Oct. 11, 1966 D. H. YOUNGMAN ETAL 3,277,630

FEEDING OF WEBS OF MATERIAL

Filed March 6, 1963 5 Sheets-Sheet 1

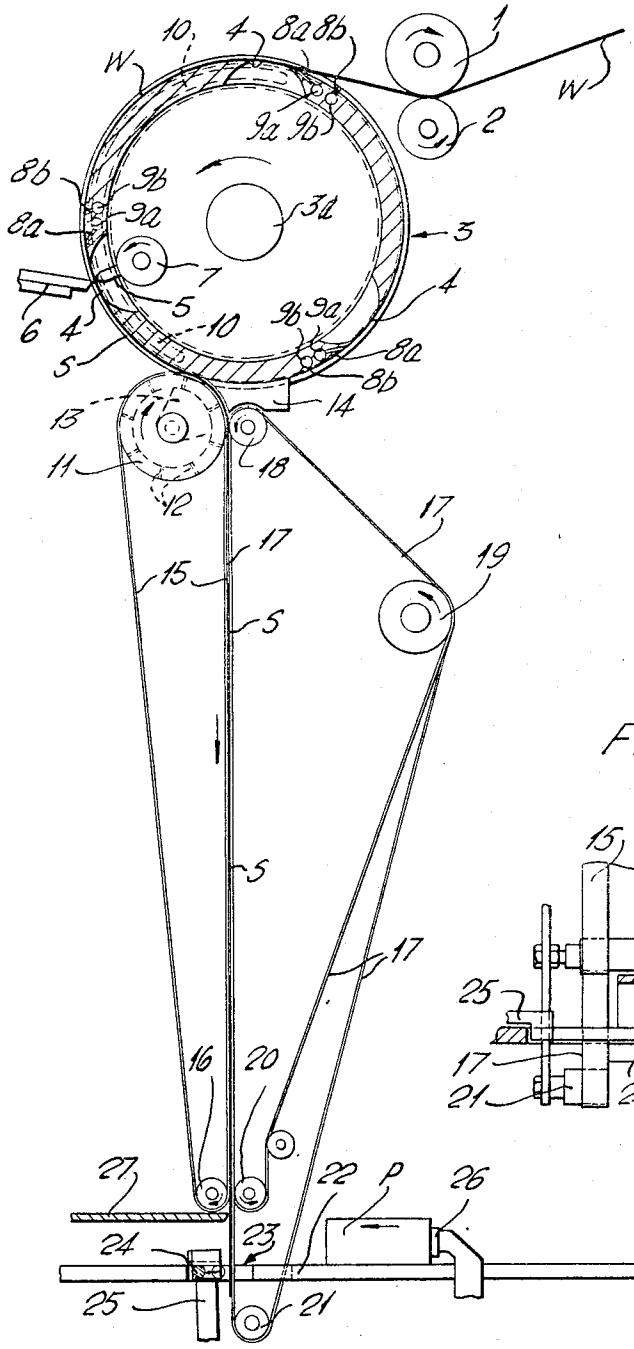
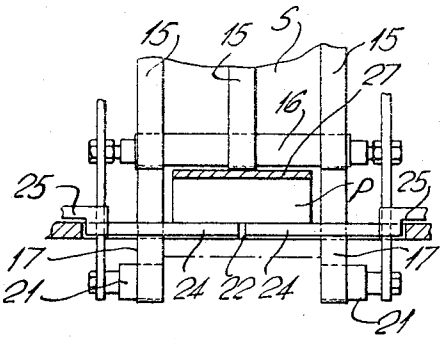


FIG. 1.

FIG. 2.



