

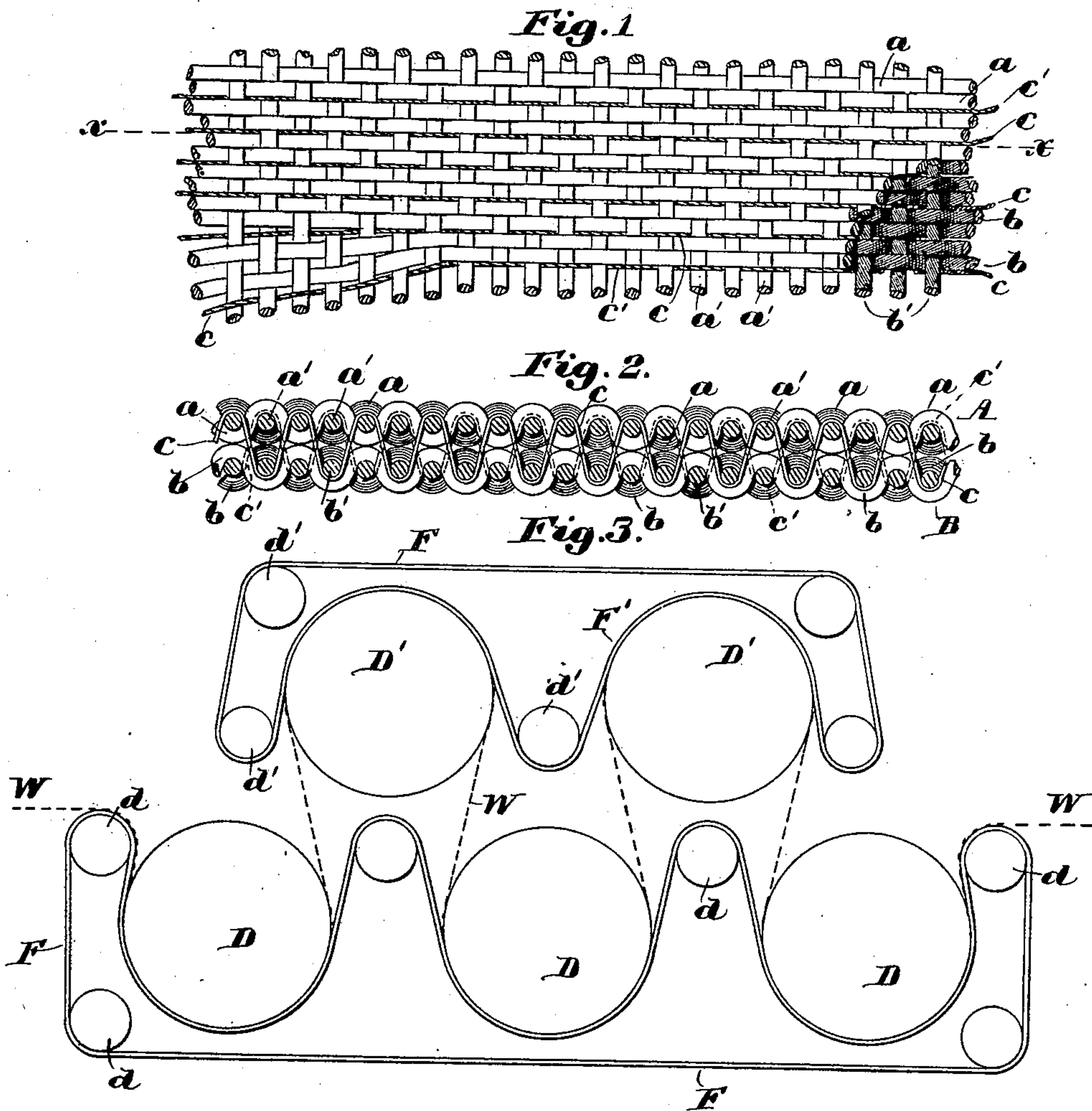
No. 636,482.

Patented Nov. 7, 1899.

W. L. BARRELL.
DRYER FELT FOR PAPER MACHINES.

(Application filed Apr. 12, 1897.)

(Specimens.)



Witnesses:
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DRIER-FELT FOR PAPER-MACHINES.

SPECIFICATION forming part of Letters Patent No. 636,482, dated November 7, 1899.

Application filed April 12, 1897. Serial No. 631,725. (Specimens.)

