

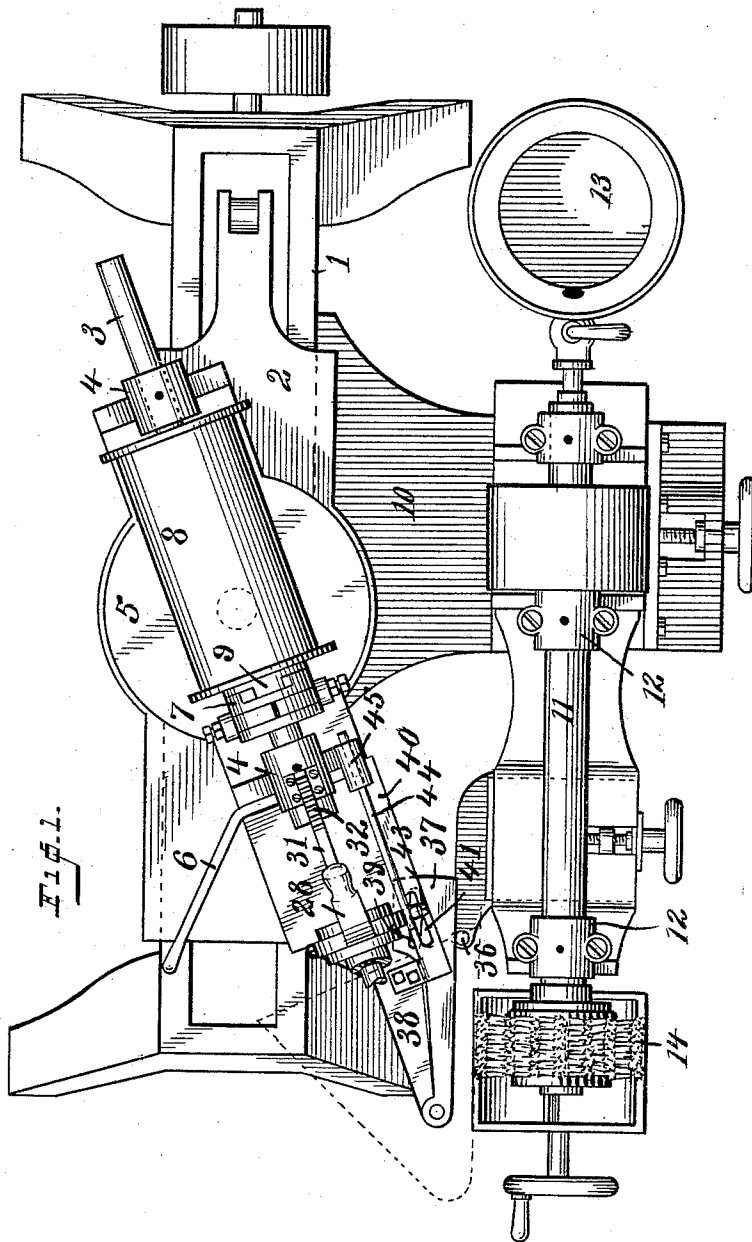
(No Model.)

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F. J. MURPHY.
HAT STIFFENING MACHINE.

No. 465,721.

Patented Dec. 22, 1891.



WITNESSES

C. M. Newman,
Asley I. Munson

INVENTOR

Frank J. Murphy
By J. M. Wooster
Att'y.

