

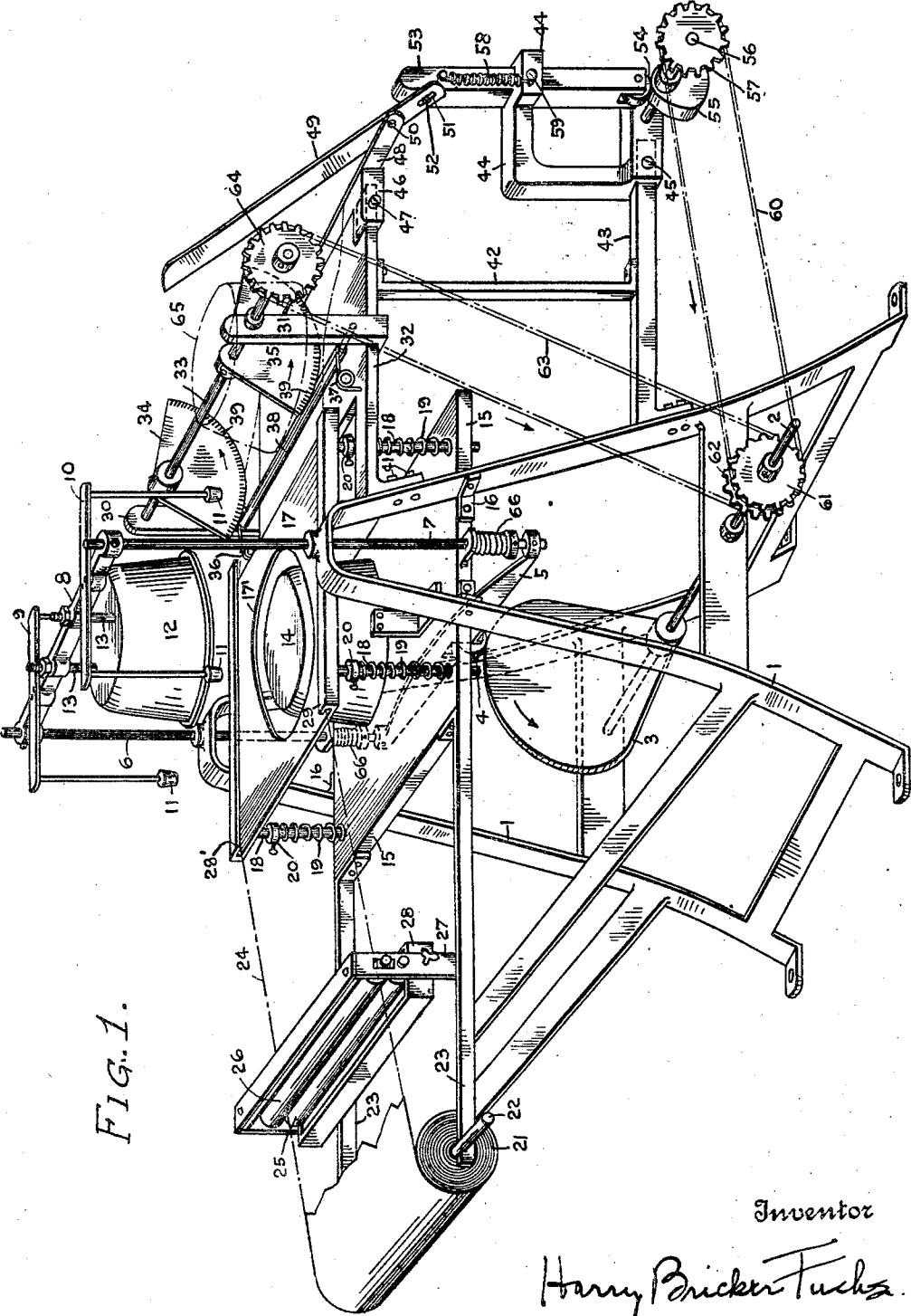
Nov. 14, 1939.

