests receded within the wire, but a sufficient crimp is developed in the warp to adequately lock with the weft threads to position the weft for achieving a stable fabric. Advantages of such a weave are multiple. Abrasive wear encountered in travel over Fourdrinier machine rolls and suction boxes is shifted to the weft threads, which allows a more judicious selection of materials for both the warp and weft threads. Heretofore it has been necessary in the selection of the warp to compromise between the requirement of providing a wear resistant material and of having sufficient flexibility to move in and out with the machine rolls and other parts. Now, with the abrasive wear being transferred to the weft a material can be selected for the weft which need not also meet some requirement of flexibility. Also, the weft can be made quite stiff to minimize wrinkles in the fabric. The warp, on the other hand, can be selected of a material having sufficient flexibility with tensile strength, without special regard to wear resistance. Therefore, there is a distinct advantage in shifting the wear of a Fourdrinier fabric from the longitudinal warp threads to the transverse weft threads. Each then has a more sharply defined separate role or function, and it is an important object of the invention to accomplish this result.

This new weave also advantageously overcomes several problems heretofore encountered in the use of Fourdrinier fabrics. First, as has been noted, life can be increased by the shift of abrasive wear to the weft threads. In reducing the erosive wear of the warp cracks which formerly developed prematurely in the warp because of fatigue in the worn strands will be minimized. Consequently, fabric life is enhanced from this additional stand-point. Next, fabrics have a tendency to wrinkle in a lengthwise direction, and aggravated wrinkles may require the removal of a fabric. This is overcome in the practice of this invention by increasing the relative mass of the weft and by inclusion of a stiff weft that would have been incompatible with former weaves.

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Another difficulty has been grooving of suction boxes and other machine parts by the warp knuckles. The resulting high spots between the grooves in turn cut the fabric, resulting in very rapid wear, possible filling up of the fabric with particles of pulp, possible failure of the seams, or possible filling up of the fabric adjacent to the seams. Drainage characteristics of the fabric may also be affected, but by recessing the warp and utilizing the weft as the wear surface these difficulties are overcome.

Under certain conditions fabrics will fail prematurely due to corrosion, which not only eats away the warp and weft strands but also accelerates the abrasive wearing process. Heretofore, the corrosion of the bronze and brass threads has been minimized by nickel plating, or coating with tin or plastic. Wear of the warp knuckles quickly removed the protective coating and corrosion could readily occur at these vulnerable worn spots. In practicing the present invention this problem of corrosion can be more readily overcome by utilizing stainless steel, for the weft threads and a coated bronze for the warp. Since the warp is recessed and does not wear its coating will remain intact and corrosion is therefore inhibited.

As will be more fully discussed and described, a weave is provided in which the number of warp threads per inch is less than the number of weft threads per inch for the purpose of obtaining extended lengths of weft between the cross-over points. The increased lengths of the weft between cross-over points are exposed as predominant knuckles and on the wear side they may consequently give a greater bearing area. On the paper side the protruding weft knuckles tend to align pulp fibers transverse of the fabric. Since a fabric traveling down a Fourdrinier machine will tend to orientate pulp fibers in a longitiudinal direction, which tendency is increased with greater machine speed, a weave which counteracts this tendency is of extreme value. Paper strength is enhanced in the cross direction by the action of the raised weft knuckles, and if desired greater speeds of travel for the fabric can be obtained without crosswise diminution of paper strength. Fabrics made with dominant weft knuckles in accordance with this invention also demonstrate increased water drainage. It further appears that there may be less water re-entry due to the swirling imparted by the table rolls because of the predominance of cross direction threads and hence the advantages of the invention extend not only to fabric life, but the paper making process itself.

It is an object of this invention to provide a Fourdrinier fabric of a greater life span than for fabrics heretofore employed.

It is another object of this invention to provide a Fourdrinier fabric in which the wear caused by travel in the Fourdinier machine is borne by the weft threads.

