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CIGARETTE MAKING MACHINE UNITING BAND CONVEYING DRUM

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FIG. 2

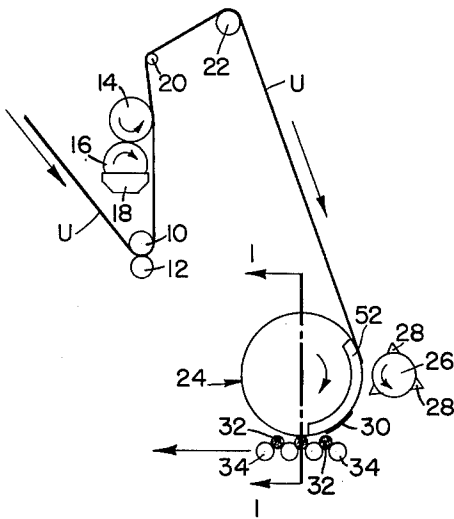


FIG. 3

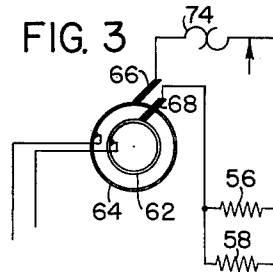
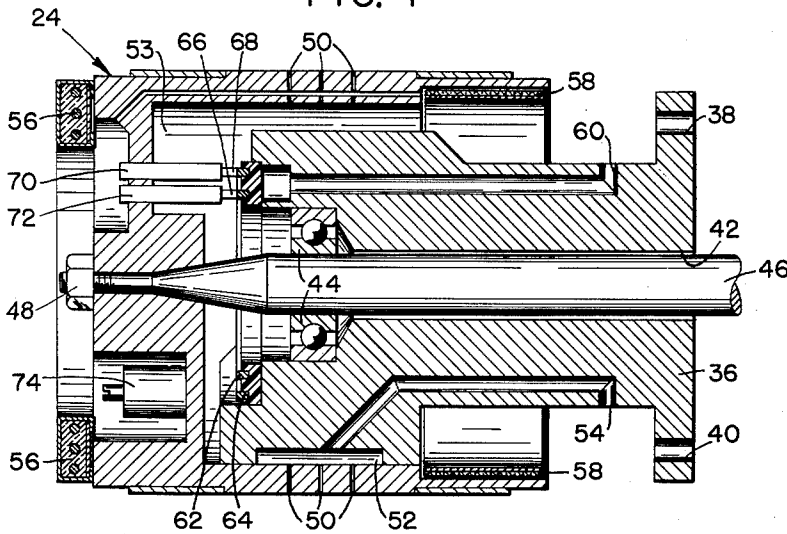


FIG. 1



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CIGARETTE MAKING MACHINE UNITING BAND
CONVEYING DRUM

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6 Claims. (Cl. 131—94)

This invention relates to cigarette making machines and more particularly to machines for making mouthpiece cigarettes.

Mouthpiece cigarettes today are generally made by joining a length of cigarette material and a mouthpiece together by means of a uniting band. When the uniting bands are secured about a length of cigarette material and a mouthpiece in this manner, there is sometimes a tendency for the uniting band material to become loose or unravel at the lap edge. Various efforts have been made to overcome this such as using different types of adhesive, rolling the cigarette after the band has been applied and applying heat to the cigarette mouthpiece and cigarette assembly after the uniting band has been applied thereto and blowing hot air on the uniting band material.

The former procedures while, for the most part, they succeeded in making the uniting band adhere to itself, the excessive rolling disturbed the uniformity of the cigarette filler and often caused tobacco to fall out of the end of the cigarette. The latter procedure of blowing hot air on the adhesive had the disadvantage that sometimes tobacco shreds and foreign matter would be blown against the uniting band and would stick to the adhesive and when the uniting band was finally applied about the cigarette assembly, the foreign matter and shreds would show through the uniting band which was objectionable.

It is an object of this invention to provide an improved mechanism for securing uniting bands about assemblies of cigarette material and mouthpieces which will avoid the tendency of the uniting band to become loose.

A further object is to provide a uniting band conveying and cutting drum which heats and continues to maintain the uniting band material heated up to and including the time it is applied about a cigarette mouthpiece assembly.