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2,179,692

MACHINE FOR SHAPING FORMS FROM FABRIC MATERIALS

Original Filed Sept. 7, 1934 2 Sheets-Sheet 1



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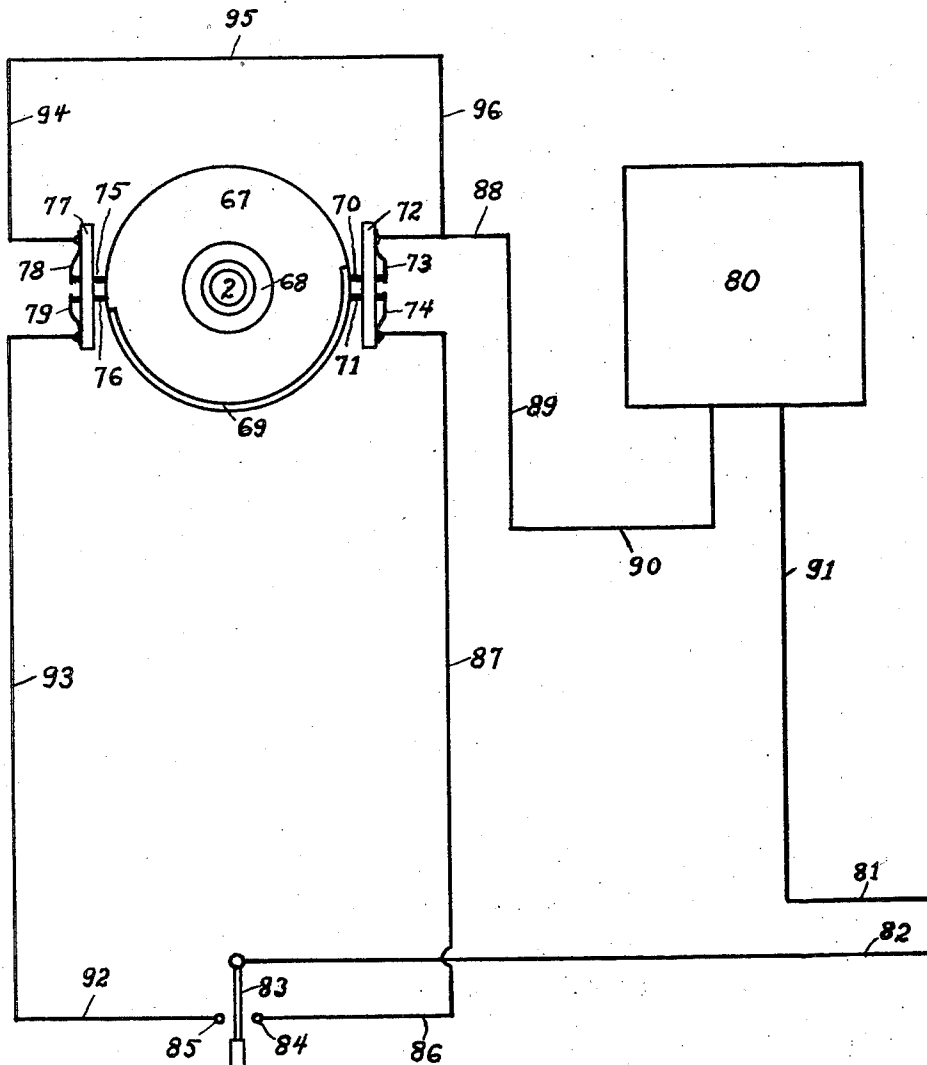


FIG 2.

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MACHINE FOR SHAPING FORMS FROM
FABRIC MATERIALS

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10 Claims. (Cl. 18—19)

My invention relates to improvements in machines for shaping forms from woven, felted, knitted and other materials.

One object of my invention is to establish a new industry similar to the pressed metal industry.

Another object of my invention is to produce shaped fabric articles, such for instance as hollow articles for industrial and commercial purposes, hat forms, and containers for enclosing many different kinds of glassware, and electrical, mechanical, automotive and other specialties, accessories, tools, instruments, parts, etc.

Another object of my invention is to consume large quantities of fibers that can be produced by farmers in many parts of our country, and to provide employment in the conversion of the fibers into finished products.

