J. F. LEE, Jr.

BROOMS.

No. 181,454. Patented Aug. 22, 1876.

Fig. 1.

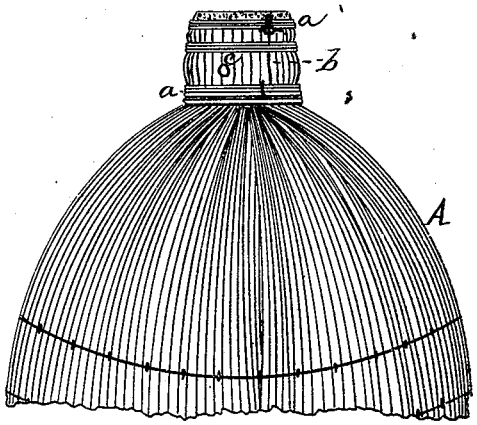


Fig. 2.

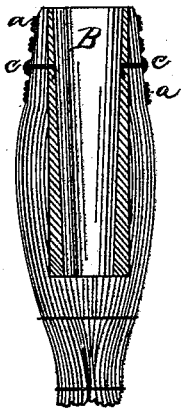


Fig. 3.

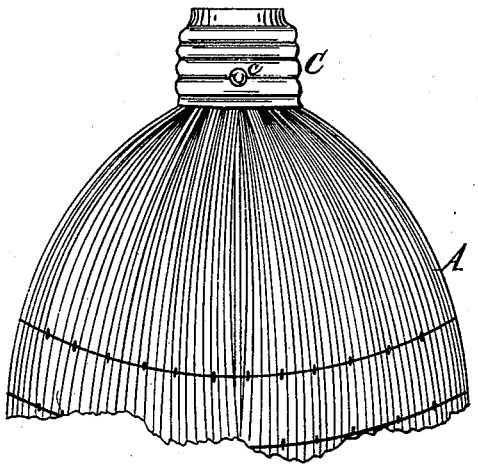
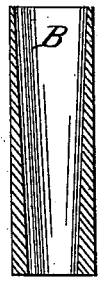


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN F. LEE, JR., OF BROOKLYN, NEW YORK, ASSIGNOR TO CHARLES F. LINDE, OF SAME PLACE.

IMPROVEMENT IN BROOMS.

Specification forming part of Letters Patent No. **181,454**, dated August 22, 1876; application filed December 22, 1875.

To all whom it may concern:

Be it known that I, JOHN F. LEE, Jr., of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Brooms, of which the following is a specification:

The invention which I am about to describe relates to that class of brooms which, instead of being formed upon a fixed handle, are formed upon a conical or tapering socket, to receive the conical or tapering end of the handle to be inserted after the broom is finished.

Heretofore sheet-metal sockets have been chiefly used in this class of brooms, probably chiefly on account of the difficulty of securing sufficient strength in the wood socket without making the head of the broom inadmissibly large, the difficulty of securing the brush of the broom to the wood socket, and the difficulty of securing the socket itself from being driven too far into the brush of the broom when considerable force or percussion is applied in the insertion of the handle. The use of the sheet-metal socket, however, involves not only the additional cost over and above the wood socket, but the more serious difficulty that, in making the broom, the workman is obliged, in cutting off the corn, to cut down upon the metal socket, which speedily dulls the knife, and requires it to be frequently sharpened, thus greatly retarding the work, and thereby increasing the cost of manufacture.

The object of my present invention is to obviate each of these difficulties, and to furnish a broom having a wood socket, which broom shall be at once simple and easy of construction, cheap, and reliable in all the particulars hereinbefore alluded to.

One part of the said invention consists in the mode hereinafter described of constructing the broom with an internally-tapering socket to receive the handle, whereby such construction is much facilitated, and made entirely practicable and easy of accomplishment, and by which mode of construction a broom with a wooden socket, tapering on the inside to receive the handle, and of considerably greater thickness in its lower portion than at its upper end, so as to secure sufficient strength and substance in the socket without undue enlargement of the head of the broom, is made attainable with practical facility and at reasonable cost.

Another part of the said invention consists in the method of securing the binding-wire hereinafter described, by which the almost insurmountable difficulty of fastening the binding-wire securely at the head of the broom to the thin wooden socket is avoided.

Another part of the said invention consists in the mode hereinafter described of securing the socket from being driven too far into the broom.

Another part of the said invention consists in the combination of the said socket, the head of the broom, a cap surrounding the head of the broom, and fastenings extending through the head of the broom to unite the parts with each other.

Figure 1 is a side view of the upper portion of the brush of a broom constructed according to the said invention, without a cap around the head of the broom. Fig. 2 is a transverse vertical section of the same. Fig. 3 is a side view of the same constructed with a metal cap around the head of the broom. Fig. 4 is a vertical central section of the socket.

A is the brush of the broom, which, with the exceptions I am about to describe, is constructed in the manner commonly practiced. B is the socket, which is a cylindrical piece of wood with a conical hole bored therein for the reception of the handle of the broom.