Other objects and features of the invention will appear as the description of the particular physical embodiment selected to illustrate the invention progresses. In the accompanying drawings, which form a part of this specification, like characters of reference have been applied to corresponding parts throughout the several views which make up the drawings.

Figure 1 is a sectional elevation of my heated uniting band conveying and cutting drum taken on the line 1—1 of Figure 2.

Figure 2 is a schematic end elevation of my uniting band applying apparatus.

Figure 3 is a schematic wiring diagram of the wiring connections for my heated uniting band applying drum.

The type of uniting band material used for joining a length of cigarette material and a mouthpiece together depends upon the desire of the manufacturer. Some manufacturers have applied or have used uniting band material having thermo plastic adhesives while others have used a uniting band material to which they apply an adhesive prior to its being applied about the assembly. My invention may be used with either type of uniting

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band material and can be used to activate the thermo plastic adhesive that has been pre-applied to the uniting band so as to activate the adhesive and to render it tacky and to maintain it in this condition up to and including the time the uniting band material is wrapped about the assembly.

For purposes of illustrating the invention I have shown how my apparatus may be used with a uniting band material which has an adhesive applied thereto during the cigarette manufacturing process. In this case my uniting band conveying, cutting and applying drum renders the adhesive which has been applied to the band tacky by heating it from the underside which avoids contaminating the adhesive surface which is to come into direct contact with the cigarette length and mouthpiece.

Uniting band material U is drawn from a source of supply such as a reel by means of a pair of feed rollers 10, 12 and moves past an adhesive applying roller 14 which applies adhesive to the uniting band material U. A transfer roller 16 is mounted so that part of of its periphery rotates in the paste or adhesive held in container 18 and transfers the paste adhering to the periphery onto the surface of paste applying roller 14.

The uniting band tape U travels over suitable guide rollers 20, 22 and has the leading end thereof riding on the suction vacuum drum 24. The peripheral speed of the vacuum drum 24 is greater than the linear speed at which feed rollers 10 and 12 feed the tape U to the vacuum drum 24. When the desired amount of uniting band material has been fed by feed rollers 10 and 12, a suitable cutter 26 having cutting knives 28 engages with the uniting band U and cuts the leading length of material therefrom by cutting against the drum 24. Suction causes the uniting band material U to be held against the suction drum 24 while allowing the suction drum to rotate at a faster speed than the uniting band material U travels. As a result there will be a slippage occurring between the drum 24 and the uniting band material U, similar to that described in co-pending application of George Dearsley, S.N. 509,293, filed May 18, 1955.

Because of this slippage when the leading end of the uniting band has been severed it will adhere to the uniting band conveying drum 24 and will travel at the same speed as the peripheral surface thereof, so as to make a space between the leading end of the uniting band U and the severed section of uniting band material 30.

The severed section of uniting band material is then, by the movement of drum 24, brought into contact with the cigarette assembly 32 to which it is to be applied. The cigarette assembly consists of a cigarette length and mouthpiece or a pair of cigarette lengths and a double length mouthpiece positioned there-between such as shown in the co-pending application of George Dearsley, S.N. 509,293.

The cigarette assembly is supported and conveyed in-between a pair of rollers 34 which are supported in either a drum or between a pair of belts.

Because of the rather short radius of a cigarette and mouthpiece there has been a tendency for the uniting band material to unravel after it has been applied about the assembly. I have found a very satisfactory way of overcoming this is by heating the drum which conveys and applies the uniting band to the assembly so that the uniting band will be heated and maintained in a heated condition up to and including the time it is applied about an assembly which results in a very satisfactory application of the uniting band about the assembly.

Figure 1 shows in detail the construction of my uniting band conveying drum.

The stationary vacuum drum shoe 36 is fixedly secured to a stationary support by means of suitable bolts passing through holes 38 and 40. A hole 42 extends through

the center of stationary vacuum drum shoe 36. A bearing 44 is mounted in the vacuum drum shoe 36 and supports a shaft 46 which is rotated from the main drive of the cigarette making machine.

