July 4, 1939. I. LUBBOCK 2,165,144

MACHINE FOR MAKING CIGARETTES

Filed March 18, 1937 4 Sheets-Sheet 1

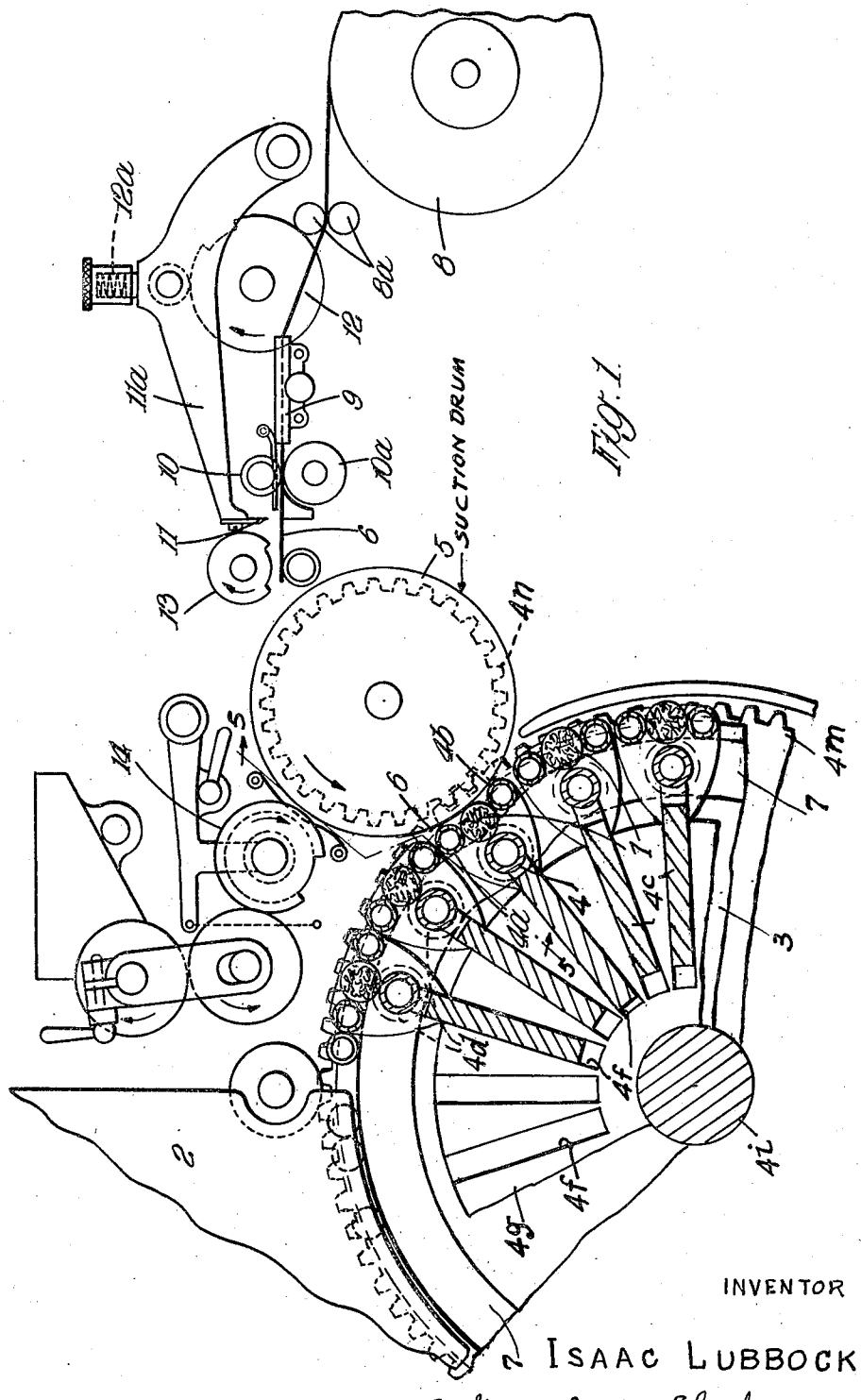


Fig. 1.

