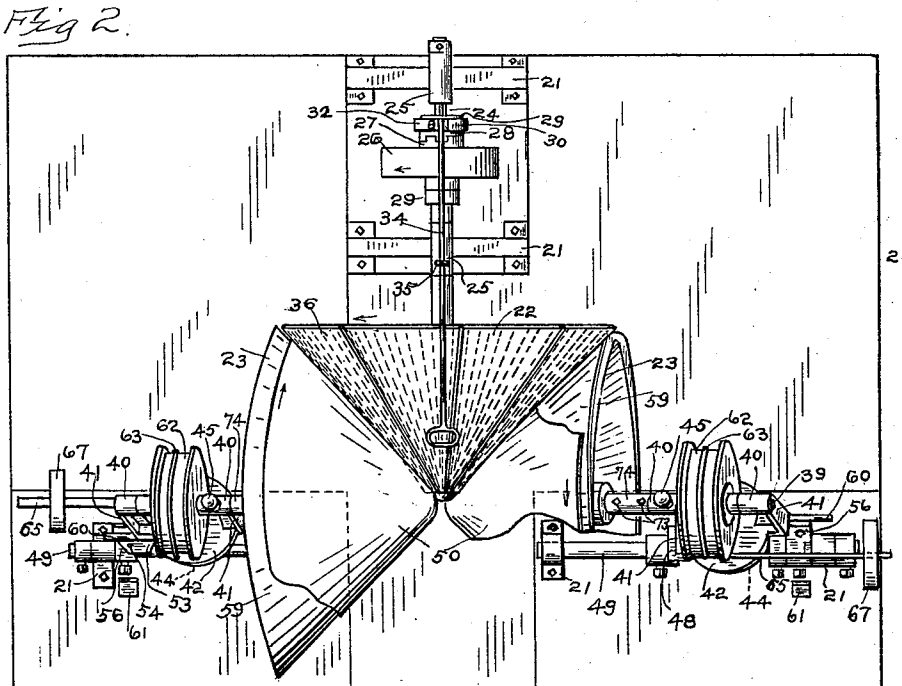
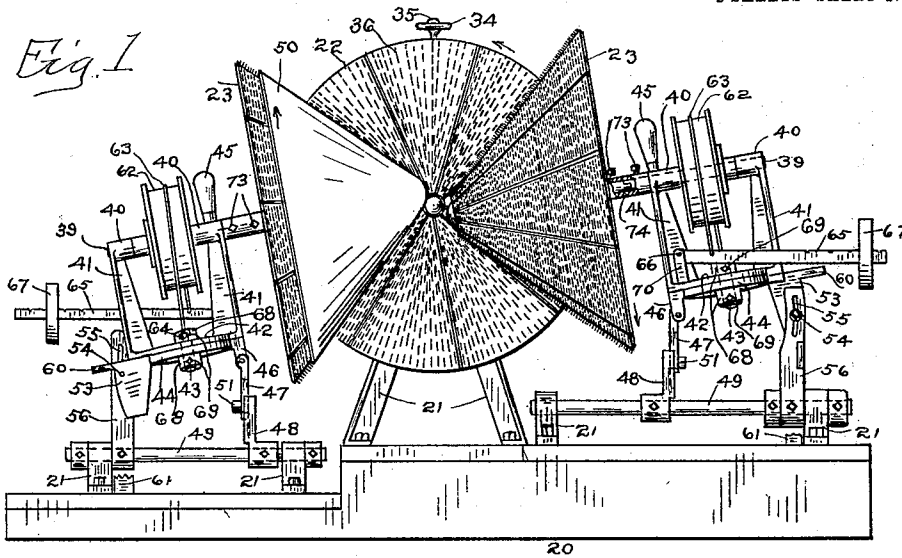


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 APPLICATION FILED MAR. 16, 1910.

1,017,952.

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2 SHEETS—SHEET 1.



WITNESSES:

Ernest P. Vold
S. W. Arthurton

INVENTOR

George E. Brush
 BY *A. M. Proctor*
 ATTORNEY

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Fig. 3.

