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(54) **Apparatus for cutting and feeding thin web lengths.**

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FR-A- 1 469 856
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Description

The invention concernes an apparatus for cutting and feeding thin web lengths, which is provided particularly in a machine for packing articles into lengths of a heat-contractible thin web and showing the features of the preamble of claim 1.

An apparatus of this kind is known from FR-A-1 469 856. In this appartus a continuous thin web is fed vertically by a pair of counter-rotating, parallel feed-rollers to a cutting device, comprising a revolving cutter and a cooperating, stationary counterblade. The revolving cutter shows a revolving support for a radial blade, whose axis of rotation is fixed relatively to the counterblade. At each revolution of the revolving support, the blade fastened thereon is brought in a position coacting with the counterblade. Thus a section of thin web that has passed between the said revolving cutter and stationary counterblade is cut from the continuous thin web.

From the internal state of the art of the applicant, an appartus of the aforementioned kind is known, in which the revolving cutter is driven by a motor in an intermittent operative mode, comprising means, for example a friction clutch and a break, which are so provided that after the balde of the revolving cutter having caused to make a cut in the thin web, the said revolving cutter will be stopped in a position, in which the same does not interfere with the thin web, and in which it is ready for being again operated and moved into its motor-interlocked condition, so that the blade is caused to cut the successive thin web section.

A similar apparatus is known also from US-A-30 15 978. In this apparatus, the revolving cutter is connected to spring means and is driven for a certain part of each revolution by impelling means, which accomplish a complete revolution at constant speed at each complete cycle of the machine, but as regards the control of the revolving cutter, they serve to load said spring means whilst for the remaining part of each revolution, which corresponds to an arc of a circle passing tangentially to the counterblade, the cutter is uncoupled from said constant speed revolving impelling means and moves rapidly under the influence of the said loaded spring means along said arc of a circle, so as to strike rapidly against the web passing over said counterblade, thus effecting a clean cut thereof and detaching from the continuous band a section of predetermined length. After this cutting action the said revolving cutter is brought by said spring means into a position in which it is again coupled to the said continuously revolving impelling means and the cycle is thus repeated.

As a result of the above descibed intermittent operative mode of the cutting apparatus, the several components of the cutting apparatus are subjected to an anomalous stress, whereby their average life is much reduced, and considerable limits are set to their operation, the more so to their high speed operation.

The invention aims to obviate the aforementioned inconvenients.

The invention achieves this aim with an apparatus for cutting and feeding thin web lengths according to the preamble of claim 1 which further comprises the features of the characterizing part of claim 1.

Further inventive features and improvements are delt with in the dependent subclaims.

The lifting and lowering system carrying the revolving cutter causes this revolving cutter to make a cut in the thin web, when this revolving cutter is moved into its down position, while when no cutting in the thin web is to be made, the said revolving cutter is lifted and kept rotating at a suitable, preferably low speed. Down-stream of the cutting apparatus, the thin web is pulled forward by two pairs of rollers by which the thin web is kept stretched as required. The speed of rotation of said roller pairs can be changed so as to have the thin web pulled through the cutting apparatus by the needed amount each time, before the revolving cutter is lowered down against the counterblade and caused to make a cut in the thin web with the blade thereof. By modifying the angular speed or quite exceptionally, the frequency of the lifting and lowering motion, for example the cam track in a lifting and lowering system of a cam-controlled kind, the apparatus according to the invention is made capable to feed thin web sections of any desired length and at any speed. Also a possible variation in the speed of the thin web-entraining roller pairs is contemplated, which is achieved in such a manner that the said rollers will be imparted a variable motion, whith an initial deceleration and a successive acceleration, whereby to cause the thin web to be delicately slipped under a to-be-packaged article.

The features of the invention and the advantages arising therefrom will clearly appear in the following specification of one preferred embodiment of the same, which is shown merely by way of a non-limiting example in the Figures of the three annexed sheets of drawing, in which:

Figure 1 is a diagrammatic, side elevational view of the primary means forming the apparatus according to the invention.

Figures 2 and 3 respectively are a top plan view with parts in section, and a side elevational view of the kinematic motions for imparting an in-phase motion to the cam, by which the rotary blade means and the thin web-entraining roller pairs are caused to swing.

Figure 4 is a plan view with parts in section, showing the upper pressure rollers in the thin web-entraining unit, and the rotary blade means.

Figure 5 is a plan view with parts in section, showing the lower rollers in the thin web-entraining unit, and the initial part of the belts for taking up and transferring under vacuum a cyclically cut web length.

Referring first of all to Figure 1, there is shown that the thin web F being unwound from a not shown bobbin, after having being passed on the rollers 1, 2, 3 and on the device 30 for neutralizing any electrostatic charges, is led between a first pair of superposed parallel rollers 4, 5, and then between a further pair of superposed parallel rollers 6, 7. In the said roller pairs 4, 5 and 6, 7, the lower rollers 5, 7 are smooth rollers and are, for example, made of aluminum, while the upper rollers 4, 6 are covered with rubber, are given a grooved configuration, and are supported at their ends by respective pairs of swingable supporting members 8, 9 which are fulcrumed respectively at 10, 11 about the machine frame, and are urged downward by the springs 12, 13 that are adjustable by means of screw/nut screw means 14, 15 (see also Figure 4). By numerals 31, 131 thin web-ejecting fingers are designated, which are fitted into the annular recesses in rollers 4, 6, and are supported by the stationary crosspieces 32, 132.

