April 28, 1925. 1,535,324

W. A. LORENZ

MACHINE FOR SHRINKING FELT ARTICLES

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Fig. 1

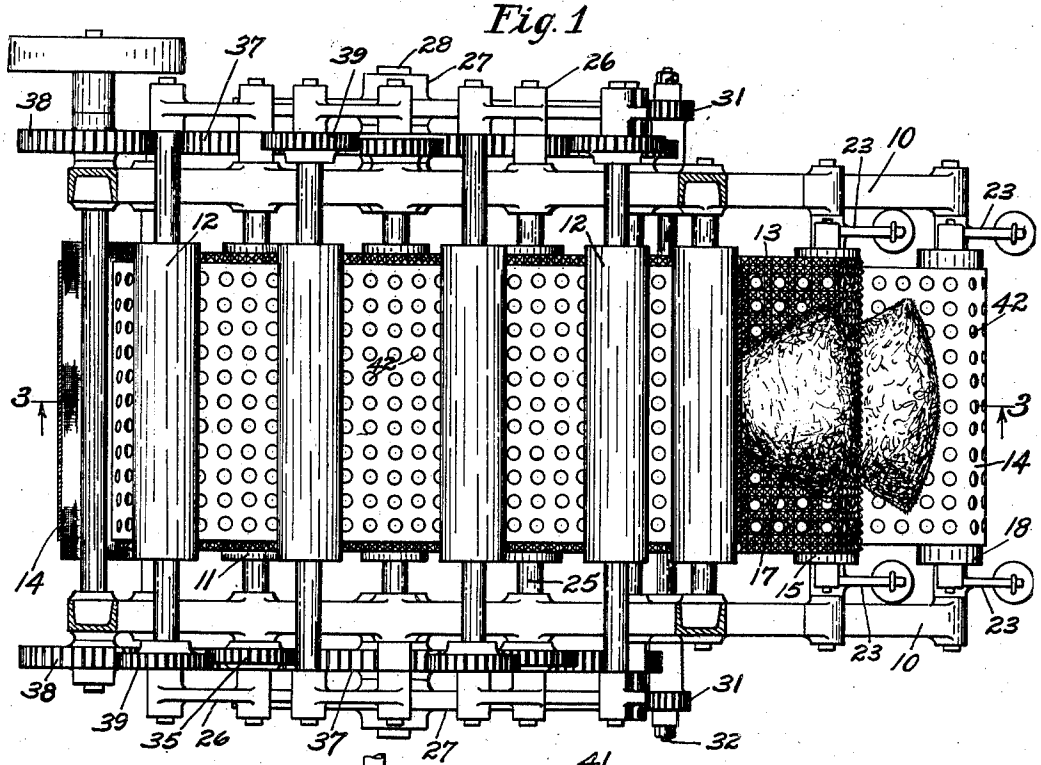
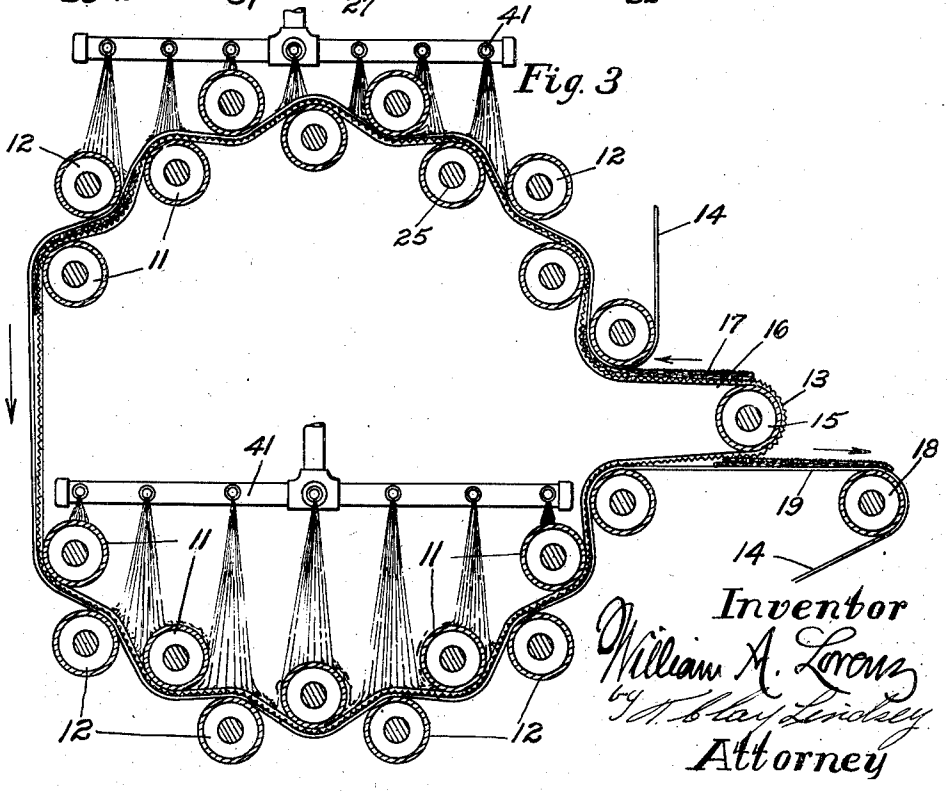