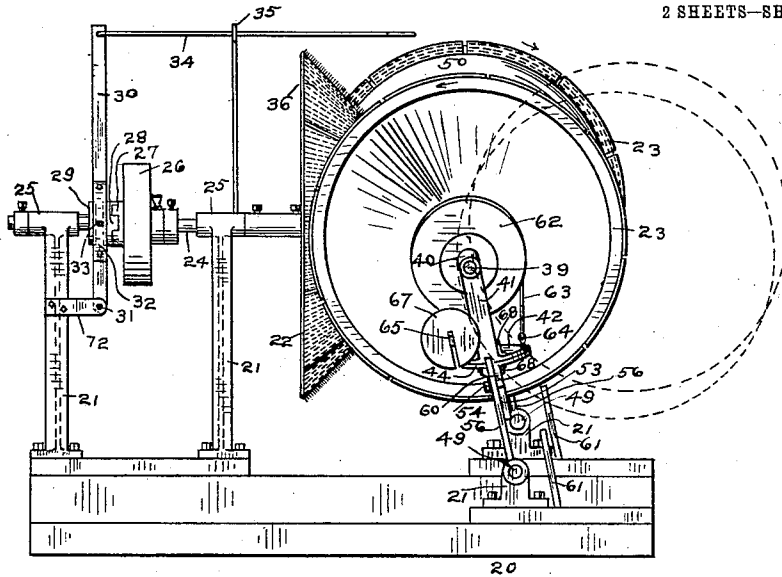


Fig. 4.

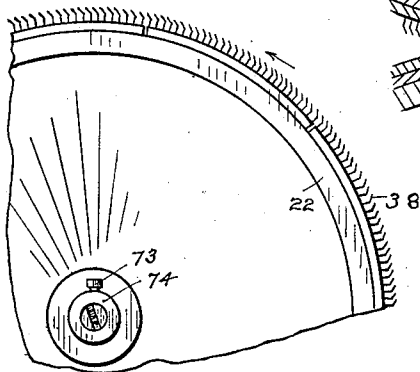


Fig. 9.

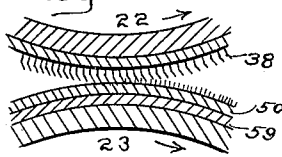


Fig. 5.

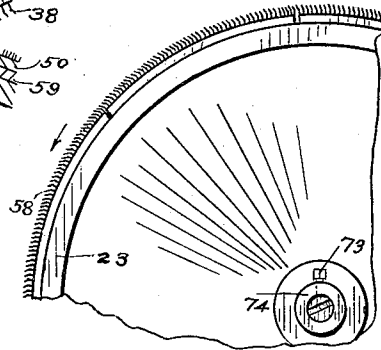


Fig. 8.

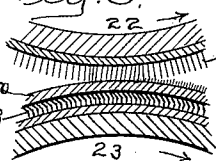


Fig. 6.

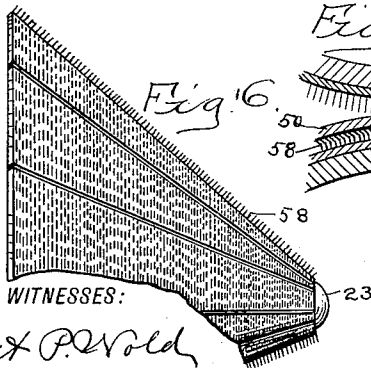
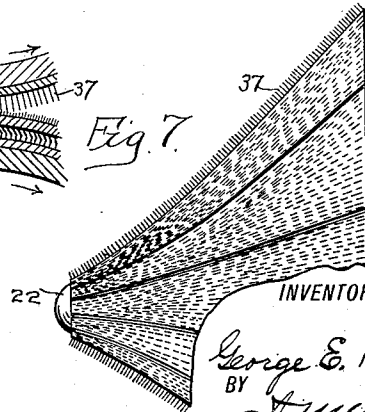


Fig. 7.



WITNESSES:

Ernst P. Vold,
 S. W. Atherton.

INVENTOR

George E. Brush
 BY
 A. H. Wooster
 ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE E. BRUSH, OF DANBURY, CONNECTICUT, ASSIGNOR TO E. A. MALLORY AND SONS, INCORPORATED, OF DANBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

NAP-RAISING MACHINE FOR FELT HATS.

1,017,952.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed March 16, 1910. Serial No. 549,684.