It is another object of this invention to achieve greater Fourdrinier machine speed with controlled drainage through the provision of an improved fabric.

It is another object of this invention to provide a Fourdrinier fabric that will produce quality paper in which the cross direction strength is enhanced and in which the fibers are better orientated at the time the pulp is lead down upon the fabric to form the initial paper web.

It is another object to have a fabric that will reduce the grooving of Fourdrinier machine parts and thereby eliminate the problems connected with such grooving.

It is another object of this invention to provide a fabric that is not as susceptible to wrinkling as prior fabrics.

It is another object to have a fabric in which the threads subject to wear from bearing on the Fourdrinier machine parts are not limited in cross section size by reed dents of a loom.

It is an additional object of the invention to reduce the number of warp threads per unit width of fabric, whereby set-up time for a loom is materially decreased and production procedures are thereby improved.

It is another object of this invention to have a Fourdrinier fabric in which a reduced number of warp meshes



will provide a complete range of fabrics satisfactory for producing a full line of paper grades.

It is another object of this invention to provide an improved Fourdrinier fabric that can be manufactured on existing looms without need of alteration or redesign.

It is a still further object of this invention to have a fabric that may be woven from materials more resistant to corrosion and wherein advantage may be taken of stainless steel and the like.

The foregoing and other objects and advantages of this invention will appear from the following description. In the description reference is made to the accompanying drawings, which form a part hereof, and in which there is shown by way of illustration and not of limitation specific forms in which the invention may be embodied.

In the drawings:

FIG. 1 is a view in perspective of a Fourdrinier fabric embodying the invention.

FIG. 2 is a fragmentary view on an enlarged scale of a portion of the paper making side of the Fourdrinier fabric of FIG. 1, such portion being referred to in FIG. 1 by the designating reference character A,

FIG. 3 is a view of the reverse, or wear side of the fragmentary portion shown in FIG. 2,

Fig. 4 is a transverse view in section of the Fourdrinier fabric of FIG. 1 taken in the plane 4—4 and showing the knuckle structure in a weft thread,

FIG. 5 is a longitudinal view in section of the Fourdrinier fabric of FIG. 1 taken in the plane 5—5 and showing the knuckle formation in a warp thread,

FIG. 6 is an ink print of the side of the Fourdrinier fabric of FIG. 1 shown in FIG. 3,

FIG. 7 is an ink print of the side of the Fourdrinier fabric of FIG. 1 shown in FIG. 2,

FIG. 8 is an ink print of the long weft knuckle side forming the wear surface of another Fourdrinier fabric embodying the invention which has a mesh count of 20 x 56,

FIG. 9 is an ink print of the short weft knuckle side forming the paper making surface of the Fourdrinier fabric referred to with respect to FIG. 8,

FIG. 10 is an ink print of the long weft knuckle side of a Fourdrinier fabric of the invention having a mesh of 40 x 67,

FIG. 11 is an ink print of the short weft knuckle side of the Fourdrinier fabric of FIG. 10,

FIG. 12 is a fragmentary view of the long weft knuckle side of a Fourdrinier fabric of the invention having a cable type warp and a mesh of 20 x 86, and

FIG. 13 is a fragmentary view of the short weft knuckle side of the Fourdrinier fabric of FIG. 12.

Referring now to the drawings, FIG. 1 shows a Fourdrinier fabric **1** for paper making which has a paper, or pulp, supporting surface **2** and a wear surface **3** that travels over the rolls and suction boxes of a Fourdrinier machine. The fabric **1** is woven on a conventional loom and after removal from the loom is fashioned into a large endless belt by means of a seam **4**. The overall dimensions of a woven fabric may be as great as 350 inches by 180 feet, and the stresses created in such a fabric as it travels over and turns the rolls of a Fourdrinier machine at speeds as high as 2800 feet per minute or more are very substantial. Forces encountered in stopping and starting are also large and consequently the strength and wear characteristics of a fabric are important considerations together with uniform smoothness for the paper supporting surface **2**.

