J. H. STARR.

NAP RAISING MACHINE FOR FELT HATS.

APPLICATION FILED JUNE 9, 1911.

1,017,924.

Patented Feb. 20, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

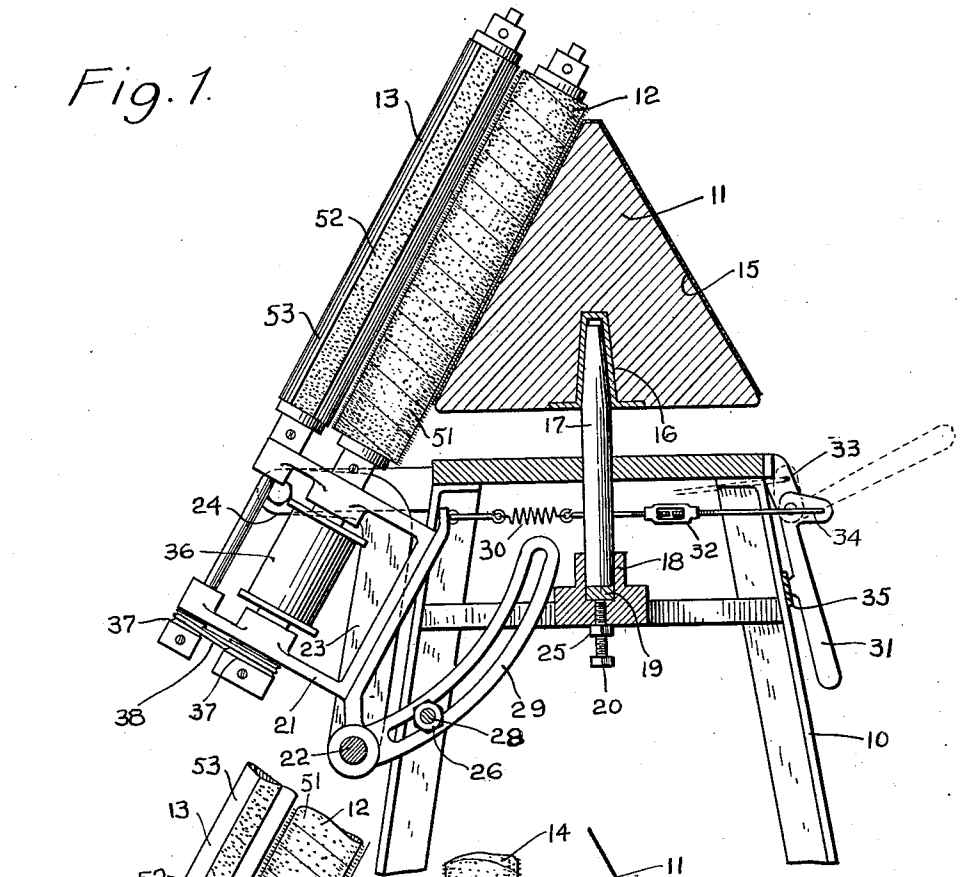
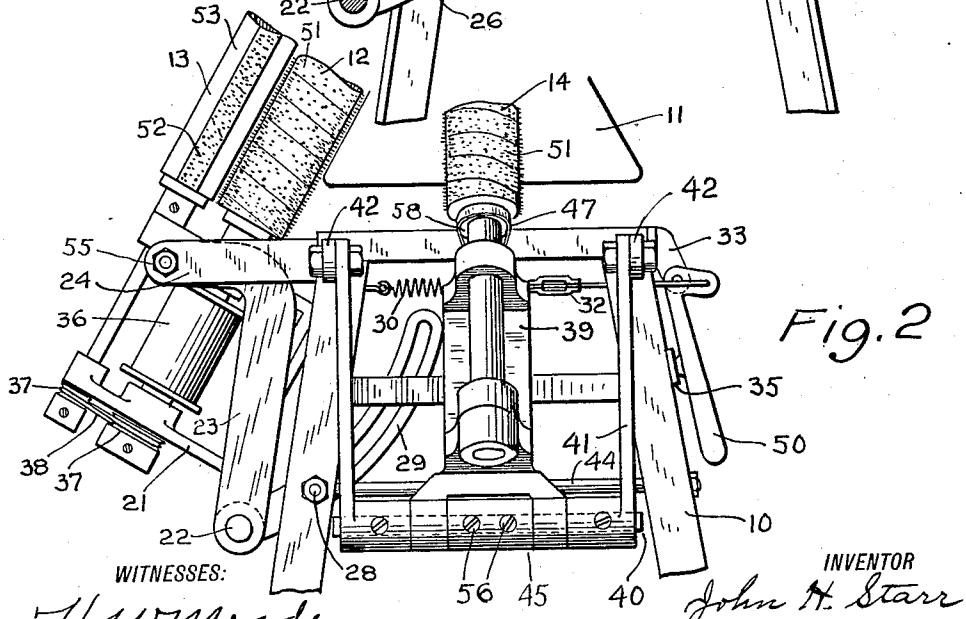