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5 Sheets-Sheet 2

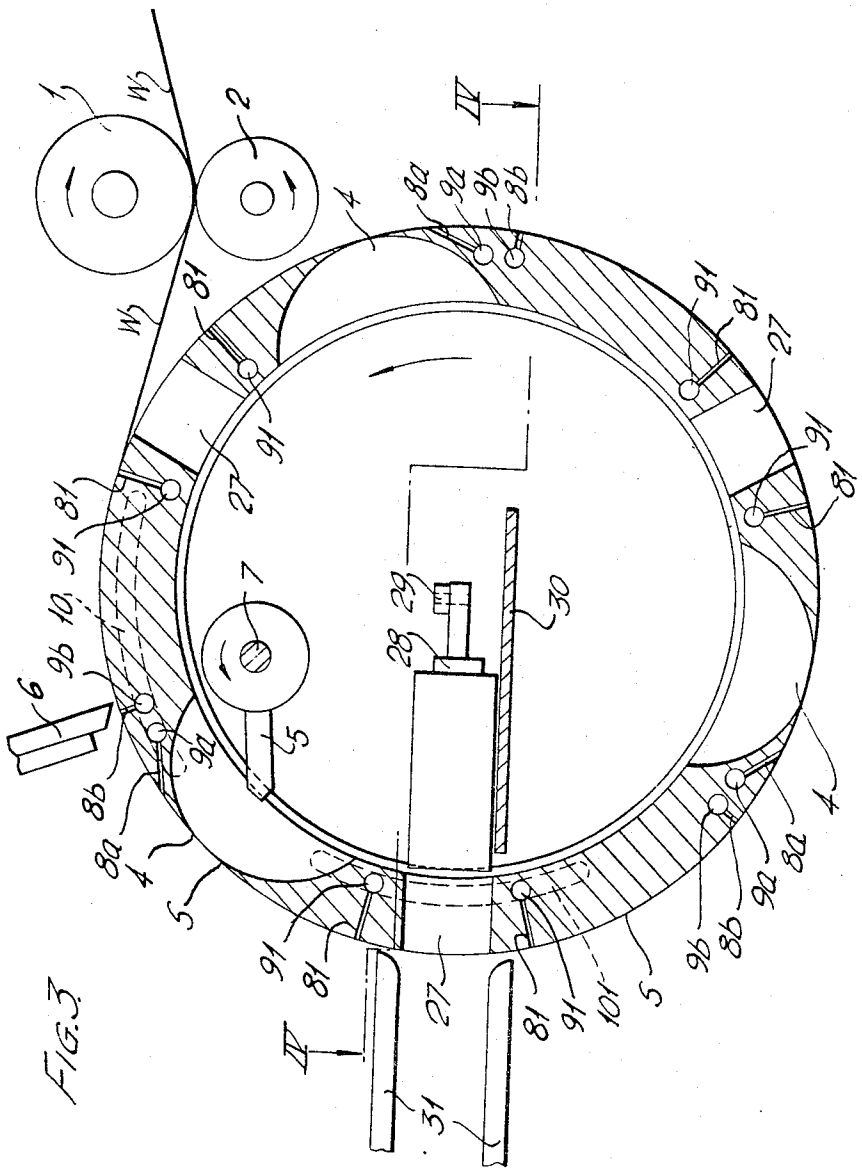


FIG. 3

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FEEDING OF WEBS OF MATERIAL

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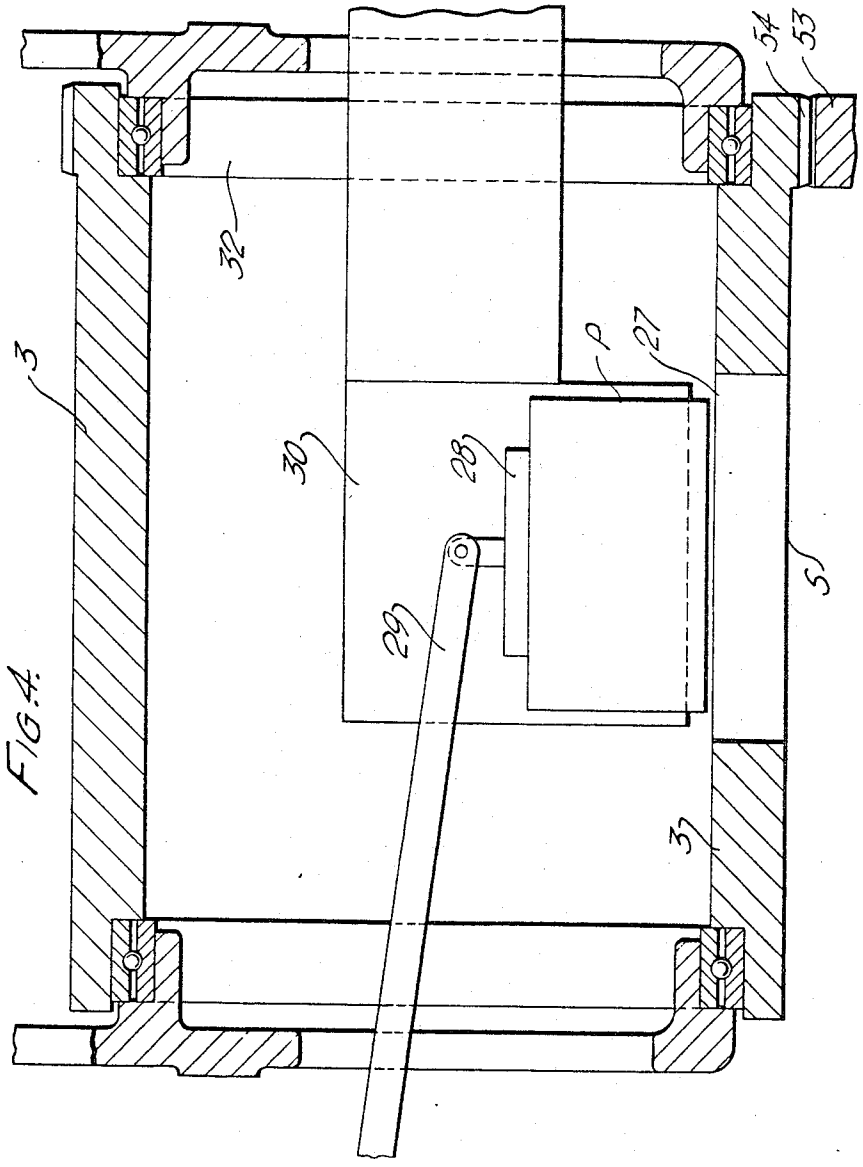


FIG. 4.

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Oct. 11, 1966 D. H YOUNGMAN ETAL 3,277,630