INVENTOR

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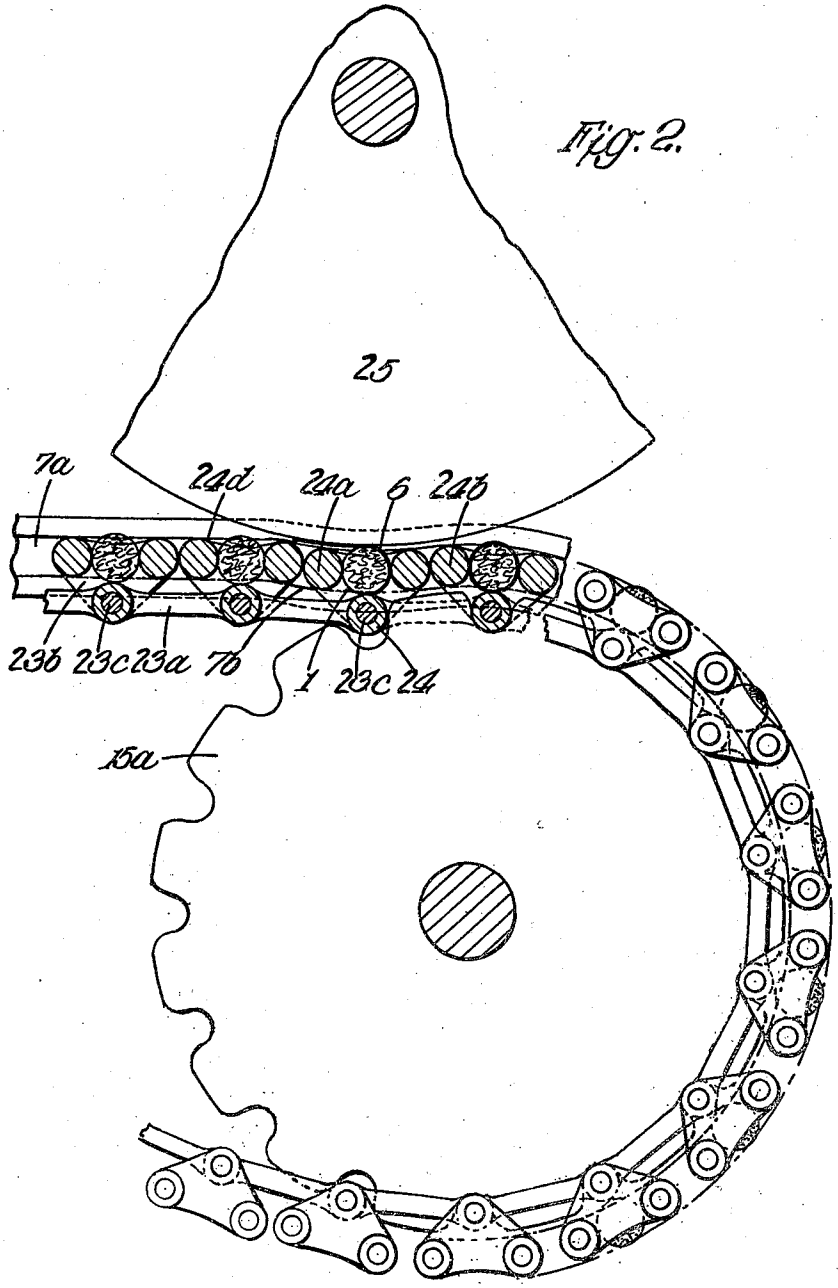
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Fig. 2.