Fig. 2.



WITNESSES:

H. W. Mead

S. W. Atherton.

INVENTOR

John H. Starr

BY

A. M. Wooster

ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

J. H. STARR.

NAP RAISING MACHINE FOR FELT HATS.

APPLICATION FILED JUNE 9, 1911.

1,017,924.

Patented Feb. 20, 1912.

2 SHEETS—SHEET 2.

Fig. 3a

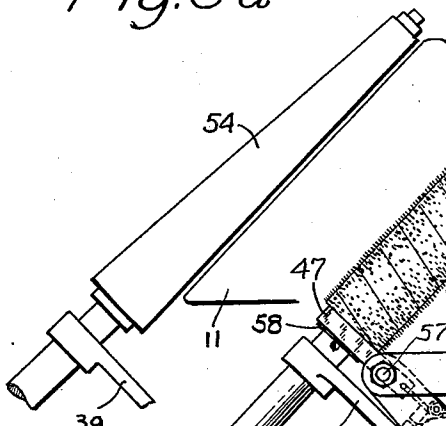
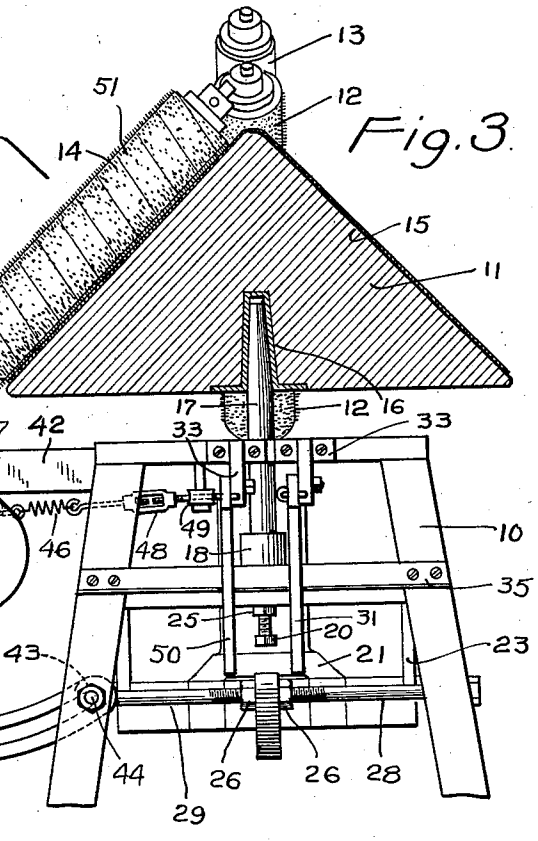


Fig. 3.



WITNESSES:

H. W. Mead

S. W. Atherton.

INVENTOR

John H. Starr

BY

A. M. Wooster

ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN H. STARR, OF DANBURY, CONNECTICUT, ASSIGNOR TO E. A. MALLORY AND SONS, INCORPORATED, OF DANBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

NAP-RAISING MACHINE FOR FELT HATS.

1,017,924. Specification of Letters Patent. Patented Feb. 20, 1912.

Application filed June 9, 1911. Serial No. 632,260.

