

Oct. 15, 1957

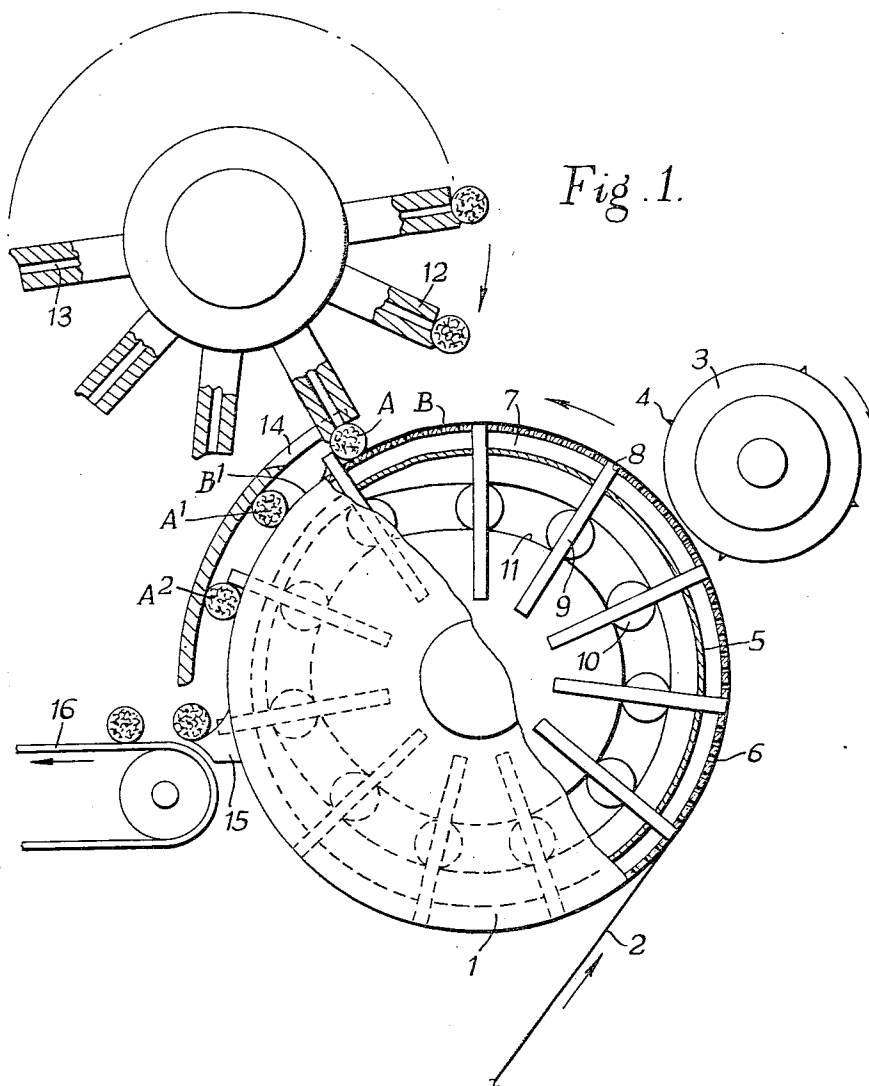
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2,809,639