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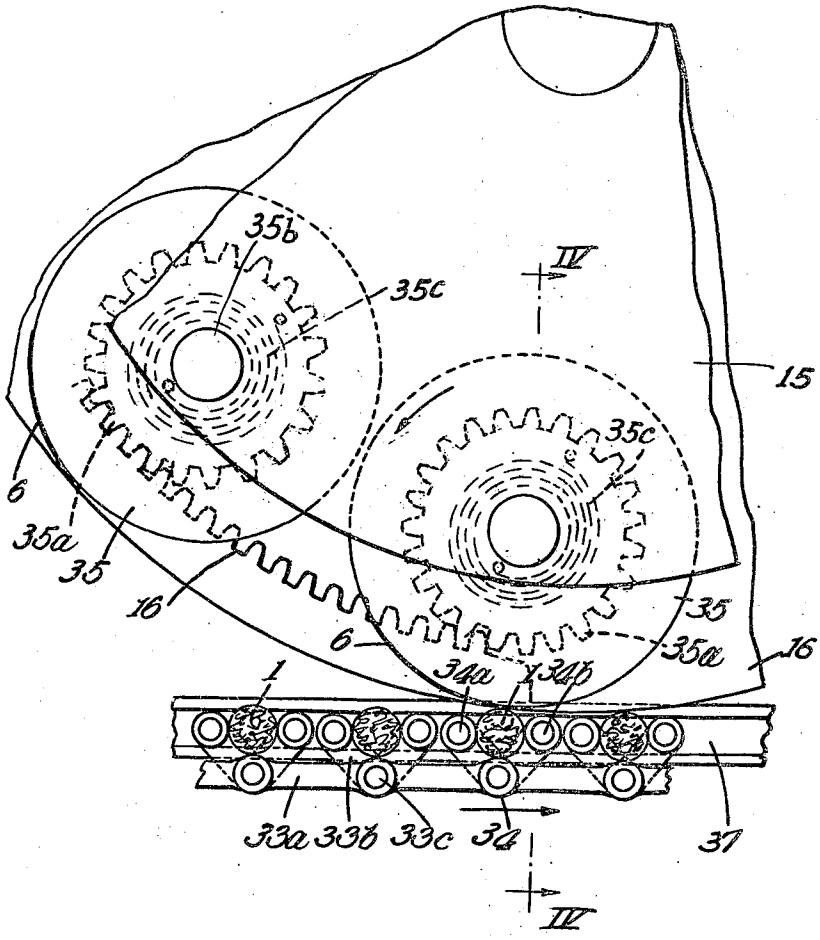
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Fig. 3.



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Fig. 4.

