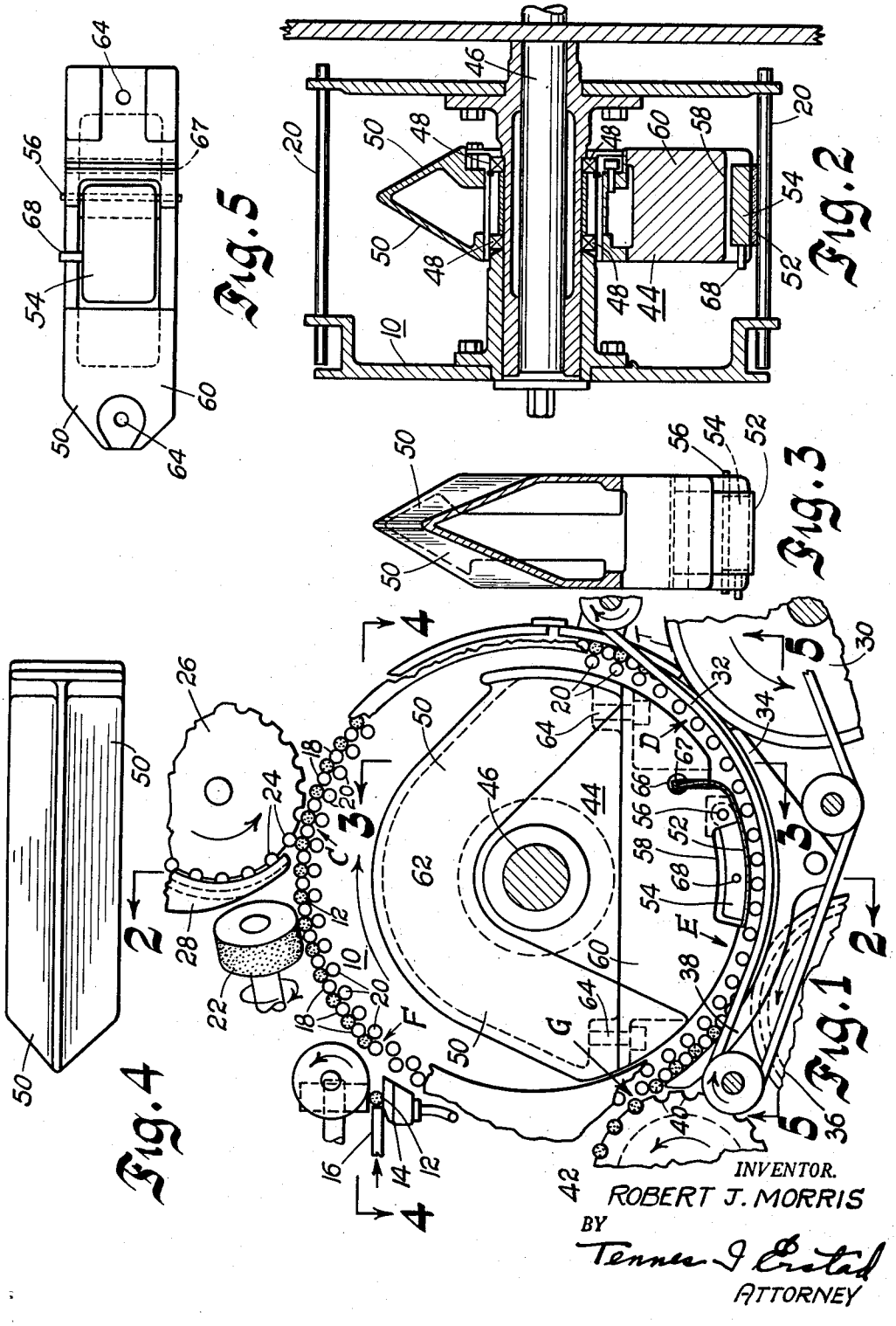
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CIGARETTE MACHINE

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CIGARETTE MACHINE

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This invention relates to a machine and method for making mouthpiece cigarettes and is particularly concerned with an apparatus for attaching cut lengths of filter plug or other mouthpieces to cut lengths of cigarette rod.

