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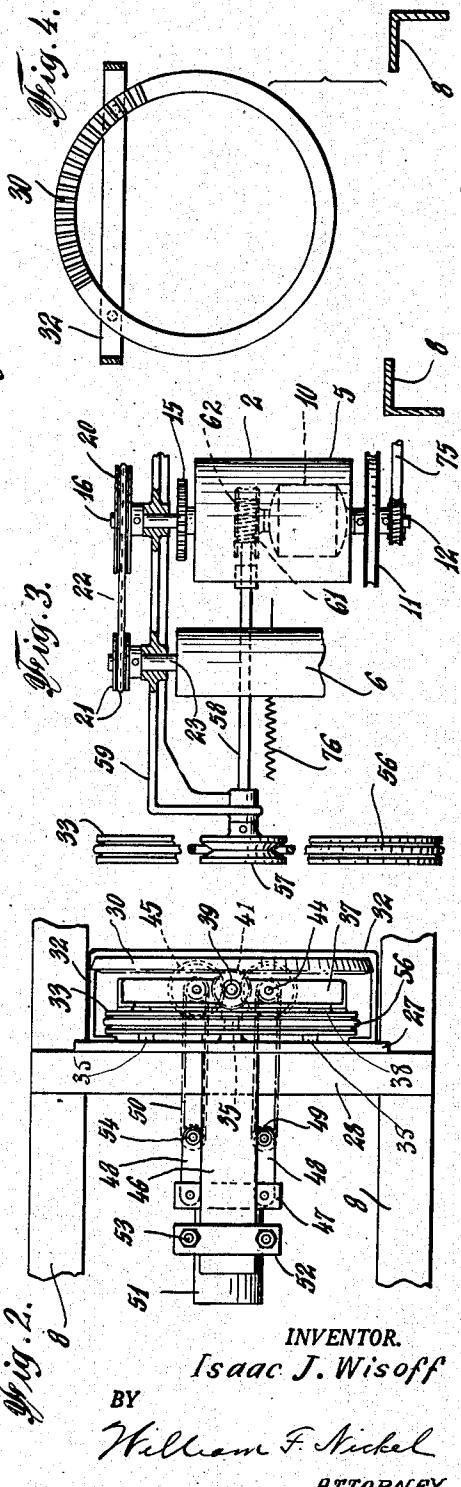
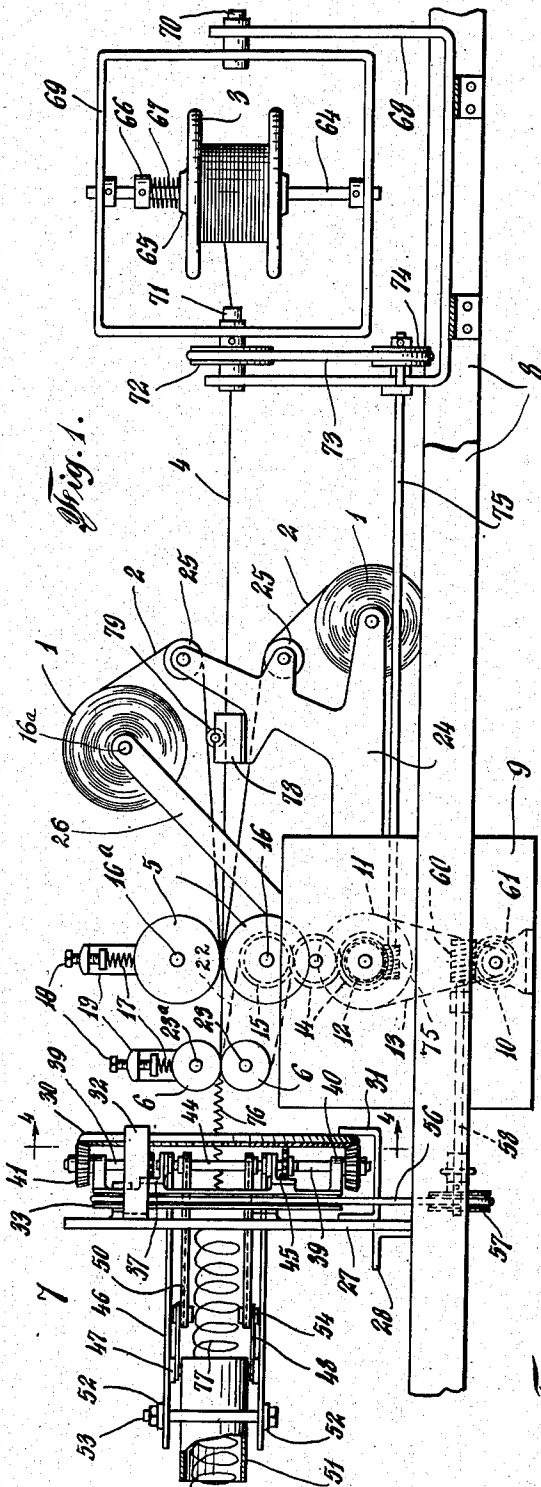
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2,386,172

