July 9, 1929. G. W. MUDD 1,719,899

HAIR CURLING MACHINE

Filed Nov. 19, 1928 2 Sheets-Sheet 1

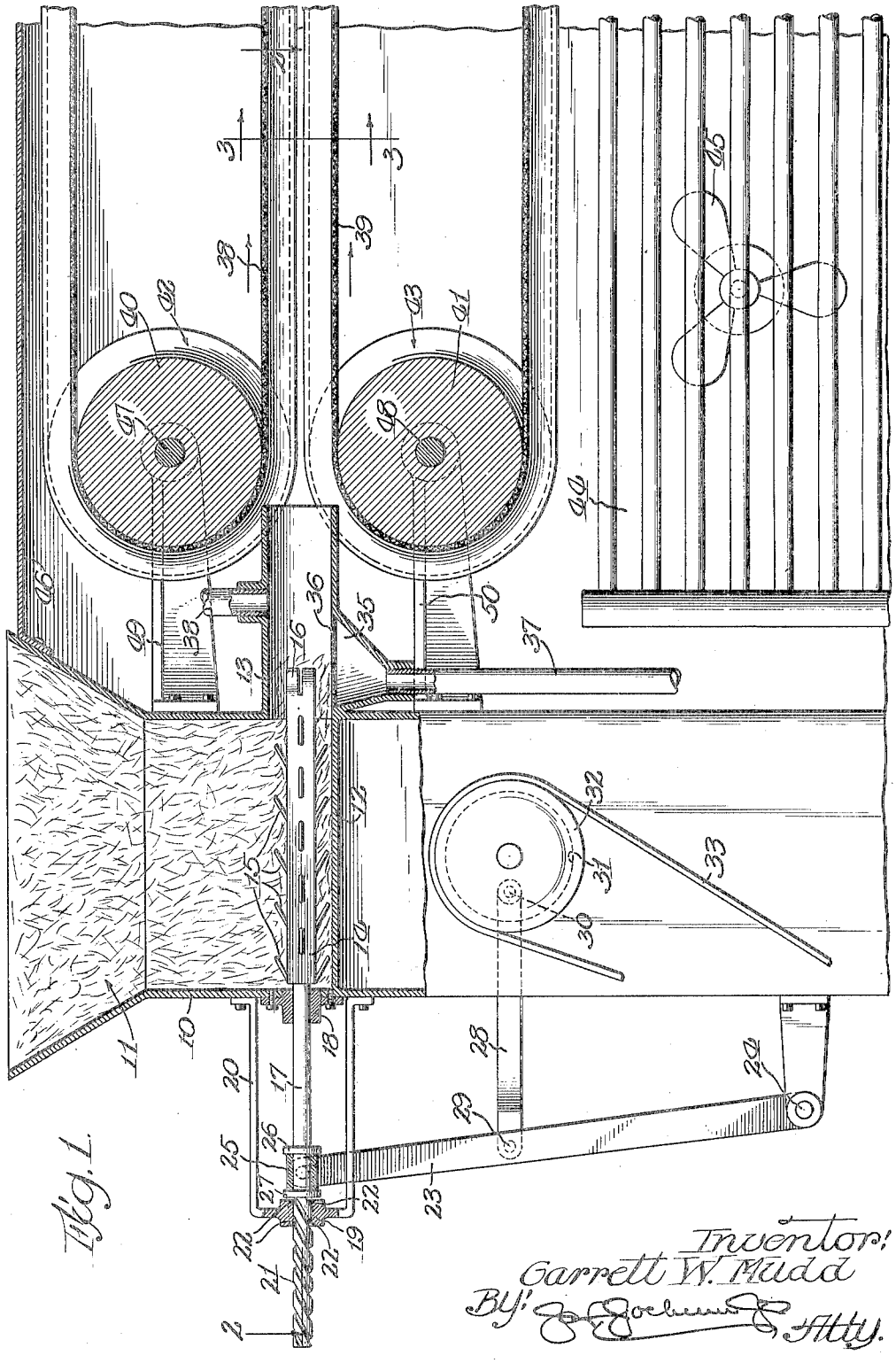


Fig. 1.