Through gears 16, 17 (see Figures 4 and 5), the upper rollers 4, 6 are kinematically connected to the respective lower roller 5, 7. As shown in Figures 2, 5, the shafts of the lower rollers 5, 7 have one end protruding from the relative supporting member, and are provided with toothed equal pulleys 18, 19 for their connection through a toothed belt 20 to the output shaft of a speed variator 21. Downstream of pulley 15, the roller 5 is provided with an electromagnetic clutch 23, and at the opposite end thereof is provided with an electromagnetic brake 24 (Figure 5), so that the roller pair 4, 5 can be stopped when needed. Numeral 25 denotes an idler for belt 20 (Figure 3).

The kinematic chain 18-19-20 and/or the diameter of the roller pairs 4, 5 and 6, 7, are so provided that the downstream roller pair 6, 7 is rotated at a surface speed which is a little higher than the surface speed of the upstream roller pair 4, 5, so that the thin web length extending between the said roller pairs, will be longitudinally stretched to a proper degree. Perforated, equal endless belts 26 (Figure 1) are led over the lower roller 7, and these belts are set in a close relation, whereby a suction conveyor is formed. At their starting lower end the said belts 26 are led over an idler 27 by which the initial section of the said suction conveyor is arranged in a properly tapering down manner, between the said thin web-entraining roller pairs 4, and 6, 7. The suction conveyor is driven in motion by being set in contact with the pair of rollers 6, 7, and by the provision of any other kinematic connections, by which a linear velocity of the suction conveyor is ensured, that is the same as, or is slightly higher than the surface speed of the said pair of rollers 6, 7. In Figure 1, by numeral 28 are designated the channels in which the active upper branches of belts 26 are caused to slide, and to which suction is applied through the transversely arranged manifold 29.

Still in Figure 1 there is shown that the thin web F being delivered from the first pair of rollers 4, 5, is caused to slide on a transversely arranged, stationary comb-like member 34, and the rotary blade means 60 to be disclosed later, for cutting with its blade the thin web F, which is set at a short distance therefrom, is caused to cooperate with the edge 134 of the said comb-like member 34 that performs the function of counterblade. At the outlet of the comb-like member or counterblade 34, the thin web F sinks on the inclined initial section of belts 26 and is then moved between the pair of rollers 6, 7, whereupon the thin web is carried by the straight upper branch of said belts 26.

Referring to Figures 2 and 3, there is shown that the variator 21 for transmission to the thin web-entraining roller pairs 4, 5 and 6, 7 of their motion of rotation, is in its turn driven through the motion transmission drive consisting of the toothed pulleys 35, 36, the toothed belt 37, and the idler 38, by a crank member 39 keyed onto the shaft 40 of pulley 36. In the said crank member 39 the one end is fitted of a pivot pin 41 which is parallel to the said shaft 40, and which by its opposite end is made integral of a bushing 42 that is fitted on a straight guide 43 with its axis extending at right angles thereto, and that is slidable thereon. The guide 43 is by its ends rotatably supported by supporting members 44, 144 secured to a flat disc 45 that by one of its faces is in turn secured to a pinion 47, in an offset position relative to this pinion, and that is angularly adjustable in position by means of the slots 46 shown in Figure 1, the said pinion 47 transmitting to other components of the packaging machine their motion off rotation. The pinion 47 is keyed onto a shaft 48 rotatably supported by the machine frame, and by means of a further pinion 49 and a chain 50 with an idler 51, this pinion 47 is connected to a pair of pinions 52, 53 which are dowelled to a shaft 54 to be disclosed later, the pinion 53 being connected to a driving geared motor, not shown in the drawings.

The above mentioned shaft 40 is rotatably supported by a slide 55 (Figure 3) which is slidably mounted on a guide 56, and is connected to an adjusting screw 57, the whole arrangement being such that the said shaft 40 can be translated parallelly to itself, up to the each time required extent.

By means of the adjusting screw 57, the shaft 40 can be set in line with, or can be offset from the shaft 48 (Figure 2), to the each time needed degree. When the two shafts 40, 48 are set in line with each other, these shafts are rotated at a same costant speed. Whereas, when the shaft 40 is offset from the shaft 48, the shaft 40 is rotated in a variable motion mode, so that the roller units 4, 5 and 6, 7, and the belts 26 are allowed to feed the thin web F to a to-be-packaged article, at first with a decelerated, and then with a suitably accelerated motion. In Figure 3, the pulley 36 is shown in two different operative positions, re-

spectively by a solid line and by a dash line.

The motion adjustment means just described are not a feature particularly characterizing the invention, so that these means may be actually provided in any other suitable manner, or they may be even omitted.