APPARATUS FOR TURNING OUT DECORATIVE MATERIAL

Filed July 18, 1944

2 Sheets-Sheet 1



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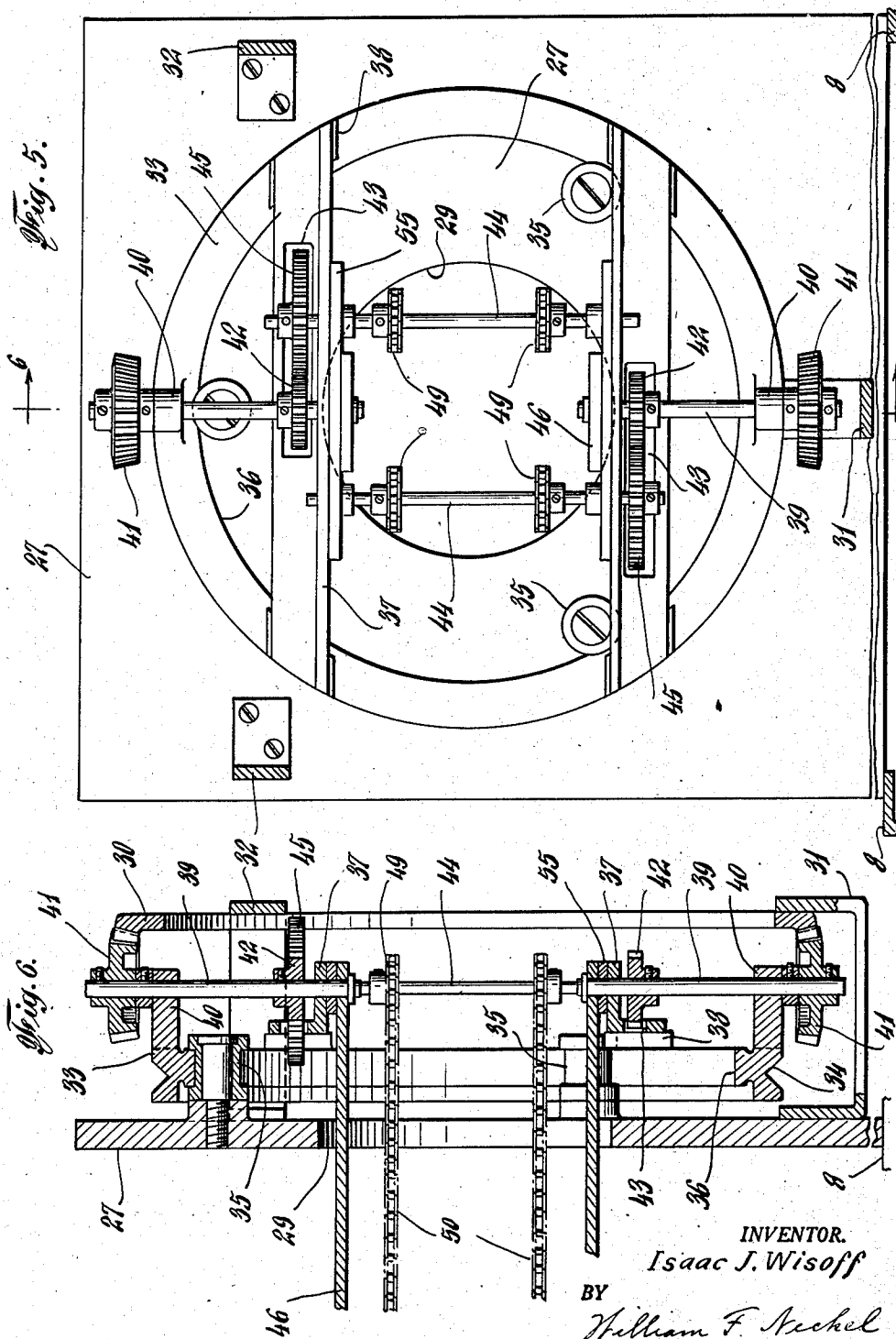
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UNITED STATES PATENT OFFICE

2,386,172

APPARATUS FOR TURNING OUT
DECORATIVE MATERIAL

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Application July 18, 1944, Serial No. 545,525

8 Claims. (Cl. 41—1)

My invention relates to improvements in apparatus for turning out decorative material, especially decorative material of Cellophane, in strip form, worked to give it the pleated and spiral appearance of the product shown and described in my Patent No. 2,112,723, granted March 29, 1938.