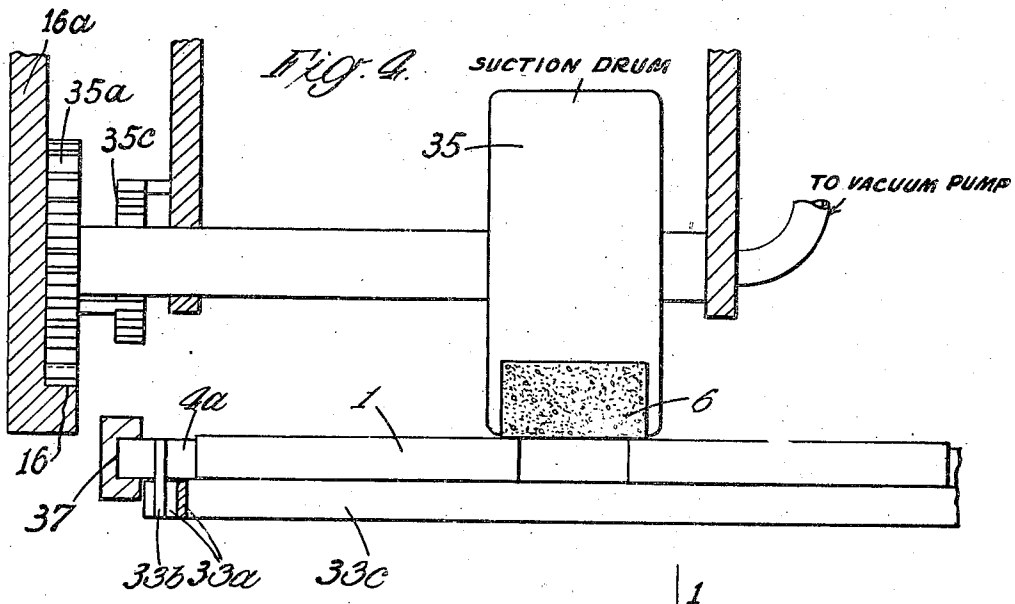
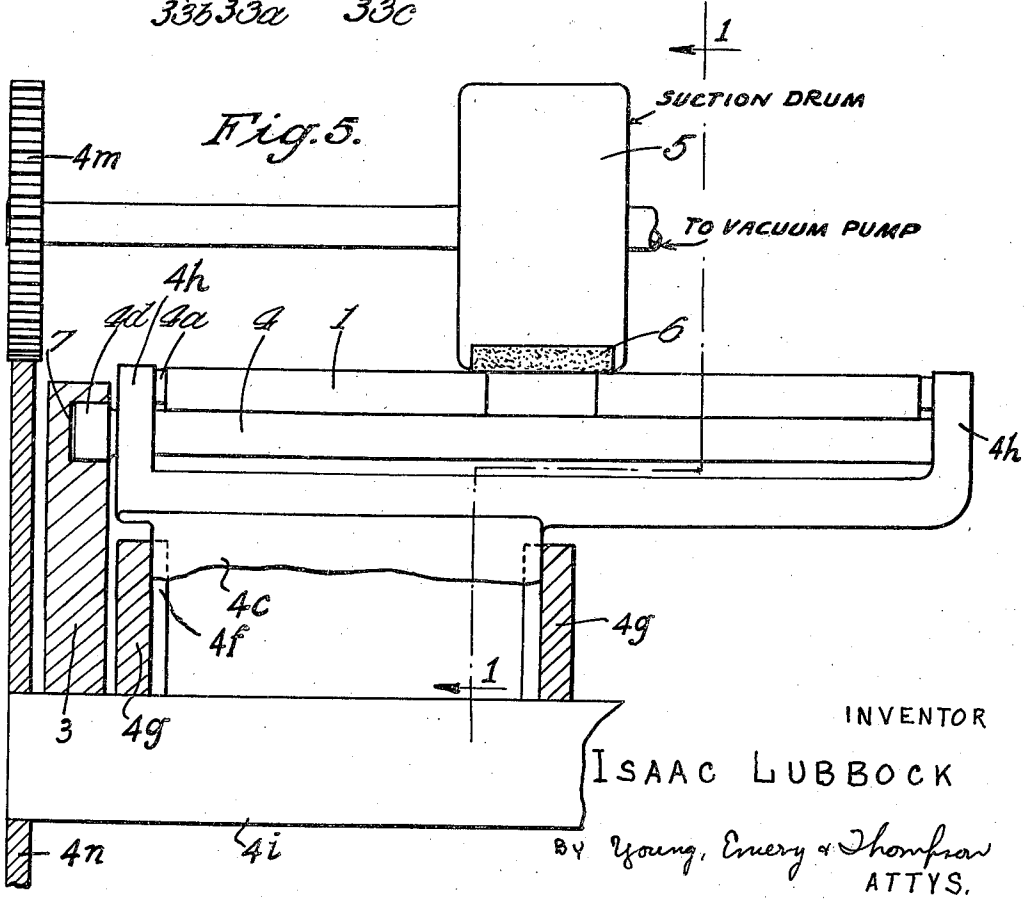


Fig. 5.



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Patented July 4, 1939 2,165,144

UNITED STATES PATENT OFFICE

2,165,144

MACHINE FOR MAKING CIGARETTES

Isaac Lubbock, Hendon, London, England, assignor to Filter Tips Limited, London, England

Application March 18, 1937, Serial No. 131,726
In Great Britain October 15, 1935

14 Claims. (Cl. 131—39)

This invention relates to the manufacture of filter tip or like composite cigarettes, and is particularly concerned with improvements in the manufacture of such cigarettes by uniting cigarettes and filter tips or like stub portions by means of encircling bands of cork or the like applied around the assembled lengths during rotation thereof about their axes.

The invention has for its object to provide improvements in apparatus for this purpose whereby a continuous operation may be attained and whereby accurate alignment of the lengths during the wrapping operation may be ensured, and furthermore to provide apparatus for the purpose which is comparatively simple in construction and more effective in operation than the apparatus heretofore proposed.

More specifically the invention has for its object to provide for the positive location of the assembled lengths in alignment while the uniting band is wrapped therearound by rolling the assemblage of lengths between relatively moving members one of which acts as a conveyor so that during the rolling operation the assemblage is moved laterally towards the point of discharge of the product.

Further objects of the invention will be apparent in the following description with reference to the accompanying diagrammatic drawings, in which:

Figure 1 is a side elevation illustrating one embodiment according to the invention;

Figure 2 is a similar view illustrating a modification;

Figure 3 is a part side elevation illustrating a further modification;

Figure 4 is a sectional view taken on line IV—IV of Fig. 3, the suction drum and pinion being shown in non-sectional view for purposes of clarity; and

Figure 5 is a sectional view of Fig. 1 showing the details of the mounting and guiding means for the rollers.