MANUFACTURE OF COMPOSITE CIGARETTES

Filed June 23, 1954

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

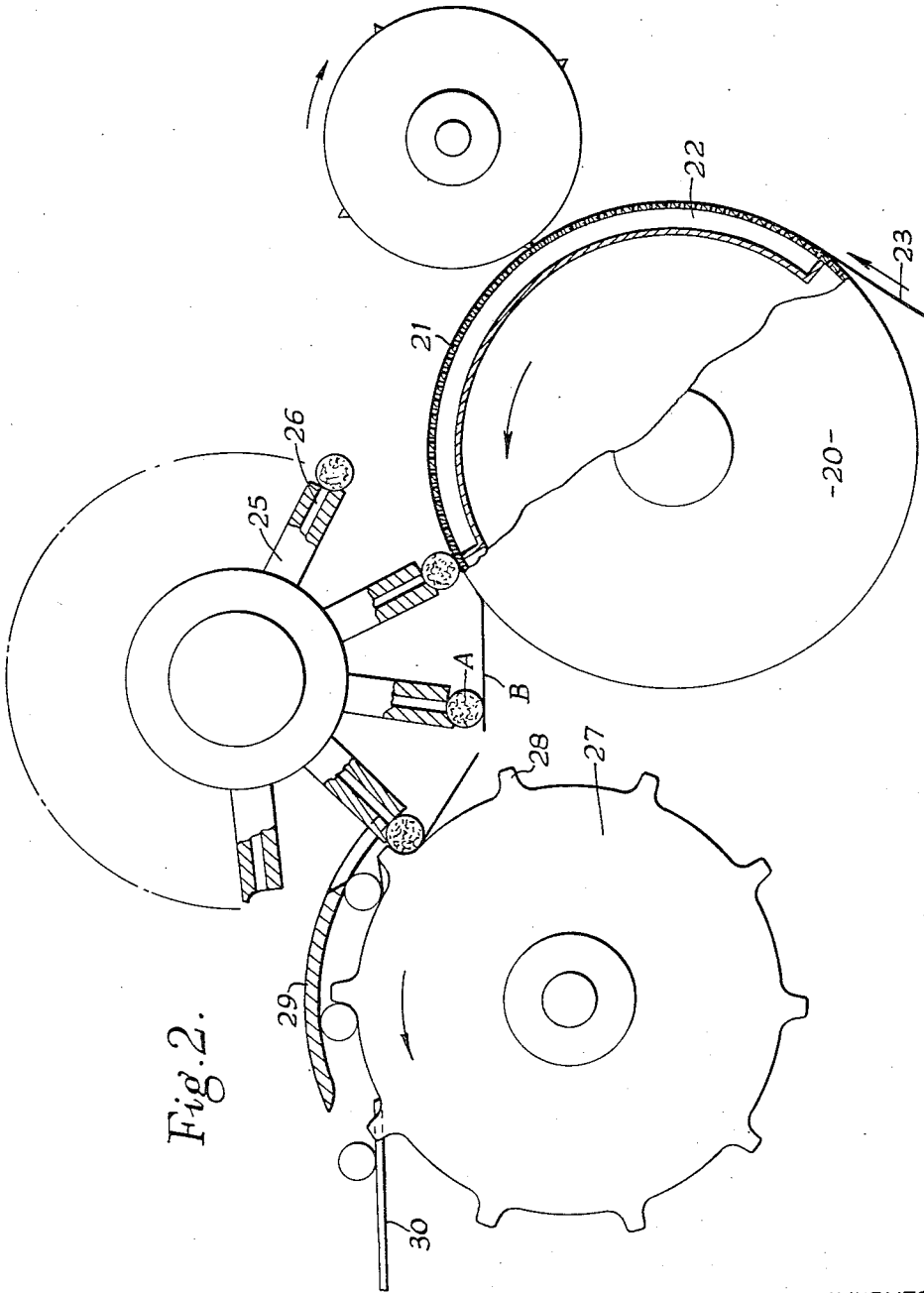


Fig. 2.