The mode of procedure which I recommend in making the broom is as follows: The workman takes either a solid cylindrical stick of the proper size to form the socket, and of at least sufficient length to be conveniently held in making the broom, or else a similar stick with a cylindrical hole, not larger than the smallest internal diameter of the socket, bored longitudinally through its center, and, having secured this stick in position for working, commences the formation of the brush of the broom in exactly the same manner now ordinarily practiced in forming the brush of a broom upon a handle, care being taken, however, in fastening the inner end of the binding-wire to the socket, not to use a tack of sufficient length to ex-

tend into the hole in the socket or interfere with the bit or reamer in boring or reaming the hole for the introduction of the handle. The work is then proceeded with in the ordinary manner till it comes to fastening the binding-wire *a* at the top of the broom-head; and to accomplish this I run a short piece of wire, *b*, under some of the coils below the top series of outside coils of the binding-wire, and, having secured its end by turning it down over the coil, as shown in Fig. 1, I extend it up either through or outside of the broom-corn, under the upper coil of wire, and secure the upper end of the binding-wire to it by interlocking their ends, as shown in the same figure, preferably by twisting the ends of the two wires together.

The securing of the binding-wire by means of this auxiliary wire *b* is an important feature of this invention, owing to the very great difficulty of securing it to the wooden socket, the latter being too thin at the top when finished to allow the upper end of the wire to be secured to it by a tack, as usually practiced in making brooms upon a handle.

The broom having been thus far constructed, and the surplus corn at the head of the broom cut away, the socket or cylindrical piece of wood on which the brush is formed is then cut off even with the head of the broom, if no cap is to be used, or, if a cap is to be used, then of the proper length to reach the top of the cap, and the cap, if any, being placed in position and temporarily secured there, and the brush so formed being properly secured in a chuck or holding device, the socket is then bored or reamed out, as the case may be, with a tapering bit or reamer, to form the proper conical socket for the reception of the end of the handle, which is made tapering to correspond with it. The socket of the broom is then slipped upon a metallic mandrel, preferably hardened steel, made conical to fit the said socket, and small nails or tacks *c* are driven in through corn and socket, (and the cap, if any,) and clinched upon the said mandrel, as shown in Fig. 2, when the brush of the broom is complete and ready for the reception of the handle when required. Any number of these nails *c* that may be desirable may be used; but two—one on each side—driven in the lower part of the broom-head, as shown, will generally be found sufficient.

A cap, C, while adding slightly to the cost, also adds strength and finish to the broom-head. It aids in holding the outer portions of the nails *c*, and, combined with the other parts by means of the said nails extending through the corn of the broom-head, helps to hold the socket B firmly in position, and prevent its being driven in out of place by the application of force applied in the insertion of the handle.

Any form of cap adapted to the purpose may be used.

It may be, and often is, desirable to secure the handle more permanently in the socket, and more effectually prevent its being worked loose by the vibratory motions to which it is subjected in use than would be done by simply pushing or driving it into place; and this I provide for by coating the end of the broom-handle where it fits into the socket, or is to enter the socket, with a soluble adhesive substance, which, when the broom-handle is to be inserted, may be sufficiently softened by dipping it in water to make it adhere to the sides of the socket. Glue, or a mixture of glue and gum, may be used for this purpose; but I find by experiment that gum-arabic answers every requisite, and I prefer it for the reasons that it is more convenient of application, and more readily softened by dipping it in water than a coating composed in whole or in part of glue. Dextrine would also probably answer the same purpose.

While I consider the construction above described the most feasible and satisfactory on the whole, such construction may nevertheless be varied somewhat without departing from the said invention—as, for example, the socket B, instead of being made exactly cylindrical on the outside, might be enlarged toward its base, so as to give still greater thickness at or near the lower end; or the wire *b*, instead of being extended directly upward from the coils below of the binding-wire to the top coil, might be run spirally through and around the corn of the broom-head, so as to meet said upper coil running in nearly or quite an opposite direction; or it might be so carried round and through the broom-head, and made to form the top coil, and the wire *a* used to fasten it, without changing the nature of this part of the invention.

It is important, and perhaps indispensable to the success of the manufacture of brooms with the internally-tapering wood sockets which I have described, that the stick of which the socket is formed should extend sufficiently from the head of the broom to allow its being firmly held in a proper lathe or clamp while the broom is being formed upon it, and have sufficient strength to resist the strain thrown upon it in the formation of the broom, which can hardly be realized if each socket were first made separately and properly reamed out to receive the handle before the brush was formed upon it, the socket being then too thin at and beyond the top of the broom-head to be so held and to withstand the necessary strain; and for this reason the mode I have described of first forming the brush of the broom upon a solid stick, or a stick having a cylindrical bore of less diameter than the largest internal diameter of the socket when finished, and then, after the brush of the broom is made, reaming or boring out the conical socket, is important.

I claim as my invention—

1. The mode hereinbefore described of constructing the broom with an internally-tapering socket, by first forming the brush of the

broom upon the stick of which the socket is to be formed, and afterward boring or reaming the socket to the size and taper required, substantially as hereinbefore set forth.

2. The combination, with the brush of a broom and its binding-wire *a*, of the fastening-wire *b*, the ends of the wires being interlocked with each other, substantially as hereinbefore set forth.

3. The combination, with the brush of a broom and the conical socket, of the nails or tacks, or their equivalent, extending through one side of the head of the broom, and through one side of the socket, and clinched on their inner ends, substantially as hereinbefore set forth.

4. The combination of the brush of the broom, the conical socket B, and the cap secured to said socket by one or more tacks, or their equivalent, extending through one side of the said cap, through one side of the head of the broom, and through one side of said socket, substantially as hereinbefore set forth.

JOHN F. LEE, JR.

Witnesses:
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THOS. P. HOW.