One such machine to which the present invention may be advantageously applied is described in detail in U.S. application Serial No. 509,293 by George Dearsley filed on May 18, 1955. The inventive improvement herein disclosed will be described in connection with this machine.

One of the criticisms sometimes made regarding the products of filter tip machines is that tobacco particles, sometimes referred to as "shorts," frequently become entrapped under the overlap of the uniting band material. This is very objectionable to the feel and eye of the cigarette smoker. Consequently, cigarette manufacturers are desirous of having this objectionable feature in their products removed.

Heretofore it has been difficult to avoid this, because in the process of making the filter tip cigarettes shorts would escape, and come in contact with the supporting members and uniting band so that when the band was applied to the cigarette lengths some of these shorts would be entrapped and be visible through the uniting band.

It is an object of the present invention to overcome this objection by means of a simple deflecting member which will be so mounted that it will not interfere with the operation of any of the components of the filter tip making machine and will still be efficient in removing shorts that escape during manufacture so that they will not come in contact with cigarettes being united with mouthpiece material.

Heretofore it has been the practice in the art of making cigarettes to coat the rollers of the assembly drums with a suitable material such as Teflon to facilitate the removal of any cork patches or other tipping material which may during mal-functioning of the machine become wound around the individual rolls and also to prevent the accumulation of adhesive on the rolls. This practice of Teflon coating the rollers was objectionable however because the Teflon becomes statically charged and sometimes carries tobacco shorts into the tip lap in spite of any shields that might be employed to deflect shorts. This problem of static electricity is completely avoided when the Teflon coating is removed. However with uncoated rolls, adhesive is liable to build up thereon during periods of protracted operations.

To overcome this difficulty I have equipped a deflector which will be described with a flexible wiper made of any suitable material and which is pressed against the rolls by suitable means so as to positively remove any shorts that might be picked up by the rollers.

A primary object of the invention is therefore to prevent tobacco shorts or other particles from contaminating the tip end of the cigarette assembly during the process of joining the mouthpiece to the cigarette rod.

Another object of the invention is to free the rollers of the assembly drum from excess adhesive that may cling

thereto during the tip joining operation and before the heat applied by the heating drum causes the adhesive to set on the roller surface.

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.

Fig. 1 is a side elevation partly in section illustrating the assembly drum and adjoining component parts of the cigarette filter tip attaching mechanism described in the application earlier referred to hereinabove.

Fig. 2 is a partial vertical section through the assembly drum and the shield and wiper device herein disclosed when taken on line 2—2 of Fig. 1.

Fig. 3 is another partial vertical section through the inventive shield and wiper device, taken on line 3—3 of Fig. 1.

Fig. 4 is a plan view of the shield and wiper device taken on line 4—4 of Fig. 1.

Fig. 5 is an underside view of the lower portion of the herein disclosed shield and wiper device, taken on line 5—5 of Fig. 1.

Referring now to Fig. 1 the assembly drum 10 of the filter tip attaching machine, rotating in the direction indicated by the arrow, receives cut lengths of cigarette rod 12 at F from the cigarette making machine. They are delivered, axially spaced by suitable means, upon a table 14. A kicker plate 16 is reciprocated in the direction indicated by the arrow, by means not shown, to push a pair of cut cigarette lengths from the supporting table 14 into suitable roller receiving pockets formed on the periphery of the assembly drum 10. Each pocket is made up of three pivoted rollers, a short roller 18 on either side and a longer inside roller 20. The cigarettes thus discharged into the pockets of the cigarette assembly drum 10, are moved apart a pre-determined distance by means of a pair of rubber rollers 22 rotating in opposite directions.