Fig. 3




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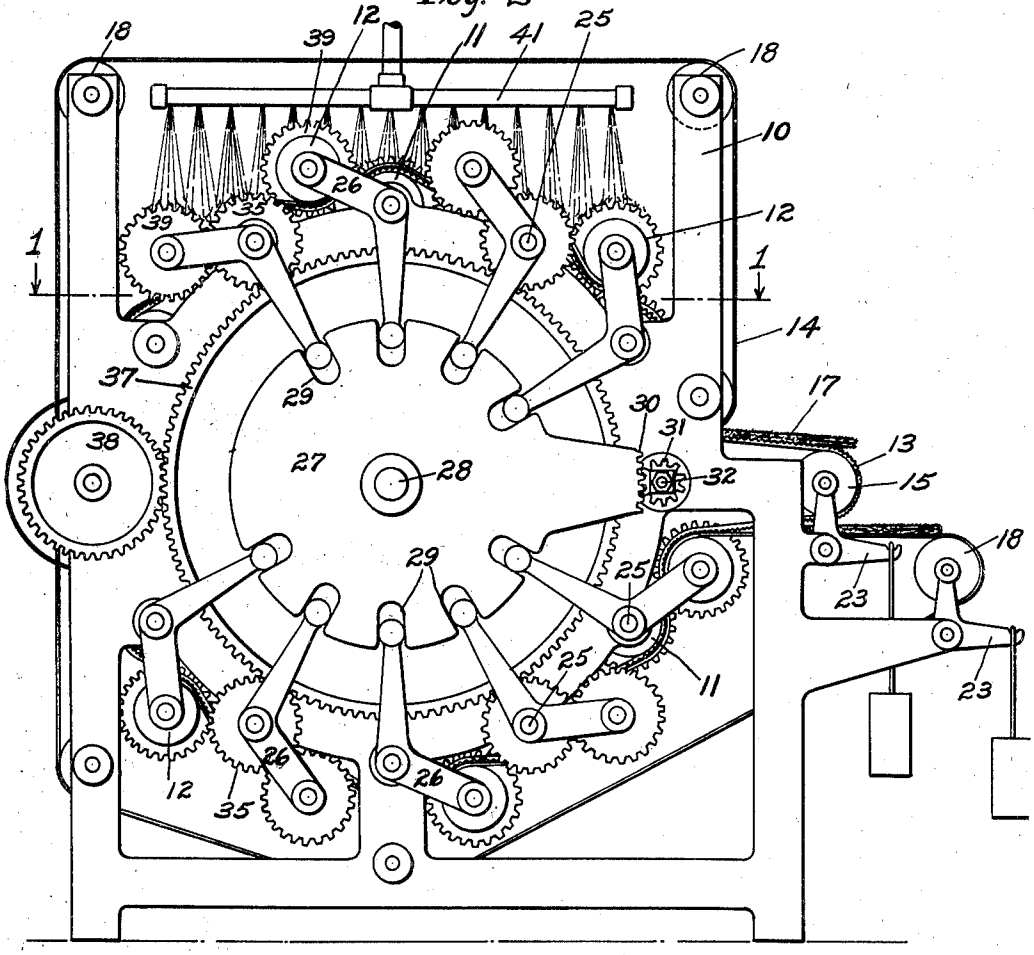
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*Fig. 2*




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# UNITED STATES PATENT OFFICE.

