H. G. ROWELL.

MOP.

APPLICATION FILED AUG. 28, 1909.

1,008,071. Patented Nov. 7, 1911.

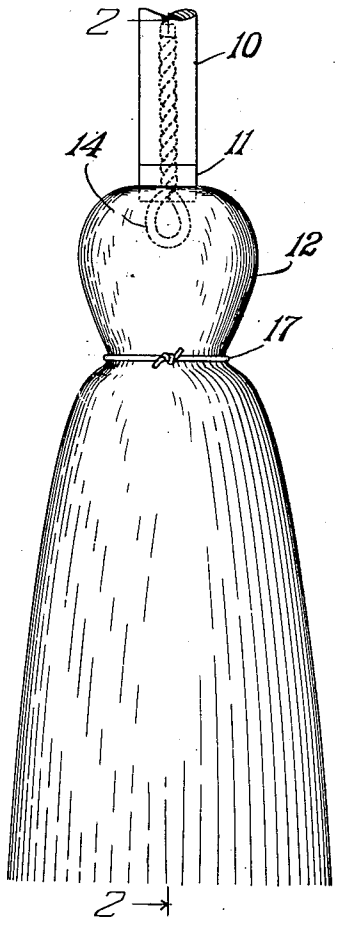

FIG. 1.

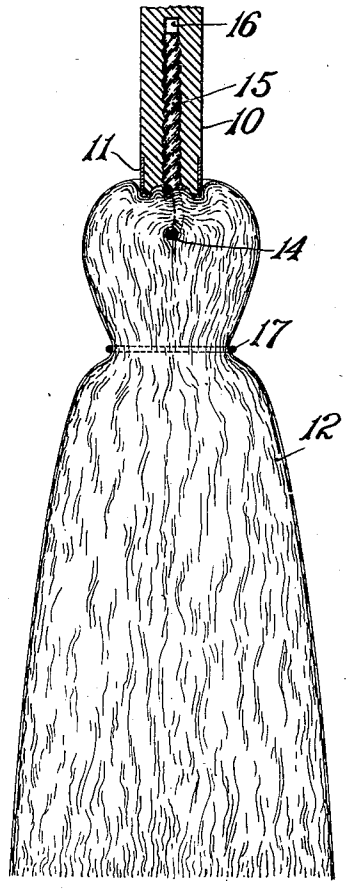

FIG. 2.

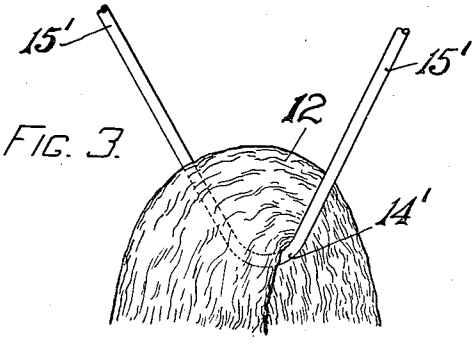

FIG. 3.

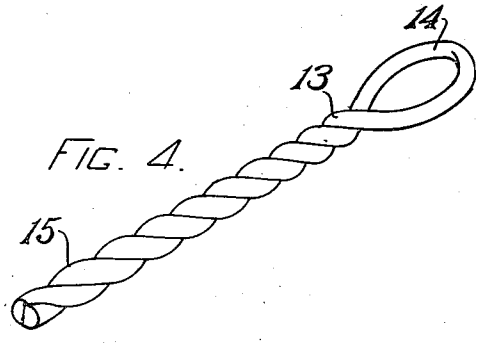

FIG. 4.

WITNESSES

Joseph T. Brennan.

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BY HIS ATTORNEYS

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UNITED STATES PATENT OFFICE.

HERBERT G. ROWELL, OF AUBURN, MAINE, ASSIGNOR OF ONE-HALF TO DANIEL W. HOWLAND, OF BROOKLINE, MASSACHUSETTS.

MOP.

1,008,071. Specification of Letters Patent. Patented Nov. 7, 1911.

Application filed August 28, 1909. Serial No. 515,093.

To all whom it may concern:

Be it known that I, HERBERT G. ROWELL, a citizen of the United States, residing at Auburn, in the county of Androscoggin and State of Maine, have invented new and useful Improvements in Mops, of which the following is a specification.

This invention relates to improvements in mops.

More particularly it relates to mops, such as dry mops, having permanently fastened heads, and to means for fastening the tuft of thrums or other material forming the mop head firmly in a flexible and durable manner by a simple process of manufacture.

The present invention is to provide means by which a head may be sustained at the very end of a handle in a perfectly durable manner, at a cost of manufacture which I believe to be less than any method previously known, thereby attaining complete flexibility, utilizing material previously wasted in some forms of mops because wrapped about the stick, rendering the mop reliable and reducing its cost.