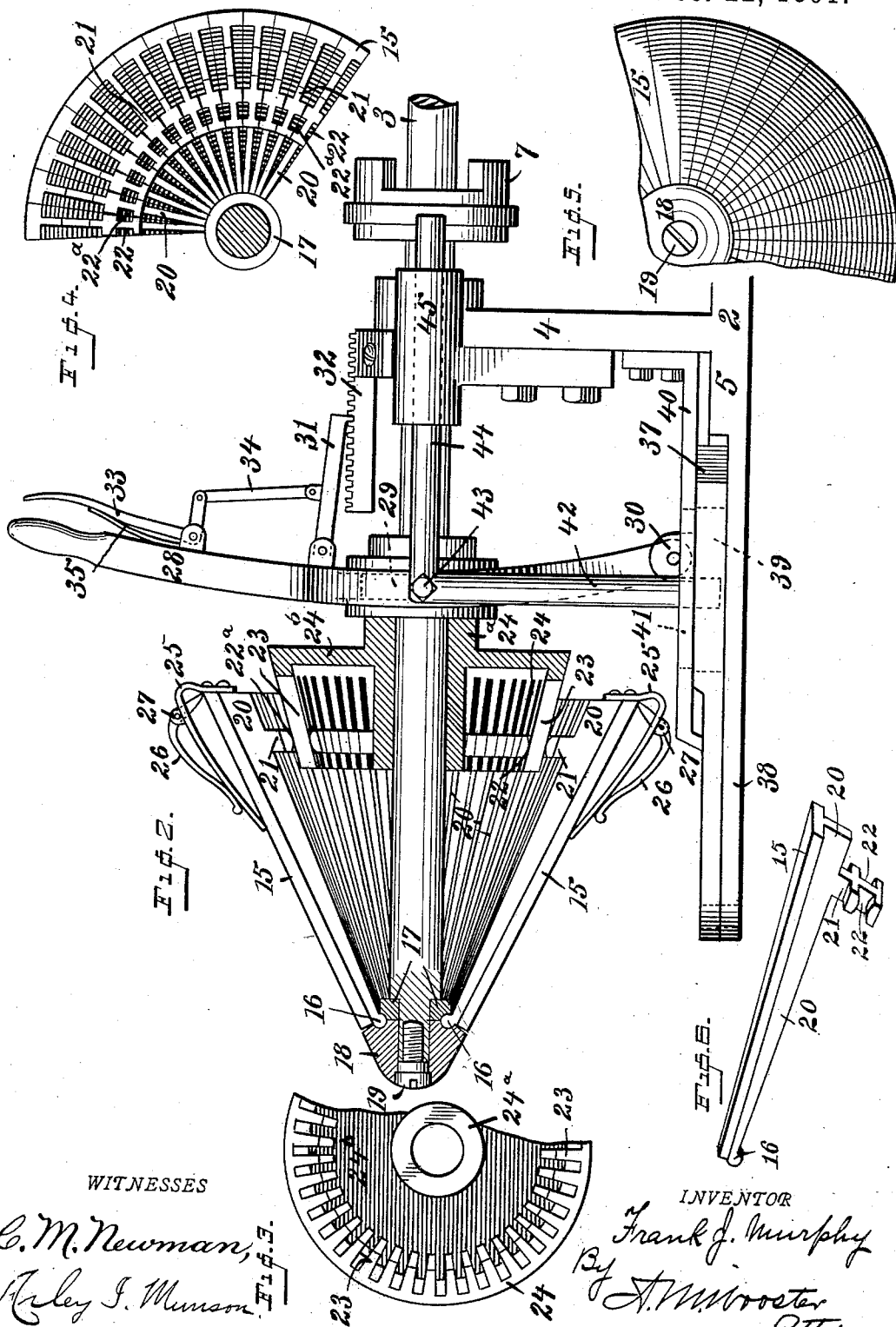
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By J. M. Worcester
Atty.

UNITED STATES PATENT OFFICE.

FRANK J. MURPHY, OF DANBURY, CONNECTICUT, ASSIGNOR OF ONE-HALF
TO ANTHONY M. RUNDLE, OF SAME PLACE.

HAT-STIFFENING MACHINE.

SPECIFICATION forming part of Letters Patent No. 465,721, dated December 22, 1891.

Application filed February 12, 1891. Serial No. 381,192. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. MURPHY, a citizen of the United States, residing at Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Expanding Cones for Hat-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide a simple and easily-operated expanding cone for hat-bodies, my novel cone being adapted for general use in the manufacture of hats, but more especially adapted for use in connection with hat-stiffening machines of the class illustrated and described in patent to Murphy and Rundle, No. 426,125, dated April 22, 1890.

With this end in view my invention consists in the novel expanding cone which I will now describe, and also, in combination with my novel expanding cone, of a novel self-adjusting guide.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of a hat-stiffening machine, illustrating the application thereto of my novel expanding cone and self-expanding guide, the cone itself being removed, its position being indicated by dotted lines. Fig. 2 is a view, on an enlarged scale, partly in elevation and partly in vertical section, of my novel expanding cone and the parts operating in connection therewith; Fig. 3, a detail view illustrating the construction of the operating-slide; Fig. 4, a partial elevation of the interior of the cone. Fig. 5 is a partial elevation of the exterior of the cone, and Fig. 6 is a perspective of one of the hinged pieces detached.