The particular fabric **1** shown in FIG. 1 is comprised of metallic warp and weft threads, and a small fragmentary section of the fabric **1**, as designated by the reference character A in FIG. 1, is shown on an enlarged scale in FIG. 2. Warp threads **5** extend longitudinally of the fabric **1** and deft threads **6** run in transverse direction. The surface viewed in FIG. 2 is the paper side **2** of the fabric **1**, and FIG. 3 depicts a section of the opposite, or wear side **3** of the fabric. As will be hereinafter discussed, the fabric **1** may be reversed at the time of being made into an endless belt, so that the pattern of FIG. 2 may become the wear side and the pattern of FIG. 3 may become the paper side. The weave shown in FIGS. 2 and 3 is similar to a semi-twill in that each thread, warp or weft, passes first to one side of a single opposite thread and then passes to the other side of a pair of opposite threads. The knuckles developed in the warp **5** are shallower than for the weft **6**, and this very marked difference from conventional weaves is illustrated in FIGS. 4 and 5. The crimp in each weft thread **6** is seen to be greater than in the associated warps **5**, so that the weft knuckles on both sides of the fabric are deeper than the warp knuckles to present weft crests that define the thickness of the fabric, i.e., the dimension between the lines **7**, which represent the planes of the fabric surfaces, is measured by the vertical distance between weft crests. These weft crests comprise elongated crests **8** on one side of the fabric **1**, which side is usually intended as the wear side, and shorter crests **9** on the opposite side of the fabric **1**, which is usually intended as the paper side of the fabric. The warp crests **10** on the paper side and **11** on the wear side are, as shown in FIG. 5, well recessed within the fabric surfaces **7** defined by the weft crests **8**, **9**. Nevertheless, a definite crimp is made in the warp **5** to form a satisfactory lock with the weft **6** to maintain the respective threads firmly in position with definite spacing therebetween. The recessed warp functions as a number of flexible tension bands for carrying the fabric about the Fourdrinier machine, and the weft functions to sustain the wear caused by travel over the Fourdrinier machine rolls and suction boxes.

The mesh count for the particular fabric **1** illustrated in FIGS. 1–5 distinctly departs from that of conventional semi-twill. Conventional weaves have meshes in which the warp count per inch is ordinarily greater than the weft count per inch, and typical warp counts run from about 48 to 110 threads per inch. For a warp count of 48 the weft count is typically 33 or 34 threads per inch and for a 110 thread warp count the weft count is about 100 threads per inch. Intermediate counts give a more representative picture, and for a warp count of 64 the weft mesh varies from 44 to 53, while for a warp count of 70 the weft mesh varies from 50 to 58. These figures are for semi-twill weaves, and single strand plain weave meshes for Fourdrinier fabrics are usually 70 x 48 or 74 x 52, in each instance the warp count being given first.

The warp count for an actual fabric upon which the disclosure of FIGS. 1–5 is based was 20 threads per inch, and as more clearly shown in FIGS. 4 and 5 the particular warp which was selected was a flat wire. A flat wire can aid in obtaining a crimp in the warp to develop the knuckles that lock at the cross over points with the weft threads to form a dimensionally stable fabric. A flat warp, however, is not necessary for the practice of the invention, and its selection is dependent upon the weaver's choice and the needs of the particular fabric. The weft mesh for the particular fabric of FIG. 1 was 64 threads per inch, and as clearly shown in FIGS. 2 and 3 pronounced rectangular openings **12** were formed in the fabric **1** with their lengthwise dimension extending transverse of the fabric.