These objects are accomplished by the simple method hereinafter described, in which the head material is bound tight in a loop of twisted wire; the twisted ends of which constitute a straight shank having a round end and helical ridges of steep pitch. When this shank is inserted axially in the end of a handle it cannot be extracted under any normal conditions; because these ridges project into the wood and prevent its direct withdrawal, and their pitch is so great that they prevent its rotation if an effort be made to extract it like a screw.

An embodiment of the invention is illustrated in the accompanying drawings in which—

Figure 1 is a side elevation, Fig. 2 is a side elevation in section on line 2—2 of Fig. 1, Fig. 3 shows an early stage of manufacture, and Fig. 4 shows a detail in perspective, on an enlarged scale.

In the drawings 10 represents a handle or stick for the mop, 11 a ferrule at the end of the stick and 12 a bunch of cotton thrums or yarn, which forms the mop head. 13 is the wire by which this is fastened, having a loop 14 through which all the threads pass and having a shank 15 inserted in a hole 16 bored axially in the end of the handle 10. A cord 17 is generally tied around the exterior of the mass to make it shapely in form.

In assembling the parts, the required quantity of thrums 12 for a complete mop are first arranged parallel to each other in a loose mass as indicated in Fig. 3, resting in the bend 14′ of a piece of wire of suitable strength, preferably galvanized iron wire. The two ends 15′ are then brought together, and by a rotating chuck or other means are twisted while the portion 14′ is held firm. As the twisting progresses stock 12 is forced farther and farther down into the bend 14′, which becomes loop 14, until any desired degree of tightness or compression of the wire on the fibrous stock has been attained. Then the twisted ends are cut off at the right length, and the end compressed to form it into circular form, or a cross section approximately circular as seen in Fig. 4. This operation may conveniently be performed in a powerful press whose jaws are semi-circular die faces, slightly conical. This compresses the two wire ends, each of which originally was circular in cross section (forming in the shank two circles side by side), into forms which are approximately semi-circles; and which unitedly make the end of the shank circular.

The handle 10 is prepared by boring a hole 16 axially in its end, preferably a little smaller than the diameter of the twisted shank 15 and a trifle larger than its compressed circular end, and by placing ferrule 11 upon the end of the handle. The shank is then pressed into the hole. Its helical ridges, formed by the twist of wire, are forced into and compress the wood around the hole slightly as it goes in. Its entrance may be lubricated by first dipping the shank in glue if desired, and this glue subsequently helps retain the parts in place. Its entrance may also be facilitated by rotating the handle slowly while the pressure is being applied and the shank is entering, in which case the twists will screw themselves in, this being the line of least resistance. The reaction of the compressed wood against the rigid and grooved surface of the shank binds it tightly, preventing its extraction by a direct pull; while the extreme pitch of the helix prevents its extraction by rotation in the manner of a screw. This extreme pitch results naturally in the twisting of the wire ends 15′.

This construction may be better understood by bearing in mind that the force ordinarily applied to rotate and extract a screw embedded in wood is a rotatory force acting around the axis and having no component in the axial direction of propulsion. This force has to be resolved into components respectively parallel and perpendicular to the thread, which is the surface on which the screw must slide in unscrewing. If the pitch of the helix be considerable the component parallel to the sliding surfaces will be too small to overcome the friction (to which the other component contributes) between these surfaces, and no sliding will occur. Consequently, no amount of twisting applied by holding the handle and twisting the mop head relatively thereto would be sufficient to unscrew and extract the shank; although if a force pulling outward in the axial direction were added, the component in the direction of slip might become great enough to start the shank. Such extra force never arises under ordinary usage, but has to be deliberately and intentionally applied and the parts therefore never work loose. As a result, the shank 15 is held firmly in the handle, the loop 14 is fixed at the end of the handle and the entire amount of material composing the head held thereby is available for flexible use. With the aid of very simple machinery, the loops 14 can be formed and twisted tight about as fast as a boy can pick up the bunches of material, and the shank ends can be trimmed, compressed and inserted in the handle ends, practically as fast. This reduces the cost of material and of labor a considerable amount relative to costs customary hitherto so far as known to me, and at the same time makes a more durable and flexible mop.

I claim:

A mop comprising a handle, mop material and a twisted wire; said wire being twisted about itself and forming an approximately circular loop, wherein said mop material is gripped in one mass and held tight by said twist of the wire, the twisted portion forming a shank, inserted in and held by the end of the handle.

Signed by me at Auburn, Maine, this twenty-fourth day of August, 1909.

HERBERT G. ROWELL.

Witnesses:

FRANCES M. ROWELL,

DAISY M. RICE.