Further objects of my invention will appear hereinafter.

The invention accordingly consists in the method, system, combinations of elements, arrangement of parts and in the several steps and relation and order of each of the same to one or more of the others, as will be described herein. The many novel features embraced in this invention are far-reaching in their scope and are applicable in many embodiments other than that described, and I therefore do not wish to be limited except as indicated in the appended claims.

Referring to the accompanying drawings, in Figure 1 I have illustrated in perspective a suitable form of machine embodying an application of my invention, and in Figure 2 an electrical device for opening and closing the machine by means of a switch.

1 indicates the frame of the machine, and 2 the drive shaft, which may be driven by any suitable means such as a motor, sprocket chain, or pulley belt, not shown. Upon this drive shaft is secured a disc 3 adapted to give reciprocating motion upon which is adapted to ride a roller 4, held in the yoke 5, in the ends of which are secured the rods 6, 7, carrying at the top the yoke 8, across which are secured cross-pieces 9, 10, having frictional surfaces such for instance as the rubber ends 11, for holding the goods while the shaping operation is in progress. It will be understood that clamps for gripping the goods or pins for piercing the goods may be used instead of frictional ends 11 for holding the goods. 12 indicates the female shaping member which is preferably held by pins or rods 13, in the yoke 8, as shown. 14 indicates the male shaping mem-

ber, which is suitably secured upon the table 15, which in turn is suitably secured to the frame 1, as indicated at 16. 17 indicates a vertically movable platform having a central hole 17' for the passage of the shaping member 14, and is provided with four depending legs 18, from the corners thereof as shown, the ends of said legs passing through the table 15. 19 indicates springs retained upon the table 15, by the collars 20, secured to the legs 18, so that when the ends 11 press down upon the platform 17, they are opposed by the action of the springs 19, which are compressed thereby.

The ends 11 may be placed sufficiently close to form a ring. Only four are shown for purpose of clearness. The ends 11 cooperate with the opposing yielding platform 17 to hold the material 21 as the ends 11 press on the platform 17, causing the shaping member 14 to increasingly stretch the material 21 as the platform 17 descends. The purpose of the holding and stretching is to obtain a formed product having a minimum of wrinkles. The relative motion between the material and the platform 17 when the material is held and stretched during the forming operation, depends on the elasticity of the material and the force exerted by the springs 19 against the multiple ends 11, permitting the material to slide therebetween under sufficient pull to obtain a minimum of wrinkles in the formed product. It will be understood that when clamps are used to grip the material or pins to pierce the material, the material can not slide as between the ends 11 and the platform 17, and a product with a minimum of wrinkles is obtained by the stretching of the material to an extent permitted by its elasticity.

21 indicates a roll of woven, felted, knitted or other suitable material, upon the rod 22, held in the arms 23, secured to the frame of the machine 1, or platform 15, and the free end 24, of the material passes between the rollers 25, 26, retained in the frame 27, which also carries a trough 28, provided with impregnating material such as sizing or water, in which the lower roller 25 rotates, thereby impregnating the material as it is fed rightwardly over the table 17 between the turned-in guides 28', 29, and between the shaping members 12 and 14. The trough 28 may contain sizing for stiffening the material, or water 50 or steam for softening material which has already been sized. It will be understood that a device producing steam may be used instead of the trough 28, for moistening the material, and also that a device for producing the steam for

moistening the material may be used in conjunction with the trough 28.

