Oct. 22, 1929. J. F. MURPHY 1,732,767

METHOD OF MAKING HATS

Filed June 10, 1927

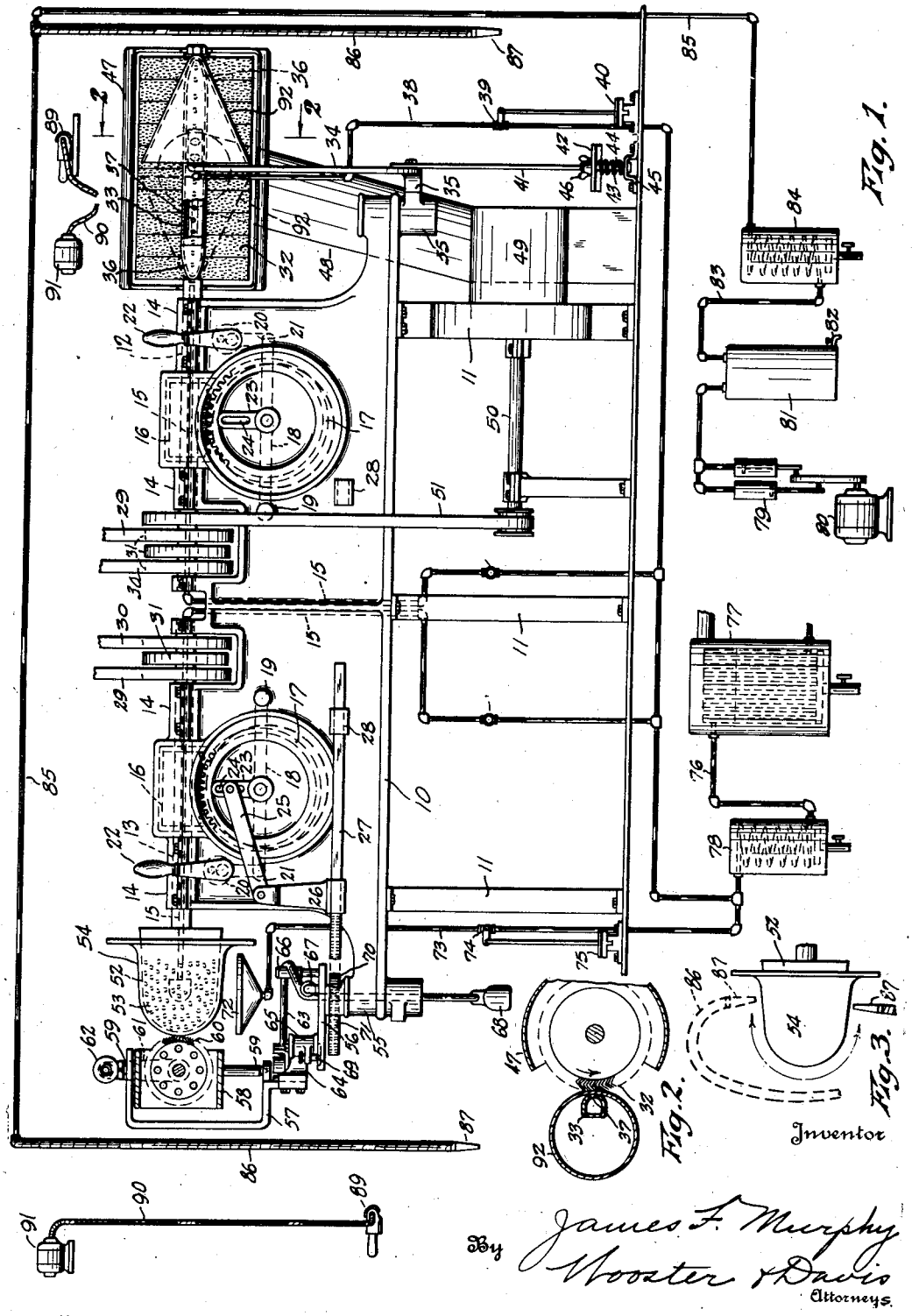


Fig. 1.

Fig. 2.

Fig. 3.