FEEDING OF WEBS OF MATERIAL

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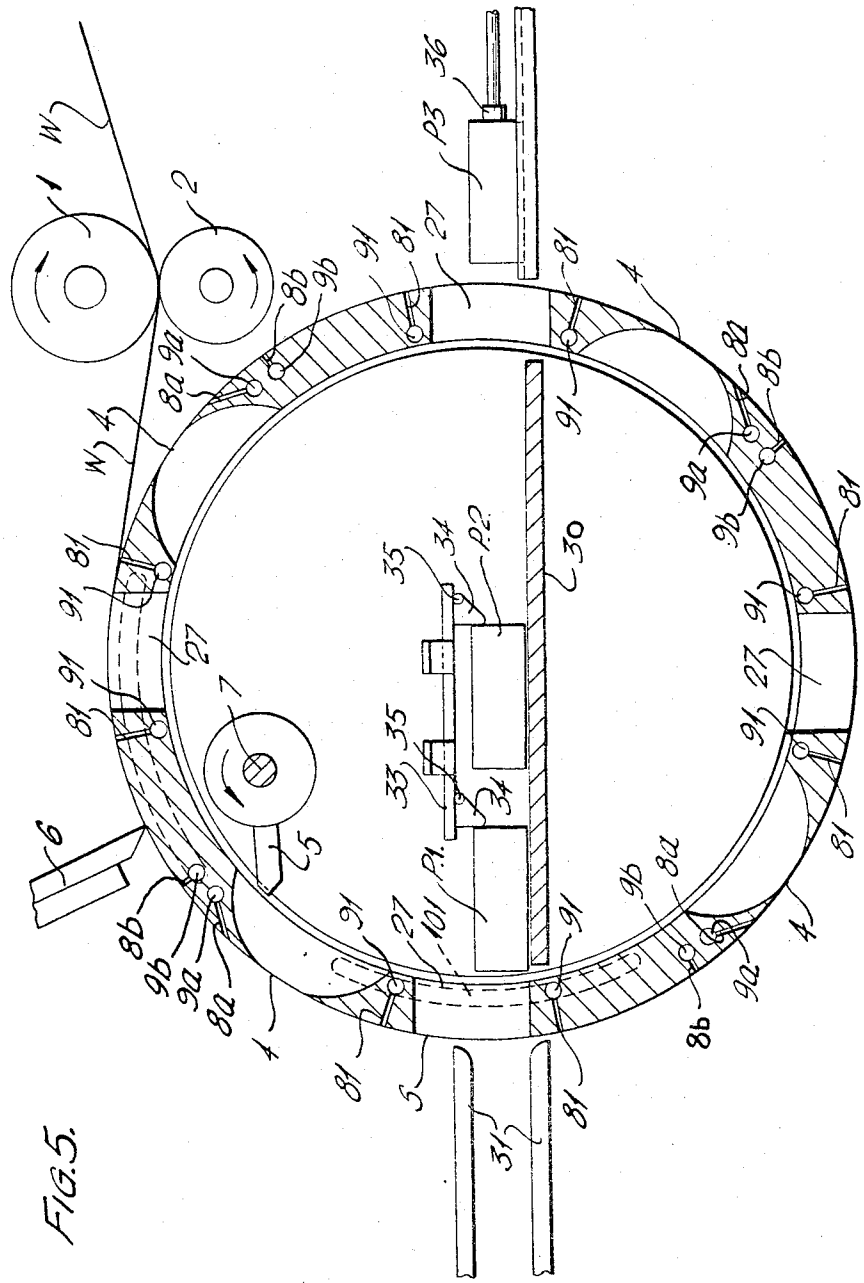


FIG. 5.

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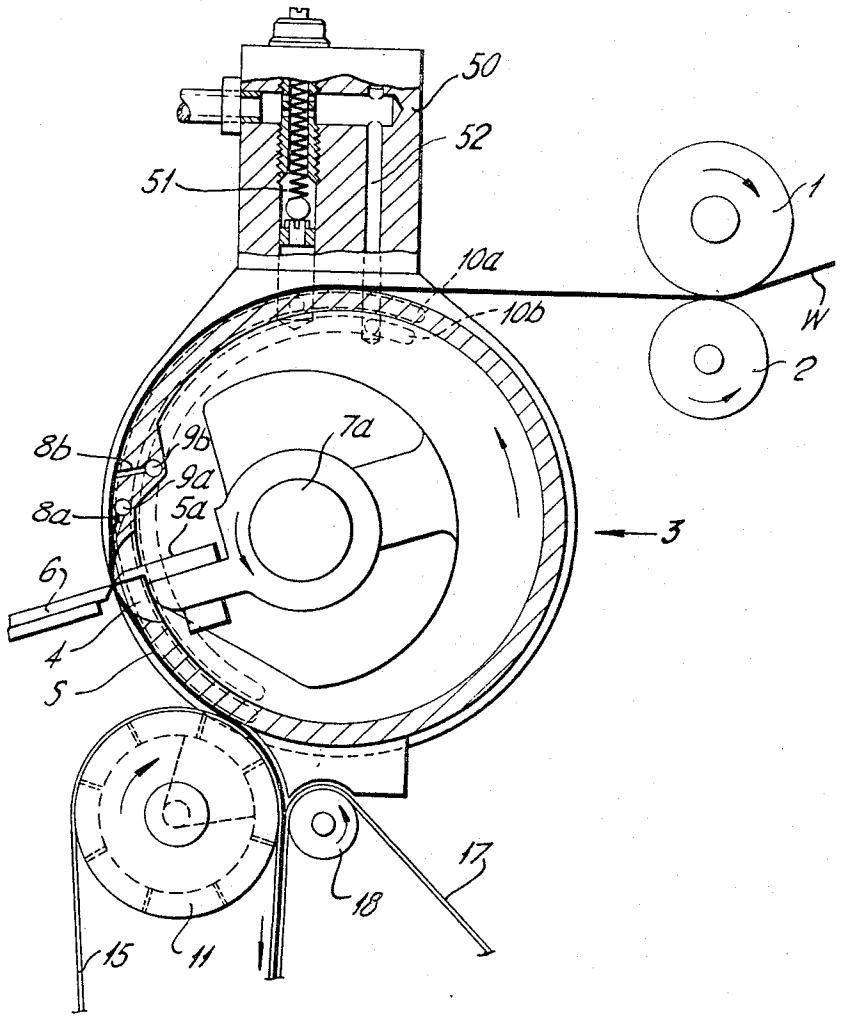
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FIG. 6.



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United States Patent Office 3,277,630 Patented Oct. 11, 1966

3,277,630

FEEDING OF WEBS OF MATERIAL

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Filed Mar. 6, 1963, Ser. No. 263,337
Claims priority, application Great Britain, Mar. 8, 1962, 8,971/62
19 Claims. (Cl. 53—389)

This invention concerns improvements in or relating to the feeding of wrapper material and in particular to the cutting of desired lengths from a web of wrapper material whilst the latter is being fed, and to the application of lengths of wrapper material to articles to be wrapped.

