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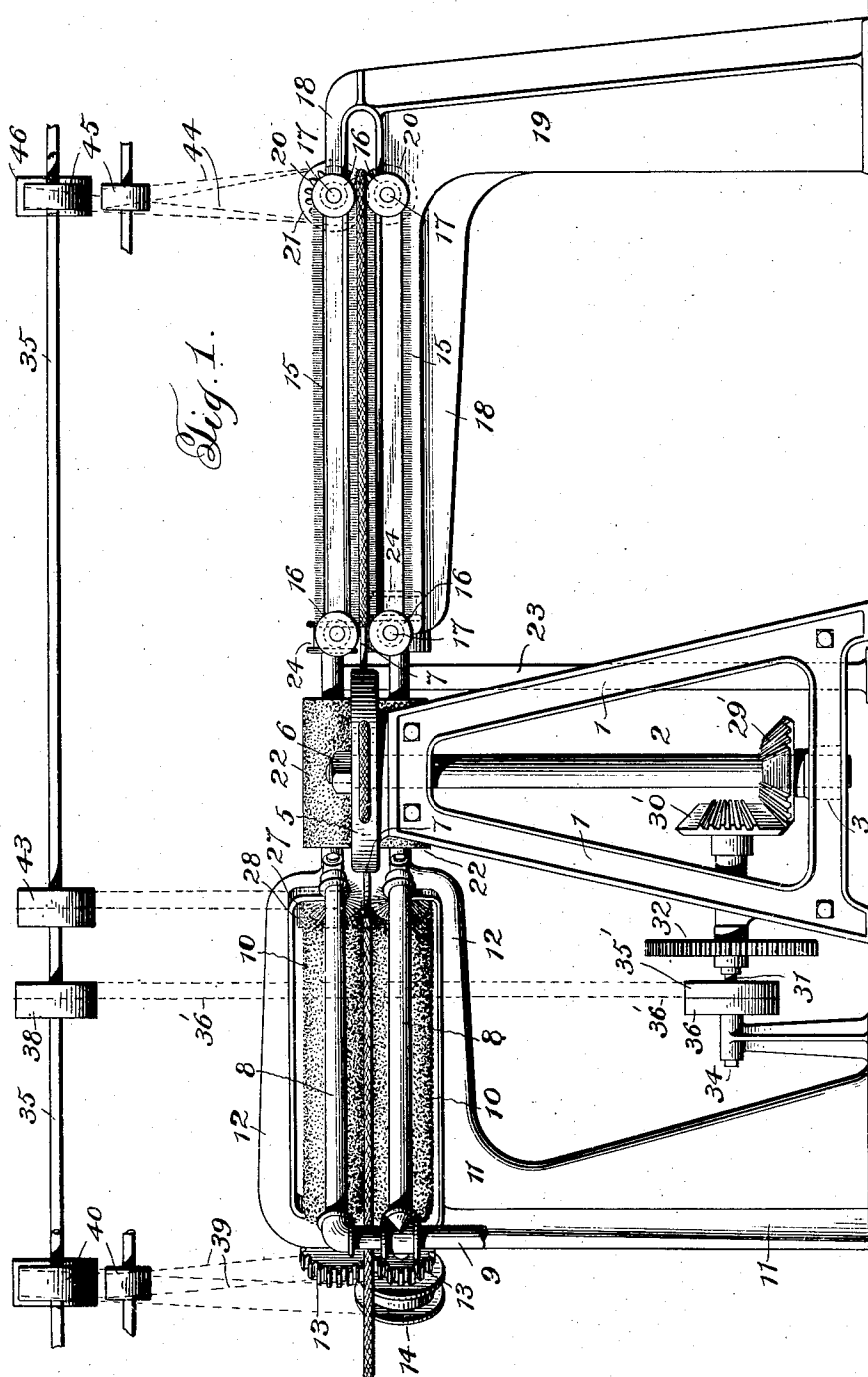
SINGEING MACHINE.

APPLICATION FILED FEB. 13, 1908.

1,047,875.

Patented Dec. 17, 1912.

3 SHEETS—SHEET 1.



Witnesses:

Jas. Hutchinson:
J. H. Reid.