In carrying the invention into effect according to one embodiment and as illustrated in Figure 1 of the accompanying diagrammatic drawings, cigarettes 1 are fed in pairs from duplicate hoppers 2 on to a conveyor 3, and double length filter tips or stub portions are fed from an intermediate hopper (not shown) in known manner so as to be disposed between the pairs of cigarettes which are caused to abut the filter tips or stub portions by means of side guides or equivalent means. The conveyor 3 is provided with assemblies of rollers each consisting of three rollers 4, 4a, 4b constituting chambers in which the assembled cigarettes and filter tips are positively located in alignment while being freely rotatable. The assembly of rollers 4, 4a and 4b is carried in brackets 4h. The inner roller 4 of each assembly of rollers supports the assembled lengths so that part of the periphery thereof projects for contact with a member such as a drum 5 by which the uniting bands 6 are applied to the assemblages. The drum 5 preferably is driven from shaft 4i by gear 4m and pinion 4n so that it feeds the uniting bands 6 in the same direction as the assemblage but at a greater speed, thereby causing by frictional engagement with the assemblage the necessary rotation thereof to effect the wrapping operation while the assemblage is being carried laterally by the conveyor 3. If desired, however, the drum 5 may be driven at a slower peripheral speed than the conveyor 3 or in the opposite direction. In order to maintain the necessary spacing of the rollers 4 and the drum 5 during the rolling operation which takes place during the continuous movement of the conveyor 3, the brackets 4h for the rollers 4 are carried by radially disposed members 4c slidably mounted in grooves 4f of plates 4g and movable by co-operation of rollers 4d with a stationary cam track 7.

The cork, paper or the like from which the uniting bands 6 are constituted may be fed from a spool 8 between rollers 8a and through a guide 9 to feed rollers 10, 10a, the strip being cut off into suitable lengths by a cutter 11 mounted on an arm 11a operated by a cam 12 and a return spring 12a. The piece of material cut off and constituting the uniting band 6 is fed to the drum 5 by means of the feed roller 13, the band 6 being held to the drum by suction in known manner while it is carried past a pasting roller 14 and eventually brought into contact with the asemblage to be united.

In a modification, as illustrated in Figure 2, the cigarettes and filter tips or stub portions are fed from hoppers 2 and caused to abut in the manner before referred to, but the conveyor consists of a chain 23a adapted for the mounting of the roller assemblies 24, 24a, 24b. These rollers may be carried in substantially triangular end plates 23b pivoted on the link pins 23c of the chain 23a and rollers 24d disposed outside the plates 23b run in stationary cam tracks 7a which are curved or shaped to carry the assemblages around part of the periphery of the drum 25 carrying the uniting bands 6, thereby ensuring the proper spacing of the rollers 24 in rela-

tion to the drum 25 throughout the rolling operation. The chain 23a may be carried by sprockets 15a adapted to engage the rollers 24 which are mounted on the link pins 23c of the chain.

The drum 25 may be driven continuously or, if desired, may only move during the rolling operation and feeds the uniting band 6 in the same direction as the assemblage, but at a different, and preferably greater, speed. If desired, however, the drum 25 may rotate in the opposite direction so as to feed the uniting band in opposition to the assemblage.

