

United States Patent Office.

A. F. BISHOP AND JOHN H. AIKEN, OF NORWALK, CONNECTICUT, AND JOHN M. PENDLETON AND A. W. GATES, OF NEW YORK, N. Y.

Letters Patent No. 92,149, dated July 6, 1869.

IMPROVEMENT IN CARD-CLOTHING.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, A. F. BISHOP, of Norwalk, in the county of Fairfield, and State of Connecticut, JOHN M. PENDLETON, of New York city, in the State of New York, JOHN H. AIKEN, of Norwalk aforesaid, and A. W. GATES, of New York city aforesaid, have invented certain new and useful Improvements in Card-Clothing; and we do hereby declare that the following is a full and exact description thereof.

In this country, leather is the staple article for the backs for card-clothing, while in Europe cloth backs, or cloth with sheets of India rubber, are extensively, and almost exclusively used. American manufacturers cannot use the European backs successfully, for the reason, that with them, much more stock is carded in a given time, and this puts so much work upon the card as to raise the sheets from the cylinder, and to cause the card-teeth to clash and break. The best ends, however, are not attained in cloth card-clothing, even in the European practice, because it must necessarily be manufactured as hard as possible, which detracts from its elasticity, and tends to defeat a very desirable quality.

Most American manufacturers use leather, not so much because they are satisfied with it, but because they have been unable to obtain a reliable substitute. The objections to leather are, first, want of uniformity in its natural texture and elasticity. A strip of leather four feet in length must necessarily come from different parts of the animal, and, in the process of tanning, or otherwise, will disclose variations, and form hard spots, difficult of removal. When subjected to wear, there is, in practice, a want of pliability in the whole, or in part, which results disastrously to the card-teeth. And, second, leather is sensitive to hygrometric changes, and, before the cards are half worn out, the leather, constantly deteriorating, becomes so hard and unyielding as to cause the wire teeth to break off, or become much less serviceable and perfect in action.

These objections our invention, in a great measure, overcomes, and, at the same time, secures sufficient strength and power of resistance to do the work of the American manufacturer. We secure, in practice, the genial and uniform softness of the English cloth clothing, and the greater resistance of leather, and thus a quality of work equal to that produced on the English cards, and a quantity equal to that attained by the use of leather, can be secured by our invention.

It will be observed that our invention employs materials and a combination substantially in accordance with the claim in the Letters Patent granted to Bishop, Pendleton, and Aiken, dated September 1, 1868, but with additions and variations, formed by adding and incorporating, with the wool and rubber, stronger fabrics, which render the product strong and serviceable for card-backs.

To prepare our backing, we employ wool closely felted, according to the most improved methods, upon both sides of a strong fabric of muslin or linen, or textile fabric of any kind possessing the necessary strength, and a substantial body is obtained, of the required thickness. This is then immersed and completely saturated in a vulcanizable compound, composed of rubber or allied gum, or mixtures of the same, held in solution by benzine, or some other well-known solvent.

The article thus prepared is then covered, on one or both sides, with a strong muslin or linen fabric, with a sheet of unvulcanized India rubber between, and the combined mass is then placed between steam-tables, and, the heat being raised to about 300° Fahrenheit, the rubber in the interstices of the fibre becomes thoroughly vulcanized, and the muslin or linen cover or covers, during the vulcanization under pressure, becomes fully united with the woollen base, and is firmly held by the India rubber.

We now have a body of the required thickness, very pliable, and of a character resembling new leather, and, at the same time, of sufficient strength to stand the strain to which it must be subjected in putting it tightly upon the cylinders, and all the subsequent strain to which it must be subjected in use.

We set the wire teeth by any ordinary machine; but the holes required, in order to receive the same-sized wire, in our card-backs, are found, upon trial, to be much smaller than those required in leather, and the needle used in perforating them should be several sizes smaller. The exact size must be determined, by trial, with any given stock, but, as a general suggestion, we should say three sizes smaller than for leather.

The wire is thus held much more closely, and, being firmly supported in an elastic body, will bear deflecting to a much greater extent, and still return to its upright position; and it returns with a vigor and force not found in leather, or any substitute hitherto in use, with every indication that these qualities will remain permanent.

In short, there results a combination of the great and desirable qualities of pliability, uniformity, strength, and durability, in a higher degree than ever before attained.

It may not be essential to fix the muslin upon both surfaces. We believe that a sufficiently strong body may be produced with the central fabric, and a tough and uniform muslin on one side.

It may be practicable to dispense with the central fabric.

It may be preferable to use a woollen woven cloth, instead of felt, or to mix some other animal or vegetable fibre with the wool, such as hair or flax.

In the matter of fibre, we do not expect to confine ourselves, in practice, to any plan, but leave it for experience to prove what kind of fibre, or what kinds, may be most advantageously employed. We esteem

it only essential to secure a sufficiently-thick and uniform body of wool, or similar material, strengthened with some kind of non-elastic cloth, without coarse yarns, to deflect the teeth, and then to have the mass saturated with a vulcanizable material or compound, and thus change the character of the compound mass by thoroughly vulcanizing at the proper temperature.

We think that our card-clothing can be manufactured, in large quantities, at a less price than the cost of ordinary leather-backed card-clothing now in use.

We do not wish to be understood as claiming the materials employed in our card-clothing; but having now fully described our invention,

What we claim as new, and desire to secure by Letters Patent, is—

1. The compound vulcanized fabric, having the central cloth, the enveloping softer fibre, the gum vulcanized in place among the fibres, and the covering-fab-

ric or fabrics, combined and arranged as specified, and so as to possess the qualities substantially as herein set forth.

2. The above-defined backing-material, in combination with the card-teeth, as specified.

In testimony whereof, we have hereunto set our names, in presence of four subscribing witnesses.

A. F. BISHOP.

JOHN M. PENDLETON.

JOHN H. AIKEN.

A. W. GATES.

Witnesses for A. F. BISHOP and JOHN H. AIKEN:

JOHN H. BRADY,

JOSEPH F. FOOTE.

Witnesses for J. M. PENDLETON and A. W. GATES:

FRED. T. SEEDS,

J. R. STURGES.