In wrapping articles, such as packages containing cigarettes, it is frequently the practice to feed a continuous web of wrapping material and to cut the material into suitable lengths for wrapping around the articles. The web is sometimes led past a fixed knife and then cut by means of a removable knife which coacts with the fixed knife to sever a desired length from the web, but in such arrangements it is sometimes difficult to move the web, from which a length has been severed, past the fixed knife without crinkling its leading end. The leading end of the web may tend to engage the fixed knife, which then restricts its movement, and undesirable creasing or crinkling of the web may then occur, this being especially the case when a very thin web of wrapping material (e.g., polypropylene), or films with an electro-static charge (e.g., polythene, etc.), are used.

Further, articles to be wrapped (e.g., packages containing cigarettes) are sometimes moved (e.g., pushed) along a bed to engage the severed lengths of wrapper material and to be partly covered thereby, a wrapper length being led past an article so that it can be engaged thereby and folded about the article when the latter is moved along the bed. In such arrangements it is sometimes difficult to effectively control a wrapper length as it is moved past the article and as its leading end travels beyond the level of the bed (considered in the direction of movement of the wrapper length), so that it can be engaged by the article and subsequently be wrapped thereabout.

According to the present invention there is provided mechanism for cutting desired lengths from a continuous web of wrapper material, comprising means to feed the web of wrapper material on to a movable endless conveyor, having an opening through which a movable knife can project to coact with a fixed knife and sever the web transversely of its length, the fixed knife and the movable knife being mounted respectively on opposite sides of the path of the web carried on the conveyor, and the movable knife being arranged to move relatively to the conveyor to project through the said opening as the latter moves past the fixed knife.

Preferably the movable knife is arranged to rotate about a fixed centre so that its cutting edge travels in a circular path which crosses the path of the web on the conveyor, the movable knife being rotated in timed relationship with the movement of the conveyor so that it projects through the said opening, and so that its cutting edges is moving in the same general direction of movement as the conveyor, as the opening moves past the fixed knife. There may be provided suction means associated with the conveyor to hold the web to its conveying surface at a position substantially directly behind the said opening, considered in the direction of movement of the conveyor, so that the leading end of the severed web can be suctionally held to the conveyor as it is carried past the fixed knife.

The conveyor may comprise a rotatable drum, the web being fed about the drum's periphery, and the said opening being in the drum's cylindrical shell, and the movable knife may be arranged to rotate in the direction of rotation of the drum about a fixed centre inside the drum and offset from the axis of the drum. The said suction means may comprise suction ports in the peripheral surface of the conveyor drum, which communicate with a stationary suction chamber in such a way that suction is applied through the ports during only a part of each revolution of the drum (e.g., so that suction is applied through the ports as they travel from the position at which the wrapper web is first received on the drum to the position at which the wrapper material leaves the drum).

The rate of rotation of the drum may be arranged to be such that its peripheral speed is greater than the rate of feed of the web thereto, so that there is constant "slip" between the drum and the web carried thereon, whereby the web is tensioned on the drum's peripheral surface. There may be provided valve means associated with the suction ports, whereby suction can be cut off from a port when the latter ceases to be covered by wrapper material.

There may be provided a plurality of openings, through which the movable knife can project, spaced around the peripheral surface of the conveyor drum, and, where the movable knife is arranged to rotate about a fixed centre inside the drum, the movable knife may be arranged to rotate at a speed such that it coacts with the fixed knife whenever one of the said openings moves past the latter. There may be provided a group of suction ports substantially directly behind each of the said openings in the drum, suction being applied through each group as it travels past the fixed knife.

The conveyor may be arranged to move continuously and the web is fed continuously and the movable knife may be arranged to rotate continuously.

The mechanism may comprise an endless conveyor band system arranged to receive and convey the wrapper material from the said conveyor, and may comprise a rotatable receiving drum positioned adjacent to the said conveyor to receive wrapper material therefrom, and suction means associated with the said receiving drum to suctionally hold the wrapper material thereto whilst it is carried thereon. For example, the said conveyor band system may include a plurality of narrow conveyor bands arranged in grooves around the periphery of the said receiving drum, the latter having suction ports arranged between the grooves in its peripheral surface so that the wrapper material can be suctionally held to the drum and to the conveyor bands. The said conveyor band system may comprise opposed conveyor bands adapted to cooperate, so that the wrapper material is held therebetween, to positively convey the wrapping material from the said conveyor (e.g., the system may include a further plurality of narrow conveyor bands arranged opposite the first said plurality of narrow bands). The conveyor band system may be arranged to move at a speed greater than the speed of the said conveyor whereby the severed lengths of wrapper material can become spaced apart from each other as they are carried away from the said conveyor.

The said conveyor band system may have a space through which an article (e.g., a package containing cigarettes) to be wrapped can pass, and the mechanism comprise means to move articles to be wrapped along a predetermined path past which the conveyor band system extends, whereby a severed length of wrapper material, positioned across the said space, can be conveyed to a position in front of an article to be wrapped, and the article can be moved through the said space and become partly covered by the said length as it removes the latter from the conveyor band system. For example, the conveyor band system may include a pair of conveyor bands which are spaced apart sideways, and extend past

the said path at opposite sides of the path, the said space being the space between the two bands.

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

FIGURE 1 is an end elevation, partly in section,

FIGURE 2 is a side elevation of part of FIGURE 1,

FIGURE 3 is an end elevation, partly in section, of a further embodiment,

FIGURE 4 is a sectional view on the line IV—IV of FIGURE 3,

FIGURE 5 is an end elevation, partly in section, of another embodiment,

FIGURE 6 is an end elevation, partly in section, of a further embodiment.