To all whom it may concern:

Be it known that I, JOHN H. STARR, 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 nap felt hats and has for its object to provide a simple, inexpensive and thoroughly effective machine for raising the nap upon the bodies, the operation being known in the art as jacking.

With this end in view I have devised the novel machine, of which the following description in connection with the accompanying drawings is a specification, reference characters being used to indicate the several parts:

Figure 1 is a view of my novel machine, partly in elevation and partly in vertical section, showing a hat body in position on the cone; Fig. 2 a side elevation corresponding with Fig. 1; Fig. 3 a front elevation of the machine, the view being from the right in Fig. 2 but showing a different style of cone; and Fig. 3ª is a view showing the use of a tapering secondary nap raising roller.

An important feature of the present machine is that it performs two independent jacking operations, the secondary operation being performed by a retarded roller which is rotated by the hat body on the cone.

10 denotes the framework, 11 the body carrying cone, 12 the primary nap raising roller, 13 the cleaning roller, 14 the secondary nap raising roller and 15 a hat body on the cone. The cone is provided in its under side with a socket having a metal bushing 16. This bushing is shown as tapering inward and receives closely the correspondingly tapered end of a shaft 17 which is stepped in a bearing 18 in the framework. The end of the shaft bears upon a block 19 which rests upon a set screw 20 by which the shaft may be raised or lowered to adjust the height of the cone and locked at the desired adjustment by a set nut 25. The primary nap raising roller and the cleaning roller are journaled on a bracket 21, which is pivoted on a cross rod 22 forming part of a yoke 23 itself pivoted as at 55 to arms 24 rigidly secured to and extending from the framework.

The yoke is locked at any required adjustment, depending upon the shape of the cone, by means of nuts 26 on a threaded rod 28, forming part of the frame, which passes through an arc slot in an arm 29 which is rigidly secured as by set screws to cross rod 22. The pressure of the primary nap raising roller upon a hat body on the cone is determined by means of a spring 30 and chain or rod connections intermediate bracket 21 and an operating lever 31. The tension of the spring is adjusted by means of a turn buckle 32. The operating lever is shown as pivoted to an arm 33 extending from the framework and is itself provided with an angle arm 34 to which the turn buckle is connected. A cross bar 35 on the framework or any suitable stop is provided to limit the movement of the operating lever in swinging to the operative position. When this lever is swung down against the stop, as in Fig. 1, the nap raising roller will be drawn by the spring into close engagement with the hat body on the cone, and when the lever is swung into the position indicated by dotted lines, the pull of the spring upon the bracket and roller will be relieved and the weight of the bracket will swing the roller out of engagement with the hat body, the outward movement of the roller being limited by the engagement of angle arm 34 on the lever with the framework.

The primary nap raising roller is driven by means of a belt (not shown) passing over a pulley 36 on the shaft of the roller. At the ends of the shafts of the primary nap raising and the cleaning rollers are relatively large and small belt pulleys 37 over which a crossed belt 38 passes which drives the cleaning roller. As the pulley on the cleaning roller shaft is smaller than the other pulley, the cleaning roller is driven faster than the nap raising roller and acts to clean it and prevent clogging. The secondary nap raising roller is journaled in a bracket 39 which is pivoted on a cross rod 40 forming part of a yoke 41 itself pivoted, as at 57, to arms 42 rigidly secured to and extending from the framework. The yoke is locked at any required adjustment depending upon the shape of the cone by means of nuts 43 on a threaded rod 44, forming part of the frame, which passes through an arc slot in an arm 45 which is rigidly secured as by set screws 56 to cross rod 40.

The pressure of the secondary nap raising roller upon a hat body on the cone is determined by means of a spring 46 and flexible connections shown as passing over a pulley on the bracket and including a strap 47 which passes over a pulley 58 on the roller shaft and the other end of which (not shown) is connected to any suitable fixed portion of the machine. The tension of the spring, which also determines the drag upon or retardation of the roller, making it a nap raising roller, is adjusted by means of a turn buckle 48. The other end of the flexible connection passes over a pulley 49 and is connected to an angle arm on an operating lever 50 which is identical in construction and operation with lever 31 and is similarly pivoted to an arm 33. When this operating lever is swung downward, as in Fig. 3, the roller will be drawn by the spring into close engagement with the hat body on the cone, and when the lever is swung upward the pull upon the bracket and roller will be relieved and the weight of the bracket will swing the roller out of engagement with the hat body. In practice, sufficient tension is given to spring 46 to cause it to appreciably retard roller 14 and thus make it effective as a nap raising roller.