To all whom it may concern:

Be it known that I, GEORGE E. BRUSH, a citizen of the United States, residing at Danbury, county of Fairfield, State of Connecticut, have invented an Improvement in Nap-Raising Machines for Felt Hats, of which the following is a specification.

This invention relates to the manufacture of napped or velvet hats, so called, that is felt hats having a nap raised or picked up from the body of the hat, and the invention has for its object to provide a machine for raising the nap upon a plurality of hat bodies simultaneously or, as it is called in the art, "jacking" the bodies.

With this end in view I have devised the novel nap raising machine which I will now describe, referring to the accompanying drawings forming a part of this specification and using reference characters to indicate the several parts.

Figure 1 is a front elevation of my novel machine as in use; Fig. 2 a plan view partly broken away; Fig. 3 a side elevation as seen from the left in Fig. 1; Fig. 4 a partial rear elevation, on an enlarged scale, of the nap raising cone detached; Fig. 5 a similar view of a body carrying cone detached, the surface of the cone being covered with a special form of card cloth; Figs. 6 and 7 are side elevations of variant forms of nap raising cones detached, Fig. 6 showing a straight cone, that is a cone in which the line from base to apex is a straight line, and Fig. 7 showing a concave cone; Fig. 8 a detail sectional view illustrating the operation of raising the nap, the carrying cone being shown with a card surface, as in Fig. 5, and the nap raising cone with a straight wire surface, that is a surface covered with card cloth having straight wires; and Fig. 9 is a similar view showing the carrying cone provided with a felt surface and the nap raising cone provided with a bent wire surface, that is a surface covered with card cloth having bent wires.

For convenience in illustration I have shown two body carrying cones only although it should be understood that three, or if preferred four, body carrying cones may be used in coöperation with a single nap raising cone, an important feature of the invention being that the body-carrying cones are placed so that their acting surfaces are at a slight angle to the direction of

slant of the surface of the nap raising cone, so that the action of the nap raising cone is to crowd the hat bodies upon the carrying cones instead of to draw them off.

20 denotes a suitable base to which brackets 21 of any ordinary or preferred form are rigidly secured.

22 denotes the nap raising cone and 23 body carrying cones.

24 denotes a shaft by which the nap raising cone is carried and which is shown as journaled in bearings 25 upon two of the brackets 21 in line parallel with the base or the longitudinal median line of the machine. This cone is driven by means of a belt (not shown) passing over a belt pulley 26 on shaft 24, said pulley being in the present instance loose upon the shaft, and provided with a clutch member 27 which is adapted to be engaged by a corresponding clutch member 28 on a collar 29 which is keyed to the shaft but is adapted to slide longitudinally thereon. The clutch is operated by means of a lever 30 pivoted, as at 31, to an arm 72 extending from one of the brackets and provided with a yoke 32 having pins 33 which engage a groove in the collar. This lever is shown as operated by means of a rod 34 pivoted to the lever and supported in a holder 35 extending from one of the bearings 25, the rod extending into position to be conveniently manipulated by the operator.

The surface of the nap raising cone is covered with card cloth which is applied thereto in sector-shaped pieces, indicated by 36. In Fig. 8, I have shown the nap raising cone as covered with card cloth having straight wires, indicated by 37, and in Fig. 9 have shown this cone as covered with card cloth having wires indicated by 38 which are bent forward in the direction of rotation of the cone, as clearly shown. The action of these wires is to dig into the surface of hat bodies, indicated by 50, on the carrying cones and to pick up the surface raising a nap thereon, the wires snapping away from the surface of the bodies with a spring action as the surface of the nap raising cone passes away from the surface of the carrying cone, means being provided to retard the rotation of the carrying cones, as will presently be fully explained. Owing to this difference in speed of rotation between the nap raising cone and the carry-

ing cones, the breaks or lines without wires between the sections of card cloth on the nap raising cone cannot come into alignment with the surface of hat bodies on the carrying cones twice in the same place, consequently all portions of the surface of the bodies are acted on uniformly by the nap raising cone.