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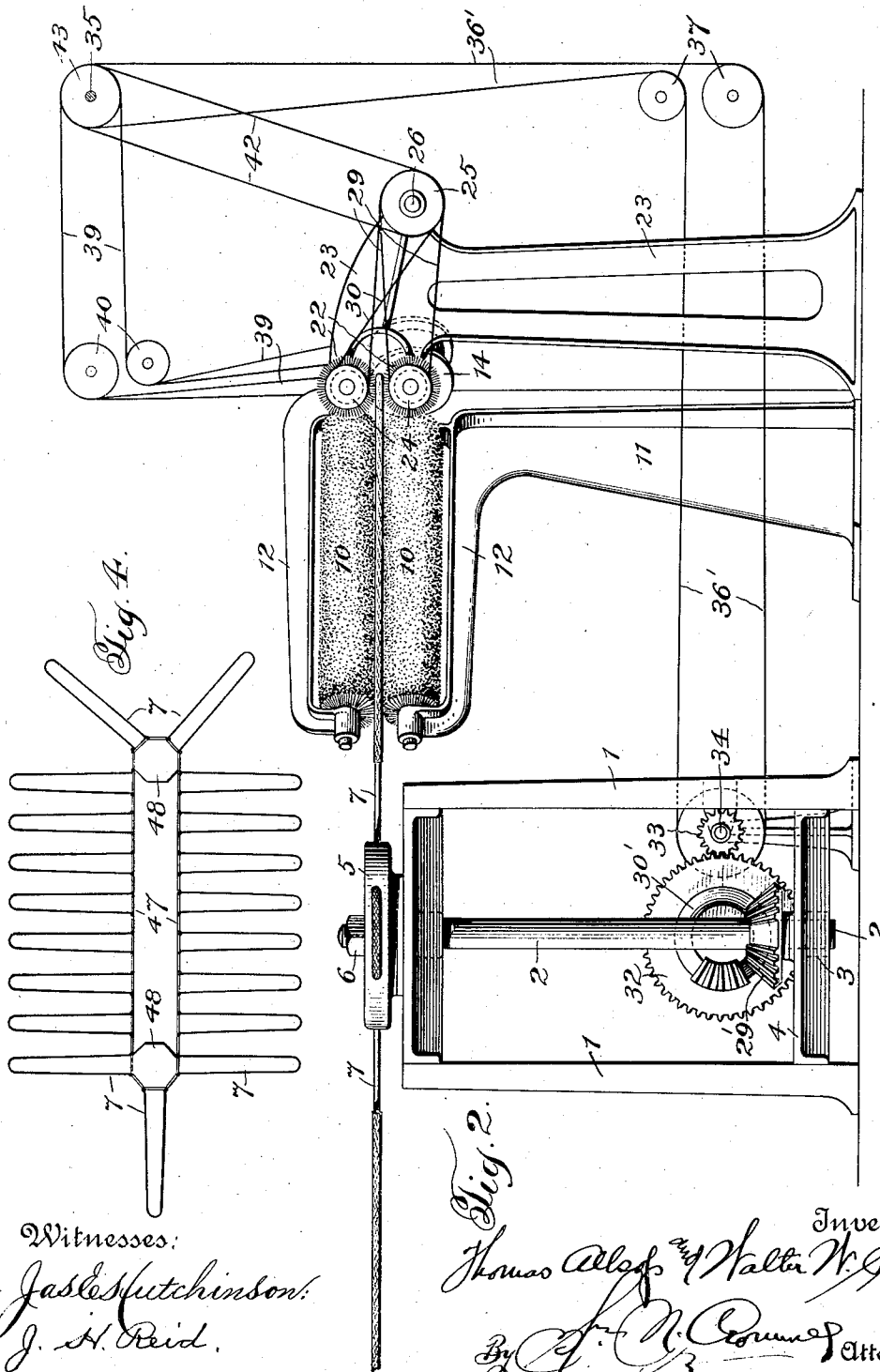
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3 SHEETS—SHEET 2.



Witnesses:

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Fig. 2.