While the invention is not limited to any special construction of primary and secondary nap raising rollers, I preferably make said rollers of uniform diameter from end to end and cover them with strips of card cloth, indicated by 51, wound spirally from end to end of the rollers. The cleaning roller is provided on its periphery with two longitudinal strips of card cloth, indicated by 52, with spaces 53 between them.

In Fig. 3ª, I have shown the use of a tapering secondary nap raising roller which is indicated by 54.

The operation of the machine is as follows: The primary nap raising roller which is driven performs the first nap raising or jacking operation and also causes rotation of the hat body and cone. The secondary nap raising roller performs a second nap raising or jacking operation. This roller, which is non-driven, is rotated through its engagement with the hat body but as its rotation is retarded by strap 47 and the spring it jacks the body, that is picks up the nap the same as the other roller, the primary or driven nap raising roller acting to pull the nap forward and the secondary or retarded nap raising roller pulling the nap backward as the body is drawn under it by the driven roller. The amount of drag or retardation of the secondary nap raising roller is determined by the tension of spring 46 which is regulated by turn buckle 48. The pressure of the primary nap raising roller upon the hat body is determined by spring 30 which is adjusted by turn buckle 32. As cleaning roller 13 is caused to rotate faster than the primary nap raising roller it acts to clean said roller and prevent it from clogging. In order that the operator may have independent control of the nap raising rollers, each is connected to a separate operating lever. In starting, the operator throws both of the operating levers to the inoperative position, as indicated by dotted lines in Fig. 1. This relieves the tension of springs 30 and 46 and the weight of the brackets by which the rollers are carried will cause them to swing downward on their pivots and raise the rollers away from the cone. This is done without stopping the rotation of the primary nap raising roller, which is the only element of the machine to which power is directly applied. Having placed a body in position on the cone, the operator swings both operating levers to the operative position as shown in full lines in the drawings. When the jacking operation is completed the operator swings the levers to the inoperative position, which causes the nap raising rollers to swing away from the cone and enables the operator to remove the jacked body and place another body on the cone in position to be operated upon.

Having thus described my invention I claim:

1. A machine of the character described comprising a body carrying cone, a driven primary nap raising roller adapted to engage a body on the cone and to rotate said body and cone, a secondary nap raising roller which is rotated by a body on the cone and means for retarding the rotation of the secondary nap raising roller.

2. A machine of the character described comprising a body carrying cone, a driven primary nap raising roller adapted to engage a body on the cone and to rotate said body and cone, a cleaning roller for said primary nap raising roller, a single bracket for supporting both of said rollers, means for driving the cleaning roller faster than said nap raising roller, a secondary nap raising roller rotated by a body on the cone and means for retarding the rotation of said secondary nap raising roller.

3. A machine of the character described, comprising a body carrying cone, a driven nap raising roller of uniform diameter and covered with a strip of card-cloth wound spirally from end to end, and a cleaning roller coöperating with said nap raising roller and provided on its periphery with longitudinal strips of card cloth with spaces between them.

4. A machine of the character described, comprising a body carrying cone, a driven primary nap raising roller adapted to engage a body on the cone and to rotate said body and cone, a pivoted bracket in which said roller is journaled, means for regulating

the pressure of said roller on a hat body and an adjustable yoke on which the bracket is pivoted.

5. A machine of the character described comprising a body carrying cone, a driven primary nap raising roller adapted to engage a body on the cone and to rotate said body and cone, an operating lever, connections including a spring and turn buckle between said bracket and lever, for the purpose set forth, and an adjustable yoke on which the bracket is pivoted.

6. A machine of the character described comprising a body carrying cone, a driven nap raising roller adapted to engage a body on the cone and to rotate said body and cone, a cleaning roller therefor, a swinging bracket on which the shafts of both of said rollers are journaled adjacent one end, driving connections whereby the cleaning roller is driven and an adjustable yoke on which the bracket is pivoted.