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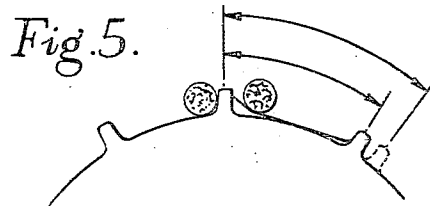
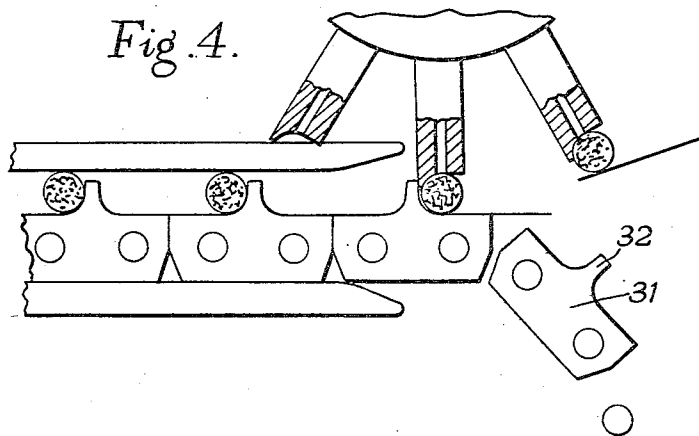
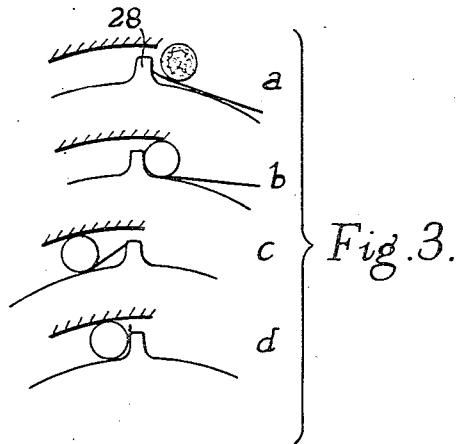
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MANUFACTURE OF COMPOSITE CIGARETTES

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3 Sheets-Sheet 3



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2,809,639

MANUFACTURE OF COMPOSITE CIGARETTES

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Application June 23, 1954, Serial No. 438,716

Claims priority, application Great Britain June 26, 1953

4 Claims. (Cl. 131-94)

This invention concerns improvements in or relating to the manufacture of composite cigarettes, such as filter tip cigarettes, from lengths of cigarette rod and stub portions of filter tip or other material.

The expression "stub portion," where used herein and in the appended claims, is to be understood as including any portion of material which is suitable for uniting with a length of cigarette rod so as to be incorporated in a composite cigarette, and includes portions which are double the length required in an individual cigarette. A stub portion may include a portion of filtering material, or a hollow tube, or a portion of tobacco different from that of which the main part of the cigarette is made, or any combination of the foregoing.

According to the present invention there is provided a method of making composite cigarettes in which uniting bands are wrapped about assemblages which comprise aligned lengths of cigarette rod, or lengths of cigarette rod and stub portions, said method comprising the steps of causing a band to be partly wrapped about an assemblage by rotation of the latter about its own axis, and partly by causing relative movement, laterally of the assemblage, between the assemblage and an abutment so as to cause the latter to engage an end portion of the band and cause it to be pressed against the assemblage.

The said end portion may be pressed against the assemblage to commence the wrapping operation, or to complete the wrapping operation. The assemblage may be moved laterally against one abutment to cause one end portion of the band to be pressed against the assemblage to commence the wrapping operation, and against another abutment to cause the other end portion of the band to be pressed against the assemblage to complete the wrapping operation.

An assemblage may be first applied to a uniting band near one end of the band, and thereafter moved laterally against an abutment to cause the end portion of the band in the region of said end to be pressed against the assemblage, the assemblage thereafter being caused to roll on the said band, and thereafter to engage another abutment whereby the other end portion of the band is pressed against the assemblage.

An end portion of a uniting band may be pressed against an assemblage while the latter is not rotating about its axis.

Further according to the invention there is provided a method of making composite cigarettes, in which uniting bands are wrapped about assemblages consisting of aligned lengths of cigarette rod and stub portions, said method comprising the steps of causing a band to be partly wrapped about an assemblage by rotation of the latter about its own axis, and causing an end portion of said band to be pressed against said assemblage while the latter is not rotating.

Still further according to the invention there is provided apparatus for making composite cigarettes by wrapping uniting bands about assemblages which comprise aligned lengths of cigarette rod or lengths of cigarette rod

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and stub portions, comprising means to bring an assemblage into contact with a uniting band, means to roll said assemblage on said uniting band so as partly to wrap the latter about the assemblage, and means to cause relative movement, laterally of the assemblage, between said assemblage and an abutment so as to cause the latter to engage an end portion of said band and cause it to be pressed against the assemblage.

