

(No Model.)

2 Sheets—Sheet 1.

G. H. AVERY.
LEATHER COIL FOR WASHERS.

No. 386,051.

Patented July 10, 1888.

Fig. 1.

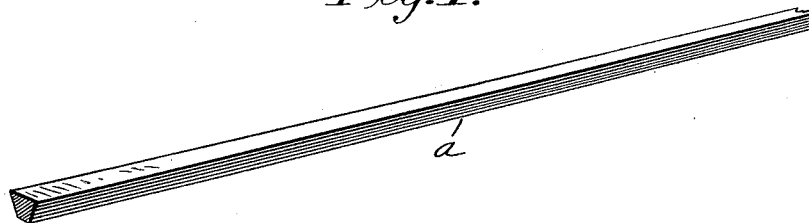


Fig. 2.

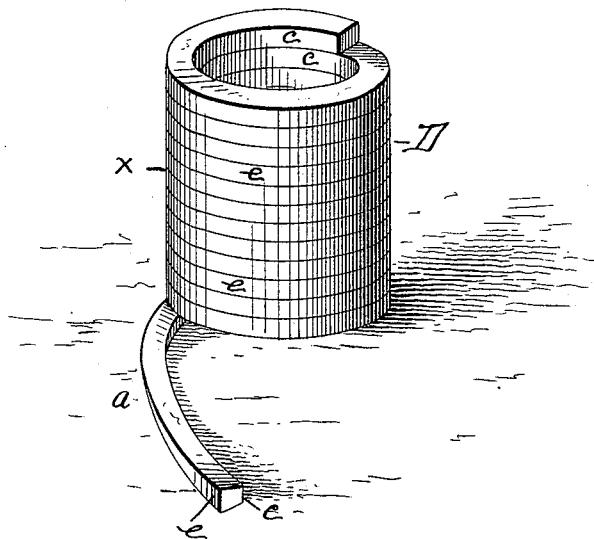
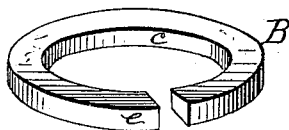


Fig. 3.



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Fig. 4.

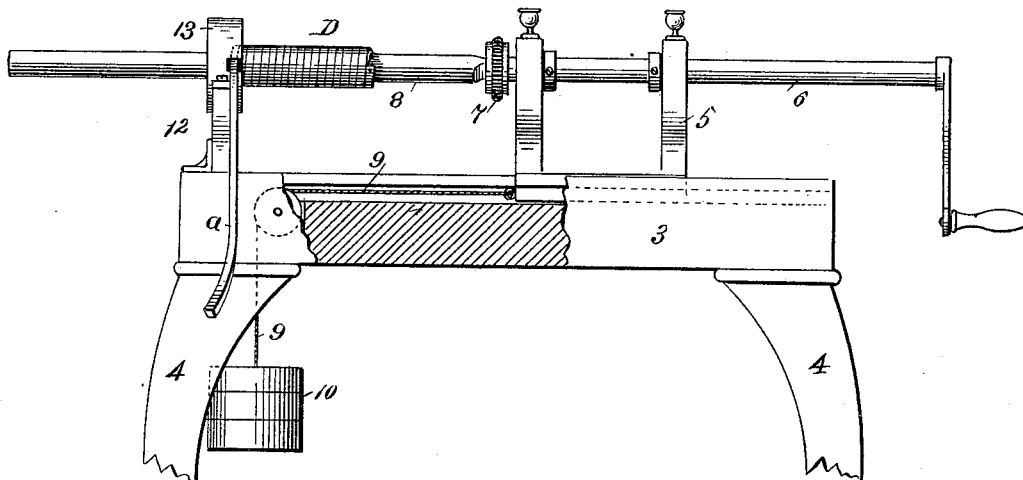


Fig. 5.

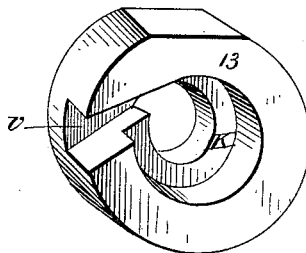
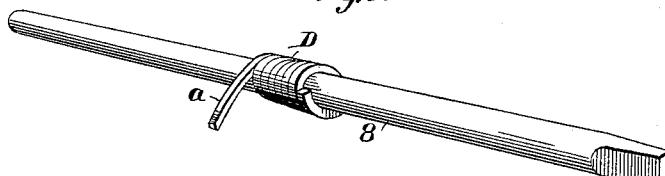


Fig. 6.



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UNITED STATES PATENT OFFICE.

GEORGE H. AVERY, OF EASTHAMPTON, MASSACHUSETTS.

LEATHER COIL FOR WASHERS.

SPECIFICATION forming part of Letters Patent No. 386,051, dated July 10, 1888.

Application filed September 19, 1887. Serial No. 230,033. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. AVERY, a citizen of the United States, residing at Easthampton, in the county of Hampshire and State of Massachusetts, have invented new and useful Improvements in Leather Sleeves and Washers, of which the following is a specification.

This invention relates to leather sleeves and washers, the object being to provide sleeves and washers made from a strip or strips of leather possessing improved characteristics pertaining to the surface and durability of said sleeves and to the solidity and enduring qualities of said washers, all as hereinafter set forth.

In the drawings forming part of this specification, Figures 2 and 3 are respectively perspective views of a sleeve and of a washer constructed according to my invention. Fig. 1 is a perspective view of a strip of leather from which said sleeve and washer are made. Fig. 4 is a side elevation of a machine for rolling said sleeves from a leather strip, the side of the machine being shown partly broken away. Fig. 5 is a perspective view of the coiling and pressure die of said machine. Fig. 6 is a perspective view of the rolling mandrel of said machine, said mandrel, as well as that in said machine, showing a coil of leather wound thereon.