7. A machine of the character described comprising a body carrying cone, a driven nap raising roller adapted to engage a body on the cone and to rotate said body and cone, a cleaning roller therefor, a swinging bracket on which the shafts of said rollers are journaled adjacent one end, driving connections for the cleaning roller, an operating lever and an adjustable resilient connection between said bracket and the operating lever.

8. A machine of the character described comprising a body carrying cone, a driven nap raising roller adapted to engage a body on the cone and to rotate said body and cone, a swinging bracket on which said roller is journaled, an operating lever having an angle arm and connections including a spring and a turn buckle intermediate the bracket and the angle arm of the lever.

9. A machine of the character described comprising a body carrying cone, a driven nap raising roller adapted to engage a body on the cone and to rotate said body and cone, a swinging bracket on which said roller is journaled, an operating lever, yielding connections between the lever and bracket, a yoke on which the bracket is pivoted and means for adjusting said yoke, for the purpose set forth.

10. A machine of the character described comprising a body carrying cone, a driven primary nap raising roller adapted to engage a body on the cone and to rotate said body and cone, a secondary nap raising roller which is rotated by a body on the cone, brackets on which said rollers are journaled, operating levers and yielding connections between the brackets and the levers, one of said connections acting to retard the rotation of the secondary nap raising roller.

11. A machine of the character described comprising a body carrying cone, a driven primary nap raising roller adapted to engage a body on the cone and to rotate said body and cone, a secondary nap raising roller which is rotated by a body on the cone, means for regulating the pressure of said rollers upon a hat body and means for retarding the rotation of the secondary nap raising roller.

12. A machine of the character described, comprising a body carrying cone, a driven nap raising roller adapted to engage a body on the cone, a bracket on which said roller is journaled, a swinging yoke on which said bracket is pivoted and which is provided with a slotted arm, a threaded rod passing through the slot and nuts on said rod for locking the bracket at any required adjustment.

13. A machine of the character described, comprising a body carrying cone, a driven nap raising roller adapted to engage a body on the cone to rotate the latter, a bracket on which said roller is journaled, a swinging yoke on which said bracket is pivoted, means for adjusting said yoke to correspond with the cone and means engaging said bracket for regulating the pressure of the roller on a hat body.

14. A machine of the character described, comprising a body carrying cone, a driven nap raising roller adapted to engage a body on the cone to rotate the latter, a bracket on which said roller is journaled, a swinging yoke on which said bracket is pivoted, means for adjusting said yoke, for the purpose set forth, an operating lever and yielding connections between the bracket and the lever.

15. A machine of the character described, comprising a body carrying cone, a driven primary nap raising roller adapted to engage a body on the cone and to rotate said body and cone, a secondary nap raising roller engaging a body on the cone, brackets on which said rollers are journaled, swinging yokes on which said brackets are pivoted, means for adjusting the yokes, operating levers, yielding connections between the brackets and the levers and means for retarding the rotation of the secondary nap raising roller.

16. In a machine of the character described, the combination with a body carrying cone, means for rotating the same, and a nap raising roller rotated by engagement with a hat body on the cone, of a swinging bracket on which said roller is journaled, an operating lever, a strap passing over the roller one end of which is connected to a fixed portion of the machine, and flexible connections intermediate said strap and the lever.

17. In a machine of the character described, the combination with a body carrying cone, means for rotating the same, and a nap raising roller rotated by engagement with a hat body on the cone, of a

swinging bracket on which said roller is journaled, an operating lever, a strap passing over the roller one end of which is connected to a fixed portion of the machine, and flexible connections including a spring and turn buckle intermediate said strap and the lever.

18. In a machine of the character described, the combination with a body carrying cone, means for rotating the same, and a nap raising roller rotated by engagement with a hat body on the cone, of a swinging bracket on which said roller is journaled, an adjustable yoke on which the bracket is pivoted and means for regulating the pressure of the roller on a hat body and for retarding its rotation.

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

JOHN H. STARR.

Witnesses:
HARRY B. MALLORY,
HERBERT HENDLEY.