Referring to FIGURE 1, a web W of wrapping material is fed by feed rollers **1** and **2** about the periphery of a rotatable conveyor drum **3** rotated by a shaft **3***a*. The drum **3** has openings **4** in its cylindrical shell and running axially along its length, through which a movable knife **5** can project to coact with a fixed knife **6** to sever a length S from the web W, the latter being carried on the drum between the two knives. The knife **5** is rotatably mounted on a shaft **7**, the centre of rotation of the knife **5** being offset from the axis of the drum and remaining stationary while the drum **3** is rotated around it. The knife **5** is rotated, in timed relationship with and in the same direction as (anti-clockwise as viewed in FIGURE 1) the rotation of the drum **3**, so that its cutting edge travels in a circular path which crosses the path of the web W carried on the drum **3**, and so that it projects through an opening **4** as the latter moves past the fixed knife **6**. Since the movable knife and the drum are rotated in the same direction, the cutting edge of the knife **5** moves in the same general direction of movement as the drum **3** while it projects through the opening **4** and coacts with the cutting edge of the fixed knife **6**.

Directly behind each of the openings **4**, considered in the direction of rotation of the drum **3**, is provided a group of suction ports **8***a* and **8***b*, arranged in two lines which run axially along the length of the drum **3** and which are spaced closely one behind the other. The ports **8***a* and **8***b* communicate with longitudinal holes **9***a* and **9***b* respectively, which can register with a stationary suction chamber **10**, extending in an arc from the position at which the web W is first received on the drum **3** to the position at which it is received from the drum **3** by a rotatable receiving drum **11**, rotated by a shaft **11***a*.

The drum **11** is provided with suction ports **12**, about its periphery and spaced along its length, which can register with a stationary suction chamber **13** around which the drum **11** rotates. The suction chamber **13** extends from the position at which wrapper material is first received from the drum **3** to the position at which it leaves the drum **11**. A stationary guide member **14** is positioned to guide the wrapper material from the drum **3** about the periphery of the drum **11**. A plurality of narrow endless conveyor bands **15** pass about grooves in the periphery of the drum **11** and about a roller **16**, the ports **12** being arranged at positions between the said grooves. The bands **15** are driven by the drum **11**, and have a straight run from the latter to the roller **16**, and are positioned so that one lies adjacent each side edge of the severed lengths S, and one lies centrally (see FIGURE 2). A further plurality of endless conveyor bands **17**, of the same width as the bands **15** and passing about rollers **18**, **19**, **20** and **21**, (of which the roller **18** drives the bands), are arranged with a run adjacent and parallel to the said straight run of the band **15**, a band **17** being positioned opposite each band **15** (see FIGURE 2). The two opposed sets of bands **15** and **17** constitute an endless conveyor band system which positively conveys the severed lengths S from the drum **3**, the wrapper material being held between opposed bands **15** and **17**, and the two sets of bands being moved at substantially the same speed.

The centre band **17** passes about the roller **20** and the two side bands **17** pass about the rollers **21**, which are positioned below the level of a bed **22** (see also FIG. 2), the rollers **16** and **20** being positioned above the level of the bed **22**. Thus a severed length S can be conveyed between the bands **15** and **17** as far as the rollers **16** and **20**, and then by the side bands **17** as far as the roller **21**.

A gap **23** is provided in the bed **22** through which the leading end of a severed length S can pass and rods **24**, mounted on movable bars **25**, are positioned in the gap **23**, and operate in a manner which will be described later. A pusher **26** is provided to push a package P containing cigarettes along the bed **22**, i.e., along a predetermined path.

As can be seen in FIGURE 2, the two side bands **17** extending past the bed **22** are spaced apart sideways and are positioned at opposite sides of the path of the package P so that there is a space therebetween through which the package P can pass. A guide member **27** is positioned above the bed **22** to receive the package P as it passes through this space.

The operation of the mechanism described so far is as follows:

The web W of wrapper material is continuously fed by the feed rollers **1** and **2** about the periphery of the drum **3**, which is continuously rotated anti-clockwise as viewed in FIGURE 1. As the ports **8** pass the position at which the web W is first received on the drum **3**, suction is applied therethrough by registry of the holes **9** with the suction chamber **10**. When an opening **4** moves past the fixed knife **6**, the movable knife **5**, which is continuously rotated on its shaft **7** in the same direction as and in timed relationship with the movement of the drum, coacts with the knife **6** to sever the web W across its width. The leading end of the web W immediately behind the position at which it is severed (consider in the direction of movement of the web) is suctionally held to the periphery of the drum **3** by means of the group of ports **8** positioned directly behind the opening **4**, so that it can move past the knife **6** without its movement being restricted by the latter.

The wrapper material is received from the drum **3** on the drum **11**, which is continuously rotated clockwise as viewed in FIGURE 1, and on the conveyor bands **15**, the holes **9** moving out of register with the suction chamber **10** as the ports **8** pass the position at which the wrapper material leaves the periphery of the drum **3**, so that the wrapper material ceases to be held suctionally thereto at that position. The guide member **14** guides the wrapper material about the periphery of the drum **11**, suction being applied through the ports **12**, by registry with the suction chamber **13**, between the position at which wrapper material is first received from the drum **3** to the position at which it leaves the drum **11**. Thus the wrapper material is suctionally held to the drum **11** and to the bands **15** between the two said positions.

The rate of rotation of the drum **3** is such that its peripheral speed is greater than the rate of feed of the web W by the feed rollers **1** and **2** so that there is constant slip between the web W and the drum **3**, whereby the web W is tensioned on the periphery of the drum **3**, and whereby a severed length S can become separated from the web W.

The rate of rotation of the movable knife **5** is such that it coacts with the fixed knife **6** whenever an opening **4** passes the latter; thus, in the construction shown in FIGURE 1, the knife **6** revolves three times during each revolution of the drum **3**.

