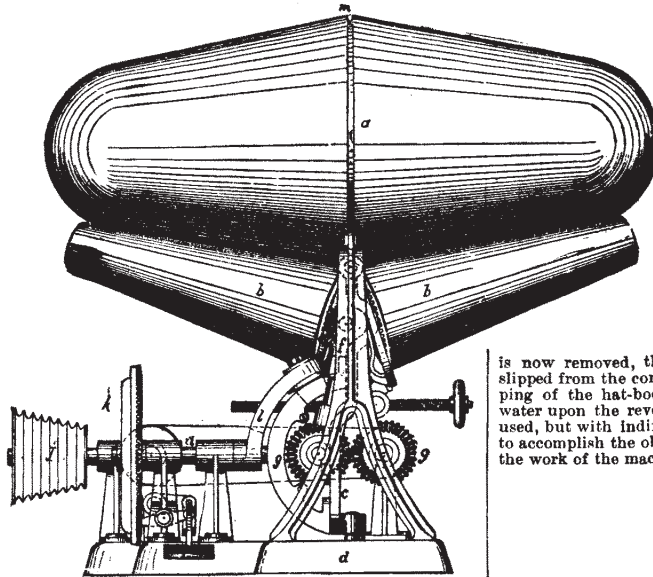


Hat-form'ing Ma-chine'. A machine for setting up hat-bodies. The wool and fur body machines are essentially different.

The first improvement in hat-making over the ancient hand processes was the hat-forming machine of Mason, followed by the patents of Grant. These machines consisted of a conical block upon which a web of wool was wound as fast as it was delivered from the carding machine.

Fig. 1326 is a front view of a wool hat former with a double cone upon which the web is wound. This double cone *a* is supported upon four conical rollers, *b*, two of which only are seen in the view. The rollers are pivoted upon a frame *c*, which is supported on a step in the bed-plate *d*, and is also pivoted on the upper end of the standard *f*. The pivot line of the frame *c* is coincident with the pitch line of the two bevel wheels *g g'*; it is at right angles with the crank-shaft *t*, and in a position close to the front of the double cone *a*.

Fig. 1326.



Wool Hat Forming Machine.

The cone pulley *j* is driven from the carding machine, and gives rotation through the gears *g g'* to the rollers *b b*, and thus to the double cone *a*. By means of a cone and pinion on a suitable countershaft, motion is given to the bevel-wheel *k*, shaft *i*, and crank *l*, which give to the supporting frame and forming cone a vibratory motion in a horizontal plane while the cone is revolving slowly on the rollers, the web from the carding machine winding on to the cone.

When a sufficient quantity of wool has been wound upon the double cone to make two hats, the *bat* is cut in two by the operator, who sets one blade of his shears into the equatorial groove which serves as a guide, and separates the two bodies while the cone is revolving.

It is of the utmost importance to lay the woolen web evenly upon the cone, and also to cross the wool fibers so as to make the hat body of equal strength in every direction; and it is also necessary to be able to adjust the supporting rollers to form cones of various shapes, and to adjust the speed to the different sizes of hats to be formed. All the woolen hat formers are therefore made adjustable in these various ways, and answer the requirements in greater or less degree, as the mechanism is more or less perfect.

The hat-forming machine for fur bodies is very different from that used for woolen bodies. Instead of a fine fleece from the carding machine wrapped upon a revolving former, the fur body former is a perforated cone with an interior exhaust blast and a fur picker which sends a fine cloud of hairs toward the cone on which they collect in a bat.

The machine is the invention of Henry A. Wells, who accomplished for the fur hat-body trade what Grant had previously done for the woolen hat-body. Wells's machine, improved by Taylor, Burr, St. John, and others, has disposed of the hatter's bow for ever. With an improved Wells machine 400 hat-bodies of superior quality can be made per day, and these, by dipping in a suitable bath, are made sufficiently firm to be sized into proper shape.

The machine is shown at Fig. 2431, p. 1075, "*Mech. Dict.*" As now used it consists of a feeding apron and a suitable picker which throws the fur upon a perforated cone.

The feeding apron and feeding rollers are upon a frame which furnishes also support for the bearings of the picker cylinder and the main driving shaft. A trunk or covered way is closely fitted to the frame and the cover which encloses the upper part of the picker cylinder. The trunk or conductor has a sectional shape corresponding somewhat with the shape of the former cone, and is adjustable in height by a supporting screw. The former cone is placed centrally upon a revolving table which has an opening in its center communicating with the inlet of the suction blower. The operator who weighs out the quantity of fur required for

each hat-body places it evenly upon the feed apron, which is then started; the fur is delivered to the picker and guided by the conductor to the cone, where the fur is held by the pressure of air created by the fan which exhausts the air from the inside of the perforated cone.

When the fur for a hat has all been deposited upon the cone, a wet cloth is thrown over the tip, another cloth wrapped around the sides, and a hollow cap corresponding with the former cone is placed over the whole. The cone, with the hat-body thus held between it and the cap, is removed, another cone placed on the turning-table, and another hat-body formed as before.

To make the fibers adhere to each other the cone with its cover is then put upon a platform which is suspended by balancing weights over the dipping-tub, and is gradually submerged in hot water. The outer cone

is now removed, the cloths taken off, and the hat-body slipped from the cone ready to be sized. To avoid the dipping of the hat-bodies, a sprinkling-pipe which blows hot water upon the revolving hat-body has been to some extent used, but with indifferent success, as more time is required to accomplish the object by the last-mentioned method, and the work of the machine is to this extent diminished.