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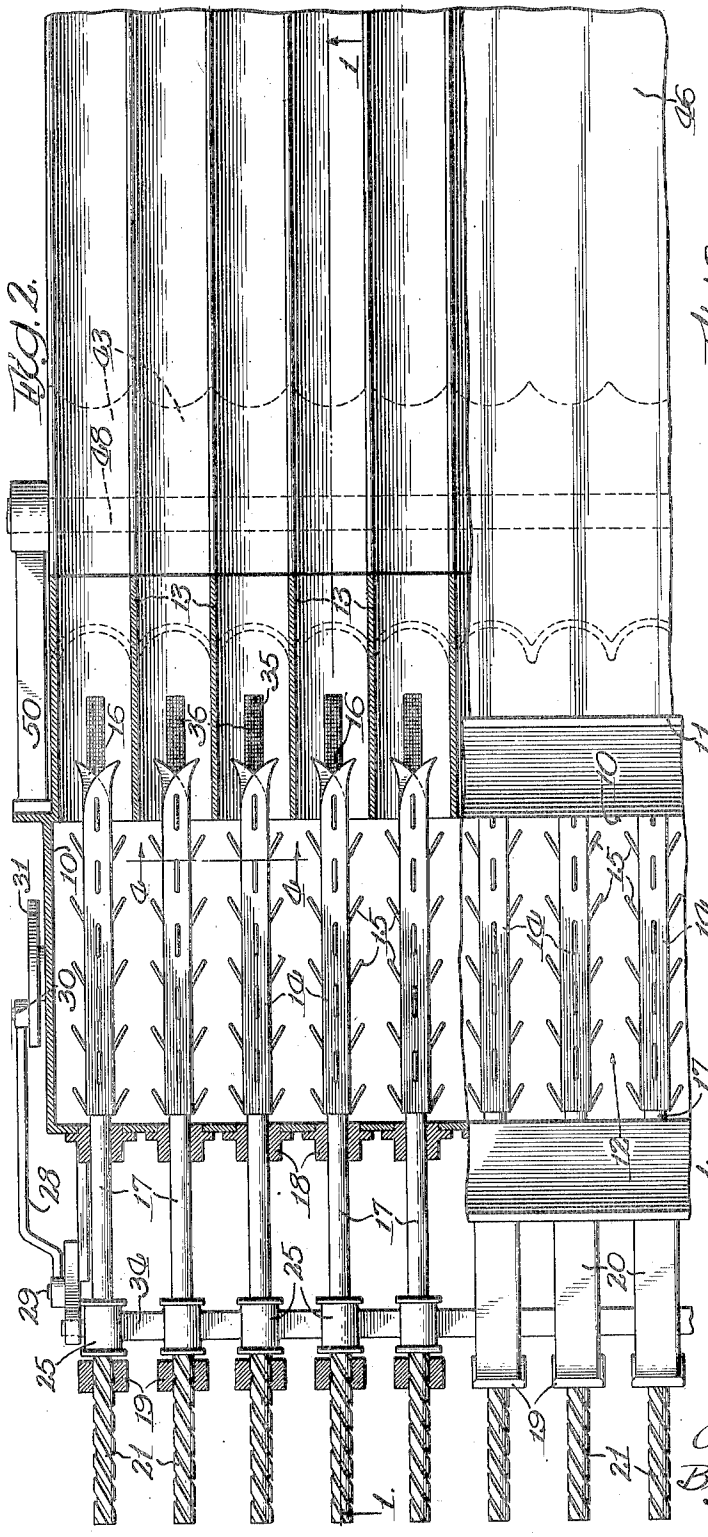


Fig. 2.

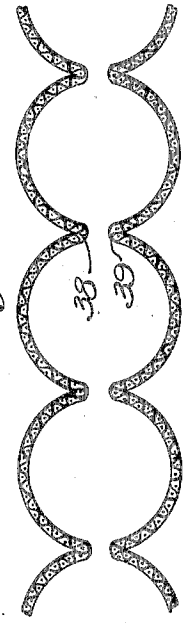


Fig. 3.

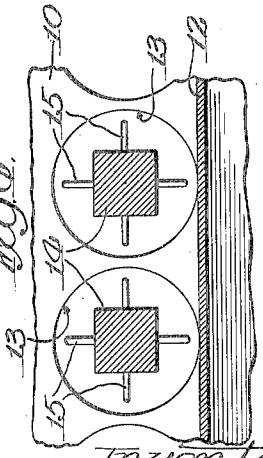


Fig. 4.