WILLIAM A. LORENZ, OF HARTFORD, CONNECTICUT, ASSIGNOR TO UNITED STATES HAT MACHINERY CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF VIRGINIA.

## MACHINE FOR SHRINKING FELT ARTICLES.

Application filed June 23, 1923. Serial No. 647,312.

*To all whom it may concern:*

Be it known that I, WILLIAM A. LORENZ, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in a Machine for Shrinking Felt Articles, of which the following is a specification.

This invention relates to machines for shrinking and felting hat bats and the like and has as its aim to provide in an apparatus of this sort an improved arrangement of parts, and various features of novelty and advantage.

More particularly, the object of the invention is to provide a machine for shrinking and felting hat bats and the like which is characterized by its simplicity and economy in construction, its compactness in arrangement, its effectiveness in operation, and the ease and facility with which certain adjustments may be made.

The above and other objects of the invention are obtained in the structure shown in the accompanying drawings, by way of illustration. In these drawings:

Figure 1 is a top plan view of the machine, a portion of one of the belts being broken away, and the pipes for delivering hot water onto the bats being omitted;

Fig. 2 is a side elevation of the machine; and

Fig. 3 is a diagrammatic showing of the machine in vertical section, on line 3—3 of Fig. 1.

Referring to the drawings in detail, the machine is illustrated as having a frame of suitable construction and which, in the present instance, comprises a pair of side frames 10 tied together in any approved manner. Circularly arranged within the frame are a plurality of guide rolls between which the bats are passed in an unrolled condition substantially in the path of a circle. In the present instance, the rolls are arranged in staggered relation so that, while the path of the bats is generally circular, it is also somewhat wavy, resulting in the bats being progressively bent to and fro as they are passed through the machine. These rolls support and guide one or more belts, in the present instance two such belts being shown by way of illustration. More particularly, the guide rolls consist of circularly arranged supporting rolls 11 constituting a circular track-way for the belts, and deflecting or wave rolls 12 interposed between the supporting rolls 11 and adapted to bear upon the belts and depress the same between the supporting rolls. One of the belts, which, in the present instance, is designated by the numeral 13, is a relatively short one and travels over and is directly supported by the supporting rolls 11. The other belt 14, for a portion of its length, overlies and engages the working face of the belt 13. Thus, the belts are paired, so to speak, providing, what may be called, a double belt arrangement in that the belts travel together in a circular path between guide and deflecting or wave rolls.

In the present illustrative embodiment, the belt 13 at the forward end of the machine, is passed about a roller 15 which is outside of the circle in which the guide rolls 11 and 12 are disposed so as to provide a horizontally extending receiving portion 16 on which the bats, such as the one indicated by the numeral 17, are placed. The outer belt 14 is in the form of a pair of loops, so to speak, the inner loop being guided by the guide rolls 11 and 12, and the outer loop being carried about the rollers 18. This belt 14 has, at the forward end of the machine and immediately beneath the bat receiving portion of the belt 13, a horizontally extending delivery portion 19 from which the bats are taken after they pass through the machine and replaced by the operator on the receiving portion 16 of the belt 13. It will be noted that the horizontally extending portion 19 passes about a roller 18′ spaced in advance of the roller 15. The belts may be placed under suitable tension in any desired manner, as by mounting the rollers 15 and 18′ on weighted levers 23. Preferably, at least one of the belts is provided with a multiplicity of kneading knuckles so that, as the bats are passed through the machine, they are each kneaded or manipulated at a multiplicity of points, which action greatly facilitates the shrinking and felting operation. For example, the outer or working face of the belt 13 may be provided with such knuckles and, by preference, these knuckles are elastic, and to this end they may be formed of rubber. The face of the belt 14 which engages the work-

ing face of the belt 13 in the present instance is smooth but, if desired, the contacting faces of both of the belts 13 and 14 may be provided with elastic kneading knuckles.