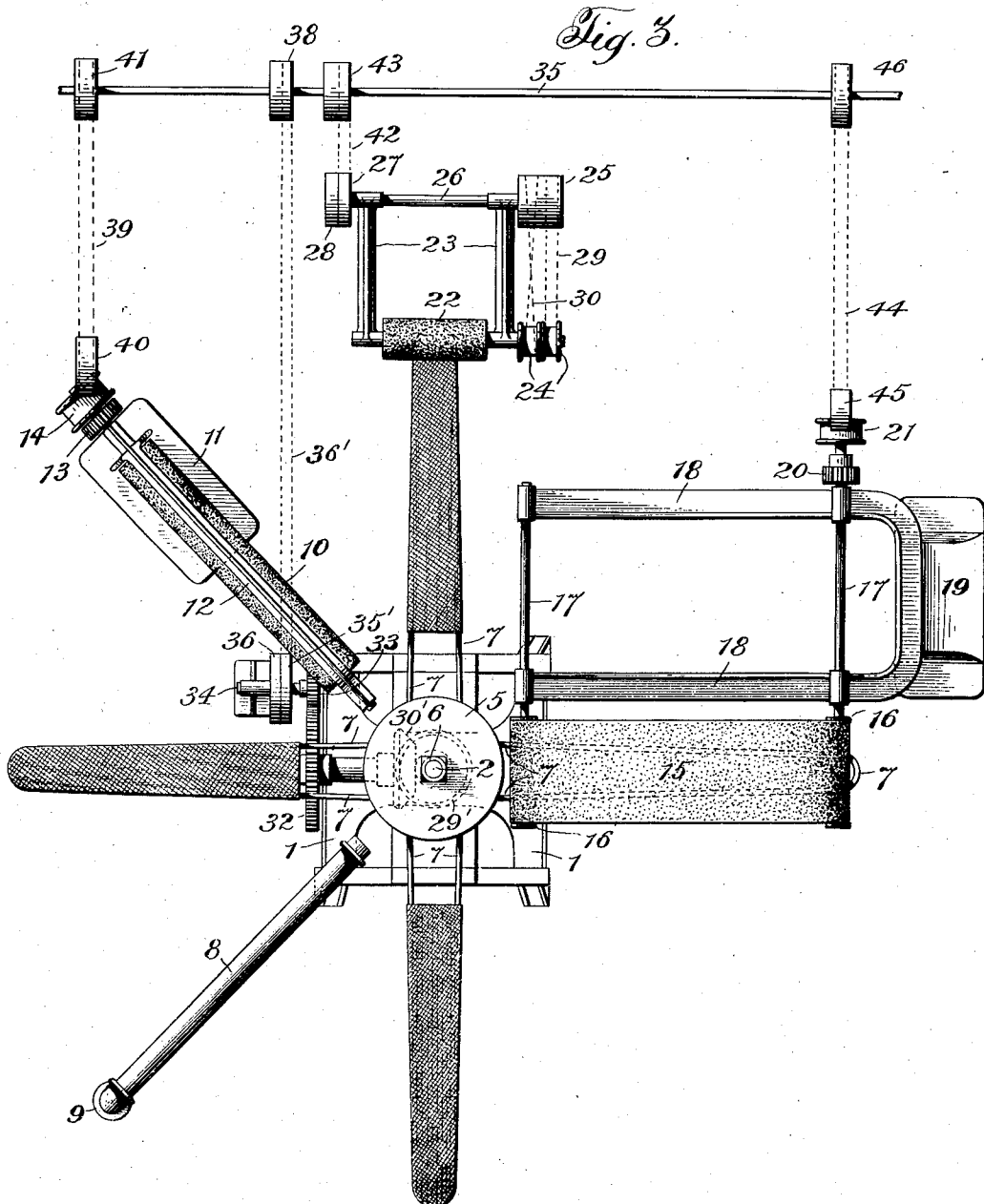
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3 SHEETS—SHEET 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

THOMAS ALLSOP AND WALTER W. SIBSON, OF PHILADELPHIA, PENNSYLVANIA,
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SINGEING-MACHINE.

1,047,875.

Specification of Letters Patent.

Patented Dec. 17, 1912.

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To all whom it may concern:

Be it known that we, THOMAS ALLSOP and WALTER W. SIBSON, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Singeing-Machines; and we 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.

This invention relates to improvements in singeing machines, and more particularly to machines of this character for use in the singeing of stockings.

Heretofore, in the practice of the art, machines have been devised and employed wherein forms, partaking of the character of boards, have been utilized as carriers for the stockings to be singed, these forms supporting the stocking as the latter have progressed through the machines, and serving to distend the stockings to enable the singeing element, usually in the form of gas jets, to act upon the stockings. Such machines, however, are open to objection. Primarily, the boards employed as the forms each presents an unbroken or solid barrier when in the stockings, so that it is absolutely impossible for the hot gases to pass through the interstices of the fabric, or to penetrate from both sides of the latter, and this results in an imperfect singeing of the stocking. In the second place, each stocking must be manually placed upon its form, and, in the machines now commonly used, manually removed therefrom after the singeing operation, although some machines have been devised wherein it is proposed to automatically remove the singed stocking from the forms. The employment of forms of the character mentioned imposes undue labor upon the operatives of the machine, and multiplies the number of such operatives. Furthermore, these forms have no fixed path of travel through the machines, and are, therefore, susceptible of deviation from the path intended to be followed by the same.