An important object of this invention is to provide mechanism for twisting the Cellophane strip in the final stage after pleating; so designed that the capacity of the apparatus is enlarged and the speed of manufacture increased. Also waste is reduced and costs are decreased. Instead of Cellophane, paper may be used.

Other objects and advantages are set forth in the ensuing description taken with the accompanying drawings, which illustrate a preferred embodiment of the invention. But the disclosure is of course explanatory only; and changes in various details may be made without departing from the principles of the invention or going beyond the meaning of the terms in which the appended claims are expressed.

On the drawings:

Figure 1 is a side view showing the complete apparatus.

Figure 2 is a view of the twisting mechanism viewed from the top of Figure 1.

Figure 3 is a top plan of the operating connections for the feed rolls in the apparatus.

Figure 4 is a vertical section on line 4—4 of Figure 1.

Figure 5 is a front view of said twisting mechanism; and

Figure 6 is a section on line 6—6 of Figure 5. The same numerals identify the same parts throughout.

The apparatus mounts one or more reels 1 wound with strips of Cellophane or paper 2, and at least one reel 3 bearing a coil of wire 4. The strips 2 receive the wire 4 between them and are fed by feed rolls 5 and 6 to the twister attachment or mechanism 7. The wire 4 is retarded somewhat in relation to the strips 2; and when the combined strips with the wire forming a core emerge from the rolls they are transversely pleated. In this condition the twister 7 revolves the strips about the core, and gives to the finished product the form of spirals or convolutions, as fully described in my aforesaid patent and in my prior Patent No. 2,157,583, granted May 9, 1939.

The supporting framework of the machine is shown in part at 8. One or more members shown diagrammatically at 9 carry a motor 10,

having a pulley at one end of its armature shaft to drive a larger pulley 11 on the end of a shaft 12, suitably mounted in the framework, through a belt 13. At its opposite end said shaft carries a gear 14 to actuate a similar gear 14 meshing with a gear 15 on the shaft 16 of the lower pulley 5. The upper roll 5 turns on a shaft or trunnions 16a and is rotated by friction from the lower roll 5 and the strips 2 passing between the two rolls. The motor, belting and gearing for the pulleys and various cooperating parts are arranged in any suitable manner in the framework 8. The pressure of the upper roll 5 on the lower is regulated by springs 17, bearing on the trunnions or shaft 16a of the upper rolls 5 or on the ends thereof. The springs are controlled by bolts or screws 18 in projections or posts 19 on the framework 8. Only the lower rolls appear in Figure 3, for the sake of clearness.

The rolls 6 are likewise disposed one above the other; and the lower has a shaft 23 carrying a gear 21 connected by a chain 22 to a gear 20 on the shaft of the lower roll 5. The rollers 6 are preferably half the diameter of the rolls 5, and are driven at twice the speed of rotation, so that the peripheral speed of the rolls 5 and 6 is properly matched. The upper roll 6 is also rotated by friction and its pressure on the lower roll 6 is regulated by elements of the same kind as for the upper roller 5. Rolls 5 and 6 are of course located so that the strips pass them in a straight horizontal line.

Brackets 24 secured to the framework support the shaft of the lower reel 1, and brackets 26 carry the shaft or trunnions for the upper reel 1. The brackets 24 also bear idle rolls 25 over which the strips 2 pass to the feed rolls 5.

The twister 7 comprises a fixed plate 27 arranged transversely of the framework, and fixed thereon; being firmly attached at its lower edge to a cross angle bar 28 on the framework. In the center of the plate 27 is an opening 29. Between the plate 27 and the feed rolls 6 is a fixed annular gear or rack 30. The center of the opening 29 is in line with the middle of the length of the feed rolls, and the gear 30 is concentric therewith. This gear is held in place by a bent bar or bracket 31 connecting it to the plate 27 at the bottom, and by a horizontal bracket 32 connecting it to the plate 27 at the top. A space of some width separates the plate 27 from the gear 30.

Between the gear 30 and the plate 27 is a pulley ring 33 with a groove 34 in its circumference.

Flanged rollers 35 on the plate 27 surrounding the opening 29 support the pulley ring 33, and are rotatably mounted by means of screws or bolts engaging the plate 27 and forming suitable journals on which the rollers are free to turn. The inside edge 36 of the ring 33 fits these rollers between the flanges thereof; and thus the ring is rotatably secured on the face of the plate 27 in position also concentric with the opening 29. The ring is of course larger than this opening.