The rate of rotation of the drum **11** is such that its peripheral speed, and hence the speed of the conveyor bands **15**, is greater than the peripheral speed of the drum **3**, whereby the severed lengths become spaced apart from each other along the conveyor bands **15**.

The conveyor bands **17** are moved at the same speed as the bands **15** and co-operate with the latter to convey

the served lengths S of wrapper material as previously described, the roller **18** being driven to move the bands **17**.

A severed length S is thus conveyed between the bands **15** and **17** as far as the rollers **16** and **20**, its leading end being further conveyed through the gap **23** in the bed **22** by the side bands **17**, the rods **24** being at a position away from the length S, i.e., to the left as viewed in FIGURE 1. A package P is then pushed along the bed **22** by the pusher **26**, the bars **25** being swung to the right as viewed in FIGURE 1 so that the rods **24** are in contact with the length S when it is engaged by the package P. The package P is then pushed through the space between the side bands **17** (see FIGURE 2), carrying the length S with it between the "nip" of the rods **24** and the guide member **27**. On the continued movement of the package P the length S becomes partly folded about it by the action of the member **27** and the rods **24**, the package then being moved to further wrapping mechanism (not shown). The rods **24** are then moved to the left as viewed in FIGURE 1, by movement of the bars **25**, so that the leading end of a further length S can pass cleanly through the gap **23**, and the operation is then continuously repeated.

The rods **24** are positioned in line, there being provided a gap between them through which the pusher **26** can pass (see FIGURE 2). The pusher **26** is of a known construction, being mounted on an endless chain (not shown) so that it can move along the bed **22** and along one run of the chain, and then disengage the package P and return along a further run of the chain to its original position. A slot is provided along the bed **22** through which the pusher can move.

The embodiment shown in FIGURE 6 is similar to that described above with reference to FIGURE 1, and the same references have been used to indicate like parts. In the embodiment shown in FIGURE 6, however, the conveyor drum **3** is provided with a single opening **4** in its cylindrical shell, through which a movable knife **5***a*, rotated about a fixed centre, offset from the axis of the drum, by a shaft **7***a*, can project to coact with the fixed knife **6** and severe the web.

Also in the embodiment shown in FIGURE 6, the longitudinal holes **9***a* and **9***b*, with which the lines of ports **8***a* and **8***b* respectively communicates, are arranged at different radial distances from the centre of the drum **3** and can register with two separate arcuate suction chambers **10***a* and **10***b*. The suction chamber **10***a*, with which the leading line of ports **8***a* (as considered in the direction of rotation of the drum **3**) can communicate, is connected to a suction manifold **50** through a valve **51**, and the suction chamber **10***b*, with which the trailing line of ports **8***b*, can communicate, is connected to the manifold **50** through a pipe **52**. By the provision of valve means in association with the suction ports **8***a* and **8***b*, suction can be cut-off from the ports **8***a* should the latter become uncovered while the hole **9***a* is in register with the suction chamber **10***a*, e.g., due to the difference of speed between the periphery of the drum **3** and the web W, thus preventing the breaking of suction at the ports **8***b*. The valve **51** is adapted to close responsively to the flow of air thereto from the ports **8***a*, and the arrangement of the valve means is generally similar to that more fully described in co-pending United States application Serial No. 245,220.

It will be appreciated that a similar arrangement of valve means, whereby when a line of ports is covered with wrapper material suction can be applied therethrough, but when a port becomes uncovered suction is automatically cut off, may be provided in association with the drum **3** in the embodiment described above with reference to FIGURE 1.

Referring now to FIGURES 3 and 4, in which the same reference numerals indicate like parts to those described with reference to FIGURE 1, the suction chamber **10** extends in an arc from the position at which the web W is first received on the drum **3** to a position shortly beyond the fixed knife **6** considered in the direction of rotation of the drum **3**. Apertures **27**, of dimensions sufficient to allow a package P to be wrapped to pass therethrough, are provided in the drum's cylindrical shell and positioned so as to lie centrally of a length S of wrapper material when the latter is severed from the web W. Further suction ports **81** which can communicate through holes **91** with a stationary suction chamber **101**, are provided in the periphery of the drum **3** and positioned either side of the apertures **27**. A reciprocating pusher **28**, mounted on a bar **29**, is provided to push packages P along a bed in the form of a support plate **30** inside the drum and through apertures **27**. Guide chambers **31** are provided to receive packages P when they are so pushed.

The operation of the mechanism is as follows:

The drum **3** is intermittently rotated so that it is stationary when an aperture **27** is opposite the members **31**, the rotation of the knife **5** and the feed of the web W by the feed rollers **1** and **2** being correspondingly intermittent. Packages P are fed on to the plate **30** in the drum **3** through an open end **32** thereof (FIGURE 4) and the pusher **28** is arranged to operate in a pushing stroke at a time when the drum **3** is stationary.

A length S is severed from the web W as the drum **3** rotates, by coaction of the knives **5** and **6** as previously described with reference to FIGURE 1. The severed length S then covers an aperture **27** and the drum **3** continues to rotate until the aperture **23** lies opposite the members **31**, at which time the length S is suctionally held to the drum **3** by means of the ports **81**. The pusher **28** then operates in a pushing stroke and moves a package P along the plate **30**, through the aperture **27**, and between the guide members **31**. As the package P is pushed between the members **31**, the length S becomes partly folded about it being tensioned by the action of suction through the ports **81**. Valve means, similar to that described above, may be provided in association with the ports **81**, whereby suction can be applied through a port **81** when it is covered by wrapper material and whereby suction is automatically cut off when the port becomes uncovered. The package P is then moved from the members **31** through further wrapping mechanism, the pusher **28** returning to its original position. The drum **3** is further rotated, another package P being delivered to a position in front of the pusher **28**, and the operation is continously repeated.