The present invention has in view the production of a singeing machine the construction of which is such as to obviate the objections noted by providing means for support-

ing the stockings in distended form but capable of admitting the hot gases to and through the interstices thereof, thus enabling the stockings to be singed to the required extent without, however, burning the same by the presence of the singeing flame.

The invention also aims to provide a singeing machine embodying in its construction means for automatically feeding the stockings to the forms and stripping the same therefrom, when the singeing operation has been completed, whereby manual effort for the accomplishment of these steps is entirely eliminated, and a resultant reduction in the number of operatives for the machine effected.

The invention also contemplates the provision of a singeing machine wherein means are embodied for imparting to the respective forms a fixed orbital movement, during which movement the stockings are subjected to the different steps incident to singeing, and after completing the cycle of operations the forms are returned successively to the point of application of the stockings, there to be automatically charged with the unsinged stock.

With these general objects in view, and others that will appear as the nature of the improvements is better understood, the invention consists substantially in the novel construction, combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the appended claims.

While the form of the invention herein shown and described is one embodiment thereof, it is manifest that the same is susceptible of different embodiments, and being capable of changes in the form, proportion and minor details of construction, the right is reserved to modify or vary the invention as falls within the spirit and scope thereof.

In the drawings, Figure 1 is a side elevation of a singeing machine constructed in accordance with the present invention. Fig. 2 is a similar view taken at right angles to the point of view in Fig. 1. Fig. 3 is a top plan view of the machine illustrated in Figs. 1 and 2. Fig. 4 is a plan view illustrating another form of carrier for the stockings.

Referring in detail to the drawings, the numeral 1 designates the main frame of the machine, said frame being of suitable con-

struction and material, and mounted within said frame is a vertically-extending shaft 2, the lower end of said shaft being arranged in a suitable bearing 3 formed in a transversely-extending support 4 adjacent the lower end of said frame. At the top of the shaft 2, and at a point above the upper portion of the frame 1, is a head 5, said head being fixedly connected to the shaft 2 through the medium of a binding nut 6, and thus rotatable with the shaft 2. The head 5 constitutes a rotatable carrier, and supported by the latter is a series of radially-extending forms 7 designed to carry the stockings during the steps incident to singeing. These forms 7 are preferably constructed in skeleton outline, to which end the same may be made of heavy wire, and by reason of such construction it is apparent that the stockings will be effectually distended when upon the forms, and while distended the stockings are capable of admitting the hot gases of the singeing flames to and through the interstices of the stockings. Moreover, the wire forms 7 will permit the hot gases to penetrate from both sides of the stockings without, however, burning the same, so that the singeing is effected to the required extent in a most thorough manner. Each of the forms 7 slightly tapers from its outer end to the inner end thereof, and hence this tapering of the forms acts to hold the stockings firmly in place when the same have been applied to the forms.

Arranged in diagonal relation to the head 5 is a pair of burner tubes 8. These tubes are arranged also in parallel relation to each other, and are spaced a sufficient distance apart to permit the forms 7, charges with the unsinged stockings, to readily pass therebetween, and the lower side of the upper tube, and the upper side of the lower tube are perforated for the exit of the gases that constitute the singeing flames. The tubes 8 are supported through the medium of a feed pipe 9, which feed pipe may be held in position in any suitable manner, and it will be understood that suitable mixing devices are employed with the feed pipe 9 to produce the necessary admixture of air and gas for the singeing flames. Also arranged in diagonal relation to the head 5 is a pair of rotary brushes 10, these brushes being journaled in a suitable supporting frame 11, and said frame is provided with upper and lower horizontally-disposed legs 12 in each of which one of the brushes 10 is journaled. The brushes 10 are in sufficient proximity to each other that when the forms 7, charged with the stockings, leave the burner tubes 8, the same will pass between the brushes 10 and be acted on by the latter to brush off the carbonized fiber produced by the singeing flames, it being understood that rotary movement is given to

the brushes 10 to effect such brushing action during the passage of the forms. To this end each of the brushes 10 is provided with a suitable gear 13, mounted upon the outer end of the brush axis, said gears meshing with each other, and thereby imparting reverse movement to the brushes, and for driving the latter a pulley 14 is mounted upon the axis of one of the brushes to which power is applied in the manner hereinafter to be described.

