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APPARATUS FOR MAKING ORNAMENTAL MATERIAL

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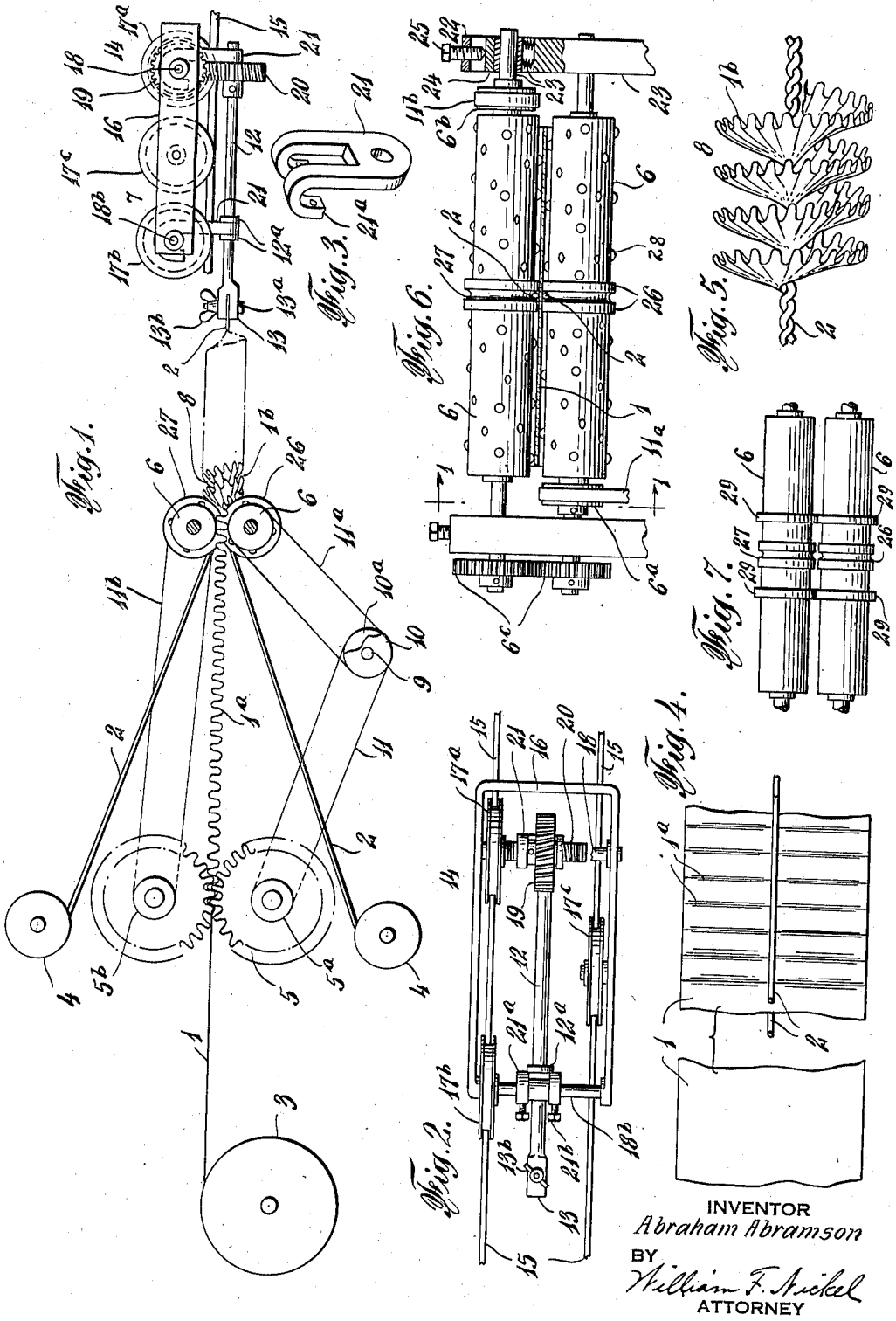


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

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APPARATUS FOR MAKING ORNAMENTAL MATERIAL

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3 Claims. (Cl. 41—1)

This invention relates to improvements in methods and apparatus for turning out a product that is ornamental, and adapted to serve for decorative purposes at holiday time and on other festal occasions.

An object of the invention is to devise a process and a machine for working a strip of suitable material into a round body of considerable length, with a central core, about which the strip is arranged in the form of a long spiral. The edges of the strip of the spiral make the edges of the turns of the spiral, which are waved or scalloped to add to the ornamental appearance.