By way of example, the gudgeons 25 of the supporing rolls 11 are shown as being journalled in suitably fixed bearings provided in the side frames 10, and the deflecting rolls 12 are rotatably supported in the free ends of crank levers 26 appropriately pivoted as, for instance, on the gudgeons 25 of the guide rolls. The levers 26 are pivotally adjusted so as to move the deflecting rolls towards and away from the supporting rolls in order to increase and decrease the waviness of the path which the bats take as they pass between these rolls. If the bats are relatively soft, the wave rolls are adjusted so that the bats are subjected to a lesser bending movement to and fro, and if the bats are relatively hard, the wave rolls are brought in further between the supporting rolls so as to increase the waviness of the path and accelerate the shrinking and felting action. This adjustment of the wave rolls is accomplished by a pair of rotatable members, one on either side of the machine, in the present instance these members being in the form of disks 27 journalled on the opposite ends of a shaft 28, journalled centrally of the machine. The disks, as will be seen most clearly from Fig. 2, are provided at their peripheries with radial slots 29 which slidingly receive the inner ends of the levers 26. For the purpose of simultaneously adjusting these disks 27, each is provided with a segment 30 meshing with respective pinions 31 secured to a shaft 32 the end of which may be squared to receive a handle whereby it may be turned. With the arrangement described, it will be clear that to adjust the wave rolls relative to the supporting ones and thereby vary the waviness of the path of the belts, it is merely necessary to turn the shaft 32 and thereby simultaneously swing the levers 26 to the desired extent. This adjustment can be made while the machine is operating and, therefore, without interrupting the manipulation of the bats within the machine.

Preferably, the guide rolls 11 and 12 are driven, and to this end, the gudgeons 25 of the supporting rolls have fixed to them gears 35 meshing with a large common gear 37 fixed to the shaft 28 and driven in any suitable manner, as by means of a drive gear 38. If desired, two gears 37 may be provided, one on either side of the machine, and alternate supporting rolls will be provided at one end with gears 35 meshing with one of these gears 37 and the intervening supporting rolls may be provided with gears 35 meshing with a gear 37 on the other side of the machine. Such an arrangement is shown in the drawings by way of illustration. The deflecting rolls may also be driven, and to this end I have shown these rolls as having gears 39 meshing with the gears 35.

A constant flow of scalding hot water is supplied to the bats as they are passed through the machine in order to obtain the desired shrinking action. In the present instance, this water is delivered from the pipes 41 down onto the top of the belts. In order that the water may reach the bats positioned between the belts, the belts are perforated, as indicated at 42. The water will run through the perforations of the belt which is uppermost but, as the perforations of one belt will rarely register with those of the lower belt, the water will not drain off immediately through the lower belt. I have found, in actual practice, that by thus providing the belts with holes or perforations, shrinking of the bat is greatly accelerated, because the hot water is properly supplied thereto.

The operation of the device will be clear from the foregoing description. It is understood that the bats are placed on the receiving portion 16 of the inner belt 13 and are then passed in a circular path between the supporting and deflecting rolls and, as the bats are so passed, they are repeatedly bent to and fro, subjected to a kneading action at a multiplicity of points, owing to the elastic knuckles on the belt 13, and are maintained in a saturated condition by the water delivered onto the belts and through the perforations thereof. After the bat has made one pass through the machine, the operator may take it from the portion 19 of the outer belt and position it again on the receiving portion 16 of the belt 13, and the operation may be repeated until the bat is shrunk to the desired extent.

It is, of course, obvious that my invention is susceptible of various modifications and changes which are within the spirit of the invention without departing from the scope of the following claims, it being understood that the present disclosure of my invention is by way of illustration only and it is not to be taken as restrictive of my conception.

I claim as my invention:

1. In a machine of the character described, a plurality of generally circularly arranged guide rolls forming a generally circular track-way, and belts guided by said rolls and arranged to carry bats in an unrolled condition in the circular path formed by said rolls.

2. In a machine of the character described, a bat carrying belt, and staggeredly and generally circularly arranged supporting rolls and deflecting rolls forming a generally circular and wavy path for said belt and the bats carried thereby.

3. In a machine of the character described, a bat carrying belt having its working face

provided with a multiplicity of kneading knuckles, and a plurality of staggeredly and generally circularly arranged supporting rolls and deflecting rolls forming a generally circular and wavy path for said belts and the bats carried thereby.