In Figures 1 and 4 there appears that upstream of rollers 4, 5 a shaft 58 is provided at a short distance therefrom and in parallel relation therewith, which by means of a pair of arms 59 rotatably supports the rotary blade means 60 that is arranged parallel to the said shaft 58, and is of the type comprising, for example, a shaft 160 on which a serrated blade 260 is longitudinally fitted. Whenever the blade 260 is caused to act on the stretched thin web F being supported from its underside by the comb-like member 34 performing the function of counterblade, this blade will make a transverse cut in the thin web F. The shaft 160 is fitted at its one end with a toothed pulley 61 that by means of a toothed belt being kept stretched by jockey pulleys 62 carried by a stationary arm 63 secured to the shaft 58, is connected to a toothed pulley 64 keyed onto a bushing 65 being rotatably mounted on shaft 58. A tothed wheel 66 is keyed onto the bushing 65, and is caused to mesh with, or is indirectly connected to a respective toothed wheel 67 keyed onto the shaft 54 that is driven by the main geared motor of the machine. A cam 68 is keyed onto the said shaft 54 (see also Figures 2 and 3), and is caused to cooperate with the pin 69 provided at the free end of a lever 70, that by its opposite end is connected to the shaft 58.

The operation of the thus conceived apparatus is simple and apparent. The blade means 60 is rotated at a suitable, preferably reduced speed, and the track of cam 68 is so provided as to promote the cyclical lifting and lowering of the said rotary blade means. When the rotary blade means 60 is angularly moved into its down position, the blade thereof is caused to cooperate with the edge 134 of the underlying comb-like member or counterblade 34, whereby a cut will be made in the thin web F. The rotary blade means 60 is imparted its swinging motion at a frequency that is interlocked with the frequency at which a group of to-be-packaged articles is moved forward by the means for advancing these articles and for dealing out thereto the respective thin web length as obtained by successive thin web-cutting operations. In order to cause the length of the thin web sections to be changed, is it sufficient to have the variator 21 so adjusted as to modify the speed of rotation of the roller pairs 4, 5 and 6, 7, and of the next-following suction conveyor. By modifying the gear unit 66, 67, any feeding problem can be certainly solved. Of course, a speed variator can be fitted in place of the said gear unit.

Only in exceptional cases it will become necessary to have the cam track modified. Of course, any other suitable means may be provided in place of the cam 68.

Should the supply of the to-be-packaged articles fail, the friction clutch 23 is set apart, and the brake 24 is operated and caused to stop the roller pair 4, 5, while the rollers 6, 7 and the conveyor 26 delivering the thin web length cut in the preceding cycle, are kept in motion.

Claims

1. An apparatus for cutting and feeding lengths of a thin web (F), which is provided particularly in a machine for packing articles into lengths of a heat-contractible thin web, comprising:
   a) a revolving cutter (60) fitted with a serrated blade (260) and cooperating with a stationary counterblade (34) for cyclically cutting a continuous thin web (F) into sections of predetermined length;
   b) at least a pair of opposed feed-rollers (4, 5, 6, 7), for feeding the continuous thin web (F) between said revolving cutter (60) and said cooperating counterblade (34);
   characterized in that
   c) the feed path of the thin web (F) has an approximately horizontal orientation, between the revolving cutter (60) and the cooperating counterblade (34);
   d) the continuously revolving cutter (60) is mounted on means (58,59,68,69,70) allowing it to move up and down, from and to the stationary, cooperating counterblade (34);
   e) adjusting means are provided to ensure that the continuously revolving cutter (60) is lowered against the stationary counterblade (34) after a predetermined length of said thin web (F) has passed between the revolving cutter (60) and the cooperating counterblade, and in that said mounting means (58,59,68,69,70) (34) lift the cutter (60) from said counterblade (34) immediately after cutting.
   f) control means are provided to lower the continuously revolving cutter as soon as its blade (260) is going to arrive at the angular position for its cooperation with the counterblade (34).

2. The apparatus according to claim 1, characterized in that the angular velocity of the revolving cutter (60) is adjustable.

3. The apparatus according to claims 1 or 2, characterized in that the frequency of the lowering and lifting of the revolving cutter (60) is adjustable.

4. The apparatus according to one or more of the preceding claims, characterized in that the feed-

ing velocity of the continuous thin web (F) between the revolving cutter (60) and the counterbalde (34) is adjustable.

5. The apparatus according to one or more of the preceding claims, in which the revolving cutter (60) is carried by the one end of a pair of levers (59) pivotally connected to a shaft (58) arranged parallel to the said revolving cutter (60), with at least one lever (70) being connected by its one end to the said shaft (58), and which through a pin (69) provided at the opposite free end thereof, is caused to cooperate with a cam (68) being operated in an in-phase relation with the other component of the packing machine, and the said shaft (58) about which are fulcrumed the levers (59) that carry the revolving cutter (60), rotatably supports a part (61, 62, 63, 64, 65, 66) of a chain of the kinematic motions imparting the said revolving cutter (60) its motion of rotation.

6. The apparatus according to claim 4, in which a gear unit (66, 67) is provided in the chain of the kinematic motions imparting the revovling cutter (60) its motion of rotation, and the said gear unit (66, 67) may be replaced, when needed, with another gear unit having a suitable gear ratio, any time the speed of rotation of said revolving cutter (60) has to be changed.