39 denotes the shafts of the carrying cones which are journaled in bearings 40 on standards 41 which extend upward from carrying plates 42. The carrying plates are shown as pivoted on studs 43 extending from bearing plates 44, so that the carrying plates may oscillate on the bearing plates. Shafts 39 are shown as made in two parts which have an end to end engagement and are locked together within a tube 74 by means of set screws 73. This enables the operator to remove carrying cones and substitute others without removing the entire shafts from their bearings. The carrying plates and bearing plates are provided with hubs 68, and set screws 69 in said hubs engage stud 43 which passes through both hubs. This enables me to adjust the carrying plates relatively to the bearing plate and to lock the carrying plates after adjustment. This adjustment enables the operator to swing the tips of the carrying cones into closer engagement with the nap raising cone should it be required to raise a longer nap upon the tip ends of the bodies than upon the brim ends. Handles 45 are provided on bearings 40 for the convenience of the operator in adjusting the carrying cones relatively to the nap raising cone in the planes of the axes of the carrying cones. In addition to this means for adjusting the carrying cones toward and from the nap raising cone in approximately the same horizontal plane, I provide means for adjusting the carrying cones in the vertical plane, which also comprises means for tilting them in the vertical plane, and also provide means for swinging the carrying cones into and out of operative position for the purpose of applying and removing hat bodies. The vertical and the tilting adjustments are effected as follows: At the forward end of each carrying plate is a lug 46 which is pivoted to a slide 47 adapted to move vertically in ways in a bracket 48 rigidly secured to a rock shaft 49 journaled in brackets 21. The slides are provided with slots, indicated by dotted lines only, and are retained at any required adjustment by means of cap screws 51 which pass through the slots and are tapped into the brackets, thereby locking the forward ends of the bearing plates and the parts carried thereby at any required vertical adjustment. At the rear ends of the carrying plates are arms 53. Cap screws 54 tapped into these arms extend through arc-slots 55 in brackets 56 which are rigidly se-

cured to the rock shaft. The rear ends of the bearing plates and parts carried thereby are locked at any required vertical adjustment by tightening up the cap screws. It will be seen that by loosening cap screws 51 and 54 the bearing plates and with them the carrying cones may be given any required adjustment in the vertical plane and that furthermore by raising either ends of the carrying plates only or by raising one end and lowering the other end, any required inclination of the axes of the carrying cones relatively to the axis of the nap raising cone may be secured. I find in practice that it is only necessary to provide sufficient inclination of the axes of the carrying cones relatively to the axis of the nap raising cone to cause the wires of the card surface of the nap raising cone to engage the surface of bodies on the carrying cones with a slight pull toward the bases of the cones, so that in use the action of the nap raising wires on the nap raising cone will be to draw the hat bodies more firmly on the carrying cones instead of to draw them off. The holding surface of the carrying cones may be either a surface of relatively fine bent wires 58, as in Fig. 8, or a felt surface, as indicated by 59 in Fig. 9. I have likewise found in practice that the line of the nap raising cone from base to apex may be either straight, as in Fig. 6, or slightly concave, as indicated in Fig. 7.

In applying and removing hat bodies, the operator swings the rock shafts, brackets 48 and 56, the bearing and carrying plates and the carrying cones over away from the nap raising cone and wholly out of operative position, the receiving position of the carrying cones being indicated by dotted lines in Fig. 3. Handles 60 on arms 53 are provided for the convenience of the operator in swinging the carrying cones out of operative position, and stops 61 are provided which are engaged by brackets 56 to limit the movement of the brackets and carrying cones when swung out of operative position.

The carrying cones are not driven in use but receive rotary movement from the nap raising cone through the contact of the hat bodies on the carrying cones with the nap raising surface of the nap raising cone.

In order to secure an operative or nap raising effect on the hat bodies, it is necessary to retard the movement of the carrying cones. This is effected by means of friction drums 62 on the shafts 39 of the carrying cones which are partly encircled by straps or ropes 63, one end of each strap or rope being connected to a carrying plate 42 and the other end connected to a lever 65 which in turn is pivoted, as at 66, to a lug 70 extending from the carrying plate.

67 denotes weights adjustable on the levers which enable me to secure any required

friction on the drums to secure the required retardation.

It will of course be understood that the exact speed of either the nap raising cone or the carrying cones is immaterial so far as the principle of the invention is concerned. Suppose, for example, that the nap raising cone was making from fifty to sixty revolutions per minute; the carrying cones might have a speed of thirty to forty revolutions per minute.