Inventor

By James F. Murphy
Wooster & Davis
Attorneys.

Patented Oct. 22, 1929

1,732,767

UNITED STATES PATENT OFFICE

JAMES F. MURPHY, OF DANBURY, CONNECTICUT

METHOD OF MAKING HATS

Application filed June 10, 1927. Serial No. 197,814.

This invention relates to the art of making and finishing hats, particularly to an improved method of forming a nap on the surface of the hat or finishing this nap to improve its condition and appearance.

In forming the nap on the surface of the so-called beaver, velour or the like hats the fibres at or adjacent the surface of the hat are brushed with a brush to draw out free one end of these fibres. I have discovered if the hat is treated with sufficient steam to soften and loosen the fibres immediately prior to or during the brushing operation to soften and loosen the fibres adjacent the surface of the hat, that in jacking or brushing the hat while still under the influence of the steam the fibres are more evenly drawn out giving a much better and heavier nap, as the brush is able to get down into and draw out fibres below the surface better than where the hat is brushed dry. However, if after the brushing operation the fibres are allowed to dry without agitation there is a tendency for the fibres of the nap to adhere to each other and mat down and thus give an uneven and undesirable appearance to the nap. I have, however, discovered that if this nap is blown up with a blast of drying air while still under the influence of the steam and while drying, the fibres of the nap are kept free and in proper position to give a full and free nap and is also greatly improved in appearance, and has a much better lustre, apparently because the fibres are kept separated and prevented from having their surfaces dulled by contact with one another. Furthermore, by treating the fibres of the nap with a blast of drying air the fibres dry much more quickly, so that this method will not only secure a better and heavier nap but will also greatly improve its appearance, and I am enabled to increase production as the time required for finishing the hat is shortened.

These operations may be carried out by hand, but the time required may be greatly shortened by the use of proper machinery. In the accompanying drawing I have illustrated somewhat diagrammatically a machine for performing these operations. In this drawing,

Fig. 1 is a front elevation of a double ended machine which may be used for either brushing and raising the nap of a hat while controlled by the operator's hand, or it may be jacked automatically, and showing also somewhat diagrammatically connections and mechanism which may be used for applying the steam and air.

Fig. 2 is a detailed section substantially on line 2—2 of Fig. 1, and

Fig. 3 is a top plan view of the block at the left hand of Fig. 1 showing the application of air blast for drying the nap.

The machine illustrated comprises a bed or frame 10 carried by suitable supports 11, and has two suitable similar shafts 12 and 13 mounted to rotate in suitable bearings 14. These shafts are hollow for passage of steam pipes 15. These shafts also carry worms 16 adapted to mesh with worm gears 17 which are mounted on swinging arms 18 pivoted to the frame at 19 so that the gear may be swung to and from mesh with the worm 16. This is accomplished by means of eccentrically mounted shafts 20 connected to the free end of the arms 18 by the links 21 and operated by a hand lever 22. By swinging this lever the worm gears 17 are swung to and from mesh with the worm 16. The worm gears 17 also carry arms 23 provided with a longitudinally extending slot 24 for adjustable connection with a connecting bar 25. At its other end it is pivoted to an arm 26 secured to a sliding bar 27 mounted for reciprocation in suitable guides 28 on the frame. The shafts 12 and 13 are driven in opposite directions by any suitable means, such as straight and cross belts 29 and 30, from any suitable source of power running on suitable fixed and loose pulleys 31 on the shaft.

On one end of the machine is shown a wire brush 32 detachably mounted on the shaft 12 so that it is rotated thereby, and in front of this brush is a rest or support 33 for the hat, hood or cone being brushed. In the form shown this is a double rest extending on opposite sides from a supporting bar 34 pivoted to the frame at 35 so that it may be moved toward or from the surface of the brush.