7. The apparatus according to one or more of the preceding claims, in which a variator (21) is provided in the chain of the kinematic motions imparting the revolving cutter (60) its motion of rotation, whereby the speed of rotation of the said revolving cutter (60) is adjustable.

8. The apparatus according to one or more of the preceding claims, in which the blade (260) of the revolving cutter (60) is caused to act on the thin web (F) between two pairs of driven parallel rollers (4, 5, 6, 7), by which the thin web (F) is longitudinally pulled in the manner as required for the thin web (F) to be unwound from a bobbin, and is longitudinally streched to a proper degree, provisions beeing made for the said roller pairs (4, 5; 6, 7) to be mutually synchronized and to be imparted their motion of rotation from a motive unit of the machine, with the interposition of a speed variator (21), the pair of rollers (4, 5) being connected to the kinematic motion driving the same, with the interposition of a friction clutch and brake unit (23, 24), whereby the said rollers can be uncoupled and braked, when needed, while the pair of rollers (6, 7) will deliver the thin web length having been cut during the preceding cycle.

9. The apparatus according to one or more of the preceding claims, in which the speed variator (21) is connected to the actuating unit, whith the interposition of a variable motion-generating device (35 to 48), which is so adjustable that the thin web length being cyclically fed by the said apparatus, will be moved in a properly decelerated manner, and positioned at a to-be-packaged article.

Patentansprüche

1. Vorrichtung zum Schneiden und Zuführen von Längen einer dünnen Materialbahn (F), vorzugsweise angeordnet in einer Maschine zum Verpacken von Artikeln in Längen einer unter dem Einfluß von Wärme schrumpfenden dünnen Materialbahn (Schrumpffolie), mit
   a) einer sich drehenden Schneideinrichtung (60), die ein Sägezahnblatt (260) aufweist und die mit einem stationären Gegenblatt (34) zusammenarbeitet, um eine fortlaufende dünne Materialbahn (F) in Abschnitte vorbestimmter Länge zyklisch zu schneiden,
   b) wenigstens ein Paar von einander gegenüberliegenden Förderrollen (4,5,6,7), um die fortlaufende, dünne Materialbahn (F) zwischen der sich drehenden Schneideinrichtung (60) und dem damit zusammenarbeitenden Gegenblatt (34) zu fördern, dadurch gekennzeichnet, daß
   c) der Förderweg der dünnen Materialbahn (F) zwischen der sich drehenden Schneideinrichtung (60) und dem damit zusammenarbeitenden Gegenblatt (34) eine etwa horizontale Ausrichtung hat,
   d) daß die sich kontinuierlich drehende Schneideinrichtung (60) an Mitteln (58,59,68,69,70) befestigt ist, die eine nach oben und nach unten gerichtete Bewegung erlauben, und zwar von dem stationären, damit zusammenarbeitenden Gegenblatt (34) hinweg und zu diesem Gegenblatt,
   e) daß Justiermittel vorgesehen sind, um sicherzustellen, daß die sich kontinuierlich drehende Schneideinrichtung (60) gegen das stationäre Gegenblatt (34) abgesenkt wird, nachdem eine vorbestimmte Länge der dünnen Materialbahn (F) zwischen der sich drehenden Schneideinrichtung (60) und dem damit zusammenarbeitenden Gegenblatt (34) hindurch gegangen ist, und daß die Befestigungseinrichtung (58,59,68,69,70) die Schneideinrichtung (60) vom Gegenblatt (34) unmittelbar nach dem Schneiden anhebt, und daß
   f) Steuerungs- oder Regelungsmittel vorgesehen sind, um die sich kontinuierlich drehende

Schneideinrichtung abzusenken, sobald ihr Schneidblatt (260) in einer Winkelposition ankommt, in der es mit dem Gegenblat (34) zusammenarbeitet.

2. Vorrichtung nach Anspruch 1,
dadurch gekennzeichnet,
daß die Winkelgeschwindigkeit der sich drehenden Schneideinrichtung (60) einstellbar ist.

3. Vorrichtung nach Anspruch 1 oder 2,
dadurch gekennzeichnet,
daß die Frequenz des Absenkens und des Anhebens der sich drehenden Schneideinrichtung (60) einstellbar ist.

4. Vorrichtung nach einem oder mehreren der vorhergehenden Patentansprüche,
dadurch gekennzeichnet,
daß die Fördergeschwindigkeit der durchgehenden dünnen Materialbahn (F) zwischen der sich drehenden Schneidein- richtung (60) und dem Gegenblatt (34) einstellbar ist.

5. Vorrichtung nach einem oder mehreren der vorhergehenden Patentansprüche,
dadurch gekennzeichnet,
daß die sich drehende Schneideinrichtung (60) an einem Ende eines Hebelpaars (59) getragen ist, das schwenkbar sich drehenden Schneideinrichtung (60) vorgesehen ist, wobei wenigstens ein Hebel (70) mit seinem einen Ende mit der Welle (58) verbunden ist, und wobei über einen Stift (69), der am anderen freien Ende dieses Teils vorgesehen ist, der Hebel mit einer Nocke (68) zusammenarbeitet, die sich in einer phasengleichen Beziehung mit dem anderen Bauteil der Verpackungsmaschine befindet, und wobei die Welle (58), an die die Hebel (59) angelenkt sind, die die sich drehende Schneideinrichtung (60) tragen, drehbar ein Teil (61,62,63,64,65,66) einer Kette der kinematischen Bewegungen trägt, die der sich drehenden Schneideinrich- tung (60) ihre Drehbewegung mitteilt.