The operation will be obvious from the description already given. Having secured a satisfactory elevation and tilt of the carrying cones relatively to the nap raising cone, in the manner described, the operator swings a carrying cone into the receiving position, places a hat body thereon, swings it into operative position, starts the machine into operation and then repeats the operation upon the other carrying cone while the hat body on the first carrying cone is being operated upon, hat bodies being applied to and removed from the carrying cones alternately. In practice, the operator is not required to give any attention to the retention of the hat bodies on the carrying cones as they are securely retained thereon by the action of the nap raising cone owing to the inclination of the axes of the carrying cones relatively to the axis of the nap raising cone.

Having thus described my invention I claim:

1. In a machine of the character described, the combination with a driven nap raising cone, of a body carrying cone driven thereby and having its axis obliquely inclined with relation to the axis of the nap raising cone, brackets provided with means for supporting said carrying cone, and connections between said brackets and said carrying cone for effecting a tilting adjustment of the axis of the carrying cone with relation to the axis of the nap raising cone.

2. In a machine of the character described, the combination with a driven nap raising cone, of a plurality of body carrying cones driven thereby and having their axes obliquely inclined with relation to the axis of the nap raising cone, means for independently adjusting the height of the carrying cones said adjusting means including means for independently tilting the axis of each of said carrying cones relatively to the axis of the nap raising cone independently, and means for retarding the rotation of carrying cones independently.

3. In a machine of the character described, the combination with a driven nap raising cone, of a body carrying cone driven thereby and having its axis obliquely inclined with relation to the axis of the nap raising cone, movable brackets, a swiveled support for said carrying cone, and connections between said swivel support and said

brackets for effecting a tilting adjustment of the axis of the carrying cone with relation to the axis of the nap raising cone.

4. In a machine of the character described, the combination with a driven nap raising cone, of a body carrying cone driven thereby and having its axis obliquely inclined with relation to the axis of the nap raising cone, a carrying plate for said carrying cone, a bearing plate, means for providing a swivel connection between said bearing plate and said carrying plate, movable brackets, and connections between said brackets and said bearing plate for effecting a tilting adjustment of the axis of the carrying cone, with relation to the axis of the nap raising cone.

5. In a machine of the character described, the combination with a driven nap raising cone, a body carrying cone having a shaft and a drum carried thereby, of standards on which the shaft is journaled, an oscillatory carrying plate for the standards, means for locking said plate at any adjustment, a strap connected to the plate and passing over the drum, a lever to which said strap is connected and a weight on said lever whereby the rotation of the carrying cone is retarded.

6. In a machine of the character described, the combination with a driven nap raising cone and a body carrying cone having a shaft, of standards on which the shaft is journaled, an oscillatory carrying plate for the standards, a bearing plate to which the carrying plate is pivoted, means for locking the carrying plate at any adjustment, a rock shaft, brackets secured thereto, and vertically adjustable and tilting connections between the bearing plate and the brackets.

7. In a machine of the character described, the combination with a driven nap raising cone, a body carrying cone, an oscillatory carrying plate on which the carrying cone is journaled and a bearing plate to which the carrying plate is pivoted, of a rock shaft, brackets secured thereto, a lug at the forward end of the bearing plate, a slide pivoted thereto and engaging one of the brackets, means for locking said slide at any adjustment, an arm at the rear end of the bearing plate and a cap screw and slot connection between said arm and the other bracket.

8. In a machine of the character described the combination with a driven nap raising cone, and a body carrying cone having a shaft, of a rock shaft, brackets mounted on said rock shaft and provided with means for supporting the carrying cone shaft, means connected with said brackets for effecting a tilting adjustment of the axis of the carrying cone with relation to the axis of the nap raising cone, and a stop ar-

ranged to limit the movement of said rock shaft.

9. In a machine of the character described, the combination with a driven nap raising cone and an oblique carrying cone driven thereby, of an oscillatory carrying plate supporting said carrying cone, brackets on which said plate is mounted, said brackets being provided with means for ef-

fecting a vertical and tilting adjustment of said carrying plate, and means for retarding the rotation of said carrying cone.

In testimony whereof I affix my signature in presence of two witnesses.

GEO. E. BRUSH.

Witnesses:

MINNIE C. KNAPP,
FRANK E. WARREN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."