In the embodiment shown in FIGURES 3 and 4, the drum **3** is rotated by means of a gear **53** which intermeshes with a gear **54** forming part of the drum (FIGURE 4). If desired, the drum **3** in the embodiments shown in FIGURES 1, 2 and 6 may be rotated by a similar arrangement.

Referring now to FIGURE 5, in which like parts are again indicated by the same reference numerals, the construction of the drum **3** is similar to that described with reference to FIGURES 3 and 4 but there are provided four openings **4**, series of suction ports **8***a* and **8***b*, and apertures **27**.

The apertures **27** are arranged in pairs at diametrically opposite positions, and suction ports **81** are arranged at either side of each aperture **27**. The drum **3** is rotated intermittently by means of intermeshing gears in a manner as described with reference to FIGURES 3 and 4, a length S being severed from the web W to cover an aperture **27** while the drum **3** is rotating. When the aperture **27** comes opposite the members **31** the drum ceases to rotate, and remains stationary while a pusher **33** moves forward (to the left in FIGURE 5) in a pushing stroke to push a package P_1 through the aperture **27** and between the members **31** so that the severed length S becomes partly folded about the package P_1 as previously described. Members **34**, pivoted at **35** to the pusher **33**, are spring urged to remain in the position shown in FIGURE 5, there being provided stops (not shown) to prevent their swinging anti-clockwise as viewed in FIGURE 5 beyond

that position, and are capable of swinging clockwise (as viewed in FIGURE 5) and upwardly to clear packages P. As the pusher **33** moves forwardly to push the package P_1 through the aperture **27**, it moves a further package P_2 along the bed **30** to the position from which the package P_1 has been removed. A further reciprocating pusher **36** is arranged to operate simultaneously with the pusher **33**, and pushes a package P_3 into the drum **3** through an aperture **27** at the same time as the package P_1 is pushed through the diametrically opposite aperture **27**.

The pushers **33** and **36** then move rearwardly (to the right in FIGURE 5) in a return stroke, the members **34** swinging upwardly as they are engaged by the packages P_2 and P_3 so that the pusher **33** can move over the packages to a position at which the members **34** can again drop and thus be able to move the packages P_2 and P_3 forwardly in a further pushing stroke.

The drum **3** is then further rotated, another package P being delivered to a position in front of the pusher **36**, and the operation is continuously repeated.

In the embodiments described with reference to FIGURES 3, 4 and 5, valve means may be provided in association with the suction ports **8***a* and **8***b* in the drum **3** in a manner similar to that described above with reference to the embodiments shown in FIGURES 1, 2 and 6.

What we claim as our invention and desire to secure by Letters Patent is:

1. Mechanism for cutting desired lengths from a continuous web of wrapper material, comprising a movable endless conveyor, means to move the conveyor, means to feed a web of wrapper material on to the conveyor so that the wrapper material carried thereon travels in a predetermined path, a movable knife and a fixed knife between which the web carried on the conveyor travels, the conveyor having an opening which travels with the conveyor and through which the movable knife can project, and the movable knife and the fixed knife having cutting edges which can coact to sever the web, and means to rotate the movable knife about a fixed centre so that its cutting edge travels in a circular path which crosses the said path of the web on the conveyor, the movable knife being rotated in timed relationship with the movement of the conveyor so that it projects through the said opening as the latter moves past the fixed knife, and so that its cutting edge travels in the same general direction of movement as the conveyor while it projects through the opening.

2. Mechanism as claimed in claim **1**, comprising suction means associated with the conveyor to hold the web to its conveying surface at a position substantially directly behind the said opening.

3. Mechanism for cutting desired lengths from a continuous web of wrapper material, comprising a drum hava substantially cylindrical shell and having an opening in its cylindrical shell, means to rotate the drum about its axis, means to feed a web of wrapper material on to the periphery of the drum, a fixed knife past which the web carried on the drum travels, a movable knife having a cutting edge, means to rotate the movable knife, in the direction of rotation of the drum, about a fixed centre within the cylindrical shell and offset from the axis of the drum, so that its cutting edge travels in a circular path and projects through the said opening as the latter moves past the fixed knife to coact with the fixed knife and sever the web transversely of its length.

4. Mechanism as claimed in claim **3**, comprising means defining a stationary suction chamber associated with the drum, the latter having suction ports in its cylindrical shell which communicate with its peripheral surface at a position substantially directly behind the said opening, considered in the direction of rotation of the drum, and which communicate with the said suction chamber while and immediately after the web is severed.

5. Mechanism for cutting desired lengths from a continuous web of wrapper material, comprising a drum having a cylindrical shell and having an opening in its cylindrical shell, means to continuously rotate the drum about its axis, means to continuously feed a web of wrapper material on to the periphery of the drum, a fixed knife past which the web carried on the drum travels, a movable knife, means on which the movable knife is mounted for rotation about a fixed centre within the cylindrical shell and offset from the axis of the drum, means to continuously rotate the movable knife in the same direction of rotation as the drum, so that it projects through the said opening and coacts with the fixed knife to sever the web transversely of its length as the opening moves past the fixed knife.

6. Mechanism as claimed in claim **5**, comprising a stationary suction chamber associated with the drum, the latter having suction ports in its cylindrical shell which communicate with its peripheral surface at a position substantially directly behind the said opening, considered in the direction of rotation of the drum, and which communicate with the interior of the said suction chamber during at least part of each revolution of the drum so that the leading end of the severed web is suctionally held to the periphery of the drum while it travels past the fixed knife.

