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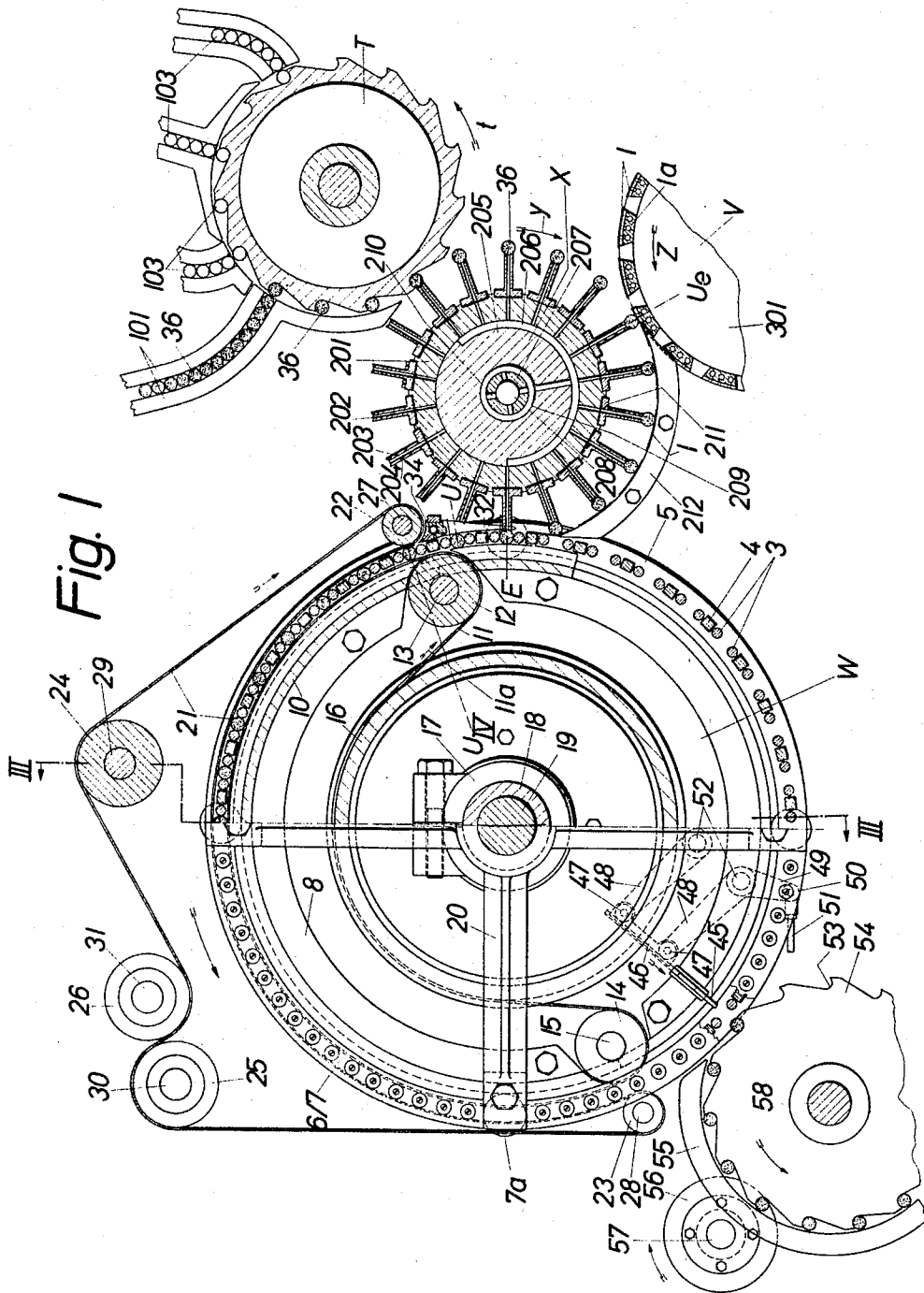
A. SCHMERMUND