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Patented July 9, 1929. 1,719,899

UNITED STATES PATENT OFFICE.

GARRETT W. MUDD, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MANUFACTURERS MACHINERY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

HAIR-CURLING MACHINE.

Application filed November 19, 1928. Serial No. 320,370.

This invention relates to improvements in machines for curling hair and is particularly adapted, though not necessary limited in its use for curling short hair, such as hog's hair and the like, for use in cushions, pads, mattresses, pillows, and the like, and one of the objects of the invention is to provide an improved machine of this character which will be comparatively simple in construction and effective and efficient in operation, and which will dispense with the laborious hand operations heretofore necessary in curling short hair.

A further object is to provide in a machine of this character improved means for moistening the hair while it is being curled, and means for receiving and holding the hair in its twisted condition while the hair is being dried and for conveying away the finished product.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which

Figure 1 is a sectional view taken on line 1—1, Figure 2, of a machine of this character constructed in accordance with the principles of this invention.

Figure 2 is a top plan view of Figure 1.

Figure 3 is a detail sectional view, with parts omitted, as taken on line 3—3, Figure 1.

Figure 4 is a detail sectional view taken on line 4—4, Figure 2.

Referring more particularly to the drawings the numeral 10 designates a hopper of any desired size and configuration into which the hair 11 that is to be curled is placed. Projecting from the hopper, preferably from one side thereof and preferably adjacent the bottom 12 of the hopper are a plurality of tubular extensions 13 which have communication with the interior of the hopper. These extensions may be of any desired diameter and of any configuration in cross section, but preferably circular, and may be of any desired length.

Arranged within the hopper and preferably adjacent the bottom 12 thereof are a plurality of plungers 14 which may be of any desired configuration in cross section but are preferably angular, and projecting from the plungers are a plurality of extensions or fingers 15 suitably spaced about the plunger and project toward the free end of the plunger or in a direction toward the tubular extensions 13 of the hopper. The forward extremity of the plunger is preferably bifurcated as at 16 and preferably twisted, and the greatest diameter of the plunger extending from the extremities of the fingers or projections 15 is slightly less than the internal diameter of the respective tubular projections 13.

One of these plungers 14 is provided for each of the tubular extensions 13 and the plungers are supported for a reciprocating movement in a direction lengthwise thereof by means of a plunger rod 17 which passes through a suitable bearing 18 and also a bearing 19, the latter being preferably supported by means of a bracket 20.

One of these plungers is provided for each of the tubular extensions 13, and as their construction and operation is the same the specific description of one will apply equally as well to them all.

The free extremity of the plunger rod 17 is provided with a spiral groove 21 with which projections 22 in the bearing 19 cooperate so that when the plunger 14 and plunger rod 17 are reciprocated a rotary movement will be imparted to the plunger in one direction while the plunger is being advanced and a rotary movement in the opposite direction will be imparted to the plunger as the plunger is retracted.

Any suitable means may be provided for reciprocating the plunger preferably a lever 23 pivotally supported at one end as at 24. The other end of the lever is connected with a collar 25 which encompasses the plunger rod 17 and is disposed between shoulders or collars 26—27.

One end of a link 28 is pivotally connected as at 29 with the lever 23 and the other end of the link is connected with a pin 30 on a disc 31, the latter in turn being connected with a pulley 32 which is driven from a suitable source of power, not shown, by means of a belt 33.

The collars 25 are preferably connected by means of a web 34 so that they will all move in unison.

As the plungers 14 are reciprocated the

hair 11 in the hopper 10 will be caught by the projections 15 and forced into the respective tubular extensions 13. At the same time that it is being forced into these tubular extensions the plunger 14 will be rotated so as to twist the hair, the bifurcated end 16 of the plunger serving as a means to force the hair along and through the tubular extension 13. As the plungers are retracted the plungers and extensions or fingers 15 will be rotated in the opposite direction which will cause the extensions 15 to disengage the twisted hair in the extension 13 and this disengagement of the plungers from the hair will be augmented by the frictional contact of the wad of twisted hair in the tubular extensions 13.