As before premised, the present invention has in view the production of a machine wherein provision is made for automatically feeding the stockings to and stripping the same from the forms. For effecting the feeding of the stockings a pair of brush conveyers 15 is employed. These conveyers are preferably of a length equivalent to the length of an ordinary stocking, and are each supported by a pair of pulleys 16 carried by shafts 17, said shafts being journaled in parallel arms 18 of a supporting frame 19. The arms 18 are spaced sufficiently apart to permit the forms 7 readily to pass therebetween, and by reference to Fig. 3, it will be observed that the brush conveyers 15 are arranged in such relation to the main frame 1 as to normally cover substantially the entire length of one of the forms 7. The outermost shaft 17 of each of the conveyers 15 is provided with a gear 20, said gears intermeshing in order to drive the contiguous stretches of the conveyers in the same direction, or toward the head 5, and one of said shafts 17 is provided with a driving pulley 21 through the medium of which power is applied for the operation of said brush conveyers. Manifestly, the bristles of the conveyers 15, at the contiguous stretches thereof, will be in such close proximity as to contact with the form 7 between the conveyers, so that when a stocking is introduced between the outermost ends of the conveyers the bristles will act to force the open end of the stocking upon the form and feed the stocking along the latter. In this feeding it is also apparent that the stocking will be brushed along the form, and all wrinkles therein entirely eliminated, so that when the form leaves the conveyers 15 the stocking thereon is ready for presentation to the action of the singeing flames.

For stripping the singed and brushed stockings from the forms 7 a pair of rotary brushes 22 is positioned in diametrical relation to the frame 1, and at a point to act upon the singed stockings after the same have left the brushes 10. These brushes 22 are journaled in a suitable supporting frame 23, and the axis of each of said brushes is provided with a driving pulley 24. These pulleys, however, are not in vertical alignment, and are each driven by a separate belt from a pulley 25 carried by a shaft 26, which

latter is journaled in the frame 23 and provided with tight and loose pulleys 27 and 28. Obviously, the brushes 22 must rotate in opposite directions, and to effect this end a straight belt 29 connects the pulley 25 with the upper pulley 24, while a cross-belt 30 likewise connects the upper pulley 24 with the pulley 25. The position of the brushes 22 in relation to the forms 7 is such that when the outer end of each of the latter is projected between said brushes a sufficient portion of the stocking is introduced to the bight of the brushes to enable the latter to draw the singed stocking from the form, and in passing from the brushes 22 the stocking may be deposited either in a suitable receptacle for the same, or into any desired form of conveyor for taking the stocking from the machine.

In the operation of the forms 7 to and through the machine it is requisite that a dwell of predetermined length should be given to the forms to permit the feeding of the stocking to each form and stripping of the same therefrom after being singed. That this may be done the shaft 2 is provided with a mutilated miter gear 29' with which a second mutilated miter gear 30' meshes. It is to be observed, however, that the gear 30' has only a segment provided with teeth, and the arrangement of the mutilated portions of the gears 29' and 30' is such that the former makes only one-quarter of a revolution to one revolution of the latter. Therefore, an intermittent drive is provided for the shaft 2, and the throw of the latter, under the influence of such drive, is only sufficient to carry each form 7 one-quarter of the circumferential path about the shaft 2. The gear 30' is carried by a shaft 31, suitably journaled in the frame 1, and mounted upon said shaft is a gear 32 that meshes with a pinion 33 carried by a jack-shaft 34, said shaft 34 being provided with tight and loose pulleys 35' and 36, respectively, through the medium of which power is applied to the shaft 34.