3,380,459

DEVICES FOR ATTACHING MOUTHPIECES TO ELONGATED ARTICLES
SUCH AS CIGARETTES OR CIGARS

Filed Oct. 19, 1965

5 Sheets-Sheet 1



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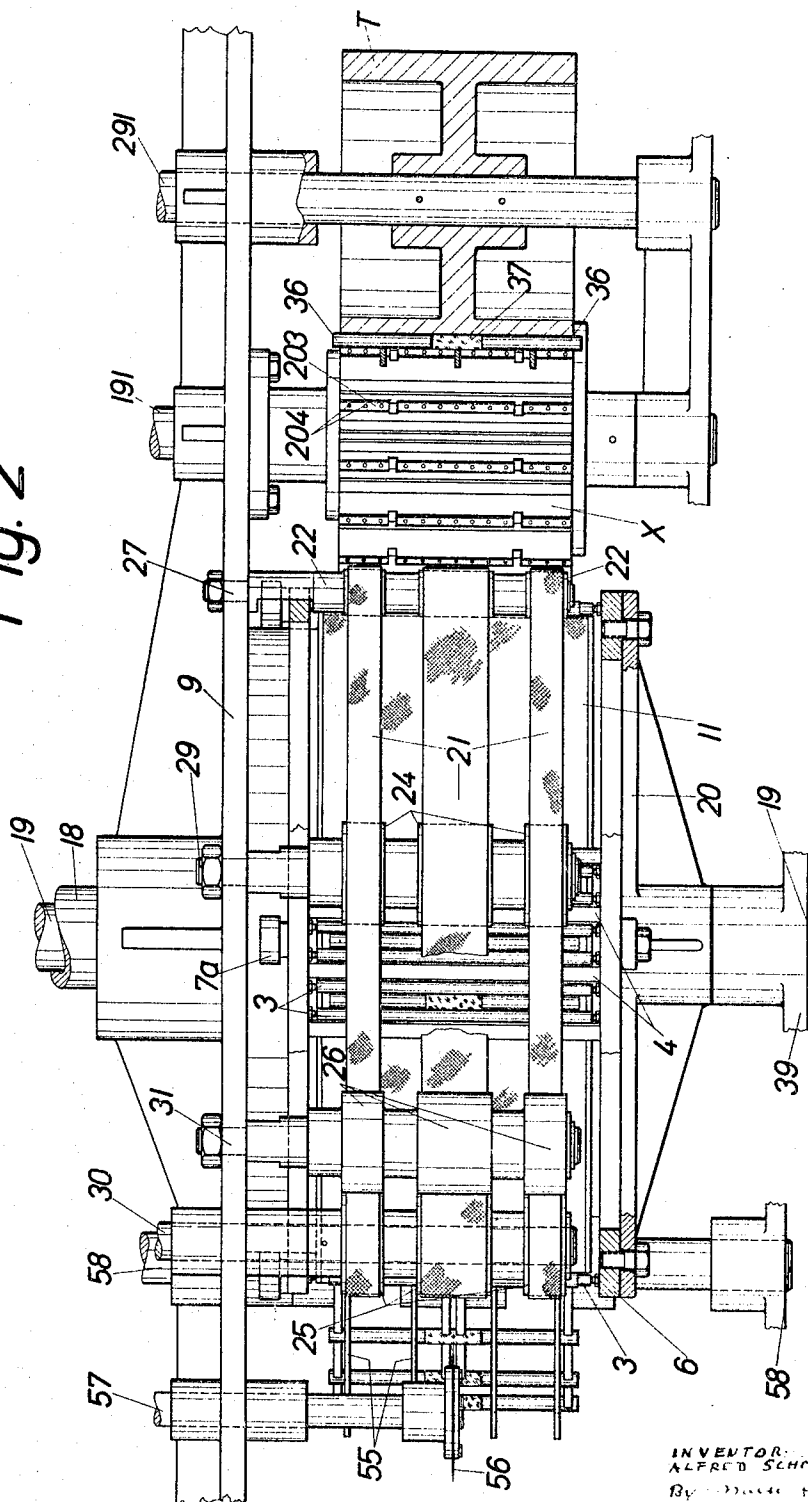
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5 Sheets-Sheet 2