6. Vorrichtung nach Anspruch 4,
dadurch gekennzeichnet,
daß eine Getriebeeinheit (66, 67) in der Kette der kinematischen Bewegungen vorgesehen ist, die der sich drehenden Schneideinheit (60) ihre Drehbewegung mitteilt, und daß die Getriebeeinheit (66,67) ggf. durch eine andere Getriebeeinheit ersetzt werden kann, die ein geeignetes Übersetzungsverhältnis hat, und zwar immer dann, wenn die Drehgeschwindigkeit der sich drehenden Schneideinrichtung (60) geändert werden muß.

7. Vorrichtung nach einem oder mehreren der vorhergehenden Patentansprüche,
dadurch gekennzeichnet,
daß eine Steuerung (21) in der Kette der kinematischen Bewegungen vorgesehen ist, die der sich drehenden Schneideinheit (60) ihre Drehbewegung mitteilt, wobei die Drehgeschwindigkeit der sich drehenden Schneideinrichtung (60) einstellbar ist.

8. Vorrichtung nach einem oder mehreren der vorhergehenden Patentansprüche,
dadurch gekennzeichnet,
daß das Blatt (260) der sich drehenden Schneideinrichtung (60) auf die dünne Materialbahn (F) zwischen zwei Paar angetriebener, paralleler Rollen (4,5,6,7) einwirkt, wodurch die dünne Materialbahn (F) in Längsrichtung derart gezogen wird, wie dies für die dünne Materialbahn (F) notwendig ist, um von einer Spule abgewickelt zu werden, und die in Längsrichtung um einen geeigneten Betrag gestreckt wird, wobei Vorsorge dafür getroffen ist, daß die Rollenpaare (4,5; 6,7) gegenseitig synchronisiert sind und daß ihre Drehbewegung von einer beweglichen Einheit der Maschine übertragen wird, und zwar unter Zwischenschaltung einer Geschwindigkeitssteuerung (21), wobei dasjenige Rollenpaar (4,5), das an die kinematische Bewegung angeschlossen ist, die das Rollenpaar antreibt, über eine Reibkupplung und Bremseneinheit (23,24) daran angeschlossen ist, so daß die Rollen bedarfsweise entkuppelt und gebremst werden können, während das andere Rollenpaar (6,7) die Länge der dünnen Materialbahn, die während des vorhergehenden Zyklus abgeschnitten worden ist, abliefert.

9. Vorrichtung nach einem oder mehreren der vorhergehenden Patentansprüche,
dadurch gekennzeichnet,
daß die Geschwindigkeitssteuerung (21) an die Betätigungseinheit angeschlossen ist, und zwar unter Zwischenschaltung einer änderbaren, bewegungserzeugenden Einrichtung (35-48), die so einstellbar ist, daß die von der Vorrichtung zyklisch zugeführte Länge der dünnen Materialbahn richtig verzögert bewegt wird und bei einem zu verpackenden Artikel positioniert wird.

Revendications

1. Un appareil pour couper et pour faire avancer des longueurs d'une bande mince (F), qui est incorporé en particulier dans une machine pour l'emballage d'articles dans des longueurs d'une bande mince thermorétractable, comprenant :

a) un dispositif coupe tournant (60) équipé d'une lame dentelée (260) et coopérant avec une contre-lame fixe (34) de façon à couper de manière cyclique une bande mince continue (F) en sections de longueur prédéterminée;
b) au moins une paire de rouleaux d'avance opposés (4, 5, 6, 7) pour faire avancer la bande mince continue (F) entre le dispositif de coupe tournant (60) et la contre-lame (34) coopérant avec lui;
caractérisé en ce que
c) le chemin d'avance de la bande mince (F) a une orientation approximativement horizontale, entre le dispositif de coupe tournant (60) et la contre-lame (34) qui coopère avec lui;
d) le dispositif de coupe tournant continuellement (60) est monté sur des moyens (58, 59, 68, 69, 70) qui lui permettent de monter et de descendre, à partir de la contre-lame fixe (34) qui coopère avec lui, et vers cette dernière;
e) des moyens de réglage sont incorporés pour faire en sorte que le dispositif de coupe tournant continuellement (60) soit abaissé contre la contre-lame fixe (34) après qu'une longueur prédéterminée de la bande mince (F) est passée entre le dispositif de coupe tournant (60) et la contre-lame (34) qui coopère avec lui, et en ce que les moyens de montage (58, 59, 68, 69, 70) soulèvent le dispositif de coupe (60) à partir de la contre-lame (34), immédiatement après l'opération de coupe;
f) des moyens de commande sont incorporés pour faire descendre le dispositif de coupe tournant continuellement, dès que sa lame (260) est sur le point d'arriver à la position angulaire à laquelle elle coopère avec la contre-lame (34).