To all whom it may concern:

Be it known that I, WILLIAM L. BARRELL, of Lawrence, in the county of Essex and State of Massachusetts, have invented an Improvement in Drier-Felts for Paper-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 In paper-machines it is usual to employ a drier-felt made as a strong closely-woven textile fabric as an apron or carrier to support the damp new web of paper as it comes in a still soft condition from the wet woolen felt, 15 the drier-felt holding the paper-web firmly and smoothly against the heated metal drier-cylinders, around and over which the web passes until dried and ready for the calender-rolls. Only one side of the drier felt or apron 20 comes in contact with the damp web of paper, through which the heat from the driers passes, and the action of the dampness and heat in a very short time rots the fabric of the drier-felt and burns holes therein, rendering it 25 worthless, so that it must be discarded. The burning and rotting of the fabric act upon and loosens the warp-threads, leaving a jagged or irregular depression or hole in the surface, into which the soft moist paper will press, 30 causing wart-like bunches or excrescences on the finished web and either spoiling it or greatly reducing its value.

In my efforts to improve the construction of drier-felts and increase the life thereof I 35 have discovered that a double-ply fabric composed of two plies of woven fabric each complete in itself, superposed one upon the other and connected by binder-warps smaller than the face-warps of the plies, will accomplish 40 the desired object, the binder-warps being so buried by and between the face-warps that the latter may be substantially burned off without separation of the plies, one of the said plies continuing to serve as a protector 45 for the other.

Figure 1 is a plan view, on an enlarged scale, of a drier-felt embodying my invention, the warp-threads being separated at one corner. Fig. 2 is a longitudinal sectional view 50 of the fabric, taken on the line $x x$, Fig. 1; and Fig. 3 is a diagrammatic view, in side elevation, of a portion of the drying-cylinder of

a paper-machine, showing the drier-felts and the paper-web.

Referring to Fig. 3, the heated drying-cyl- 55 inders $D D'$ are so arranged that the web W of damp soft paper will as it leaves the wet woolen felt pass over and around one after another of said cylinders or driers. Idler-rolls $d d'$ are arranged, as shown, relatively to the 60 drying-cylinders, and endless drier felts or aprons $F F'$ pass around them in such manner as to press the web W firmly and smoothly against the drying-cylinders. It will be seen that the same face of the drier-felt is always 65 brought into contact with the damp paper and that the rotting action of the dampness and heat acts upon the face next the paper, so that when in the ordinary felt a warp-thread is started the hole or depression will soon extend in area, and the fabric must be discarded 70 after a very short time.

My novel drier-felt is shown most clearly as to its structure in Fig. 2, and consists of two superposed plies A and B , composed, re- 75 spectively, of warp and filling threads $a a'$ and $b b'$, each ply being in itself a complete double-faced woven fabric, both the filling and warp threads being preferably of cotton. The two plies of fabric are woven in any usual 80 manner on a suitable loom, and in the process of weaving smaller or finer binder-warps $c c'$ are introduced, each of which passes around a filling-thread of one ply, through the other ply, around the next pick of filling therein, 85 then up and around the succeeding filling of the first ply. In this manner each binder-warp passes around every other filling-thread in either ply adjacent the inner or under sides of the face-warps, and successive binder- 90 warps cross each other, as it were, as clearly shown in Fig. 2, so that the two plies are firmly bound together. The binder-warps are much finer than the body or face warps, so that the latter extend considerably beyond 95 and bury the binder-warps between and under them, and in actual practice the binder-warps are thus covered or concealed, owing to the lateral spread of the face-warps and the greater tension to which the binder-warps 100 are subjected in weaving. A large number of binder-warps are employed, and they may be used one for each face-warp, one for every two face-warps, as shown in Fig. 1, or other-

wise, according to the size of the drier-felt, the diameter of the face-warps, &c.

By using my novel drier-felt the entire ply next the web of paper may be entirely or substantially burned out or used up, the burned threads serving as a protection to the other ply, to which they are firmly attached by the protected binder-threads, and the felt will remain serviceable until the outer ply becomes burned out and begins to fall apart. It will be seen that the ply next the heat and paper protects the outer ply, and even when after a time the warp-threads of the former are burned off in places still the numerous binder-warps will prevent them from falling apart and leaving a hole or depression, as in the drier-felts now in common use.

Both Figs. 1 and 2 show the filling-threads separated much more than they would be in actual practice, as the fabric presents a hard firm surface closely woven to act upon the damp paper-web.

While I have shown the successive binder-threads as crossing each other in direction—the preferable construction, as a firmer fabric is thereby produced—still the binder-warps may all run in the same direction, as in light weights of the felt or for shorter lengths.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A drier-felt for paper-machines, consisting of two superposed plies of double-face woven fabric having large face-warps, said plies being united by smaller binder-warps adjacent the under or inner sides of the face-warps and buried under the said face-warps of the plies, substantially as described.

2. A drier-felt for paper-machines, consisting of two superposed plies of close-woven double-face fabric having large face-warps, said plies being united by smaller binder-warps adjacent the under or inner sides of the face-warps, the binder-warps passing from one to the other ply and buried under the said face-warps, successive binder-warps crossing each other as they pass from one to the other ply, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM L. BARRELL.

Witnesses:

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