Fig. 2



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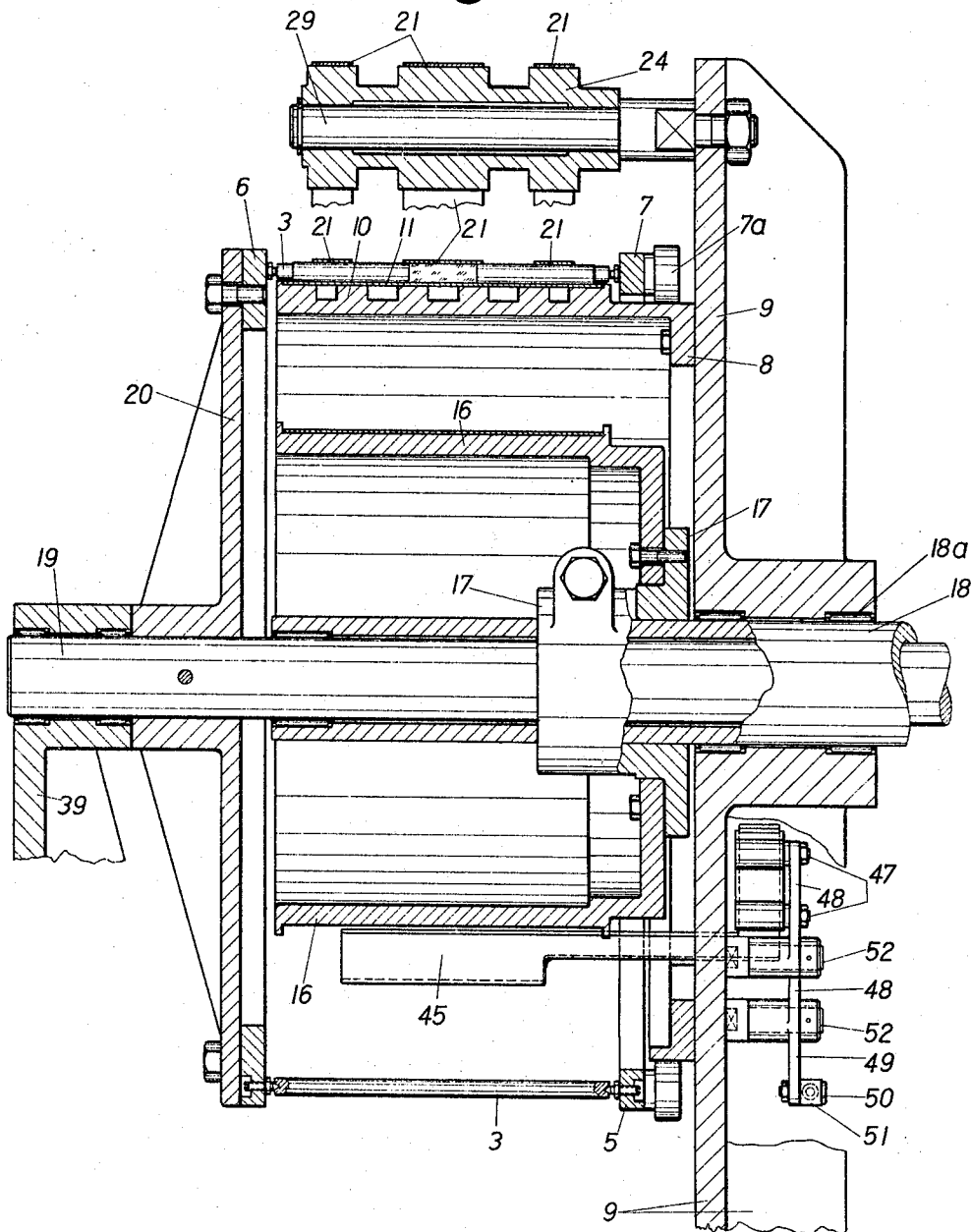
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3,380,459