7. Mechanism for cutting desired lengths from a continuous web of wrapper material, comprising a drum having a substantially cylindrical shell and having a plurality of openings in and spaced around its cylindrical shell, means to rotate the drum about its axis, means to feed a web of wrapper material on to the periphery of the drum, a fixed knife past which the web carried on the drum travels, a movable knife, means on which the movable knife is mounted for rotation about a fixed centre within the cylindrical shell, and offset from the axis of the drum, means to rotate the movable knife in the direction of rotation of the drum so that it projects through an opening and coacts with the fixed knife to sever the web transversely of its length whenever one of the said openings moves past the fixed knife.

8. Mechanism as claimed in claim **7**, comprising a stationary suction chamber associated with the drum, the latter having groups of suction ports in its cylindrical shell, which communicate with its peripheral surface, each group respectively at a position substantially directly behind each of the said openings, considered in the direction of rotation of the drum, and which communicate with the interior of the suction chamber during at least part of each revolution of the drum, so that the leading end of the severed web can be suctionally held to the periphery of the drum as it travels past the fixed knife.

9. Mechanism as claimed in claim **7**, wherein the said means to rotate the drum comprises means to continuously rotate the drum, and wherein the said means to rotate the movable knife comprises means to continuously rotate the movable knife.

10. Mechanism for cutting desired lengths from a continuous web of wrapper material, comprising a drum having a substantially cylindrical shell and having an opening in its cylindrical shell, means to rotate the drum about its axis, means to feed a web of wrapper material on to the periphery of the drum, a fixed knife past which the web carried on the drum travels, a movable knife, means to rotate the movable knife in the direction of rotation of the drum about a fixed centre within the cylindrical shell and offset from the axis of the drum, so that it projects through the said opening as the latter moves past the fixed knife to coact with the fixed knife and sever the web transversely of its length, and an endless conveyor band system to receive wrapper material from the drum and to convey severed lengths therefrom.

11. Mechanism as claimed in claim **10**, comprising a receiving drum, positioned adjacent the first said drum, to receive wrapper material therefrom, and having a plurality of spaced periphereal grooves and suction ports communicating with its periphereal surface between the said grooves, means to rotate the receiving drum, a plurality of narrow endless conveyor bands in the said sys-

tem passing about the receiving drum in the said grooves, and means defining a stationary suction chamber associated with the receiving drum with which said suction ports communicate to suctionally hold the wrapper material to the said receiving drum and to the said bands as it is received and carried on the said receiving drum.

12. Mechanism as claimed in claim 11, wherein the said conveyor band system comprises a further plurality of narrow endless conveyor bands arranged opposite the first said plurality of bands so that the wrapper material can be received therebetween, the mechanism comprising means to move the bands at substantially the same speed so that the wrapper material can be held between opposed bands and positively conveyed thereby.

13. Mechanism as claimed in claim 12, comprising means to move articles to be wrapped along a predetermined path, and wherein two conveyor bands in the said conveyor band system extend past the said path and are spaced apart sideways so as to be positioned on opposite sides of the path, so that a severed length of wrapper material positioned across the said two bands can be carried thereby to a position in front of an article to be wrapped, which is then moved between the bands to engage the wrapper length, and become partly covered thereby as it removes the length from the bands.

14. Mechanism for cutting desired lengths from a continuous web of wrapper material and applying the severed lengths to articles to be wrapped, comprising a drum having a substantially cylindrical shell and having an aperture in its cylindrical shell through which an article to be wrapped can pass, means to rotate the drum, means to feed a web of wrapper material on to the periphery of the drum, a fixed knife positioned adjacent the periphery of the drum, a movable knife, means on which the movable knife is mounted within the said cylindrical shell, the latter having an opening through which the movable knife can project, means to move the movable knife so that it projects through the said opening to coact with the fixed knife and sever a desired length from the web of wrapper material, the said length being positioned across the said aperture, and means to move an article to be wrapped through the said aperture so that it engages the wrapper length and becomes partly covered thereby as it removes the latter from the periphery of the drum.

15. Mechanism as claimed in claim 14, comprising suction means associated with the drum to hold the wrapper material to its periphery.

16. Mechanism for applying lengths of wrapper material to articles to be wrapped, comprising means to move articles to be wrapped along a predetermined path, a pair of endless conveyor bands which are spaced apart sideways and extend past the said path on opposite sides of the path, and means to move the conveyor bands so that a wrapper length carried thereon, and extending across the space therebetween, can be conveyed to a position across the path of the article, so that the later can be moved through the space between the bands to engage and become partly covered by the wrapper length.

17. Mechanism as claimed in claim 16, comprising a further pair of conveyor bands positioned adjacent to and opposite the first said pair of bands, and means to move the said further pair of bands at substantially the same speed as the first said pair of bands, so that wrapper lengths can be held between opposed bands of the two pairs and positively conveyed thereby.

18. Mechanism for applying lengths of wrapper material to articles to be wrapped, comprising means to move an article to be wrapped along a predetermined path, a plurality of endless conveyor bands, means to move the conveyor bands at substantially the same speed, the bands forming a system comprising a first conveyor band arrangement, and a second conveyor band arrangement opposed to the said first arrangement, so that a wrapper length can be held and conveyed between opposed bands of the two arrangements, the said first arrangement terminating, as considered in the direction of conveyance, before the said path, and part of the said second arrangement extending beyond the said path and defining a space through which the said article can pass, so that the leading end of a wrapper length can be carried on the said second conveyor band arrangement beyond the path of the article to position the wrapper length in front of the article, which latter can then be moved through the said space to engage and became partly covered by the wrapper length.

19. Mechanism as claimed in claim 18, comprising a bed along which an article to be wrapped is moved and having a gap through which the leading end of a wrapper length carried on said second conveyer band arrangement can pass, a member positioned in the said cap, and means to move the member towards said second conveyor band arrangement when the leading end of a wrapper length has passed through the gap, and away from said second conveyor band arrangement before the leading end of a further wrapper length moves through the gap.

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