Spanning the ring 33, in position to be tangential to the opening 29 are angle bars 37, fixed at their ends upon raised seats 38 on the ring 33. Two shafts 39 are mounted at opposite points on the ring 33, by means of bearings 40 on this ring; and the outer extremities of the shafts 39 carry gears 41 which mesh with the gear 30. Hence as the ring 33 turns, the shafts 39 revolve with it and rotate about their own long axes as the gears roll along on the annular gear or rack 30. The seats 38 terminate short of the inner edge of the ring 33, so that they clear the rollers 35 as the ring 33 revolves.

The shafts 39 also have bearing engagement with the outstanding flanges of the angle bars 37; and adjacent said flanges carry pinions 42. The flanges of the bars 37 which engage the seats 38 have slots or recesses 43 to enable the pinions to clear these bars. Also mounted in suitable bearing openings in the outstanding flanges of the bars 37 and extending across between them are spindles 44; one at each side of the spindle 39; and each of these spindles carries at one end a fixed gear 45. The gears 45 mesh with the pinions 42 and are disposed in the same recesses 43. As illustrated in Figure 5, the gears and pinions are so arranged that one of the gears 45 is at one end of the spindle 44 carrying it, and the other gear 45 is at the opposite end of the other spindle. Hence, as the pulley ring 33 revolves and its gears 41 roll on the fixed gear 30, the two spindles 44 will rotate in opposite directions. In Figure 2, for the sake of clearness, the top bearing 40 and top gear 41 are omitted; and the gears 41 and 45 are indicated in broken lines.

Rigid with the inner faces of the outstanding flanges of the angle bars 37 are two flat bars 46. These bars 46 extend through the opening 29 in the plate 27. Adjacent their extremities beyond the plate 27 each bar 46 carries a fixed transverse bar 47, which is flat and secured to the inner faces of the bar 46. The ends of the bars 47 project beyond the opposite edges of the flat bars 46; and to each outer end of the two bars 47 is fixed a short flat link 48 extending towards the plate 27. These links lie beyond the edges of the bars 46 and along same, and they support chain gears 49. One such gear is carried by each such link; and the gears 49 are matched by four similar gears 49, two on each spindle 44. Each gear on a link 48 will be connected by an endless chain 50 to the gear in line therewith on one of the spindles 44; and the four chains will all be parallel to the bars 46 and to one another. The journals 54 for the gears 49 on the links 48 may be of any suitable type; and the links may be adjustably secured as by bolts and nuts to the bars 47.

Between the outer ends of the bars 46 is a cylindrical guide sleeve 51. It begins adjacent the cross bars 47 and extends beyond the extremities of the bars 46. On the outer faces of the bars 46 at the ends are fixed cross bars 52 also extending beyond the opposite edges of the bars 46; and bridged at their extremities by connecting

bolts 53. By means of nuts these bolts can be tightened to grip the guide sleeve 51 and hold it in place. The bars 46, bolts 53 and sleeve 51 constitute a single member or frame to receive the strip and wire leaving the rolls 5 and 6.

Spacing and reinforcing bars 55 may be placed between the angle bars 37 and the adjacent ends of the flat bars 46; all said bars having bearing openings for the shafts 39 and 44.

The pulley ring 33 is turned by a belt or cable 56 in the groove 34 and also engaging a grooved pulley 57. This pulley 57 is mounted on shaft 58, supported in a bracket 59 suitably located on the framework 8. This shaft 58 carries a worm 60 which meshes with a wormwheel 61 on the other end of the shaft of the motor 10.

The reel or spool 3 for the wire 4 is mounted to turn freely on a fixed spindle 64, which is fixed in an open frame 69. Keyed on the spindle 64 and engaging one end of the reel 3 is a ring 65; and between this ring and a fixed collar 66 on the spindle 64 is a spiral spring 67 on the spindle. As the spool turns, the ring 65 acts as a brake to retard the reel and the paying out of the wire 4 thereon. The frame 69 is mounted to rotate in a fixed yoke 68 secured on the framework 8. The frame 69 turns on trunnions 70 and 71, the latter being hollow to enable the wire to pass through it. On this trunnion 71 is a pulley 72, which is operated by a cable 73 running also over a pulley 74. This pulley is mounted on another shaft 75 in bearings on the framework 8 and having a worm 75' at its other end to engage a wormwheel on the shaft 12.