A line shaft 35 is employed for driving the respective mechanisms previously described, and that the power may be transmitted from this shaft to said mechanisms a belt 36' that traverses idler pulleys 37 connects the pulleys 35' and 36 with a pulley 38 upon said shaft 35; a belt 39 likewise passes over idler pulleys 40 and connects the pulley 14 with a pulley 41 upon the shaft 35; a belt 42 connects the pulleys 27 and 28 with a pulley 43 also mounted upon said shaft 35, and a belt 44, which passes over idler pulleys 45, connects the pulley 21 with a pulley 46 carried by the shaft 35. Through the medium of these belts it will be seen that so long as the shaft 35 is continuously operating, continuous operation will be imparted to the brushes 10 and the brushes 22;

likewise to the brush conveyers 15, but the operation of the shaft 2 is dependent upon the positioning of the belt 36' upon the tight pulley 35'. Therefore, as the forms are carried between the brushes 10 and 22, the stockings will be acted thereon, first, by the brushes 10 to remove the carbonized fiber, and then by the brushes 22 to strip the stockings from the forms.

In the operation of the hereindescribed machine the mouth of a stocking is introduced between the outermost ends of the brush conveyers 15. The contiguous stretches of these conveyers moving toward the head 5, it is obvious that the stocking will be brushed along the form that is between said conveyers. During this movement it will be understood that the shaft 2 is at rest. The moving of the shaft, however, is timed so that after the stocking has been positioned upon the form between the conveyers 15 said shaft will be operated by the gears 29' and 30' for moving the stocking and its form approximately 90 degrees about the circumference of a circle the center of which is the shaft 2. This positions a second form between the brush conveyers 15, and on the next movement of the shaft 2 the first stocking is carried between the burner tubes 8, at which point it is subjected to the singeing action of the flames of said tubes. In this movement, however, the stocking does not dwell between the burner tubes, but its transit therethrough is only sufficient to enable the loose fibers to be carbonized, and the next dwell of the shaft 2 positions the first stocking between the burner tubes 8 and the brushes 10. When the shaft 2 is again moved the first stocking is carried between said brushes 10, at which point the carbonized fibers are removed from the stocking, and when the shaft 2 again comes to rest the first stocking is positioned with its toe portion between the brushes 22. These brushes being in operation, the stocking is caught in the bight thereof and removed from the form upon which it was originally placed, and on the next movement of the shaft 2 the form from which the stocking has been thus stripped is presented to the brush conveyers 15, at which point an unsinged stocking is passed thereon. This cycle of operations is repeated during the operation of the machine, and it will, of course, be understood that the speed of the shaft 2 is proportioned in accordance with the speed of the feeding and stripping mechanisms so that the shaft 2 will not be disproportionate to the feeding and stripping of the stockings, nor such as to interfere either with the proper application of the stocking to the form, or the stripping of the singed stocking from the form upon which it has been carried. It will be further understood that if so desired the stockings may

be manually applied to the forms 7, in which event the feeding mechanism described may be dispensed with, but the use of this feeding mechanism eliminates the manual effort necessary for such feeding, and at the same time positions the stocking upon the form freed from wrinkles in its application thereto. Furthermore, any other approved form of feeding mechanism might be substituted for that illustrated and described.

In Figs. 1, 2 and 3, the carrier 5 is illustrated as mounted upon a single axis. Under such conditions, the number of forms 7 carried by said carrier is limited in a measure, and consequently the number of stockings to be fed to the carrier will be limited by the number of forms thereof. To increase the capacity of the carrier, it is obvious that the number of forms 7 may be also increased, and to meet these conditions the structure illustrated in Fig. 4 is employed. Referring to that figure it will be observed that the forms 7 are mounted upon an endless conveyer 47, which conveyer may be in the nature of a sprocket chain, or made up of links, and the conveyer 47 is carried by a pair of rotating heads 48 the axis of one of which may be the shaft 2, and driven thereby in the manner described for the form of carrier illustrated in Figs. 1, 2 and 3. The driving of the conveyer 47 may be such as to cause only one of the forms 7 to pass through the successive mechanisms at each movement of the shaft 2, but if it is desired to increase the speed of the machine this driving may be so proportioned that the periodical movement of the conveyer will be such that two, three, or more of the forms 7 will pass through the respective mechanisms, in which event it is very obvious that the application of the unsinged stockings to the forms must be in such numbers at a single time as to correspond with the number of the forms caused to pass at one time through the various mechanisms. This proportion may be readily determined by the mechanic, and obviously requires no further description.

A convenient construction for the head 5 is to form the same of sections, the latter serving to clamp the forms 7 therebetween, but it is obvious that the head may be solid, and the forms 7 secured thereto in any desired manner as will readily suggest itself to a skilled mechanic.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. In a machine of the class described, singeing means, supporting means for the articles to be singed, a carrier for moving the supporting means in a fixed path, and means for feeding the articles to be singed to said supporting means.