1 denotes the bed of the machine; 2, the sliding carriage; 3, the rotating spindle; 4, standards in which it is mounted, which extend upward from the turning-plate 5; 6, an operating-handle by which the turning-plate and cone are manipulated; 7, the clutch member on the spindle; 8, a belt-pulley, which is loose on the spindle and is provided with a clutch member 9, adapted to be engaged by clutch member 7 to impart rotation to the

spindle; 10, an extension of the bed, which carries the hollow shaft 11; 12, standards in which the hollow shaft is mounted; 13, the tank for holding the stiffening solution, and 14 is the stiffening-brush. These parts may all be constructed in the ordinary or any preferred manner. In practice I ordinarily build these machines substantially as indicated in the said Murphy and Rundle patent referred to.

My novel cone consists, essentially, of a number of tapering exteriorly-rounded pieces 15, which are hinged at the forward end of the spindle. As it is desirable to give to the exterior of the cone in the expanded position as perfectly rounded a surface as possible, I use a large number of these pieces in forming the cone—for example, forty, more or less. At the forward end of each piece I provide a circular flat-sided knuckle 16, which fits in corresponding sockets formed in a ring 17, which rests against a shoulder near the outer end of the spindle and in a cap-piece 18, which passes over the end of the spindle and is locked in position by a screw 19. Upon the inner sides of pieces 15, I preferably form flanges 20, in order to give ample strength, but at the same time make the structure as light as possible. Projecting inward from these pieces are guides 21, which are in the present instance provided with recesses 22 on opposite sides thereof, the recesses in two contiguous guides forming openings 22^a. (See Fig. 4.) If preferred, openings may of course be made through the guides themselves, although in practice I preferably adopt the construction shown in the drawings. The pieces of the cone are moved inward and outward in expanding and contracting by means of arms 23 upon a slide 24. The special construction of this slide is of course not of the essence of my invention.

In order to secure perfect strength and rigidity I preferably make the slide to consist of a hub 24^a and a disk 24^b, from which the arms extend. The arms are inclined inward sufficiently to prevent their coming in contact with the pieces of the cone, and the sides of recesses 22 are beveled, as shown in Fig. 2, so as to avoid friction in expanding and contracting the cone. It is of course necessary

that the cone should expand and contract sufficiently to distend the hat-body when expanded and to allow the bodies to be easily removed and new ones slipped on when contracted. As already stated, I use a large number of pieces in forming the cone, and so form these pieces that they will permit ample contraction of the cone, while at the same time, when the cone is expanded, owing to the large number of pieces used, the space between any two of the pieces is so slight as not to be noticeable in use, so that when the cone is expanded the hat-body thereon is just as evenly and firmly distended as if it were stretched over a solid cone perfectly circular in cross-section.

In order to hold the hat-bodies in position on the cone, I provide a number of holding-springs 25, which are secured to the ends of the pieces, curve over, and lie against the sides of the pieces. These springs are clamped in the locking position by curved clamping-levers 26, which are pivoted to lugs 27 upon the springs, the outer ends of said levers in the clamping position bearing against the outer sides of the pieces and the inner ends against the springs, as clearly shown in Fig. 2. Four of these holding-springs are ordinarily found amply sufficient to hold the bodies in position on the cone in use. The slide is operated by means of a lever 28, which is preferably bifurcated to engage both sides of a groove 29 in the hub, the lower end of said lever being pivoted to a lug 30 upon the turning plate. The operating-lever may be locked in any required position by means of a pawl 31, which engages a rack 32, which in the present instance is shown as secured to one of the standards 4. The pawl is operated by a bell-crank hand-lever 33, pivoted to the operating-lever. This bell-crank lever is connected to the pawl by means of a link 34, and the pawl is held in the engaged position by means of a spring 35, lying under the bell-crank lever.

The general operation of the machine in stiffening hat-bodies is precisely the same as in the Murphy and Rundle patent referred to, and as the machine itself forms no portion of my present invention is not thought to require description here. It will of course be apparent that when the turning plate is swung toward the brush to place the cone in position, so that a hat-body thereon will be acted upon by the brush there must be a stop to limit the movement of the turning plate, cone, &c., and also that a self-adjusting guide must be provided, which will insure that the entire length of the hat-body shall be operated upon evenly without regard to the degree of expansion of the cone.

36 denotes the stop which is in the present instance a roller mounted upon any suitable portion of the machine, in the present instance one of the plates carried by extension 10 of the bed. This stop is engaged by a swinging guide 37, which is pivoted to a plate

38, extending forward from the turning plate and which may be made integral therewith or rigidly secured thereto. The swinging guide is provided with a slot 39, parallel with the operative face thereof. (See Fig. 1.)

40 is a guide-plate, one end of which is bolted or otherwise rigidly secured to plate 38, (see Fig. 1,) the other end being bolted to one of the standards 4. (See Fig. 2.) This guide-plate is provided with a slot 41, which is horizontal to its length, but lies obliquely to and intersects slot 39 in the swinging guide.