2. L'appareil selon la revendication 1, caractérisé en ce que la vitesse angulaire du dispositif de coupe tournant (60) est réglable.

3. L'appareil selon les revendications 1 ou 2, caractérisé en ce que la fréquence de l'abaissement et du soulèvement du dispositif de coupe tournant (60) est réglable.

4. L'appareil selon une ou plusieurs des revendications précédentes, caractérisé en ce que la vitesse d'avance de la bande mince continue (F) entre le dispositif de coupe tournant (60) et la contre-lame (34) est réglable.

5. L'appareil selon une ou plusieurs des revendications précédentes, dans lequel le dispositif de coupe tournant (60) est supporté par une première extrémité d'une paire de leviers (59) qui sont accouplés de façon pivotante à un axe (58) qui est disposé parallèlement au dispositif de coupe tournant (60), avec au moins un levier (70) accouplé par sa première extrémité à l'axe précité (58), et qui par l'intermédiaire d'un doigt (69) monté à son extrémité libre opposée, coopère avec une came (68) qui-est actionnée en phase avec l'autre élément constitutif de la machine d'emballage, et l'axe précité (58) sur lequel pivotent les leviers (59) qui portent le dispositif de coupe tournant (60), supporte de façon tournante une partie (61, 62, 63, 64, 65, 66) d'une chaîne des organes cinématiques qui communiquent son mouvement de rotation au dispositif de coupe tournant (60).

6. L'appareil selon la revendication 4, dans lequel un engrenage (66, 67) est incorporé dans la chaîne des organes cinématiques communiquant son mouvement de rotation au dispositif de coupe tournant (60), et cet engrenage (66, 67) peut être remplacé, lorsque c'est nécessaire, par un autre engrenage ayant un rapport d'engrenage approprié, chaque fois qu'il est nécessaire de changer la vitesse de rotation du dispositif de coupe tournant (60).

7. L'appareil selon une ou plusieurs des revendications précédentes, dans lequel un variateur (21) est incorporé dans la chaîne des organes cinématiques communiquant son mouvement de rotation au dispositif de coupe tournant (60), grâce à quoi la vitesse de rotation du dispositif de coupe tournant (60) est réglable.

8. L'appareil selon une ou plusieurs des revendications précédentes, dans lequel la lame (260) du dispositif de coupe tournant (60) agit sur la bande mince (F) entre deux paires de rouleaux parallèles entraînés (4, 5, 6, 7), au moyen desquels la bande mince (F) est tirée en direction longitudinale de la manière exigée pour que la bande mince (F) se déroule d'une bobine, et elle est étirée en direction longitudinale dans une mesure appropriée, des moyens étant prévus pour que les paires de rouleaux (4, 5; 6, 7) soient mutuellement synchronisées et reçoivent leur mouvement de rotation à partir d'un organe moteur de la machine, avec l'interposition d'un variateur de vitesse (21), la paire de rouleaux (4, 5) étant accouplée aux organes cinématiques qui l'entraînent avec l'interposition d'un dispositif à embrayage à friction et frein (23, 24), grâce à quoi ces rouleaux peuvent être désaccouplés et freinés, lorsque c'est nécessaire, tandis que la paire de rouleaux (6, 7) fournira la longueur de bande mince qui a été coupée pendant le cycle précédent.

9. L'appareil selon une ou plusieurs des revendica-

tions précédentes, dans lequel le variateur de vitesse (21) est accouplé à l'organe d'actionnement, avec l'interposition d'un dispositif de génération de mouvement variable (35 à 48), qui est réglable de façon que la longueur de bande mince que l'appareil fait avancer de façon cyclique, soit déplacée avec une décélération correcte et soit positionnée sur un article à emballer.