The rest or support 33 is a tubular member tapered at its opposite ends, as shown at 36, so that it may pass into the small ends or tips of cones, and is provided with a series of openings 37 on the side adjacent the brush for passage of steam to the hat, cone or hood being brushed. Steam is supplied to the interior of this support or rest by a pipe 38 and the flow of steam through this pipe is controlled by a valve 39 operated by a pedal 40. The supporting bar 34 is connected by a link 41 to a pedal 42 for shifting the rest or support 33 away from the brush to permit insertion of the hat between them, and a spring 43 acts to hold this support against the brush, this spring being mounted on a bolt 44 connected at its lower end to a bracket 45 secured to the floor passing at its opposite end through the pedal and having a winged nut 46 threaded thereon to adjust the relative position of the rest or support 33 with respect to the brush, and therefore, the pressure with which it is held against the brush. The relative position during the brushing operation is shown in Fig. 2, the brush rotating in the direction of the arrow and raising the nap on the surface of the hat after the fibres are softened by the steam from the rest 33. As this rest is double, as shown in Fig. 1, the hats 92 (used in a general sense to include hats, cones or hoods) may be brushed first in one direction from one side of the support, as shown in full lines, and then taken off and brushed in the opposite direction on the other side as indicated in dotted lines. To secure a proper nap it is necessary to brush the hat in opposite directions. The brush 32 is enclosed in a casing 47 the inside of which is connected by a pipe 48 with a suction fan 49 to carry away the fibres removed from the hat by the brush. This fan may be operated by a shaft 50 driven by a belt 51 from the shaft 12.

On the opposite end of the machine is shown means for automatically brushing the surface of the hat. In this case a suitably shaped block 52 is detachably mounted on the shaft 13. This block is hollow and provides openings 53 for passage of steam from the pipe 15 to the hat 54. Pivotally mounted on the machine in the upright projecting bearing 55 is a support 56. This support carries an arm 64 pivoted thereto at 65 and this arm carries a bracket 57 in which is mounted a housing 58 pivoted on the pivots 59 to turn about an upright axis. Mounted in this housing is a rotating brush 60 driven by any suitable drive as a belt 61 from a motor 62 mounted to turn with the housing. A flexible cord 63 is connected to the arm 64, passed over an upright guide 66 and a guide pulley 67, and carries a depending weight 68. This cord is connected to the arm at a distance from the pivot 65 so that it tends to swing this arm about its pivot and hold the brush against the surface of the hat. A pin 69 carried by the arm may seat in a recess in the support 56 to hold the brush away from the hat when not in use. The support 56 is swung on its pivot by a gear 70 meshing with a rack 71 on one side of the reciprocating bar 27. Thus as the bar 27 is reciprocated from the worm gear the support 56 is swung on its pivot to pass the brush over the surface of the hat from a point adjacent the brim to the crown and around to the other side and back. Steam may also be applied to the outer surface of the hat by means of a funnel 72 placed beneath the block 52 connected to the steam pipe 73 controlled by a valve 74 by a pedal 75.

The brush 32 and the block 52 are interchangeable. Also the rest or holder 33 may be mounted at the left end of the machine and the automatic brushing arrangement with its support 56 and swinging arm 64 may be mounted at the right hand end of the frame.

I have found if saturated steam is fed through the steam pipe that there is a certain amount of condensation in the pipes and also the hat supports, so that there is danger of feeding water to the surfaces of the hats, and this is especially true when first starting the operations. This is very objectionable because the free water interferes with the brushing and clipping operations and does not give as fine a nap, and still further it requires a longer time to dry the hat after the brushing or clipping operation. I, therefore, insert in the outlet pipe 76 from the boiler 77 a super-heater 78 to super-heat the steam and to insure a supply of dry steam at all times to the hat. This dry super-heated steam being at a higher temperature also acts quicker on the fibres of the hat so that they are loosened and softened and brought into proper condition for brushing quicker than where saturated steam is used, all of which tends to reduce the time required for the operation.