4. In a machine of the character described, a bat carrying belt having its working face provided with a multiplicity of kneading knuckles, a smooth face belt paired with and contacting with the working face of said first belt, and a plurality of staggeredly and generally circularly arranged supporting rolls and deflecting rolls forming a generally circular and wavy path for said belts and the bats carried thereby.

5. In a machine of the character described, paired belts adapted to receive and hold bats between their contacting faces, and a plurality of generally circularly and staggeredly arranged supporting rolls and deflecting rolls for guiding said belts, together with the bats therebetween, in a generally circular and wavy path.

6. In a machine of the character described, paired flexible belts adapted to receive and hold bats between their contacting faces, rolls for guiding said belts, and means for discharging a flow of water onto the uppermost belt, the uppermost of said belts having perforations for accommodating the passage of water therethrough said belt being impervious, except for said perforations.

7. In a machine of the character described, paired flexible belts adapted to receive and hold bats between their contacting faces, rolls for guiding said belts, and means for discharging a flow of water onto the uppermost belt, said belts having perforations for accommodating the passage of water therethrough said belts being impervious, except for said perforations.

8. In a machine of the character described, paired belts adapted to receive and hold bats between their contacting faces, a plurality of staggeredly and generally circularly arranged guide rolls forming a generally circular and wavy path for said belts, and means for discharging a flow of water onto the belts, said belts being provided with a plurality of perforations to accommodate the passage of water therethrough said belts being impervious, except for said perforations.

9. In a machine of the character described, a plurality of generally circularly arranged guide rolls forming a generally circular track-way, a centrally positioned gear for rotating said rolls, and belts guided by said rolls and arranged to carry bats in an unrolled condition in the circular path formed by said rolls.

10. In a machine of the character described, a plurality of generally circularly arranged supporting rolls, deflecting rolls between said supporting rolls, gears on said supporting rolls, a large common gear meshing with said gears, and a bat carrying belt passing between and guided by said supporting rolls and deflecting rolls in a generally circular path.

11. In a machine of the character described, a bat carrying belt, staggeredly and generally circularly arranged supporting rolls and deflecting rolls forming a generally circular and wavy path for said belt and the bats carried thereby, a driven shaft journalled centrally of said rolls, a large gear fixed on each end of said shaft, gears on one end of some of said rolls meshing with one of said large gears, and gears on the other end of other of said rolls meshing with the other large gear.

12. In a machine of the character described, a plurality of generally circularly arranged supporting rolls, deflecting rolls between said supporting rolls, gears on said supporting rolls, a large common gear meshing with said gears, intermeshing gears on said deflecting and supporting rolls, and a bat carrying belt passing between and guided by said supporting rolls and deflecting rolls in a generally circular path.

13. In a machine of the character described, a plurality of generally circularly arranged supporting rolls, deflecting rolls between said supporting rolls, a bat carrying belt passing between and guided by said supporting rolls and deflecting rolls in a generally circular path, and means such, for example, as a disk for simultaneously adjusting said deflecting rolls.

14. In a machine of the character described, a plurality of generally circularly arranged supporting rolls, deflecting rolls between said supporting rolls, pivoted levers in which said deflecting rolls are journalled, rotatable means common to said levers for adjusting said deflecting rolls relative to said supporting ones, and a bat carrying belt passing between said supporting and deflecting rolls.

15. In a machine of the character described, a plurality of circularly arranged supporting rolls, deflecting rolls between said supporting rolls, a bat carrying belt passing between said supporting and deflecting rolls, pivoted members in which said deflecting rolls are journalled, a rotatable disk having peripheral slots in which the ends of said members are adapted to slide, and means for rotatably adjusting said disk.

16. In a machine of the character described, a plurality of generally circularly arranged supporting rolls, deflecting rolls between said supporting rolls, a bat carrying belt passing between said supporting and deflecting rolls, pivoted levers in which the opposite ends of said deflecting rolls

are journalled, a rotatable disk at each side of the machine having radially extending slots in their peripheries adapted to receive the inner ends of said levers, and means for rotatably adjusting said disks in unison.

17. In a machine of the character described, a plurality of generally circularly arranged supporting rolls, deflecting rolls between said supporting rolls, a bat carrying belt between said supporting rolls and deflecting rolls, a centrally positioned gear for rotating said rolls, and means for simultaneously adjusting said deflecting rolls.

WILLIAM A. LORENZ.