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Fig. 3



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5 Sheets-Sheet 4

Fig. 4

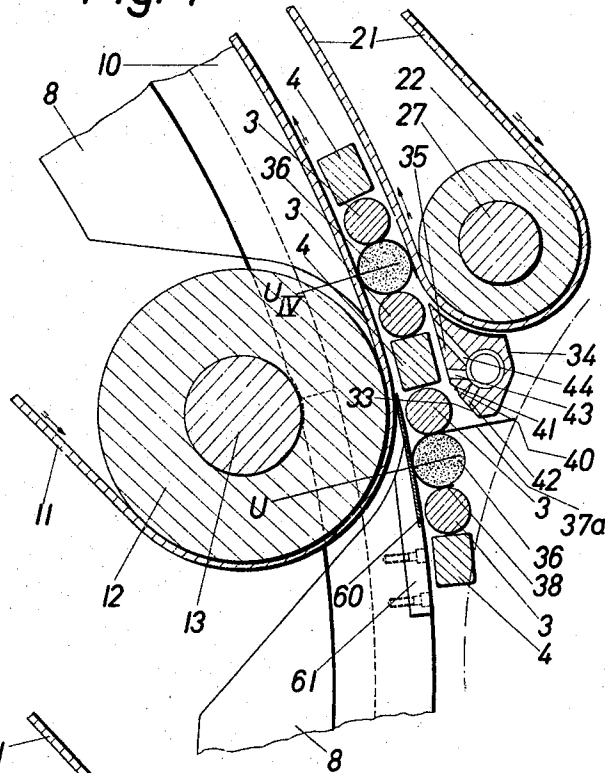
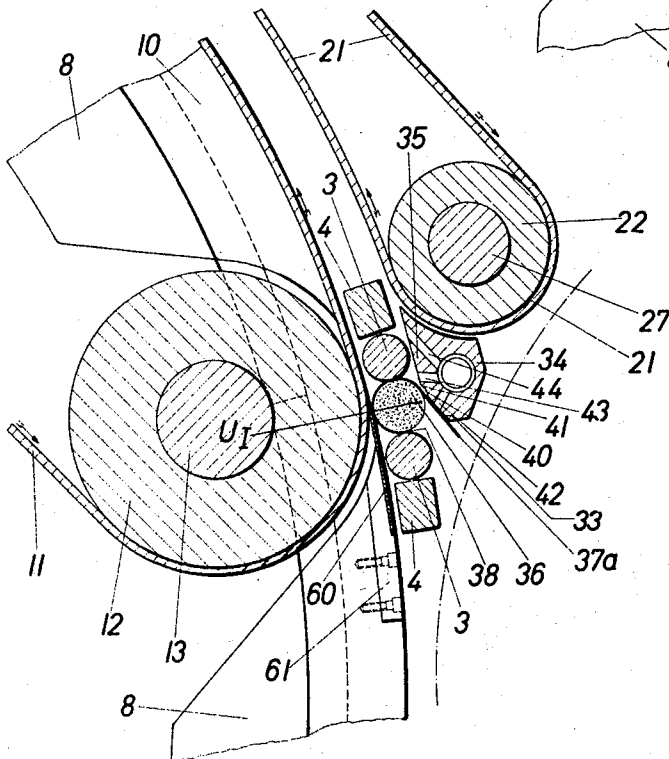