30, 31 indicate standards secured to the table 32 as shown, and provided with a shaft 33, carrying segmental feeders 34, 35, the peripheries of which have a gripping surface as indicated by 38, to engage the material 24 as the same passes over the roller 38, which is pressed upwardly against the engaging peripheries of the feeders 34, 35, by the springs 36, 37, the said springs being retained in the shelf 32, secured to the frame of the machine in any suitable manner, such as indicated at 41. This shelf is further supported by the bracket 42, secured to the bracket 43, which is also provided with the bracket 44 slidably adjustable upon the bracket 43 by any suitable means such as the screw 45. 46 is an extension of the shelf 32, also slidably adjustable, and securable by the screw 47, and the extension 46 is provided with a cutting edge 48 to which is pivotally secured the knife 49, as indicated at 50, the short end of the said knife being provided with a slot 51, through which passes the screw 52, secured in the plunger 53, passing through the bracket 44, and provided at the lower end with a roller 54, adapted to ride upon the disc 55 adapted to give reciprocating motion upon the shaft 56, carrying sprocket wheel 57. 58 indicates a tension spring, the upper end of which is secured to the upper portion of the vertically moving plunger 53, as shown, and the lower end of which is secured to the bracket 44, at 59, as shown, the said spring tending to keep the knife open and up as shown in the drawings. The sprocket 57 is driven by the sprocket chain 60, which also passes over the sprocket 61, upon the shaft 2, which also carries the sprocket 62, provided with sprocket chain 63, engaging sprocket wheel 64.

As the material 24 is fed from the roll 21, it is moistened and/or impregnated with suitable substances while passing between the rollers 25, 26, and as the ends 11 come down upon the material on the vertically moving platform 17, the material is held sufficiently smooth thereby while it is formed between the shaping members. While this operation is going on, the feeders 34, 35, are rotating free of the roller 38, and the knife 49 is above the extension platform 32. When the material has been formed, providing a hollow shape such as 65, the upper shaping member 12 lifts sufficiently high, as shown, to clear the formed shape 65, which is then drawn rightwardly by the gripping surface 39 of the feeders, which now pinch the material against the roller 38, and in rotating anti-clockwise pass the formed shape 65 to the position shown in dotted outline, and when in that position the material 24 which is now again stationary, is cut by the descending knife 49, while the shaping member 12 may also descend, forming another shape.

The upper shaping member 12 is drawn downwardly by the action of the tension spring 66, and is lifted by the disc 3 adapted to give reciprocating motion as previously stated, these springs 66 being of greater tension than the compressibility of the springs 19, which yield thereto as the platform 17 descends under pressure of the ends 11. The lateral depth of the guides 28, 29, may, of course, be greater than as shown, in order to maintain guiding control of the material 24, the same being shown of less depth than may be required for purpose of clearness.

While Figure 1 shows a machine which may

continuously operate to form shapes from the roll of material 21, Figure 2 shows electrical means for opening and closing the machine as may be necessary when shaping forms from individual blanks instead of from the roll of material 21.

In Figure 2, 67 indicates a disc of electric insulating material secured to hub 68 which is secured to drive shaft 2. 69 indicates a segment of electrically conductive material such as metal secured to the periphery of disc 67. 70 and 71 indicate electric current-carrying brushes supported by electric insulating holder 72 and tensioned by springs 73 and 74 to bear against disc 67. 75 and 76 indicate electric current-carrying brushes supported by electric insulating holder 77 and tensioned by springs 78 and 79 to bear against disc 67. 80 indicates an electric motor connected to drive shaft 2 by gearing, belting or sprocket chain; or it may be an electrical device, such for instance as a clutch, for controlling the connection of drive shaft 2 to a mechanical source of power. 81 and 82 indicate lines connected to a source of electric current. 83 indicates a switch blade connected to line 82 and adapted to be biased to engage with either of contacts 84 or 85.

The rotation of shaft 2 of the machine shown in Figure 1 is anti-clockwise. It will be understood that in other embodiments of my invention the shaft may rotate clockwise. As illustrated in Figure 2, disc 67 should be adjusted on shaft 2 so that when shaping members 12 and 14 are either completely engaged or disengaged, electrically conductive segment 69 will contact brushes 70 and 71. Assuming that the machine is open and shaping members 12 and 14 disengaged from each other as shown in Figure 1, when switch blade 83 is biased to engage with contact 84, current from line 82 flows through switch blade 83, contact 84, lines 86, 87, spring 74, brush 71, segment 69, brush 70, spring 73, lines 88, 89, 90, electrical device 80, line 91 to line 81, thereby energizing electrical device 80 to operate shaft 2, in anti-clockwise direction, until segment 69 deenergizes electrical device 80 and stops the rotation of shaft 2 by disengaging from brushes 70 and 71. The machine is now closed, shaping members 12 and 14 engaged, segment 69 is disconnected from brushes 70 and 71 and contacts brushes 75 and 76.