Sleeves and washers have heretofore been made by winding a strip of leather on a mandrel, said strip having in cross-section a square or rectangular form. It is found in practice that in rolling or coiling a strip of leather square in cross-section, to form a sleeve similar to D in Fig. 2, the outside of the sleeve presents a broken or divided surface; or, in other words, the sides of the convolutions adjoining the mandrel are thicker after the strip is wound than before, while the adjoining sides of the strip at and near the surface of the sleeve do not meet, but a spiral groove of a certain width exists between the said convolutions of coils. The above-described effects from winding the said leather strip arise from the fact that the side of said strip which lies against the mandrel becomes gathered in or its particles crowded together longitudinally, and thereby said side is enlarged laterally, while that side of the strip which forms the outside of the sleeve becomes more attenuated than it

is before winding, and hence the cause of the formation of said groove or spaces between the convolutions. Furthermore, it has not been the practice heretofore to so manipulate the strip of leather during the winding operation as to impart any abnormal hardness or solidity to it in a direction at right angles to its length, whereby the durable qualities of the sleeve or washer are greatly improved.

By giving a peculiar form in cross section to the leather strip *a*, from which the sleeve D and the washer B are formed, and by pressing the strip, as below described, while it is being wound, the above referred-to inconveniences are obviated and a greatly-improved sleeve and washer are produced.

In carrying out my invention the strip of leather *a*, which is to form the sleeve D or the washer B, (which is simply one of the coils or convolutions of said sleeve,) is so cut from the side of leather that that side of it which is wound against the mandrel on which the sleeve is formed is narrower than the opposite side of the strip, as shown in Figs. 1 and 2, wherein *c* indicates the narrower side of the strip, which is wound against the mandrel, and *e* the opposite side of the strip, which forms the outer surface of the sleeve and the washer. In other words, said strip has the form in cross section of a trapezoid. The said strip *a*, having been cut as described, is then taken to a machine to be rolled or coiled like or similar to that shown in Fig. 4, in which 3 is the bed of the machine, 4 the legs thereof, (the lower ends of which are shown broken off,) and 5 a sliding head-stock on said bed, in which is hung in suitable bearings a shaft, 6, which is rotated either by a crank, as shown, or by any other suitable means, and on one end of said shaft is fixed a chuck, 7, having a square socket therein to receive one end of a mandrel, 8. The said head-stock 5 is adapted to slide on the bed of the machine to such a degree as will accommodate its movements to the length of a sleeve that is being wound upon the mandrel. A chain or cord, 9, having one end attached to said head-stock, runs over a roller, as shown, and has a weight attached thereto, as shown in Fig. 4. A standard, 12, is fixed on one end of the bed 3, having rigidly secured to its upper end a coiling-die, 13, whose form is illustrated in perspective view in Fig.

5. The mandrel 8 has one end entering said chuck 7, and its opposite end extends through said die, as shown in Fig. 4. A groove, *v*, is formed in one side of said die, which leads to the portion K of its face which bears against the side of the strip while the latter is being wound, the said face K having a plane which runs spirally relative to the axis of the mandrel, whereby it is adapted to the form of the end of the coiled strip or sleeve, whereby said face K of the die has a solid bearing against the end of the coil D while it is being wound, and consequently against the side of each individual convolution of said coil or sleeve D. In making the said sleeve D and the resultant washer B the end of said strip *a* is secured, by a pin or other suitable means, to the side of the mandrel, as shown in Fig. 4, the head-stock 5 at this point in the operation standing somewhat nearer to the standard 12 than is represented in Fig. 4. The end of said strip having been attached to the mandrel, its opposite end is carried through the slot *v* in the die 13 in the position substantially as shown in Fig. 4. The shaft 6 and the mandrel 8 are now given a rotary motion, while the end of the strip *a* is held with more or less force to cause the strip to wind tightly on the mandrel. The said strip is moistened more or less before it is attached to the mandrel.

The operation of turning the shaft 6 while the free end of the strip *a* is held, as aforesaid, causes the spirally-wound sleeve D to be formed on the mandrel, and during the formation thereof each individual convolution constituting said sleeve is subjected to such a heavy pressure by the action of the weight 10, whereby each of said convolutions is pressed against the face K of the die 13, that each of said convolutions is solidified and hardened to such a degree that the quality of the sleeve and of a washer cut therefrom is greatly improved.

It will be understood that as the coiled strip builds onto the mandrel in spiral form it acts against said face of the die like a screw in a nut, and the gradual building on of the convolutions of the sleeve causes the head-stock 5 to move away from the die and to lift the weight 10, thereby pressing said convolutions in the direction of the axis of the coil.

After having formed the coiled sleeve, as above described, the free end of the strip *a* is secured to the mandrel in any suitable manner, and the latter is removed from the machine, and said coil is left to dry before taking it from the mandrel, a second mandrel meanwhile being put into the machine, and the operation is repeated. The end of the strip *a* extending from the lower end of the sleeve D in Fig. 2 indicates the free end of the strip shown in Fig. 4. By making the strip *a* of trapezoidal form in cross-section such an amount of material is removed from the inclined sides of the strip as is equal to the fullness which is given to the side *c* thereof by winding it against the mandrel, and hence the adjoining sides of the convolutions lie so closely side by side that no openings are left between the convolutions on the surface of the sleeve, and each convolution or washer is of equal thickness from its outer to its inner circumferential surface.

What I claim as my invention is—

The leather-washer coil or sleeve herein described, formed from a strip of leather of trapezoidal form in cross section, substantially as set forth.

GEO. H. AVERY.

Witnesses:

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