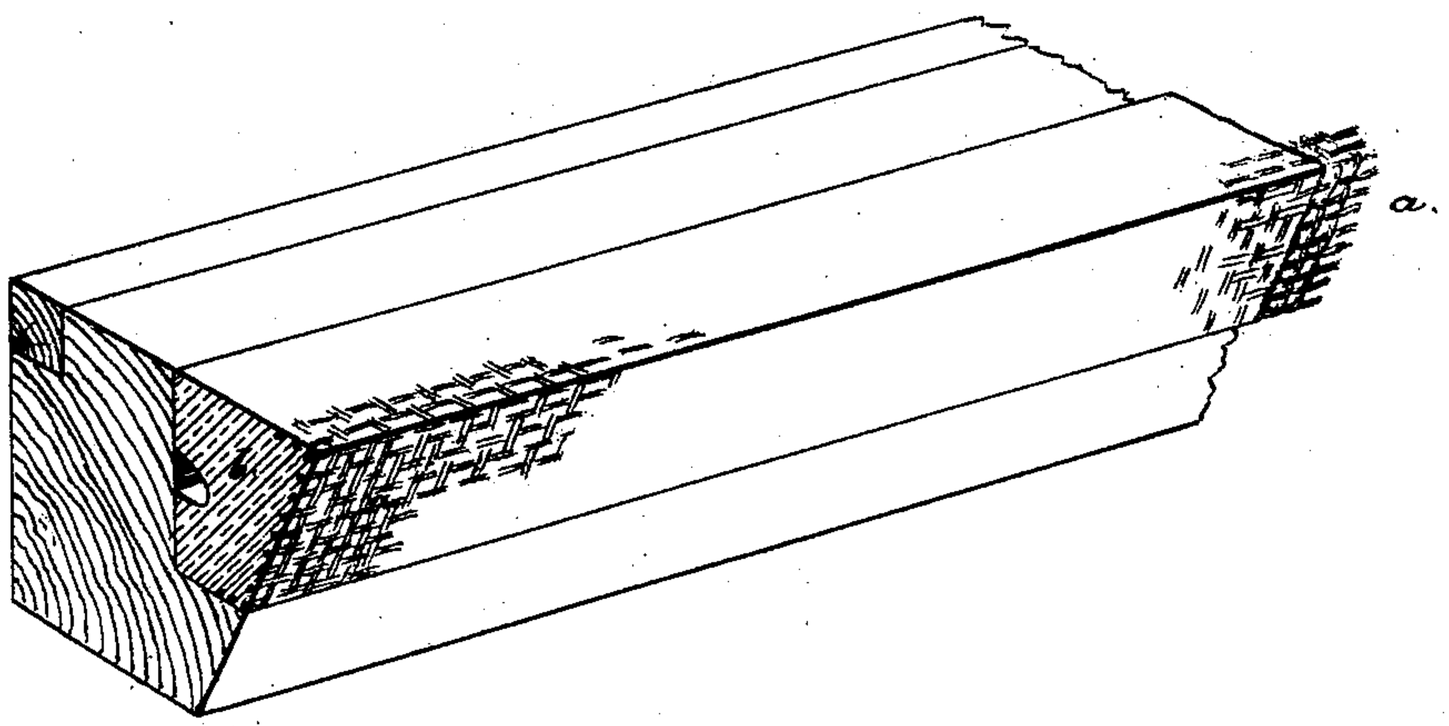
C. L. Richards',

Billiard Cushion.

No. 101,163. Patented Mar. 22. 1870.



Witnesses.

Charles Lloyd Richards
by his attorney.
A. Pollock

UNITED STATES PATENT OFFICE.

CHARLES L. RICHARDS, OF NEW YORK, N. Y.

IMPROVEMENT IN INDIA-RUBBER BILLIARD-CUSHIONS.

Specification forming part of Letters Patent No. **101,163,** dated March 22, 1870.

To all whom it may concern:

Be it known that I, CHARLES LLOYD RICHARDS, of New York, in the county and State of New York, have invented certain new and useful Improvements in Vulcanized India-Rubber Billiard-Cushions; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, which represents in perspective a portion of a billiard-cushion made in accordance with my invention.