2. In a machine of the class described, singeing means, supporting means for the articles to be singed, a carrier for moving the supporting means in a fixed path, means for feeding the articles to be singed to said supporting means, and means for removing the carbonized fiber from the singed articles.

3. In a machine of the class described, singeing means, supporting means for the articles to be singed, a carrier for moving the supporting means in a fixed path, means for feeding the articles to be singed to said supporting means, means for removing the carbonized fiber from the singed articles, and means for removing the singed articles from the supporting means.

4. In a machine of the class described, singeing means, supporting means for the articles to be singed, a carrier for said supporting means, and means for feeding the articles to be singed to said supporting means.

5. In a machine of the class described, supporting means for the articles to be singed, a carrier for moving the supporting means in an orbital path, and singeing means arranged in radial relation to said carrier.

6. In a machine of the class described, supporting means for the articles to be singed, a carrier for moving the supporting means in an orbital path, singeing means arranged in radial relation to said carrier, and means also arranged in radial relation to the carrier for removing the carbonized fiber from the singed articles.

7. In a machine of the class described, supporting means for the articles to be singed, a carrier for moving the supporting means in an orbital path, means for imparting intermittent movement to said carrier, and singeing means arranged in radial relation to said carrier.

8. In a machine of the class described, supporting means for the articles to be singed, a carrier for moving the supporting means in an orbital path, means for imparting intermittent movement to the carrier, singeing means arranged in radial relation to the carrier, and means also arranged in radial relation to the carrier for removing the carbonized fiber from the singed articles.

9. In a machine of the class described, supporting means for the articles to be singed, a carrier for moving the supporting means in an orbital path, means for imparting intermittent movement to the carrier, singeing means arranged in radial relation to the carrier, means also arranged in radial relation to the carrier for removing the carbonized fiber from the singed articles, and means for removing the singed articles from the carrier.

10. In a machine of the class described,

a carrier for the articles to be singed having a fixed path of movement, and mounted to operate in an orbital path, and singeing means arranged in radial relation to said carrier.

11. In a machine of the class described, a carrier for the articles to be singed having a fixed path of movement, and mounted to operate in an orbital path, singeing means associated therewith and arranged in radial relation thereto, and means for removing the singed articles from the carrier.

12. In a machine of the class described, supporting means for the articles to be singed, a carrier for moving the supporting means in a fixed path, burner devices arranged in the path of movement of the supporting means for acting upon the articles to be singed, means for feeding the articles to be singed to said supporting means, brushes for removing the carbonized fiber from the singed articles, and brushes for removing the latter from the supporting means.

13. In a machine of the class described, supporting means for the articles to be singed, a carrier for moving the supporting means in an orbital path, burner devices arranged in radial relation to said carrier and through which the supporting means pass to permit said burner devices to act upon the articles supported thereby, and means also arranged in radial relation to said carrier for removing the carbonized fiber from the singed articles.

14. In a machine of the class described, supporting means for the articles to be singed, a carrier for moving the supporting means in an orbital path, burner devices arranged in radial relation to said carrier and through which the supporting means

pass to permit said burner devices to act upon the articles supported thereby, and brushes also arranged in radial relation to said carrier for removing the carbonized fiber from the singed articles.

15. In a machine of the class described, supporting means for the articles to be singed, a carrier for moving the supporting means in an orbital path, burner devices arranged in radial relation to said carrier and through which the supporting means pass to permit said burner devices to act upon the articles supported thereby, brushes also arranged in radial relation to said carrier for removing the carbonized fiber from the singed articles, and means for removing the singed articles from said supporting means.

16. In a machine of the class described, singeing means, a skeleton form for supporting the articles to be singed, means for imparting intermittent movement to said form, brushes for removing the carbonized fiber from the singed articles supported by said form, and brushes for removing the singed articles from the form.

17. In a machine of the class described, singeing means, a skeleton form for supporting the articles to be singed, said form having movement in an orbital path, means for imparting intermittent movement to said form, brushes for removing the carbonized fiber from the singed articles supported by said form, and means for removing the singed articles from the form.

In testimony whereof we affix our signatures, in the presence of two witnesses.

THOMAS ALLSOP.
WALTER W. SIBSON.

Witnesses:

HARRY L. FENTON,
ELERY L. SMITH.