In a further modification, as illustrated in Figure 3, the drum 35, or an equivalent suction roller device, may be rotatably carried by a drum 15 which carries the drum or roller 35 in an orbital path such that the uniting band 6 will be brought into contact with the assemblage at a suitable point and be pressed against the same during a certain amount of travel in such orbital path. Two or more suction drums or rollers 35 may be mounted on the drum 15 as indicated and preferably each drum or roller 35, after it has picked up a uniting band, for example as described with reference to Figure 1, is, during the movement of the drum 15, rotated by the engagement of a gear wheel 35a fixedly connected to the drum or roller 35 with a fixed gear segment or rack 16 carried by a fixed plate 16a so that a coil spring 35c suitably disposed, for instance, within the drum or roller 35, is wound up. The arrangement conveniently is such that at or about the point of disengagement of the gear 35a from the rack 16, the uniting band 6 is brought into contact with the assemblage 1 and thereafter the drum or roller 35 is rotated by the action of the spring 35c at a comparatively high speed so that the wrapping of the band 6 about the assemblage will be effected during a relatively short movement in the aforesaid orbital path. Furthermore, it will be understood that the drum or roller 5, or any number of such drums or rollers, may be carried on a suitable conveyor arranged so that the uniting bands 6 are brought into contact with the assemblages carried on a continuously moving conveyor and are maintained in contact therewith during the wrapping operation. In Figure 3, the assemblages are shown as carried by an endless chain conveyor 3a having rollers 34, 34a and 34b, roller supports 33b and mounted in guides 37 as previously described with reference to Figure 2. Obviously, the particular arrangement of uniting band-applying means shown in Figure 3 may be utilised in connection with the arrangement of Figure 1 or with any other suitable form of continuously moving conveyor for the assemblages.

It will be understood that in the embodiments described, the rolling operation is effected by rolling the assembled and aligned lengths between relatively movable members one of which acts as a conveyor so that during the rolling operation the rotating assemblage moves continuously in a lateral direction, the assemblage being positively located in alignment during the rolling operation.

Furthermore, it will be seen that the lengths to be united are rotatably located in alignment and transversely on a continuously moving conveyor and that the uniting band is applied to the assemblage by means of a member, i. e. the drum 5, arranged externally of the conveyor to position the uniting band 6 for contact with the assemblage on the moving conveyor and to maintain such contact during the rolling operation. Furthermore, the encircling band is applied to the assembled lengths by the co-operation of the externally arranged member 5 and the drum or conveyor 3 or 3a whereby the assembled lengths are rolled into the uniting band by relative movement of the conveyor and the drum 5.

It will furthermore be appreciated that in one aspect the application of the uniting band to the assemblage is effected by rolling the latter within an assembly of rollers one of which is constituted by the drum 5, while the remaining rollers, serving as positioning rollers, are mounted on the continuously moving conveyor, means being provided to shift either the drum 5 (Fig. 3) or the conveyor (Fig. 2) towards or away from the other or to shift the positioning rollers (Fig. 1) in relation to the conveyor in such manner as to maintain the proper relation of the assembly of rollers during the rolling operation. In any of the embodiments described the assemblage may contain any desired number of cigarettes and filter tips or stub portions which are simultaneously united together by the application of two or more uniting bands as hereinbefore described, the rod produced being suitably sub-divided into individual cigarettes.

It will be understood that the invention is not limited to the particular constructional details hereinbefore described.

What I claim is:—

1. Apparatus for the manufacture of filter tip cigarettes, comprising a continuously moving conveyor, transversely disposed means on said conveyor for positioning and maintaining alignment of the lengths of cigarettes and filter tips to be united, and means including a member movable in relation to and at all times in the direction of feed of the said conveyor for frictionally engaging said lengths to effect rotation of the said lengths during lateral movement thereof for the wrapping of a uniting band therearound.

2. Apparatus for the manufacture of filter tip cigarettes, comprising a continuously moving conveyor, means on said conveyor for rotatably locating the lengths of cigarettes and filter tips to be united in alignment, and a member movable in relation to and in the direction of feed of the said conveyor and arranged to position a uniting band in contact with the assemblage of lengths to be united on the said moving conveyor and to frictionally engage said assemblage to effect rotation thereof for wrapping the band about the same.

3. Apparatus as claimed in claim 2, wherein the said movable member comprises a cylindrical drum and wherein means are provided for driving the said drum so that it moves continuously to convey the uniting band in the same direction as the assemblage but at a greater speed.

4. Apparatus as claimed in claim 2, wherein the said movable member comprises a drum rotatably mounted and carried by a moving carrier whereby the said drum is moved in an orbital path to bring a uniting band into contact with the assemblage of lengths to be united on said conveyor, and means are provided for rotating the said drum in relation to the said carrier for effecting the wrapping operation.

5. Apparatus as claimed in claim 2, wherein the said movable member comprises a drum rotatably mounted and carried by a moving carrier whereby the said drum is moved in an orbital path to bring a uniting band into contact with the assemblage of lengths to be united on said conveyor, and comprising spring means for

rotating the said drum in relation to the said carrier, and means for tensioning the said spring means during movement of the said carrier prior to the application of the uniting band to the said assemblage.