I have shown diagrammatically at 79 an air compressor driven by any suitable means as a motor 80. The air compressed discharges into a suitable tank 81 which may have a discharge cock 82 for water, and the pipe 83 leads from this tank to a superheater 84 so that the air may be heated and still further dried before it passes into the pipe 85 by which it is conducted to the flexible hose 86 leading to the nozzles 87 located adjacent the opposite ends of the machine. Also located adjacent each end of the machine is a clipper 89 driven through a flexible shaft 90 from an electric motor 91. In carrying out the method the hats, cones or hoods are treated with steam, preferably super-heated steam, passed either through the backing or support for the hat or from

an external device as the funnel 72, and it is given sufficient steam to soften and loosen the fibres adjacent the surface of the body being treated. The surface is then brushed by the wire brush while the fibres are still under the influence of the steam so that one end of these fibres is drawn out loose and the fibres are laid substantially parallel to each other by the brush to form the nap. To produce a proper nap the surface of the hat is usually brushed in opposite directions, first in one direction and then the other. This nap is then blown up by a blast of the drying air from the nozzles 87, preferably by directing this blast of air against the surface of the hat while it is being rotated on the machine, although it may be done while the hat is held in the hand. This blast of drying air blows up the fibres of the nap and keeps them separated so as to overcome their tendency to adhere or stick together while they are drying, and the blast of drying air also hastens the drying operation as it comes in contact with the fibres. The nap may be blown in opposite directions by passing the nozzle around one side of the body to the other while it is being rotated, as indicated in Fig. 3. If it is desired to make a velour hat or the like the nap is then trimmed to uniform length by means of clippers 89. This clipping operation may tend to mat down the nap more or less, and this nap may again be brought up to the desired position by giving the hat another treatment with the steam sufficient to again soften and loosen the fibres, and then the fibres of the nap are again dried by a blast of the drying air from one of the nozzles. This treatment gives a very fine heavy and uniform nap with a very fine lustre so that not only is the nap much heavier and more uniform than that produced by the old methods, but it has a much improved appearance with much better lustre. This method may also be used to restore the condition of the nap of a hat after it has been more or less matted down by use or handling for example. In this case the hat is treated with the steam to soften and loosen the fibres of the nap and the nap is then dried by the blast of drying air, restoring the nap to its original condition.

The air used is, of course, dried to some extent by the compressing operation. The relative humidity is still further reduced by heating in the super-heater coil 84, and then the relative humidity is still further reduced as the air expands on its release from the nozzle, so that the air has a very rapid drying effect on the fibres of the nap as it comes in contact with them, and it is projected with a sufficient force to hold the free ends elevated away from the body of the hat and to prevent their adhering during the drying.

Throughout the specification and claims I have used the term "hat" in the generic sense as meaning either a blocked hat, a hood, or a cone as these operations may be performed equally well on the hat when it is in any one of these three forms.

Having thus set forth the nature of my invention, what I claim is:

1. The step in the method of making a hat which comprises treating the hat body with sufficient steam to soften and loosen the fibres adjacent the surface of the hat, brushing the surface of the hat while the fibres are under the influence of the steam to loosen and draw out free one end of the fibres to form a nap, and drying the loosened fibres by blowing with a blast of drying air immediately after brushing and under sufficient pressure to keep them raised and separated while drying.

2. The step in the method of making a hat which comprises treating the hat body with sufficient super-heated steam to soften and loosen the fibres adjacent the surface of the hat, brushing the surface of the hat while the fibres are under the influence of the steam to loosen and draw out free one end of the fibres to form a nap, and drying the loosened fibres immediately after brushing with a blast of heated air under sufficient pressure to keep the fibres raised and separated while drying.

3. The steps in the method of making a hat which comprise treating the hat body with sufficient steam to soften and loosen the fibres adjacent the surface of the hat, brushing the surface of the hat while the fibres are under the influence of the steam to loosen and draw out free one end of the fibres to form a nap, drying the loosened fibres immediately after brushing by blowing with a blast of dry air, under sufficient pressure to keep the fibres raised and separated while drying, clipping the loosened fibres to give a nap of substantially uniform length; again treating the fibres with steam, and then drying the nap with a blast of dry air under sufficient pressure to keep the fibres raised and separated while drying.

4. The step in the method of finishing a hat which has a nap on the surface thereof which comprises treating the hat with sufficient steam to soften and loosen the fibres of the nap, and then drying the nap with a blast of dry air under sufficient pressure to keep the fibres of the nap raised and separated while drying.

In testimony whereof I affix my signature.

JAMES F. MURPHY.