Another object is to provide a machine by which the strip can first be easily and quickly plaited across its width, and then the core attached; to put the strip into readiness for twisting it and imparting thereto its final shape. The plaiting or crimping is done in a manner similar to the mode of operation in certain kinds of textile machinery for pleating or crimping cloth, so as to have ruffs therein, as when the cloth is to be used in pieces of proper size for cuffs at the ends of sleeves, or collars to be worn about the neck. The strip remains flat during the pleating, and is twisted as soon as the pleating is finished.

The objects and advantages of the invention are fully explained in the ensuing description, taken with the accompanying drawing, whereon:

Figure 1 shows the complete arrangement of all the parts of the mechanism for practicing my invention.

Figure 2 is a top view of the twisting carriage.

Figure 3 shows a detail.

Figure 4 shows the strip at the beginning and at the end of the step of transversely pleating or crimping it.

Figure 5 shows the finished product.

Figure 6 illustrates in front elevation the guide rolls for the core of the article, partly in section on line 6—6 in Figure 1, and

Figure 7 shows another type of rolls.

The same numerals identify the same parts and members throughout.

In the particular description of the mechanism that the drawing presents, the numeral 1 denotes a strip of paper, Cellophane or the like, having a chosen width; and 2 indicates filaments of wire or cord to be worked into the product and form the core thereof when the machine is in operation. The strip 1 is supplied by a reel 3 and the wires or filaments 2 by separate reels 4; these reels being suitably supported to rotate as the strip and the wires are unwound therefrom. The strip 1 first goes through the step of pre-pleating; and to this end it is passed between a pair of fluted rollers 5. These rollers are at least as long as the strip is broad, and as the strip comes out from between them, it has transverse pleats or corrugations extending across from edge to edge as indicated at 1a. Though I have shown rollers for the purpose, any type of pleating or plaiting device of standard and well-known design may be employed. The pleating may even be effected in a separate, preliminary operation, before the strip is placed upon the reel 3. The reels 3 and 4 may be geared to the rolls 5 and be actuated by such connections, or they may be free to turn as the wires and strip are pulled; and in the latter instance any efficient braking or retarding means may be provided to prevent the reels from turning too fast and the material thereon from loosening. After leaving the pleating rolls, the strip travels between a pair of guide rolls 6 for the wires, one of which is now laid upon each face of the strip. As the end of the strip with the wires on its upper and lower faces emerges from the rolls 6, this end and the wires are secured to a twister 7, which revolves the wires and the strip around the long axis of the latter. The wires are thus twisted together and the strip simultaneously into an elongated, rope-like body 8, consisting of successive spirals, the edges of which, because of the pleating, are scalloped or convoluted, as shown at 1b.

The power to drive the machine is supplied through a shaft 9, connected to an electric motor or other unit, mounted in bearings, not shown, and carrying a pulley 10. This pulley connects through a belt 11 with a pulley indicated at 5a on the shaft of the lower plaiting roll 5. It also connects by means of a separate pulley 10a thereon, a belt 11a, and a pulley 6a, with the lower wire guide-roll 6. The upper guide roll has a pulley 6b on the shaft thereof from which runs a belt 11b to a pulley 5b on the upper pleating roll 5; and the two rolls 6 have preferably positive engagement with each other through gears 6c affixed to the shafts thereof. Hence rotation of the shaft 9 will cause all the rolls to revolve at the required speed and in the necessary directions.

I of course can use sprocket gears and chains in place of pulleys and belts, to actuate the plaiting rolls and the wire rolls from the main shaft 9 without slip, so that the plaiting rolls and the wire guide rolls will be turned with power enough to feed the strip forward and at the same time be maintained in step with each other. The gears are of course calculated so that the members 5 and rolls feed the strip and wires ahead at the same rate to keep the strip flat and level.

The twister 7 carries a shaft 12 which revolves, and at the same time is caused to move away from the rolls 6. At its end it has a pair of jaws 13, through which is passed a clamping screw 13a, having a wing nut 13b. When the end of the strip is inserted between the jaws 13, and the screw tightened, the movement of the bar or shaft 12 away from the rolls 6 will of course pull the strip and wires with it. This

shaft is carried upon a wheeled member 14, which travels on rails or tracks indicated at 15. This carriage is made of a frame 16, to which are secured grooved wheels or rollers 17a, 17b and 17c. The first is affixed to an axle or shaft 18 that can turn in the frame 16; but the axle 18b of the wheel 17b is fixed to the frame, and the wheel 17b turns freely thereon. The remaining wheel 17c, which is on the opposite side of the frame, rotates on a journal rigid with the frame 16. On the rotatable axle 18 is a gear 19 which engages with a gear 20 on the shaft 12; the axle 18 in Figure 2 being shown as if broken away near one end to reveal the gear 20 below it. This shaft is mounted in hanger bearings 21 which are supported from the axles 18 and 18b, and of course do not interfere with the rotation of the former. These bearings have hooks 21a which enable them to be put into position quickly, and the rear bearing 20 is fixed to the fixed shaft 18b as by binding screws 21b. Collars on the shaft 12, indicated at 12a, in front and rear of the bearing on the shaft 18b, prevent lengthwise motion of the shaft 12, so that the gears 19 and 20 are maintained in mesh. The gears 19 and 20 are shown as skew gears, but obviously any suitable gearing between the shafts 18 and 12 may be employed.

