UNITED STATES PATENT OFFICE.

SETH W. BAKER, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN DRIER-FELTS FOR PAPER-MAKING MACHINES.

Specification forming part of Letters Patent No. **50,323**, dated October 10, 1865.

To all whom it may concern:

Be it known that I, SETH W. BAKER, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Drier-Felts for Paper-Making Machines (for which I have obtained an English patent in the name of William Boaler, bearing date May 9, A. D. 1863;) and I do hereby declare that the following description forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

The present invention consists of the substitution, in paper-making machines, of a peculiarly-suitable kind of cloth in place of the ordinary drier-felt heretofore and now in use. This drier-felt consists of an endless web of cloth running over a series of cylinders, usually termed "dry-cans," heated with steam, and carries in its revolutions to and over the surface of the dry-cans the pulp after it is formed into a sheet, thus drying and extracting the water or liquid from the pulp.

The materials most generally used for drier-felts consist either of felted wool or canvas; but in order to give them the necessary strength and thickness they are, by the very process by which they are manufactured, rendered stiff and inflexible, the wool of which one is composed and the cotton of which the other is made being so tightly compressed and the fibers of the fabric so compact as to prevent the ready escape through it of the steam or vapor arising from the wet pulp when brought in contact with the dry-cans. To remedy this difficulty it has therefore been necessary to use a large number of heating-cylinders and a high pressure of steam therein. It is well known, however, that paper made with a moderate degree of heat is much stronger and better than that made with an excessive heat.

The drier-felt which I employ consists of a peculiar cellularly-woven fabric, being, moreover, strong, even, soft, and flexible, the threads of which it is composed being so arranged in regard to each other that the steam or vapor from the pulp will pass readily through it, as water passes through a sieve. Thus I am enabled to make paper at a less degree of heat than has heretofore been possible, because the steam or vapor from the pulp finds a ready escape through the drier-felt, thereby enabling me to use a fewer number of drying-cylinders and a less pressure of steam.

The peculiar cloth which I employ consists of many threads and webs bound together in the weaving, and forming one cloth, either twill, plain, or chain. By preference I employ cotton; but linen, wool, or any other textile or fibrous material could be used either wholly or in combination with cotton.

In manufacturing the cloth which I use for the purpose above described in paper-machines of the ordinary construction I employ the following means, which will be easily understood by those who are familiar with weaving machinery.

I employ an ordinary loom of any required width, to which is attached a positive or any other taking-up motion for conveying away the cloth as it is woven. In the loom is placed a beam for holding the warp. The loom is so arranged that such a number of shafts or heddles may be employed as is requisite for the production of this fabric.

The harness can be worked with either lappet, index, chain, or Jacquard machine, as may be thought proper or most convenient.

The cloth is woven in the following manner: I employ two or more sets of warps, according to the thickness of the cloth required, which may be produced of any thickness, either by using thick yarn or more warps. The warp-threads are drawn through heddles in such a manner as to produce at every change of the tappet or other equivalent a shed, through which the shuttle passes a thread or weft, and after the requisite number of changes (which may be varied) have been repeated as often as required a soft, spongy, porous cloth is produced.

I employ looms constructed of different widths to correspond with the widths of cloth required to be made. I use for six-ply cloth, twelve harness; four-ply, eight harness; three-ply, six harness. In my experiments I have found good results from the six-ply cloth made with the twelve harness. The looms are made

sufficiently deep to work the greatest number of harness, and are of course adapted to a less number when required. The best mode of manufacturing this peculiar fabric is that fully described in the schedule annexed to the Letters Patent of the United States granted to John Geyer, bearing date May 18, 1858, and numbered 20,267. It will be observed that what distinguishes this cloth in the mode of manufacture from ordinary cloth is such an arrangement of the harness and treadles as will produce cloth of any desired thickness, whether two or more ply, six-ply being found generally most useful. I unite the ends of this thick cloth, in its adaptation for drier-felts, by the process patented by me October 22, 1861, under the head of "Improvements in Woven Endless Belts."

Having thus described my improvements, what I claim as my invention, and desire to have secured to me by Letters Patent, is—

The use of the peculiar fabric hereinabove described for a drier-felt in paper-making machines, the ends being united so as to make an endless belt or band, as set forth.

S. W. BAKER.

Witnesses:

JOSEPH GAVETT,

SAMEL. M. BARTON.