The forward end of the shaft 46 is provided with a male taper which engages a corresponding female taper cut in the drum 24. Nut 48 serves to draw the drum 24 onto the taper of shaft 46 thus providing means to time the drum 24 relative to the shaft 46 and when the timing is suitable to securely fasten the drum to the shaft thereby providing driving means for drum 24. The drum 24 has holes 50 formed therein. These holes when they pass the suction chamber 52, which is connected with a source of suction through ducts 54, draw air inwardly. When they pass the suction chamber 52 and reach another portion of the vacuum drum shoe 36 they reach a second chamber 53 which is connected with the outside atmosphere thereby releasing any suction gripping action that was exerted through the holes 50 on a uniting band lying on top of the holes 50.

Suitable electrical heating elements are secured to or imbedded in the rotating vacuum drum such as the heating ring 56 and strip heater 58. Electrical current is carried by suitable wires which pass through tunnel 60 formed in the stationary vacuum drum shoe 36. The ends of these electrical wires are connected with the slip rings 62 and 64 which are electrically insulated from each other. Brushes 66 and 68 ride against the slip rings 62 and 64 and are supported in the brush holders 70 and 72. One of the wires interconnects the brush 66 with the heating ring 56 and the strip heater 58. The other wire interconnects the brush 68 with the other terminal of the heating ring 56 and the strip heater 58 and has interposed therein an adjustable thermostat 74. These wiring circuits have been shown in the schematic diagram in Figure 3.

The vacuum drum operates in a manner similar to that shown in the co-pending application of George Dearsley, S.N. 509,293, to feed predetermined lengths of pasted uniting band material to a composite assembly as shown in Figure 2. When the uniting band material used comes in contact with the periphery of the uniting band drum 24 the heat of the vacuum drum makes the paper pliable and the adhesive thereon tacky and continues to maintain it tacky up to and including the time it is wrapped around the assembly. This arrangement has the advantage that the heated drum irons out the uniting band material and there is no tendency for the uniting band material to commence unraveling after it has been wound around an assembly because it is wrapped when it is tacky and warm and this tends to simultaneously iron it permanently into wrapped form.

Although the consistency of many liquid adhesives is suitable for application to the web U by glue application rollers 14 and 16 as herein above described, it is found that some must be thinned with water. Also, in previous practice where heat is not employed in the drum 24 it was found necessary to employ a second heated drum to roll against the cigarette assembly subsequent to application of the gummed uniting band for the purpose of drying and sealing the adhesive coated uniting band. By using a heated drum 24 as herein disclosed it is found that a thinner adhesive can be employed in the adhesive container 18, the effect of the heated drum 24 being to drive excess moisture from the adhesive thereby increasing its tackiness for satisfactory adherence to the cigarette assembly. In addition, it is found that by adding heat to the drum 24 it is unnecessary to employ supplemental heating and sealing devices such as are required with an unheated uniting band applying drum.

The invention hereinabove described may therefore be varied in construction within the scope of the claims, for the particular device selected to illustrate the invention is but one of many possible embodiments of the

same. The invention, therefore, is not to be restricted to the precise details of the structure shown and described.

What is claimed is:

1. Apparatus for applying a uniting band about a cigarette and mouthpiece assembly to form mouthpiece cigarettes comprising a stationary shoe having a suction chamber, a hollow drum mounted for rotation closely adjacent the outer surface of said shoe, a chamber formed between said shoe and said drum and opening to the outside atmosphere, there being vacuum holes formed in said drum, connecting successively with said chambers for holding and then releasing tacky uniting bands carried thereon, a heating ring integrally secured exteriorly to one end of said drum, an annular strip heater imbedded in the inner peripheral face of the other end of said drum for transmitting heat uniformly thereto to thereby heat the uniting band material continuously when it is supported on said drum so that it becomes pliable and tacky by the time it is applied about a cigarette mouthpiece assembly to thereby facilitate wrapping the uniting band material around the assembly, and means connecting said ring and said strip heater to a source of electric current.
2. Apparatus for applying uniting bands about cigarettes and mouthpiece assemblies comprising a hollow rotating outer suction drum, a stationary shoe disposed inwardly of said drum for applying suction to the portion of said drum passing past said shoe, a source of uniting band material, an adhesive applying mechanism for applying adhesive to the outside of said uniting band material so that the leading end thereof rests on the suction drum, a heating ring integrally secured exteriorly to one end of said drum, a circular strip heater imbedded in the inner peripheral face of the other end of said drum to render said uniting band material tacky and pliable, a uniting band applying station positioned adjacent to said drum and arranged to support a mouthpiece and cigarette assembly to which said band material is to be applied, and a cut-off for severing a predetermined length of mouthpiece material from the leading end of said uniting band material.
3. A uniting band conveying and applying apparatus for uniting mouthpiece and cigarette lengths comprising a source of supply of uniting band material, a feed for feeding uniting band material at a predetermined rate from said source of supply, a hollow rotatable perforated suction drum for receiving and holding the leading end of said uniting band material, a paste applying roller for applying paste to said uniting band material as it is fed toward said perforated suction drum, a cutter cooperating with said suction drum for severing a predetermined length of uniting band material from the leading end of said uniting band material, a conveyor for conveying assemblies of mouthpiece and cigarette lengths to be united toward said suction drum, a heating ring integrally secured exteriorly to one end of said drum, a circular strip heater imbedded in the inner peripheral face of the other end of said drum for transmitting heat thereto for heating said uniting band material up to and including the time the uniting band material is applied about a cigarette assembly, means connecting said heating ring and said circular strip heater to a source of electric current, a suction shoe disposed inwardly of said suction drum for cutting off said supply of suction from the area of the suction drum adjacent the point the uniting band material is applied by said suction drum about an assembly of a mouthpiece and cigarette length.
4. A uniting band applying apparatus comprising a hollow perforated uniting band rotating conveying suction drum, a stationary suction drum shoe disposed inwardly of said drum, means for feeding uniting band material having adhering qualities to said drum at a slower rate than the surface of said drum travels so as to cause slippage to occur between the leading end of said

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uniting band material and drum, both of said drums having interconnecting passages, a cutter for severing predetermined lengths of uniting band material from the leading end of the uniting band material fed to said drum, a conveyor for carrying cigarette assemblies to be united tangentially past said suction drum, and means for applying heat to said suction drum to improve the adhering qualities of said uniting band material and to continue applying heat to said uniting band material until the severed length of the uniting band material has been applied about the assembly, said means comprising a heating ring integrally secured exteriorly to one end of said drum, a circular strip heater imbedded in the inner peripheral face of the other end of said drum for transmitting heat thereto for heating said uniting band material up to and including the time the uniting band material is applied about a cigarette mouthpiece assembly, and conductor means connecting said heating ring and said circular strip heater to a source of electric current.

5. A uniting band conveying and applying apparatus comprising a rotatable hollow drum having a perforated surface, means disposed inwardly of said drum for applying suction to said surface for a predetermined portion of its travel, a heating ring integrally secured exteriorly to one end of said drum, a circular strip heater imbedded in the inner peripheral face of the other end of said drum for transmitting heat thereto, and conductor means connecting said heating ring and said circular strip heater to a source of electric current, means for feeding to said rotatable drum uniting band material having an adhesive surface on the side which does not contact the perforated drum, a cutter for severing a predetermined length of uniting band material from the leading end of said uniting band material, said drum traveling at a faster rate than the rate at which the uniting band material is fed thereto so as to cause a space to be formed between the severed length of uniting band material and the leading end of the material fed thereto, a conveyor for conveying mouthpiece and cigarette length assemblies past said uniting band conveyor to permit said heated uniting band conveyor to apply the uniting band about said assembly.

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6. A uniting band conveying and applying apparatus comprising a hollow suction drum for applying a uniting band about a cigarette length and mouthpiece to be joined comprising means disposed inwardly of said drum for supplying suction to said drum, a source of supply of uniting band material, mouthpiece means for delivering said material to said drum at a slower rate than said drum rotates, said material having a substance that is rendered tacky when it comes into contact with a heated surface, a heating ring integrally secured exteriorly to one end of said drum, a circular strip heater imbedded in the inner peripheral face of the other end of said drum for transmitting heat thereto for heating said material up to and including the time the material is applied about a cigarette mouthpiece assembly, and conductor means connecting said heating ring and said circular strip heater to a source of electric current, a knife co-acting with said drum for severing predetermined lengths of material from the leading end of the material fed to said drum and an assembly conveyor for bringing assemblies into the range of action of said drum to cause uniting bands to be applied thereabout.

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