Fig. 5



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5 Sheets-Sheet 5

Fig. 6

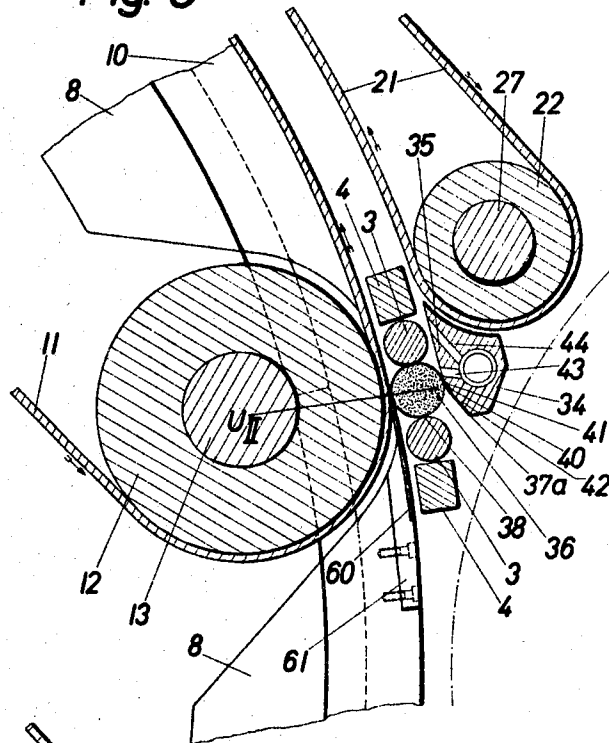
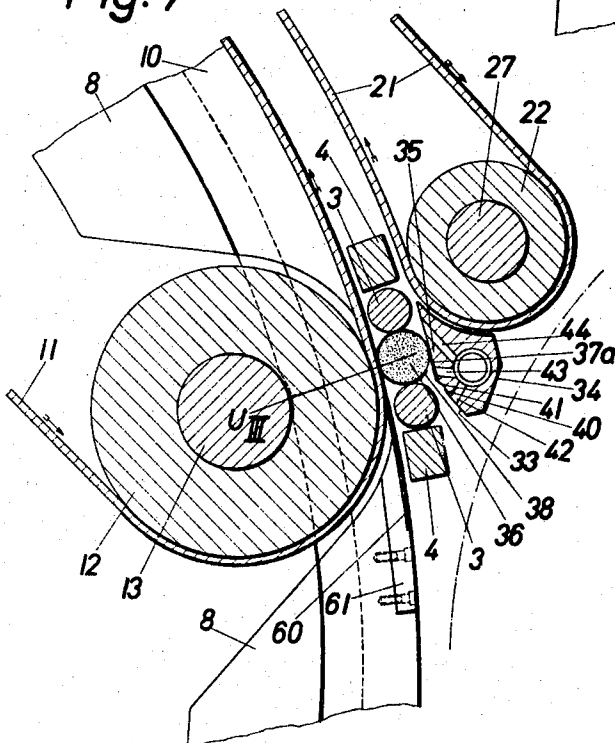


Fig. 7



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DEVICES FOR ATTACHING MOUTHPIECES TO ELONGATED ARTICLES SUCH AS CIGARETTES OR CIGARS

3,380,459

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3 Claims. (Cl. 131-94)

ABSTRACT OF THE DISCLOSURE

The invention relates to the provision in a device for attaching mouthpieces to elongated articles such as cigarettes or cigars in which groups of elongated articles and mouthpieces are received in the chambers of a rotatable drum acting as a conveyor, of marginal flanges on the drum between which bars are provided having a pair of rotatable rollers laterally of each bar, one on each side of each bar, the spaces between the rollers or adjacent bars forming the groups receiving chambers, the rollers and bars being so dimensioned that the rollers bear against the group in the chamber.

Disclosure of invention

The invention relates to devices for attaching mouthpieces, for example filter tips, to elongated articles such as cigarettes or cigars.

For attaching filter tips to cigarettes, it is known to form groups each comprising a filter plug of twice the length of a cigarette filter tip, and two cigarettes, one at each end of the plug, to wind a length of wrapping material around each plug and the adjacent ends of the two cigarettes and to cut each group centrally whereby two filter tipped cigarettes are obtained from each group. For fixing the length of wrapping material, it is customary to place the length provided with an adhesive into contact with the plug and to rotate the group to wind the material around the plug.

It has been found that the cigarettes are liable to damage, for example by loss of tobacco at their free ends, during rotation. It is an object of this invention to provide a device in which the danger of damaging an elongated article while attaching a mouthpiece thereto is avoided, or is at least reduced, as compared with known devices just referred to.

This object is attained by providing a device which permits the elongated articles to be particularly slowly rotated while the material is wound around the mouthpieces.

To make the invention clearly understood reference will now be made to the accompanying drawings which are given by way of example and in which:

FIG. 1 is a side view, partly in section, of an embodiment of the invention;

FIG. 2 is a plan view, partly in section, of the embodiment of FIG. 1;

FIG. 3 is a section along the line III-III of FIG. 1;

FIG. 4 illustrates a detail, in section, of FIG. 1 on a larger scale; and

FIGS. 5, 6 and 7 illustrate the detail of FIG. 4 in different operating positions.