It has been found that the attainment of predominant weft knuckles in all metal fabric is aided by use of a stiff weft that is preferably stiffer than the warp. Heretofore, the Phosphor bronzes employed for the warp have been used to impart both hardness to withstand abrasive wear and fatigue resistance to withstand bending and tensile stresses encountered during paper making. The softer brasses for the weft have been satisfactory in conventional weaves, since they are merely a filler which at times aids in supporting the pulp, but in the practice of this invention the use of a harder, stiffer weft may implement the development of the desired knuckle structure which includes some crimping in the warp to gain the desired locking of the threads at their points of crossover.

Stainless steel was employed as the weft thread material in the fabric upon which **FIGS.** 1–5 are based. This weft had a .0105 inch diameter and was stiffer than the bronze flat warp which had a cross section of .0145 inch by .0085 inch. Other typical weft materials in an all metal fabric which have been used in actual practice are Phosphor bronze and Inconel metal, the selection for stiffness being in part related to the selection of the warp thread material and the nature of weaving.

The weaving of the fabric can be carried out in conventional fashion with the loom heddles disposing the warp with one strand up and two strands down to define the semi-twill weave. The warp tension can also be maintained in conventional fashion by regulation of the warp weighing system. A loom, therefore, can be appropriately set and adjusted to obtain desired weaving conditions so as to weave a relatively stiff weft thread in combination with the warp threads while placing the required crimp in the warp threads. A mesh for the warp of smaller count than the weft also contributes to the attainment of a dominant weft knuckle structure when using a relatively stiff weft in a conventional loom.

The predominance of the weft knuckle crests **8** and **9** is demonstrated in FIGS. 6 and 7, which are ink imprints of the opposite sides of the fabric **1** of FIGS. 1–5 as actually embodied in the 20 x 64 fabric described in the previous paragraphs. The dashed spots **13** in FIG. 6 run transverse of the fabric and portray the long weft crests **8** of the wear side **2**, and the shorter dashes **14** in FIG. 7 portray the shorter weft crests **9** of the paper side of the fabric **1**. FIGS. 6 and 7 are drawings of prints that were obtained by inking the Fourdrinier fabric and then pressing the same against a paper surface to obtain an impression of the high spots of the fabric, and such high spots are said to form or define the surfaces of the fabric.

From a study of FIG. 6, it is apparent that the weft crests **8** define a fabric surface in which each knuckle presents a substantial bearing area extending transversely of the fabric. In this fashion there is no appreciable transverse spacing between longitudinal rows of bearing knuckles, so that grooving of Fourdrinier machine parts will be eliminated. Wear will be uniform, and an ideal bearing surface is obtained for the fabric **1**. Also, the selection of a stiff, hard weft which augments the formation of the weave will also provide a desirable wear surface, and the warp will be relieved from wear so that it can be formed of a material particularly adapted for withstanding flexing and tension loading.

The surface pattern of the rominant weft crests **9** shown in FIG. 7 forms a support for an initial paper web, and tests show that a paper made upon the fabric of this invention exhibits enhanced cross directional strength. This apparently indicates that the weave of the invention has a greater tendency to align the paper fibers in a transverse or cross direction to an enhanced degree, wherefore improved paper making techniques are obtained. Also, increased paper machine speeds can be had without loss of cross directional strength, and it is believed that the dominant weft crests are responsible for orientating the paper fibers with a greater length component in the transverse direction than obtainable in conventional fabrics. As shown in FIGS. 2 and 3 the rectangular openings **12** and reduced warp mesh count expose greater lengths of the weft threads, and these lengths protrude to form the outer surface of the fabric, rather than being recessed. This dominant weft imparts a novel surface texture characterized by an array of transverse elevated weft thread knuckles which apparently affect water drainage as well as fiber orientation. It has been observed that in drainage greater amounts of the minute pulp fibers, or fines, are retained on the fabric, and this is recognized as a factor which improves paper quality and paper machine operations. Water drainage is also enhanced, and the contact of the weft knuckles on the wear side with the machine rolls may also play a part in the favorable drainage characteristics of the fabric.