By constructing the plungers angular in cross section as shown in Figure 4, the corners formed by the angular faces of the plunger will assist in twisting the hair.

In order to cause the hair to remain twisted it is advisable, and in fact necessary, to subject the same to the action of moisture, and this may be accomplished by providing an opening 35 in the bottom of the tubular extensions 13 over which a reticulated member such as a screen 36 may be placed. Steam or vapor is supplied from any suitable source through a pipe 37 and discharged into the tubular extensions 13 through the opening 35. An exhaust pipe 38 may be provided for conveying away the steam.

As the twisted wad of hair emerges from the tubular extensions 13 it is caught between two endless conveyors 38—39 so arranged with respect to each other that one run of each of the conveyors will be disposed adjacent the other and parallel thereto, the conveyors passing respectively over pulleys 40—41 which are provided respectively with grooved peripheries 42—43, the grooves extending circumferentially about the pulleys and being spaced in directions lengthwise of the pulleys.

The conveyors 38 and 39 are so shaped that portions thereof will fit within the grooves of the respective pulleys 40 and 41 to form semicircular portions extending lengthwise of the conveyors and which co-operate to form chambers between the conveyors and into which the curled wad of hair is delivered from the extensions 13.

The conveyors 38 and 39 are preferably constructed of reticulated material so as to permit a drying fluid to be circulated through the conveyors and through the wad of hair.

This may be accomplished in any suitable manner, but preferably by means of a heater 44 and a fan 45, the latter causing air to circulate against the heater 44 and from the heater through the conveyors and the wad of hair being advanced thereby.

The heater, endless conveyors and tubular extensions 13 may, if desired, be arranged within a casing 46.

The conveyors 38 and 39 are of such a length that by the time the twisted wad of hair is delivered from between the conveyors the hair will be substantially dry and the curl or wad will be permanently fixed.

The conveyors are adapted to be driven in any suitable manner, not shown, and the pulleys are respectively mounted upon shafts 47—48 journaled in suitable brackets or bearing members 49—50.

With this improved apparatus it will be manifest that all that is necessary is to place the short hair within the hopper 10 and start the reciprocation of the plungers 14, the hair being twisted together, moistened and dried as it passes through the machine.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. A machine for twisting short hair embodying a hopper for holding a supply of hair, a tubular form communicating with the hopper, a plunger, means for moving the plunger back and forth in the hopper and into and out of said tubular form, and means for rotating the plunger in one direction during its forward movement and in the opposite direction during its backward movement.

2. A machine for twisting short hair embodying a hopper for holding a supply of hair, a tubular form communicating with the hopper, a plunger, means for moving the plunger back and forth in the hopper and into and out of said tubular form, means for rotating the plunger in one direction during its forward movement and in the opposite direction during its backward movement, and means for subjecting the hair to the action of moisture as it is being twisted by said plunger.

3. A machine for twisting short hair embodying a hopper for holding a supply of hair, a tubular form communicating with the hopper, a plunger, means for moving the plunger back and forth in the hopper and into and out of said tubular form, means for rotating the plunger in one direction during its forward movement and in the opposite direction during its backward movement, and means for subjecting the hair to the action of moisture as it is being twisted and advanced by said plunger through the said tubular form.

4. A machine for twisting short hair embodying a hopper for holding a supply of hair, a tubular form communicating with the hopper, a plunger, means for moving the plunger back and forth in the hopper and into and out of said tubular form, means for rotating the plunger in one direction during its forward movement and in the opposite

direction during its backward movement, and fingers projecting laterally from the body of the plunger.

5. A machine for twisting short hair embodying a hopper for holding a supply of hair, a tubular form communicating with the hopper, a plunger, means for moving the plunger back and forth in the hopper and into and out of said tubular form, means for rotating the plunger in one direction during its forward movement and in the opposite direction during its backward movement, and fingers projecting laterally from the body of the plunger, said fingers inclining toward one end of the plunger.

6. A machine for twisting short hair embodying a hopper for holding a supply of hair, a tubular member communicating with the hopper, a plunger movable through the hopper and into the said tubular member, forwardly projecting fingers extending from the plunger for engaging the hair, means for reciprocating the plunger, and means for rotating the plunger in one direction during its forward movement and in the opposite direction during its backward movement.