6. Apparatus as claimed in claim 2, wherein the said conveyor comprises a drum and comprising means for effecting relative movement of the said locating means and of the said movable member towards and away from one another so that during the rolling operation contact between the locating means and the said member and the assemblage of lengths to be united is maintained.

7. Apparatus as claimed in claim 2, wherein the said conveyor comprises a drum and wherein the said positioning means is mounted so as to be movable in relation to the said drum substantially radially, and comprising cam means for effecting the relative movement of the said positioning means so that during the rolling operation contact between the said movable member and the assemblage of lengths to be united is maintained.

8. Apparatus as claimed in claim 2, wherein the said movable member comprises a drum and the said conveyor comprises an endless chain structure and comprising fixed cams for guiding part of the track of the said chain structure so as to carry the assemblages of lengths to be united around part of the periphery of the said drum.

9. In apparatus as claimed in claim 2, wherein the said movable member comprises a drum and the said conveyor comprises an endless chain structure, fixed cams arranged to guide the said chain structure so as to carry the assemblage of lengths to be united around part of the periphery of the said drum, and means for feeding uniting bands to the said drum and for retaining the same thereon until such bands are brought into contact with the said assemblages.

10. Apparatus as claimed in claim 2, wherein the said locating means for the assemblages of lengths to be united comprises assemblies of rollers adapted to permit free rotation of the aligned lengths during the rolling operation.

11. Apparatus for the manufacture of filter tip cigarettes, comprising a conveyor, transversely disposed roller assemblies on the said conveyor for rotatably positioning the lengths of cigarettes and insertions to be united in assembled alignment, with part of the periphery thereof projecting, and means arranged externally of the said conveyor for frictionally engaging and applying uniting bands to the said projecting part of the periphery of the said assembled lengths, said externally arranged means being movable in relation to and in the direction of feed of the said conveyor so as to effect by the frictional engagement with said assembled lengths the rotation thereof and the wrapping of the uniting bands around the same.

12. Apparatus for the production of filter tip cigarettes, comprising a continuously moving drum, assemblies of rollers disposed transversely on the said drum for positioning the lengths to be united rotatably and in alignment, each of said assemblies consisting of two rollers spaced apart to receive the said lengths and disposed with their axes at the same radial distance from the axis of the said drum, and a third roller disposed with its axis at a less radial distance from the axis of the said drum than the two first-mentioned rollers, said third roller being carried in radially movable mountings, hopper means for feeding the lengths to be united into the said roller assemblies, a second drum the peripheral speed of which is different to the peripheral speed of said first-mentioned drum, means for feeding pasted uniting bands on said second drum so that each uniting band is brought into contact with an assemblage on the first-mentioned drum, and means for radially shifting the said third roller of each roller assembly in a radial direction so that during the application of the uniting band to the assemblage the latter is maintained in rolling contact with the said feeding drum.

13. Apparatus for the manufacture of filter tip cigarettes uniting lengths of cigarette rod and filter tips by a uniting band, comprising an endless chain structure including transversely arranged assemblies of rollers forming pockets in which the lengths to be united are located rotatably and in alignment, hopper means for feeding lengths to be united into the said pockets, a drum arranged to convey previously pasted uniting bands into contact with the assemblages carried by said chain structure, said drum moving at a peripheral speed different to the speed of travel of the said chain structure, and fixed cam means arranged to guide part of the track of the said chain structure so that during the wrapping of the uniting band around each assemblage the latter is maintained in rolling contact with the said drum.

14. Apparatus for the manufacture of filter tip cigarettes, comprising an endless chain structure including transversely arranged assemblies of rollers forming pockets for the location of assembled lengths to be united rotatably and in alignment, a rotary carrier, rotatably mounted drums on the said carrier for conveying previously pasted uniting bands into contact with the assemblages carried by the said chain structure, spring means for effecting rotating of each of the said drums after the uniting band carried thereon has been brought into contact with an assemblage on the said chain structure so that the peripheral speed of the said drum is greater than the speed of travel of the said chain structure, and means for tensioning the said spring means before the uniting band carried by the said drum is brought into contact with the said assemblage.

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