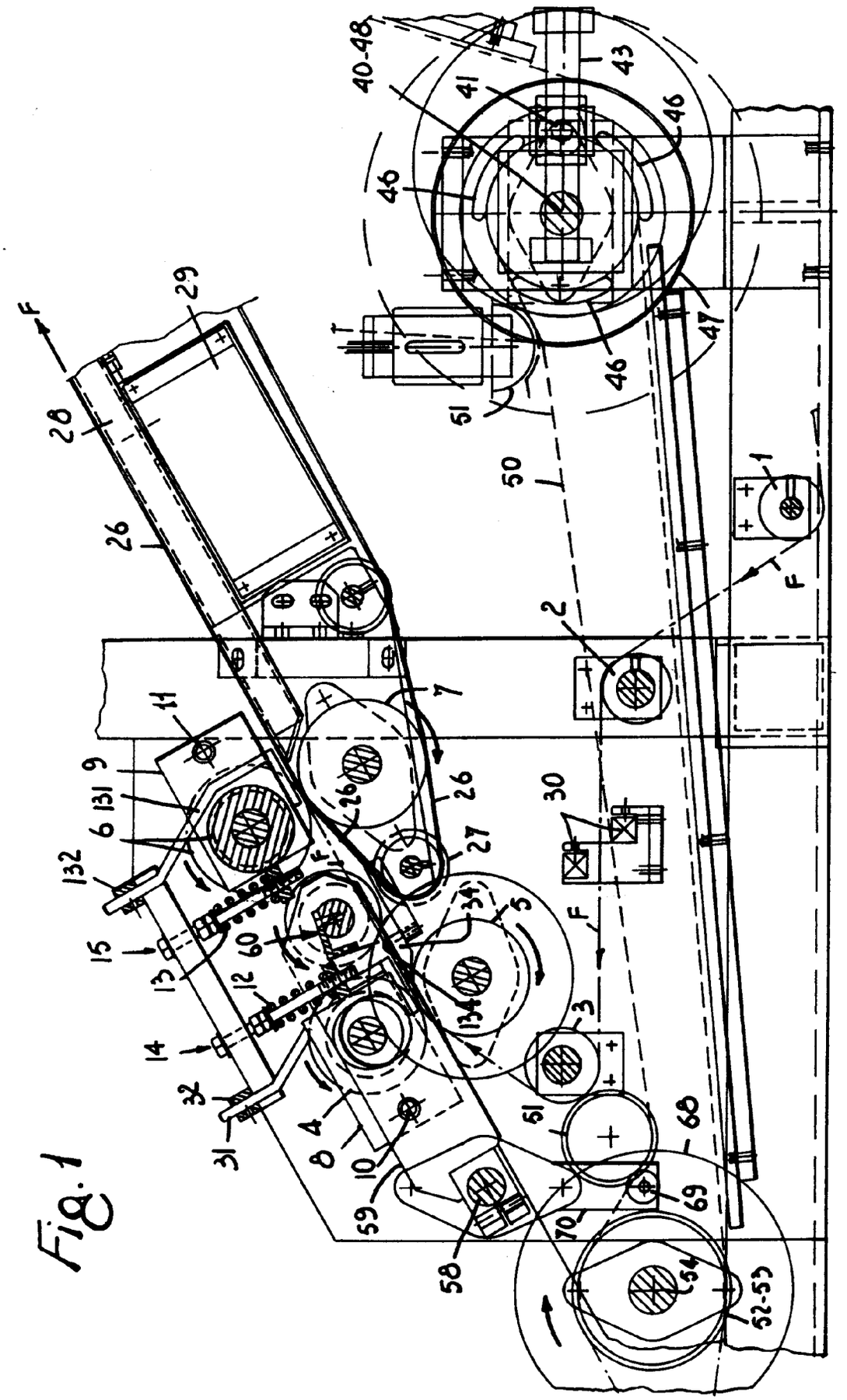
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Fig. 1

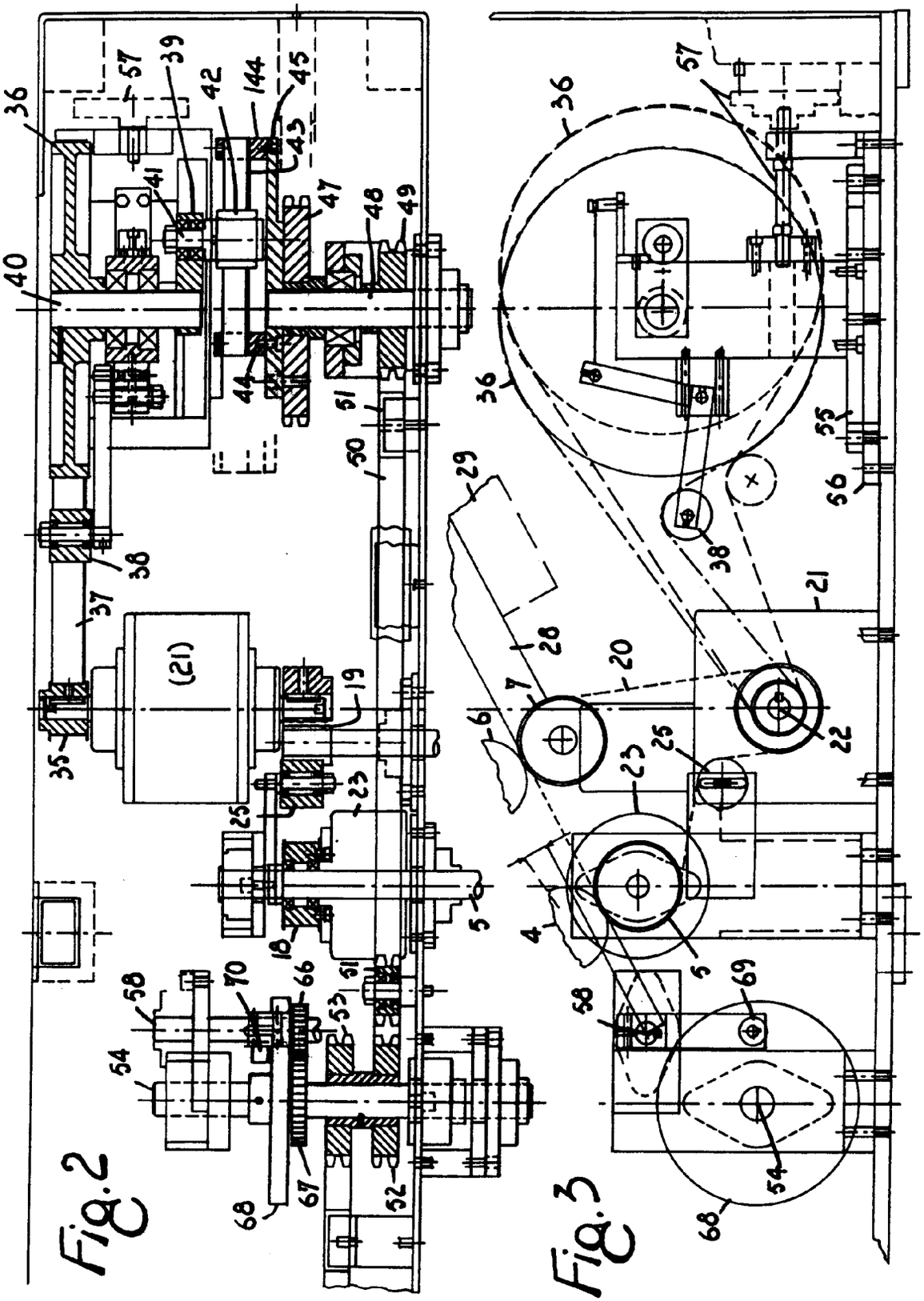
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Fig.2
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Fig.3