At position C on the periphery of drum 10 there are received into the pockets formed by the nest of rollers 18 and 20 and into the predetermined space between the two lengths of cigarette rod, a double length of filter plug 24. The plugs delivered by plug aligning drum 26 are discharged by stripper 28 into the pockets of assembly drum 10.

The cigarette assembly drum 10 rotates continuously in the direction indicated by the arrow, carrying with it the assembly of two spaced cigarette lengths and a double length of filter plug located therebetween in the pockets formed by the rollers 18 and 20.

As the assemblies of double filter plugs and cigarette lengths continue their advance, they are gradually brought into abutment by suitable means and are joined together by means of a uniting band T which is rolled around the assembly at point D on the periphery of drum 10.

The uniting band T is delivered to station D in spaced suitable lengths by band conveying suction drum 30. These lengths of uniting band are provided with a coating of adhesive on the underside thereof as described in the specification of the earlier application referred to hereinabove.

The spaced length of filter tip material carried by suction drum 30 in the direction indicated by the arrow is brought into contact with the assembly of tightly held cigarettes. The rubber belts 32 and the surface of the drum 30 engage the cigarette assembly, causing the tip material T to be rolled about the assembly between the rollers 18 and 20 and the suction drum 30. Stripping fingers 34 lift the banded cigarette assembly away from

the drum 30 and confine it in the cradle of rollers 18 and 20.

When the assembly of cigarettes, having the uniting band T applied thereon, reaches the sealing station E they come in contact with a heater drum 36 rotating in the direction indicated by the arrow, which causes the cigarette assembly to be rolled within the nest of rollers 18 and 20 and the sealing drum 36 to set and dry the adhesive carried on the filter tip material. During this portion of travel the cigarettes are held in their pockets formed by rollers 18 and 20 by means of a suitable guide plate 38 and the inner rollers 20 are positively rotated by means of belt 32 to impart to the cigarette assemblies a rotation similar to that imparted before and during the application of the uniting band T.

When the assembled cigarettes reach the station G they drop into pockets 40 of cutting drum 42. This drum rotates in the direction indicated by the arrow and delivers the double length cigarette assembly into the path of a rotating knife (not shown) to sever each assembly at the centre thereof into two filter tip cigarettes.

Because the time available for rolling the uniting band about the cigarette assembly is very short, the lap frequently pops open as soon as the assembly has left the uniting band drum 30 at station D, it being the function of the heater drum 36 to subsequently make certain that the lap is properly ironed down and sealed.

If any tobacco particles or shorts are allowed to fall onto the assembly while it travels between the band applying drum 30 and the heater drum 36, pieces of tobacco may adhere to the still wet gum where it is exposed in the case of those laps which are not completely sealed at this time, thus remaining under the lap when the heater drum 36 makes the final closure.

The shorts in question do not come from the cigarettes under consideration, for at this point of the operation the tobacco ends are effectively contained by being pressed tightly against the filter tip. The tobacco causing the trouble is believed to originate at the top surface of the assembly drum 10, where they may be shaken out from the cigarette ends during the period of travel from receiving station F to band application station D. The shorts sift through the rolls 18 and 20 and fall diametrically across the interior of drum 10 onto the cigarettes travelling from station D where the adhesive covered band T is applied, sticking to any laps which may not be sealed.

When lengths of cigarette rod are supplied with cork tips this problem is not very acute for, although undesirable, the contamination is not very prominent against the cork coloration, although it does prevent the making of a proper seal, and may be readily detectable by the fingers of the smoker.

However when a white tipping material is employed, even small inclusions are prohibitive for they are instantly visible against a white background.