Still further according to the invention there is provided apparatus for making composite cigarettes by wrapping uniting bands about assemblages consisting of aligned lengths of cigarette rod and stub portions, comprising a movable conveyor surface, a counter-surface cooperating with said conveyor surface to cause an assemblage to roll over a uniting band on said conveyor surface, thereby partly wrapping the said band about the said surface, and an abutment extending transversely of the direction of movement of said conveyor surface and arranged to move with said conveyor surface, and arranged to engage the rear end portion of the uniting band to press it against the assemblage.

Still further according to the invention there is provided apparatus for making composite cigarettes by wrapping uniting bands about assemblages consisting of aligned lengths of cigarette rod and stub portions, comprising a movable conveyor surface, an abutment extending transversely of the direction of movement of said conveyor surface and arranged to move with the latter, means to cause an assemblage, with a uniting band attached thereto, to move laterally relatively to said abutment so as to cause the latter to press the leading end portion of the said uniting band against the assemblage, and a counter-surface arranged thereafter to cause the said assemblage to roll over the said uniting band on said conveyor surface. The apparatus may comprise a further abutment arranged in the path of an assemblage rolling on said conveyor-surface and adapted to be engaged by said assemblage at the end of its rolling movement so as to cause the rear end portion of said band to be pressed against the assemblage.

Apparatus according to the invention will now be described by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a side elevation, partly in section, of apparatus according to the invention;

Figure 2 is a similar view of an alternative apparatus; Figures 3a to 3d are diagrams illustrating stages in a wrapping operation performed on the apparatus shown in Figure 2;

Figure 4 shows a modification of the apparatus shown in Figure 2;

Figure 5 diagrammatically illustrates a modification of part of the apparatus shown in Figure 2.

Referring to Figure 1, the apparatus shown in that figure comprises a rotatable suction drum 1 on to whose periphery a continuous web or band 2, of uniting material is fed, the band 2 being previously coated with adhesive on the side which does not engage the drum. A rotatable cutter consisting of a rotatable drum 3, having knives 4 which are spring-urged radially outwardly, is arranged to cut the band 2 into separate portions of suitable length, each of which portions constitutes a uniting band to be wrapped about an assemblage by mechanism shortly to be described.

The suction drum 1 comprises a suction chamber 5 extending around the whole circumference of the drum, and suction ports 6 in the periphery of the drum communicate with this chamber. One side of the chamber 5 is closed by a fixed disc 7 which is provided with a series of apertures (not shown) all communicating with a suitable source of suction, and extending only part of the way around the chamber 5.

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The periphery of the drum 1 is also provided with equally spaced slots 8 which accommodate radially slidable vanes or slides 9. The slides 9 are provided with cam rollers 10 which run in a fixed cam track 11. This cam track is so arranged as to maintain the slides with their outermost end surfaces level with the outer surface of the periphery of the drum during the greater part of a revolution of the drum, but to cause the slides to be projected radially outwardly at desired times.

The rotation of the cutter drum 3 is so timed in relation to that of the drum 1 that each knife 4 is pressed against the band 2 when the knife registers with a slide 9, so that the knife cuts against the outermost end surface of a slide, which for this purpose is made of a suitably hard material.

A rotatable assemblage conveyor, comprising radial suction arms 12 having suction ports 13 each communicating with a suitable source of suction, is provided for the purpose of conveying assemblages, each of which consists of two lengths of cigarette rod aligned with and abutting an intermediate stub portion. The assemblages may be fed to the arms 12 in any suitable and convenient way so as to be positioned on the arms and conveyed laterally by them, in the direction shown by the arrow. The suction arms 12 are arranged to deliver assemblages on to uniting bands, such as that marked B, carried on the drum 1. The suction which supports an assemblage on an arm 12 is arranged to be cut off when that assemblage has been so delivered.

An arcuate rolling ramp 14 is fixed at a distance from the periphery of the drum 1 which is substantially equal to the diameter of an assemblage and provides a countersurface which can cause assemblages carried beneath it by the drum 1 to roll. The ramp 14 is suitably slotted to allow the arms 12, which are also suitably slotted, to pass through it.