The embodiment of FIGS. 1, 2 and 3 comprises chutes 101 for feeding cigarettes 36 and filter plugs 37 to a first rotatable drum T so that groups are formed on the drum T, each group comprising two cigarettes 36 and an intermediate filter plug 37 which has twice the length of a filter tip of a single cigarette.

The groups are transferred from the drum T to a sec-

ond rotatable drum X having a plurality of suction members 203, the free ends of which are concave to form troughs 202 for receiving the groups of cigarettes and filter plugs. Each member 203 has bores 204 terminating in the trough 202 and being arranged to communicate, during a part of each revolution of the drum X, with a stationary suction duct 206, which, in turn, communicates through ducts 209, 210 with a suction line 208. By this arrangement groups of cigarettes and filter plugs are successively attracted from the drum T by suction and are held in the troughs 202 by suction while the respective bores 204 communicate with the suction duct 206. The drums T and X are rotatable in the directions of the arrows *t* and *y* respectively.

A third drum V is rotatable in the direction of the arrow *z* and serves to feed lengths 1 of wrapping material to groups of cigarettes and filter plugs held in troughs 202 of the drum X. The lengths 1 of wrapping material are held on the drum V by suction chambers 1a. Each of the lengths 1 of wrapping material is provided with an adhesive on its side facing the drum X and is glued to a group of cigarettes and filter plug at the position U, so that the drum X, on further rotation in the direction of the arrow Y, successively feeds groups of cigarettes and plugs with attached lengths of wrapping material to a fourth drum W on which the lengths 1 of material are wound about the groups.

The further drum W comprises two crossed arms 20 keyed to a rotatable shaft 19 and carrying flanges 6 and 7 interconnected by rods 4 which are rectangular in cross section. At each side of the rods 4 rollers 3 are easily rotatably mounted. The diameter of the rollers 3 is such that between each pair of adjacent rollers a chamber is formed which is open towards the side away from the shaft 19 and in which a group of two cigarettes and an intermediate filter plug can be accommodated. Discs 7a of the flange 7 are arranged to bear against a stationary segment 8 fixed to a frame 9 of the device. The segment 8 is co-axial with the drum W, and an endless belt 11 of comparatively great width bears against an outer surface 10 of the segment 8. The belt 11 is guided by rollers 12 and 14, which are mounted on the frame 9, and is laterally guided by side walls of a groove in the segment 8. The belt is movable in the direction of the arrow 11a by means of a belt drum 16 which through a flange 17 is keyed to a hollow shaft 18 surrounding the shaft 19. The hollow shaft 18 is mounted by means of needle bearings 18a in hublike extensions of the frame 9.

Three further parallel endless belts 21 extend about a portion of the drum W which corresponds approximately to the length of the segment surface 10. The belts 21 are guided by rollers 22, 23 and 24 and tensioned by rollers 25 and 26. The said rollers are respectively mounted on shafts 27, 28, 29, 30 and 31 fixed to the frame 9. The roller 25 also serves to drive the belts 21.

The operation of the embodiment described is as follows:

Groups of two cigarettes and an intermediate filter plug and provided with a length of wrapping material are held by suction in the troughs 202 of the drum X. On rotation of the drum X and W, at the position E (FIG. 1), where the drum X comes nearest to the drum W, each group is deposited, after the suction effect on said group has been terminated, in a chamber or space between a pair of adjacent rollers 3 of the drum W. By means of a stripping finger 32 the groups of cigarettes are held in such chambers. When a group enters a chamber the lengths of material is folded about the centre portion of the group in U-shaped manner, the U having, however, limbs of different lengths, the leading limb 37a (see FIG. 4) being longer than the trailing limb 38. On further rotation of the drum W, the longer limb 37a reaches a sta-

tionary suction block 34 fixed to the frame 9. As shown in FIGS. 5 and 6, the longer limb 37a is successively wound about the group of cigarettes and filter plug. The suction block 34 has suction bores 42, 43 and 44 which exert a suction effect and draw the limb 37a against an inclined surface 33 of the suction block 34 and consequently hold the limb 37a under a slight tension while the limb 37a is being wound about the group. Thereby it is avoided that the limb 37a provided with adhesive contacts an adjacent roller 3. Furthermore, the entire group is somewhat rotated so that the smaller limb 38 is pressed by the adjacent roller 3 against the group as shown in FIG. 6 at U_{II} . This effect is assisted by resilient finger 60 attached by means of a holder 61 to the segment 8 and by a recess 40 and its edge 41 of the block 34.