This problem has been successfully solved by providing in accordance with the invention a weighted shield 44 suspended within the interior of drum 10 from the drum shaft 46. A ball bearing 48 mounted on shaft 46 assures independent movement between drum shaft 46 and shield 44. The centre of gravity of shield 44 is positioned well below the axis of shaft 46 so that the shield 44 hangs stationary while the drum rotates around it. The shield is provided with inclined surfaces 50 at the upper portion thereof resembling a peaked roof. The length of this roof projected downwardly extends over the arc through which the cigarette assembly travels from the band drum 30 to the heater drum 36. Also the width of the roof is such that all shorts falling onto it are deflected away from the mouthpiece area, falling harmlessly onto the ends of the cigarettes away from the tip.

As earlier mentioned hereinabove, excess adhesive is liable to build up on inside rollers 18 causing difficulties in operation.

In accordance with the invention this problem has been successfully solved by providing a wiper 52 on the under-

side of shield 44. Wiper 52 can be made of any suitable material such as felt, soft leather, canvas etc., and is pressed against rollers 20 by a weight 54 hinged at 56. Weight 54 is placed into a recess 58 formed in a lower portion 60 of shield 44. Preferably, shield 44 is made of two parts, an upper section 62 and a lower section 60 attached thereto by screws 64, the lower section carrying wiper 52 and weight 54.

Lower section 62 is provided with a transverse slot 66 which carries a metallic clip 67 to which wiper 52 is secured. This arrangement permits easy removal and replacement of wiper 52 which must be removed for cleaning and replacement at intervals of one day to one week according to operating conditions.

This can be easily accomplished by manually lifting the weight 54 by means of pin 68 provided for this purpose.

Obviously wiper 52 can be held against rollers 20 by other means such as a spring. Also a similar wiper can be employed to keep side rollers 18 free from adhesive if such provisions should become desirable.

Furthermore shield 44 can be made the basis of a suction head providing an air connection through shaft 46 and removing tobacco shorts falling on slanted surfaces 50 of shield 44 through suitable suction openings which can be provided therein.

The invention hereinabove described may 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 uniting bands to cut lengths of rod material comprising a rotating assembly drum having pockets of driven transverse rollers for conveying composite assemblies of axially abutting lengths of said rod material, means for applying an adhesive covered uniting band to said assemblies from the outer periphery of said drum while being rotated between at least two driven rollers, and an elongated wiper of resilient material positioned independently of drum rotation, within the interior of said drum and following the beginning of said uniting operation to contact a plurality of said rollers in wiping relationship during said uniting operation.

2. Apparatus for applying uniting bands to assemblies of cut lengths of cigarette rod and abutting mouthpieces comprising a rotating assembly drum adapted for conveying said assemblies in spaced relationship along the periphery thereof, means for applying an adhesive band to said assemblies to unite said mouthpieces to said cut lengths of rod, while said assemblies pass through a predetermined arc of drum rotation, and a shield located below the axis of rotation of said drum for spanning the inside of said arc and a major mid-portion of each cigarette assembly within said arc to deflect gravitationally descending particles away from said assemblies during the uniting operation.

3. Apparatus according to claim 2 in which said shield is disposed within the interior of said drum and supported independently of drum rotation.

4. Apparatus for applying uniting bands to assemblies of cut lengths of cigarette rod and abutting mouthpieces comprising a rotating assembly drum adapted for conveying said assemblies in pockets of driven transverse rollers spaced along the periphery of said drum; means for applying sections of adhesive covered uniting bands to said assemblies while being rotated between at least two of said driven rollers and while said assemblies pass through a predetermined arc of drum rotation; and a shield and wiper combination device disposed within the interior of said drum and supported independently of the rotational movement of said device comprising a shield spanning said arc to prevent gravitationally descending

particles from clinging to said assembly during the uniting operation, and a wiper of adhesive absorbing resilient material, said wiper being yieldingly attached to and positioned underneath said shield in wiping contact relationship with at least one of said rollers to free said roller of any excess adhesive clinging thereto during said uniting operation.