A chute 15 is provided to guide assemblages from the drum 1 on to a conveyor 16 which carries the united assemblages in the direction shown by the arrow. Any suitable and convenient cutting means (not shown) is provided for cutting the assemblages in half to provide individual composite cigarettes.

In operation, the band 2 is cut by the knives 4 into separate portions, each constituting an individual uniting band. The ends of each of these bands lie on the ends of the slides 9. Consequently, as a slide is moved radially outwardly from the drum, the leading end portion of the band immediately behind it is raised by the slide, as shown in the case of the band marked B in Figure 1. The arms 12 carrying assemblages are so timed that as an assemblage A is delivered on to the uniting band B on the drum 1 it is moved laterally into contact with the raised leading end portion of the band, as shown in Figure 1, and this leading end portion is thus pressed by the slide against the assemblage in such a way as to commence the wrapping of the band about the assemblage, the slide acting as an abutment to engage the band, and press it against the assemblage.

The suction in the arm 12 which has just delivered the assemblage A is then cut off, and the assemblage is carried beneath the countersurface or rolling ramp 14, the suction on the band B being also cut off at about the same time.

As stated above, the suction apertures in the disc 7 extend only part of the way around the disc. Movement of a slide 9 past the last of these apertures (considered in the direction of rotation of the drum 1) cuts off the suction in advance of that slide. The last aperture is therefore suitably located so that the suction holding the band B on the drum 1 is cut off at a suitable time to allow the assemblage A to be rolled over the band by the ramp 14. In Figure 1 the front of the drum 1 is shown broken away to indicate the approximate extent of the part of the disc 7 which is supplied with suction apertures and thus the extent of the chamber 5 which is effective as a suction chamber.

The assemblages engaged by the ramp 14 are thereby

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caused to roll rearwardly over the surface of the drum 1, and thus each assemblage lags behind the slide immediately preceding it. The assemblage marked A' in Figure 1 is shown having rolled about half-way from the slide preceding it, towards the slide following it. The rear end portion of the band B is raised by the slide. As the assemblage continues to roll, thereby wrapping the band about itself, it eventually reaches the slide behind it, and the rear end portion of the band B' is thus pressed by the slide or abutment against the assemblage to complete the wrapping operation. Thus the commencement of the wrapping operation is effected by causing relative movement, laterally of the assemblage, between the latter and an abutment, and the operation is completed by causing such relative movement between the assemblage and another abutment.

The united assemblage A² in Figure 1 is shown against a slide which has pressed the rear end portion of the uniting band against the assemblage to complete the wrapping operation.

Figure 2 shows an alternative construction in which a suction drum 20, provided with suction ports 21 communicating with a fixed suction chamber 22, is arranged to receive a web or band 23, which is cut into individual uniting bands by a rotatable cutter 24 as in the arrangement shown in Figure 1.

An assemblage conveyor comprising radial suction arms 25 with suction ports 26 is arranged to convey assemblages towards the drum 20 so as to bring each assemblage in turn into contact with a uniting band. As the band 23 is coated with adhesive as in the previous example, each individual band in turn adheres to an assemblage, so that when the latter is carried away from the drum 1 the band is carried with it. This is illustrated in Figure 2 in which an assemblage A is shown being conveyed laterally by a suction arm 25, a band B being attached to the assemblage a little behind the leading edge of the band.

A further drum 27 is provided, towards which the assemblages, with uniting bands attached, are conveyed by the arms 25. The drum 27 has a number of abutments or teeth 28 extending transversely of the direction of movement of the drum surface. The spacing of the teeth 28 and the relative speeds of the drum 27 and the arms 25 are such that each assemblage in turn is carried laterally by an arm 25 against a tooth 28. This causes the leading end portion of the band to be pressed against the assemblage. This is illustrated in Figures 3a and 3b. In Figure 3a an assemblage is shown approaching a tooth 28, and in Figure 3b the same assemblage is shown against the tooth, the leading end portion of the uniting band having been pressed by the tooth against the assemblage to commence the wrapping operation.