FIG. 5 shows the longer limb 37a drawn against the inclined surface of the suction block 34. When the group has passed the edge 41, the group begins to rotate to place the smaller limb 38 against the group, the rotation being terminated when in position U_{II} of FIG. 6 the group is passing the edge 41. In such position the group is slightly clamped between the resilient finger 60 and the edge 41 and rotation is temporarily prevented.

On further rotation of the drum W into position U_{III} shown in FIG. 7 the group reaches the moving belt 11 and the portion 35 of the suction block 34. The inner belt 11, the drum W and the outer belts 21 move all in the same direction but with different speeds. More specifically, the inner belt 11 moves somewhat more slowly than the group rotates with the drum W. Therefore, the group rotates slowly in such a sense that the longer limb 37a is wound completely about the group, the winding being almost completed in position U_{IV} shown in FIG. 4.

During further movements of the drum W, and the belts 11 and 21, the group continues to rotate slowly in the same sense so that the length of wrapping material is pressed against the group. While the group remains on the drum W and slowly rotates, the adhesive has time sufficiently to dry. If, for example, it be assumed that the output of the machine is 600 groups per minute, or 10 groups per second and that 20 groups can be accommodated simultaneously on the drum W, then the adhesive has two seconds for drying while a group is on the drum W. As experience shows this time of two seconds is sufficient for a preliminary drying of the adhesive. The rotation of each group may be so slow that the group is rotated 5 times or even less while on the drum W. Owing to such a slow speed of rotation it is unlikely that the cigarettes of the groups will be seriously damaged although the length of wrapping material is firmly pressed against and wound about the group.

When a group has passed the belts 11 and 21, they reach an ejector 45 (see FIGS. 1 and 3) which is held by a holder 46 pivoted at 47 to arms 48 of a movable parallelogram arrangement, the arms 48 being pivotally connected by stub shafts 52 to the frame 9. The ejector 45 is operated by means of a crank shaft drive not shown through a rod 51 and a lever 49. The ejector 45 moves

the group from the drum W into recesses 53 of a drum 54 which is rotatably mounted in the frame 9 by means of a shaft 58. A stationary guide member 55 holds the groups in the recesses 53.

When the drum 54 rotates in the direction of the inscribed arrow the groups reach a circular cutter 56 on a shaft 57, the cutter 56 cutting the filter plug at the centre region whereby two filter-tipped cigarettes are obtained, which are subsequently dealt with in the usual manner.

It is of course possible to provide other elongated articles, for example cigars, with suitable mouth pieces. It should be clearly understood that the embodiment described is given by way of example only and that many modifications, omissions and additions are possible without departing from the spirit of the invention.

I claim:

1. A device for attaching mouthpieces to elongated articles such as cigarettes or cigars comprising a rotatable drum; marginal flanges on said drum; bars positioned between said flanges; a pair of rotatable rollers arranged laterally of each bar, one roller at each side of each bar, the bars and rollers being so dimensioned and positioned as to leave between the rollers of adjacent bars a chamber in which one group of the plurality of groups formed, by elongated articles and mouthpieces can be received with said rollers bearing against them; first means having a first movable surface arranged for contacting said groups on the drum at one side; second means having at least one further movable surface arranged for contacting said groups at the opposite side; means for winding a sheet like strip of material around each group; and means for moving said drum, said first surface and said further surface all in the same direction but at different speeds whereby to rotate said groups at a rotational speed depending on said different speeds.

2. A device as defined in claim 1, and comprising means for joining a length of wrapping material to each group in the shape of a U having limbs of different lengths, the larger limb being at the leading side of the group, and suction means arranged for acting on said longer limb for tensioning the same.

3. A device as defined in claim 1 wherein the said pairs of rollers are idler rollers.

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