After the introduction of vulcanized rubber as a cushion for billiard-tables, it was found that although the cushion possessed one essential qualification—elasticity—its use was attended with a drawback, which counterbalanced to a great extent the advantage derived. The drawback was the inaccuracy of the cushion, or its failure to deflect the ball at an angle equal to the angle of incidence, and this was attributed to the partial embedding of the ball, when it struck against the cushion, in the elastic and yielding rubber, from which it would naturally be thrown at a sharper or more acute angle than that at which it struck. The object therefore of billiard-table manufacturers was to reduce the yielding properties of the cushion, and this they first attempted to accomplish by the use of leather, pasteboard, cloth, or a mixture of rubber with fibrous material applied to the face of the cushion; but while these devices gave the cushion increased powers of resistance to the ball, they at the same time deadened it and detracted from its elasticity. The attempt was then made to preserve at the same time the resistant power and the elasticity of the cushion, as it was found that a cushion which, though resistant, had a reduced elasticity was as defective as one which, although highly elastic, was too soft and yielding. To this end rubber layers of various degrees of hardness were combined in the cushion, and a steel facing was also employed, as well as steel strips, or strips of cloth embedded in the cushion and cords stretched along its edge; but all these methods have been found to be defective, for the reason that the elasticity of the cushion is more or less impaired, while its accuracy is not essentially increased.

From careful and long-continued experiment I am satisfied that the true remedy for the difficulty above stated has never been ascertained. The efforts in this direction have hitherto resulted in presenting a resistant surface at the point where the ball strikes, and the effect of the impact upon other portions of the cushion, even if noticed, has not been sufficiently guarded against. The ball comes in contact with the upper part or edge only of the slanting face of the cushion, and the comparative size of the ball and cushion is such that if the ball be divided into two equal parts by a horizontal plane, its lower hemisphere will be below the top of the cushion, so that the contact of the cushion is mainly, if not altogether, with the upper half of the ball. The tendency of this is to keep the ball from hopping or jumping from the table; but its further tendency is to cause the ball, when it strikes the cushion, not only to directly indent, but also to force upward, the elastic and yielding material, and this I consider to be the main cause of inaccuracy in the angle of rebound. My object therefore is, while maintaining the elasticity of the cushion virtually unimpaired, to so bind together the face and top and bottom of the cushion as to prevent it from yielding in an upward direction under the impact of the ball. This I accomplish by the use of a loose open woven fabric—such as shown at *a* in the drawing—which is applied to the face of the rubber cushion *b* while the same is yet in a green or plastic state, the fabric extending over the top edge of the cushion and under the bottom edge, so as to tightly confine the rubber. The latter penetrates the meshes of the fabric, which may also be covered with a thin facing or coating of rubber, and the whole is then vulcanized in the usual way. The cords or threads of the fabric which run from the top to the bottom of the rubber effectually prevent the latter from being unduly stretched or forced upward by the ball, and the longitudinal threads or cords give sufficient resistant capacity in that direction. The cushion being thus bound, it becomes absolutely inextensible in either direction, while its elasticity under the direct impact of the ball remains unimpaired. It may be thus made to possess any desired degree of elasticity, while continued and careful experiment has demonstrated that the inaccuracy heretofore existing

in the cushion is, for all practical purposes, entirely removed. The cushion is thus composed of rubber provided with a facing of loosely-woven reticulated fabric, into the meshes of which the rubber enters, so that the two form one and the same piece. The manner in which the body of the cushion is constructed may be varied, (for to that my invention has no relation,) and the netting may be united with the rubber by various means, though I much prefer to put the two together and then unite them by vulcanization. The layer of rubber over the fabric may be more or less thick; or it may be dispensed with, if desired. With regard to the fabric used, I prefer that shown in the drawing, which is manufactured for this express purpose, and is composed of twisted cords or threads resembling ordinary cotton twine; but any suitable netting of an analogous nature may be employed.

Having described my invention and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

A cushion for billiard-tables, composed of vulcanized rubber, in combination with a loosely-woven or reticulated fabric, substantially such as herein described, applied to the face and extended over upon the top and bottom of the rubber, and united with the same by vulcanization or otherwise, as and for the purposes set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

CHAS. L. RICHARDS.

Witnesses:
A. POLLOK,
JOHN L. COBB.