A rolling ramp 29 which acts as a countersurface to the peripheral face of the drum 27 causes each assemblage to roll over its uniting band towards the tooth behind it. The spacing of the teeth is such that the rear end portion of each uniting band rests on a tooth, as shown in Figure 2 and also in Figure 3c. The assemblage rolls beneath the ramp 29 towards this tooth, wrapping the band partly about itself as it does so, and eventually moves against the tooth, thus causing the rear end portion of the band to be pressed by the tooth against the assemblage to complete the wrapping operation. This is illustrated in Figure 3d.

The united assemblages pass from the drum 27 over a take-off conveyor 30 and are thereafter cut in half in any suitable and convenient way.

Figure 4 illustrates a modification in which the drum 27 shown in Figure 2 is replaced by an endless chain conveyor having links 31 provided with ribs 32 extending transversely of the direction of movement of the conveyor. The links 31 are so arranged that, except for the ribs 14, they provide a flat upper run for the conveyor.

In either of the constructions shown in Figures 2 and 3, the spacing of the teeth 28 or ribs 32 can if desired be

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such that either the first or the last part of the wrapping operation can be effected without engagement of the leading or rear end respectively, of a uniting band by a tooth 28 or rib 32. That is to say, the teeth 28, for example, can be spaced further apart than as shown in Figure 2. A uniting band can be first engaged by an assemblage so that its leading edge adheres to the assemblage, or in other words so that none of the band extends forwardly from the assemblage, and thus only the rear end portion of the uniting band will rest on a tooth. Or alternatively the uniting band can be first engaged by the assemblage in the manner illustrated in Figure 2, in which case only the leading end portion of the band will be pressed against the assemblage by a tooth, the remainder of the wrapping operation (apart from the initial engagement of the band by the assemblage) being performed entirely by rolling.

Figure 5 shows in full line teeth spaced apart as shown in Figure 2, and in dotted line a tooth spaced a greater distance rearwardly of the tooth which precedes it, such as to enable the wrapping operation to be performed as just described.

What I claim as my invention and desire to secure by Letters Patent is:

1. Apparatus for making composite cigarettes by wrapping uniting bands about assemblages consisting of aligned lengths of cigarette rod and stub portions, comprising a movable conveyor surface, lateral spaced abutments projecting outwardly of said surface, means to feed uniting bands on said surface between said abutments so that the leading end portion of a band is held away from said surface by an abutment, means to convey an assemblage laterally in the general direction of movement of said conveyor surface towards an abutment so as to cause the assemblage to press the said leading end portion of a band against the rear face of the said abutment, and means providing a stationary counter-surface disposed in spaced relation to said conveyor surface for engaging the outer surface of the assemblage to cause the assemblage to roll over the said uniting band on said conveyor surface.

2. Apparatus as claimed in claim 1, comprising means

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to feed a web of material to the said conveying surface to be conveyed thereby, and cutting means to cut said web into separate portions each constituting a uniting band, and wherein the said abutments are retractable so as to provide a surface flush with said conveying surface to cooperate with said cutting means.

3. Apparatus as claimed in claim 1, wherein the said abutments are formed as teeth on the said conveyor surface and the rear face of each said teeth joins the conveyor surface in a curve having substantially the same radius as that of an assemblage.

4. Apparatus for making composite cigarettes by wrapping uniting bands about aligned lengths of cigarette rod and assemblages, comprising a movable conveyor surface, means to feed a web of material to the said conveying surface to be conveyed thereby, cutting means to cut said web into separate portions each constituting a uniting band, lateral spaced abutments projectable outwardly of said surface, and retractable so as to provide a surface flush with said conveying surface to cooperate with said cutting means, means to feed uniting bands on said surface between said abutments so that the leading end portion of a band is held away from said surface by an abutment, means to convey an assemblage laterally in the general direction of movement of said conveyor surface towards an abutment so as to cause the assemblage to press the said leading end portion of a band against the rear face of the said abutment, and means providing a stationary counter-surface disposed in spaced relation to said conveyor surface for engaging the outer surface of the assemblage to cause the assemblage to roll over said uniting band on said conveyor surface.

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