In practice the work strip 2 emerges from the rolls 6 with transverse pleats thereon, as indicated in Figure 1 at 76. Passing in between the bars 46, it is engaged by the chains 50 and pushed on through the sleeve 51 to be cut off into the desired lengths as it emerges. Between the bars 46 the material is turned into spiral convoluted form as indicated at 77 and shown fully in my patents aforesaid. The gears 49 rotate in such direction that the sections of the elements or chains 50 which engage the material impel it towards the sleeve. Thus the lower sections of the chains 50 in Figure 2 run from right to left and the corresponding sections of the other two chains move in the same direction. Or, by reference to Figure 5, the sections of the chains that are farthest from the edge of the opening 29 always move in the same direction, which is away from the observer. Hence the required feeding and delivery effect is secured. All this time the pulley ring 33 and the bars 46 are revolving about a line parallel to the bars 46 and passing through the center of the opening 29; and simultaneously with the feeding the material is twisted as desired.

The twister works well also with one strip 2 of Cellophane and a single strand of wire. At the start, the wire and the Cellophane are simply pushed through between the rollers 5 and 6, and one end of the wire is bent or hooked. The operation then pushes the strip material which impels the wire onward. The wire being retarded by the brake 65, the strip is pushed along by the rolls and is transversely pleated as it leaves the rolls 6. A small box 78 may be mounted in the framework to contain an adhesive. The wire passes over or through the sides of the box, in which is mounted a wheel 79 that dips into the adhesive. As the wire passes it runs between flanges on this wheel and is covered by the adhesive which makes it hold to the strip or strips more firmly and give a more uniform product.

The rotation of the frame 69 and reel 3 offsets any bend or twist which may exist in the wire as it runs off the reel 3. Two wires and one strip of Cellophane between them may be worked in the same way.

When paper is employed instead of Cellophane, the twister operations may be performed with two strips and one wire, one strip and one wire, or two wires with a strip between.

Having described my invention, what I believe to be novel is:

1. Apparatus for producing decorative material comprising a reel for supplying a work strip, a reel for wire, feed rolls for the wire and the strip, a twister for the wire and the strip beyond said feed rolls and comprising elements for impelling the wire and strip through the twister and means to operate said elements a fixed gear adjacent said rolls and gearing on said twister engaged by said gear to operate said twister and said means.

2. Apparatus for producing decorative material comprising a reel for a work strip, a reel for wire, feed rolls for the wire and the strip, a twister member for receiving the wire and the strip from said rolls, means for supporting and revolving said member, elements in said member for impelling the wire and the strip through said member, a fixed circular rack between said rolls and said member, and gearing meshing with said rack and connected to said elements to actuate the latter.

3. Apparatus for producing decorative material comprising a reel for wire and a reel for a work strip, feed rolls for the wire and the strip, a twister frame, a pulley ring surrounding said frame and secured thereto, means for rotatably mounting said frame and said ring, elements in the frame for engaging the strip and delivering it from the twister, a fixed circular rack between said rolls and the twister frame, and gearing mounted on said ring to engage said rack and actuate said elements.

4. Apparatus for producing decorative material comprising a reel for wire and a reel for a

work strip, feed rolls for the wire and the strip, a twister frame, a pulley ring surrounding the frame and secured thereto, means for rotatably mounting said ring, a fixed circular rack between the rolls and the pulley ring, chains extending lengthwise in the frame to deliver the material therefrom and gearing mounted on the ring to engage the rack and actuate said chains.

5. Apparatus for producing decorative material comprising a reel for wire and a reel for a work strip, feed rolls for the wire and the strip, a twister frame, a pulley ring surrounding the frame and secured thereto, means for rotatably mounting the frame and ring, gears in the outer end of said frame, gears on said ring, endless chains in the frame carried by said gears, a circular rack between the frame and the feed rolls, and gear connections mounted on said ring and meshing with said rack to actuate the chains.

6. The apparatus according to claim 4 wherein said connections comprise gears to engage said rack, shafts carrying said gears at opposite points on the ring, an additional shaft adjacent each of said first-named shafts, the additional shafts supporting said chain gears on the ring and gearing connecting said additional shafts to the first-named shaft.

7. Apparatus according to claim 4 wherein the ring is spanned by angle bars to which the frame is affixed, and said bars support the ends of shafts carrying said chain gears on the ring and gear connections.

8. Apparatus for producing decorative material comprising means for supplying a work strip, means for supplying a wire, feed rolls for the strip and the wire, a twister member for the strip and the wire, means for supporting and revolving said member, elements revolving in unison with said member and movable longitudinally thereof for impelling the wire and the strip past said member, and means operating in conjunction with said member as it revolves for actuating said elements.

ISAAC J. WISOFF.