The relative height of the weft and warp crests may vary with a change in mesh, and shown in FIGS. 8 and 9 are the imprints of the opposite sides of a Fourdrinier fabric having an identical warp count as the fabric **1** of FIGS. 1–7, that is, 20 threads per inch, and a weft count of 56 threads per inch. This weft was a Phosphor bronze, being stiffer than the warp threads, and measuring .01175 inch in diameter. The warp threads were of the same cross section as in the fabric **1** of FIGS. 1–7. The wear side imprint of FIG. 8 comprises transverse dashes **15**, again indicating a surface comprised of transverse weft knuckle crests. The paper side is seen to be comprised of short transverse dots **16** and short longitudinal dots **17**, indicating that the weft and warp crests are substantially in a common plane to present a desirable paper web supporting surface. Here again, the wear side of the fabric is characterized by dominant weft crests that relieve the warp of abrasive wear and impart new characteristics to the fabric.

FIGS. 10 and 11 are ink imprints of still another fabric of the invention. This fabric had a mesh of 40 x 67 and the dashes **18** in FIG. 10 represent the elongated weft crests on one side, while the dashes **19** in FIG. 11 represent the somewhat shorter weft crests on the opposite side. This particular fabric also had a warp of .0145 x .0085 inch cross section, and the weft was of .0085 inch diameter Inconel metal.

Both warp and weft meshes may be varied from the foregoing examples. The warp mesh, however, can be maintained at a limited number of counts to cover a substantially complete line of paper grades. While conventional weaves require a large number of warp meshes, eight or so meshes being required for the coverage of most all papers, it is possible to cover the same papers with only three or four meshes when employing the present invention. These meshes will ordinarily vary from the order of about 20 threads per inch to the order of about 60 threads per inch. This reduction in the number of warp meshes necessary for a full line of fabrics for a full range of paper grades results in improved programming of orders through a weaving mill, and a lower number of warp threads per inch markedly economizes in loom set-up time preliminary to weaving.

The weft thread count preferably remains at greater than one and a quarter times and less than four times the warp count, and relative cross section and stiffness of the threads may account for the final mesh selection. With warp meshes as low as 20, fabrics have been woven with weft meshes of 40 to 64; and with larger warp mesh counts such as, for example, 40 the weft count has ranged from 50 to 70. These are representative values and if the teachings herein are followed a wide selection of meshes is available from which a line of Fourdrinier fabrics may be selected with the characteristics and advantages of the invention which will serve to form a full range of paper grades.

A particularly desirable form of the invention resides in the use of a twisted cable warp, as illustrated in FIGS. 12 and 13. FIG. 12 is a fragmentary view of the long weft crest side of a fabric **20** using a twisted cable warp **21**, and FIG. 13 is a view of the opposite side of the fabric **20**. Weft threads **22** are formed with dominant knuckles to take the wear, and the warp being formed of cable can have flexibility and tensile strength that are near optimum values for Fourdrinier fabric construction. The cable also takes a crimp that locks with the weft to retain proper spacing between threads. In addition to the use of the twisted type cable for the warp threads, the weave of the invention has also been carried out with double strand warps in which two circular warp strands are laid side by side, as an untwisted cable, to form a composite warp similar to a single strand flat warp. This fabric is woven with two warp strands in a single reed dent and common heddle, and less fatigue from flexing results in this particular construction. When the term "cable" is used herein this untwisted form is included as well as the conventional twisted forms, and when the term "thread" is employed it includes cable, both twisted and untwisted.