The rails 15 may be as long as desired. The carriage 14 may be impelled along the rails in any manner, as by attaching a cord to the front end and taking up the cord on a reel or drum. The drum may be turned by hand or by a motor. As the carriage moves, the rollers 17a, through the axle 18 and gears 19 and 20 will turn the shaft 12 to twist the strip and wires in the manner set forth. Twisting attachments of this general type are well known, and either the twister shown and described above, or others now in use may be employed. In any case when the product has been pulled out to the length, and twisted to the extent decided upon, the machine is stopped; the finished strip removed, and the carriage moved back to its starting point near the rolls 6. The operation is then repeated. The wheeled twisting carriage will of course be heavy enough to rest firmly on the rails 15, and ensure that the rollers will be turned with enough power to rotate the shaft 12. Gears 19 and 20 will be of any desired ratio. If preferred, the rollers 17a, 17b and 17c can be replaced by gears and the rails by toothed rack bars, so that motion of the carriage will cause, with more certainty, sufficient rotation of the shaft 12.

By this apparatus, a product is easily obtained in long pieces for use as garlands or festoons, or for cutting into shorter lengths and otherwise utilized. The strips 1 can be of various width, and in any color desired.

The rolls 6 are mounted in bearings 22, which they engage by means of trunnions or shafts 23. The top shafts are pressed upon by shoes 24 in the bearings to regulate the contact of the rolls; screws 25 in the bearings controlling the pressure of the shoes. Near the middle, each roll has a pair of flanges 26, to form circumferential grooves 27 to guide the wires 2 as they pass between these rolls. From these flanges to the ends, the rollers will be separated a sufficient distance to avoid smoothing out the pleats 1a, and the flanges will afford sufficient engagement with the strip to feed it with the wires through the rolls 6. If desired the rollers may have knobs or protuberances 28 of rubber or any other substance of the right kind to assist in moving the strip 1 smoothly forward.

From the foregoing description, it will be clear that the construction set forth is well adapted to serve the purpose of the invention, and facilitate the manufacture of the material at low cost. While I have set forth a specific machine, with parts and members described in detail, the disclosure is intended as explanatory only, and I am not to be limited to the exact parts and connections illustrated; but reserve the right to make any changes that are in keeping with the nature of the invention and that do not depart from the principle of the same.

The rolls 5 and 6 are caused to run at the same peripheral speed, to feed the strip and wires forward smoothly; and any tendency of the flanges to obliterate the pleats is confined to the center of the strip, where it will not be noticed. The knobs 28 will not press out the pleats to any marked extent. The pleating may be more or less fine; and the finer it is, the fuller will be the body of the product when completed. This is a marked advantage, due to the operation of pre-pleating before the strip is combined with the wires or filaments for twisting.

I may also provide rolls 6 with bands 29 projecting a short distance from said rolls, in place of knobs 28. The strip 1 will be fed forward by the frictional engagement of the bands 29 with the strip; and the finages 26 may be so arranged that they merely form the groove for the wires and do not press on the strip. The bands 29 will be near the wires, so that if they press out the pleats somewhat, the effect will again be near the middle of the strip, where it will not be noticed.

Having described my invention, what I believe to be new and desire to secure and protect by Letters Patent of the United States is:

1. The combination of a reel for a strip, and a pair of reels for filaments, rollers to receive the strip between them and work transverse plaits in said strip, guide rolls for receiving the strip and the filaments and advancing same, one of the latter upon each face of the strip, said guide rolls being spaced apart to prevent smoothing out of said plaits, means for actuating the plaiting rollers and guide rolls to feed the strip and filaments forward, and a twisting device to revolve the strip and filaments together as they leave the guide rolls.

2. The combination of guide rolls to receive filaments and a pleated strip between same, said rolls being mounted in spaced apart relation to avoid smoothing out said strip, said rolls having knob projections to feed the strip through them, and a twister to form the strip and the filaments into a spiral as they leave said rolls.

3. The combination of guide rolls to receive filaments and a pleated strip between them, said rolls being mounted in spaced apart relation to avoid smoothing out said strip, said rolls having band projections near the center to feed the strip through them, and a twister to form the strip and the filaments into a spiral as they leave the rolls.

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