To open the machine and disengage shaping members 12 and 14 from each other, switch blade 83 is disconnected from contact 84 and biased to engage contact 85, and current from line 82 flows through switch blade 83, contact 85, lines 92, 93, spring 79, brush 76, segment 69, brush 75, spring 78, lines 94, 95, 96, 88, 89, 90, electrical device 80, line 91 to line 81, thereby energizing electrical device 80 to operate shaft 2, in anti-clockwise direction, until segment 69 deenergizes electrical device 80 and stops the rotation of shaft 2 by disengaging from brushes 75 and 76.

When segment 69 disengages from one set of brushes, the momentum of shaft 2 causes it to engage the other set of brushes, so that the machine may be closed and opened by simply biasing switch blade 83 to engage the contacts 84 and 85, and in fact, various modifications may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

I claim:

1. In a machine for shaping forms from fabric materials, forming mechanism adapted to shape

material, a platform for guiding the material adapted to move transverse to the line of feed of the material, and a feeder adapted to draw the material from the forming mechanism when the forming mechanism is disengaged therefrom.

2. In a machine for shaping forms from fabric materials, forming mechanism adapted to shape material, a platform for guiding the material adapted to move transverse to the line of feed of the material, and means connected with a continuously rotating shaft adapted to draw the material from the forming mechanism when the forming mechanism is disengaged therefrom.

3. In a machine for shaping forms from fabric materials, resilient means for supporting material, a shaping member, and spring means of greater resistance than the resistance of the resilient means adapted to move the shaping member to engage the material.

4. In a machine for shaping forms from fabric materials, resilient means for supporting material, a shaping member, spring means of greater resistance than the resistance of the resilient means adapted to move the shaping member to engage the material, and a drive shaft adapted to move the shaping member from the material.

5. In a machine for shaping forms from fabric materials, resilient means for supporting material, a shaping member, spring means of greater resistance than the resistance of the resilient means adapted to tension the shaping member, and a drive shaft adapted to overcome the resistance of the spring means and move the shaping member.

6. In a machine for shaping forms from fabric materials, two shaping members, one moving relatively to the other, a resiliently moving platform for supporting material, means for moving one of said shaping members into engagement with the material and with the other shaping members, means for moving the material from between said shaping members when one of said shaping members is disengaged therefrom, and in timed relation therewith means for severing the shaped part of said material.

7. In a machine for shaping forms from fabric materials, two shaping members, one moving

relatively to the other, means whereby one shaping member will stretch the fabric material, a shaft, connections between said shaft and one of the said shaping members for moving said shaping member into engagement with the material, means for moving the material laterally away from the path of movement of one of said shaping members, and connections between said shaft and said means for moving the material whereby the means for moving the material will move the material in timed relation with the disengagement of one of said shaping members from the material.

8. In a machine for shaping forms from fabric materials, means for feeding a strip of material, a resiliently moving platform with relation to which said material is guided, shaping mechanism extending at both sides of said platform, the shaping mechanism at one side of said platform and said platform adapted to be moved in one direction with said strip, and adapted to move in an opposite direction, and means controlled by the operation of the shaping members adapted to draw said strip from between said shapers when the said platform is at a predetermined position.

9. In a machine for shaping forms from fabric materials, means for feeding and impregnating a strip of material, a vertically moving platform with relation to which said material is guided, shaping mechanism extending above and below said platform, the shaping mechanism on one side of said platform, and said platform adapted to be moved in one direction with said strip, and adapted to move in an opposite direction, and means for drawing said strip from between said shapers when said platform is at a predetermined position.

10. In a machine for shaping forms from fabric materials, means for feeding and impregnating a strip of material, a moving platform with relation to which said material is guided, shaping mechanism extending on one side and on the other side of said platform, the shaping mechanism on one side of said platform, and said platform, adapted to be moved in one direction with said strip, and adapted to move in an opposite direction, and means for severing the shaped part of said strip.

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