42 denotes a stud which is pivoted to the operating-lever, as at 43. (See Fig. 2.) The lower end of this stud passes through slot 41 in the guide-plate and engages slot 39 in the swinging guide. The upper end of the stud is provided with a guide-rod 44, which slides through a guide 45, the latter being formed upon or rigidly secured to one of the standards 4. This guide-rod and guide give a firm support to the stud, so that when the operating-lever is moved in either direction, as in expanding or contracting the cone, the swinging guide will be moved inward or outward correspondingly through the engagement of stud 42 with slot 39.

The operation in use is so simple that explanation is hardly required. The cone being contracted, the operator removes therefrom the hat-body last operated upon and places a new one in position thereon, the new body being placed under the holding-springs and the latter being locked in position by the clamping-levers. The operator then, by means of the bell-crank hand-lever, releases the pawl from the rack and forces the operating-lever forward. The operating-lever moves forward the slide, the arms 23 of which act to force the pieces 15 which constitute the cone outward, distending the hat-body thereon. As soon as the cone has been distended, the parts are locked in that position by the engagement of the pawl with the rack. Simultaneously with the expansion of the cone, stud 42 will be moved forward, and through its engagement with slot 39 will move the swinging guide outward just the required distance to leave the operating-edge of said swinging guide parallel with the face of the cone, these parts being so adjusted relatively to each other as to preserve at all times the exact parallelism of the swinging guide and the side of the cone that is toward the brush, so that without regard to the size of the hat-body and the relative expansion of the cone the swinging guide will assume the required position to cause every portion of the hat-body upon the cone to be acted upon by the brush when the turning plate is swung into operative position and the swinging guide placed in contact with the stop.

Having thus described my invention, I claim—

1. An expanding cone consisting of a series of narrow arms rounded on their outer sides and tapering toward their forward ends, said

arms being pivoted at their forward ends and provided on their inner sides with guides 21, and a slide having forwardly and inwardly extending arms 23, which engage the guides to expand and contract the cone.

2. An expanding cone consisting of a spindle having at its forward end a ring 17, and a cap-piece, tapering rounded pieces 15, provided with knuckles which engage corresponding recesses in the ring and cap-piece, said pieces 15 having on their inner sides guides 21, and a slide having arms 23, which engage the guides.

3. An expanding cone consisting of a series of round tapering pieces 15, pivoted at their forward ends, each piece having on its inner side a guide 21, having recesses on its sides forming openings 22^a, and a slide having arms 23, which engage said openings, as and for the purpose set forth.

4. In a machine of the class described, the combination, with the turning plate, the spindle, and a stop 36, of an expanding cone having guides 21, a swinging guide adapted to engage the stop and provided with a slot 39, a slide having arms which engage the guides, a lever 28, by which the slide is operated, and a stud 42, also operated by the lever, the lower end of which engages slot 39 and moves the swinging guide in or out to correspond with the expansion or contraction of the cone.

5. The combination, with the turning plate, the spindle, and a stop 36, of an expanding cone having guides 21, a swinging guide 37, adapted to engage the stop and provided with a slot 39, a slide having arms which engage guides 21, a lever 28, by which the slide is operated, a stud 42, also operated by the lever, the lower end of which engages slot 39 and

moves the swinging guide in or out to correspond with the expansion or contraction of the cone, a rack 32, a pawl engaging therewith, and suitable connections by which the parts are locked in the expanded or contracted position.

6. In combination, an expanding cone having guides 21, a slide having arms 23, engaging the guides, a swinging guide 37, having a slot 39, a sliding stud adapted to engage said slot to swing the guide in or out, and an operating-lever which moves the slide and stud simultaneously, so that as the cone is expanded the swinging guide is moved outward to correspond therewith.

7. In a machine of the class described, the combination, with the spindle and the expanding cone having guides 21, of slide 24, having arms engaging the guides, stop 36, swinging guide 37, having a slot 39, a stud 42, engaging said slot, and an operating-lever by which the slide and stud are moved simultaneously.

8. The combination, with the spindle, the expanding cone having guides 21, and the slide having arms 23, engaging said guides for the purpose set forth, of swinging guide 37, having slot 39, guide-plate 40, having slot 41, stud 42, engaging said slots for the purpose set forth and having a guide-rod engaging a guide 45, and operating-lever 28, which engages the slide and to which the stud is pivoted.

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

FRANK J. MURPHY.

Witnesses:

JABEZ AMSBURY,
JOSEPH E. PLATT.