7. A machine for twisting short hair embodying a hopper for holding a supply of hair, a tubular member communicating with the hopper, a plunger movable through the hopper and into the said tubular member, forwardly projecting fingers extending from the plunger for engaging the hair, said fingers being spaced throughout the length of and circumferentially about said plunger, means for reciprocating the plunger, and means for rotating the plunger in one direction during its forward movement and in the opposite direction during its backward movement.

8. A machine for twisting short hair embodying a hopper for holding a supply of hair, a tubular member communicating with the hopper, a plunger movable through the hopper and into the said tubular member, said plunger being angular in cross section, forwardly projecting fingers extending from the plunger for engaging the hair, means for reciprocating the plunger, and means for rotating the plunger in one direction during its forward movement and in the opposite direction during its backward movement.

9. A machine for twisting short hair embodying a hopper for holding a supply of hair, a tubular member communicating with the hopper, a plunger movable through the hopper and into the said tubular member, the forward end of said plunger being bifurcated, forwardly projecting fingers extending from the plunger for engaging the hair, mean for reciprocating the plunger, and means for rotating the plunger in one direction during its forward movement and in the opposite direction during its backward movement.

10. A machine of the character described embodying a hopper for containing a supply of hair, a tubular form having communication with the hopper, a plunger, means for forcing said plunger through the supply of hair in the hopper, means for rotating the plunger in one direction as it is thus moved, and means whereby said plunger will operate to twist the hair as it forces the same from the hopper into said form, the plunger rotating means also operating to rotate the plunger in the opposite direction to cause it to disengage the twisted hair as the plunger is retracted.

11. A machine of the character described embodying a hopper for containing a supply of hair, a tubular form having communication with the hopper, a plunger, means for forcing said plunger through the supply of hair in the hopper, means for rotating the plunger in one direction as it is thus moved, means whereby said plunger will operate to twist the hair as it forces the same from the hopper into said form, the plunger rotating means also operating to rotate the plunger in the opposite direction to cause it to disengage the twisted hair as the plunger is retracted, and means for subjecting the hair to the action of moisture as it is being twisted by said plunger.

12. A machine of the character described embodying a hopper for containing a supply of hair, a tubular form having communication with the hopper, a plunger, means for forcing said plunger through the supply of hair in the hopper, means for rotating the plunger in one direction as it is thus moved, means whereby said plunger will operate to twist the hair as it forces the same from the hopper into said form, the plunger rotating means also operating to rotate the plunger in the opposite direction to cause it to disengage the twisted hair as the plunger is retracted, means for subjecting the hair to the action of moisture as it is being twisted by said plunger, means for conveying away the twisted hair, and means for drying the hair as it is thus conveyed along.

13. A machine of the character described embodying a hopper for containing a supply of hair, a plunger, means for reciprocating the plunger, means for rotating the plunger as it is reciprocated, for twisting the hair and forcing it out of the hopper, and a pair of conveyors having opposed grooves disposed in proximity to form a space to conform to the shape of the wad of twisted hair for holding the hair in shape while it is being conveyed by said conveyors.

14. A machine of the character described embodying a hopper for containing a supply of hair, a plunger, means for reciprocating the plunger, means for rotating the plunger as it is reciprocated, for twisting the hair and forcing it out of the hopper, and a pair

of endless conveyors having grooves extending lengthwise thereof, one of the runs of the conveyors being disposed in proximity to each other whereby the groves will co-operate to form a space between the conveyors to conform to and receive a twisted wad of hair.

15. A machine of the character described embodying a hopper for containing a supply of hair, a plunger, means for reciprocating the plunger, means for rotating the plunger as it is reciprocated, for twisting the hair and forcing it out of the hopper, a pair of endless conveyors having grooves extending lengthwise thereof, one of the runs of the conveyors being disposed in proximity to each other whereby the grooves will co-operate to form a space between the conveyors to conform to and receive a twisted wad of hair, and means for circulating a drying medium through said conveyors and against the hair for drying the same as it is conveyed by said conveyors.

In testimony whereof I have signed my name to this specification, on this 24th day of October, A. D. 1928.

GARRETT W. MUDD.