5. Apparatus for applying uniting bands to assemblies of cut lengths of cigarette rod and abutting lengths of mouthpieces comprising a rotating assembly drum having pockets of driven transverse rollers for conveying spaced composite assemblies of said axially abutting lengths of cigarette rod and mouthpieces, means for applying an adhesive covered uniting band to said assemblies from the outside of said drum to unite said mouthpieces to said cut lengths of rod while said assemblies pass through a predetermined arc of drum rotation and while being rotated between at least two driven rollers, and an elongated wiper of adhesive absorbing resilient material yieldingly positioned within the interior of said drum and within said arc to contact a plurality of said rollers in wiping relationship while said rollers are travelling within said arc of drum rotation.

6. In an apparatus for making filter tip cigarettes the combination of an assembly drum rotating in a circular path of travel about a horizontal drum shaft and having means forming radially open pockets spaced about the circumferential drum surface, said drum being adapted for receiving within each pocket a cut length of cigarette rod and an abutting cut length of filter plug; means for applying a gummed uniting band about each filter plug and the abutting end of the corresponding cigarette rod while said cigarette rod and filter plug containing pockets travels through a predetermined arc being a portion of the lower half of said circular path; and a shield freely suspended from said drum shaft within the lower portion of the said drum interior and having a center of gravity located below the axis of said shaft, the downwardly projected shielding area of said shield having a length of at least the length of said predetermined arc portion and a width of at least the width of said uniting band.

7. In an apparatus for making filter tip cigarettes the combination of an assembly drum rotating in a circular path of travel about a horizontal shaft and having a drum surface comprising cylindrical members longitudinally disposed for rotation about their axes and circumferentially spaced to form pockets adapted to receive cut lengths of cigarette rod and abutting cut lengths of filter plug; means for applying a gummed uniting band about each filter plug and the abutting end of the corresponding cigarette rod by rotation of said circular members while in contacting relationship with said uniting band and while said cigarette rod and filter plug containing pocket travels through a predetermined arc being a portion of the lower half of said circular path, a body freely suspended from said drum shaft within the lower portion of the said drum interior and having a centre of gravity located below the axis of said shaft; and a wiper of resilient material yieldingly supported from the lower portion of said body in wiping contact relationship with at least one of said cylindrical members.

8. In an apparatus for making filter tip cigarettes the combination of an assembly drum rotating in a circular path of travel about a horizontal shaft and having a drum surface comprising cylindrical members longitudinally disposed for rotation about their axis and circumferentially spaced to form pockets adapted to receive cut lengths of cigarette rod and axially abutting cut lengths of filter plug; means for applying a gummed uniting band about each filter plug and the abutting end of the corresponding cigarette rod by rotation of said circular members while in contacting relationship with said uniting band and while said cigarette rod and filter plug containing pocket travels through a predetermined arc being a portion of the lower half of said circular path; a shield freely suspended from said drum shaft within the lower portion of the said drum interior, the centre of gravity of said shield being located below the axis of said shaft the downwardly projected shielding area of said shield having a length of at least the length of said predetermined arc portion and a width of at least the width of said uniting band; and a wiper of resilient material yieldingly supported from the lower portion of said shield in wiping contact relationship with at least one of said rotatable cylindrical members.

9. Apparatus for applying uniting bands to assemblies of cut lengths of cigarette rod and abutting mouthpiece comprising a rotating assembly drum adapted to convey said assemblies in pockets of transverse rollers spaced about the periphery of said drum, means disposed adjacent the outer periphery of said drum for applying adhesive bearing uniting bands to said assemblies while being rotated between said rollers as said assemblies pass through a predetermined arc of drum rotation, and a trailing wiper made of absorbing material secured at one end adjacent the interior side of said drum independently of the rotation thereof and within said arc to cause the trailing end of said wiper to wipe over a plurality of rollers as said assembly drum is rotated, and means urging the trailing end of said wiper into contact with said rollers to effect a wiping action thereon.

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