The weave as illustrated by the foregoing examples produces a fabric that is dimensionally stable by having sufficient crimp in both warp and weft threads. While it is an object to develop a deeper weft knuckle and to recess the warp, nonetheless a crimp in the warp is desirable in order to gain dimensional stability. Spacing between weft threads for proper drainage, and to allow for flexibility in traveling over machine rolls, is maintained while precluding shifting of the individual weft threads. A characteristic of the weave in addition to those hereinbefore discussed is the permissible increase in weft as a constituent of the fabric. Sixty percent or more of the fabric, by weight, may be constituted of weft, as contrasted with an average of approximately fifty-five percent and less for conventional fabrics. With the use of greater amounts of weft transverse strength is improved and a stiffer fabric in the transverse direction is had which lies flat and resists wrinkling so as to improve the fabric life. Also, greater amounts of weft selected from abrasion resistant materials greatly enhances fabric life.

The various forms of the invention set forth herein are by way of illustration and are not intended to show the sole embodiments in which the invention may reside. As for the scope of the invention reference is made to the appended claims.

I claim:

1. In a Fourdrinier fabric the combination comprising a plurality of metallic warp threads extending lengthwise of the fabric; and a plurality of metallic weft threads of greater stiffness than the warp threads extending transverse of the fabric, knuckles being formed in both the weft and warp threads with the crests of the weft threads extending outwardly of those of the warp threads to form a surface for the fabric that is comprised substantially of weft crests and the number of weft threads per inch being between 1¼ and 4 times the number of warp threads per inch.

2. A Fourdrinier fabric in the form of a seamed, endless belt having a weave in which a weft thread passes first to one side of a pair of warp threads and then to the opposite side of the next warp thread, such fabric comprising: a plurality of metallic warp threads extending lengthwise of the fabric which are crimped to develop relatively shallow knuckles intersecting with the weft; a plurality of metallic weft threads stiffer and harder than the warp threads extending transversely of the fabric which are crimped to develop knuckles deeper than the warp knuckles to present weft knuckle crests extending above the warp knuckles which form a fabric surface composed of weft knuckles protruding outward of the warp threads; and the number of weft threads per inch of fabric in a longitudinal direction being 1¼ times or more than the number of warp threads per inch of fabric in a transverse direction.

3. A fabric in accordance with claim 2 in which the weft threads constitute sixty percent or more by weight of the fabric.

4. A fabric in accordance with claim 2 in which the warp threads are comprised of cable.

5. A fabric in accordance with claim 2 in which the warp threads are comprised of flat strands.

6. A Fourdrinier fabric in the form of a seamed endless belt having a weave in which a weft thread passes first to one side of a pair of wrap threads and then to the opposite side of the next warp thread, such fabric comprising: a plurality of metallic warp threads extending

lengthwise of the fabric which are crimped to develop relatively shallow knuckles intersecting with the weft; a plurality of metallic weft threads, selected from bronze, stainless steel and Inconel metal, extending transversely of the fabric which are crimped to develop knuckles deeper than the warp knuckles to present weft knuckle crests extending above the warp knuckles which form a fabric surface composed of weft knuckles protruding outward of the warp threads; and the number of weft threads per inch of fabric in a longitudinal direction being 1¼ times or more than the number of warp threads per inch of fabric in a transverse direction.

7. A fabric in accordance with claim 6 in which the weft threads constitute sixty percent or more by weight of the fabric.

8. A fabric in accordance with claim 6 in which the warp threads are comprised of cable.

9. A fabric in accordance with claim 6 in which the warp threads are comprised of flat strands.

10. A Fourdrinier fabric in the form of a seamed, endless belt woven with a semi-twill weave, such fabric comprising: a plurality of metallic warp threads, extending lengthwise of the fabric, which are crimped to develop relatively shallow knuckles intersecting with a weft; a plurality of metallic weft threads, at least as hard and stiff as the warp threads, extending transversely of the fabric, which are crimped to develop knuckles deeper than the warp knuckles to present weft knuckles extending above the warp knuckles which form a fabric surface composed of weft knuckles protruding outwardly of the warp threads; and the number of weft threads per inch of fabric in a longitudinal direction being at least 1¼ times the number of warp threads per inch of fabric in the transverse direction.

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