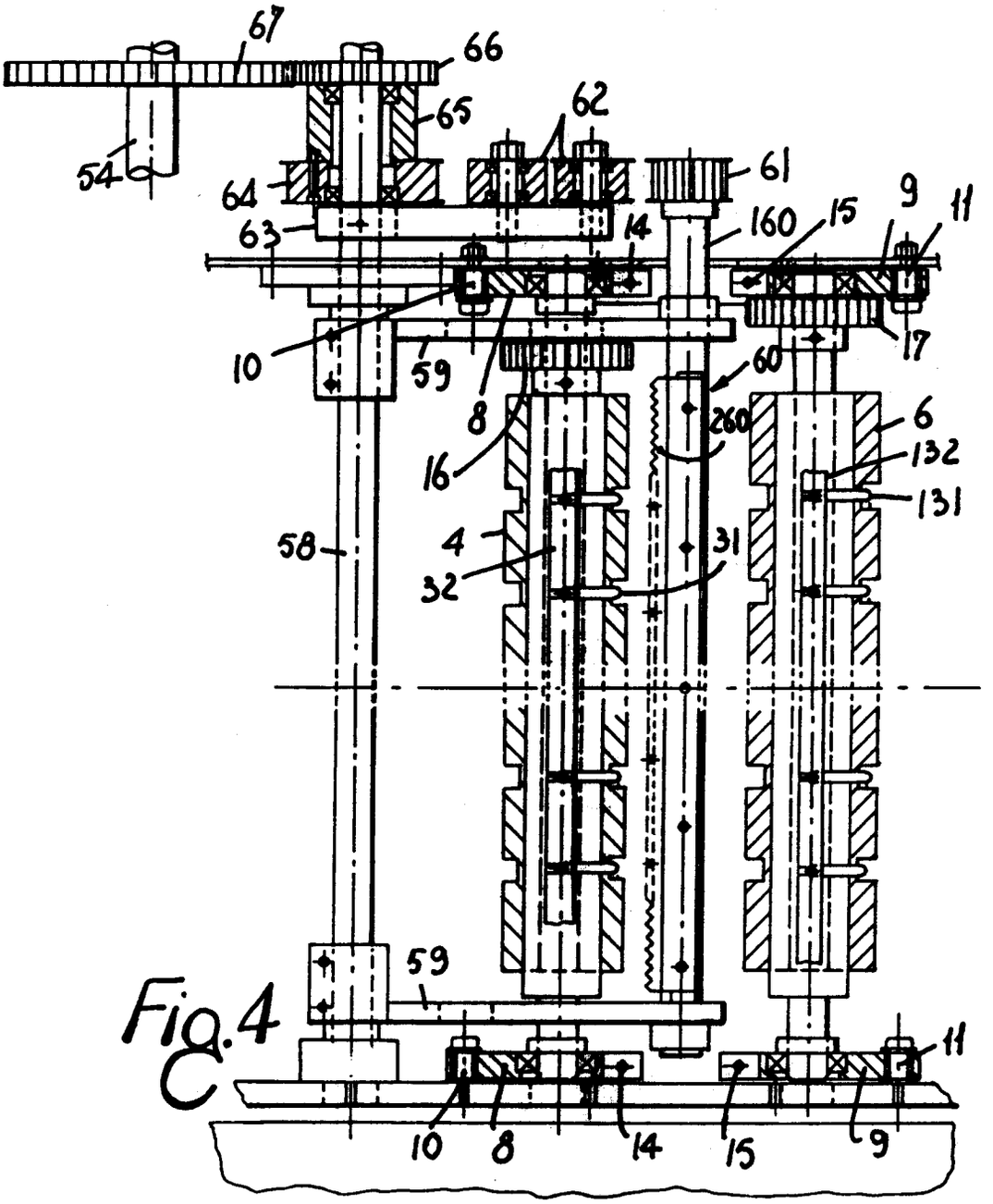
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Fig.4
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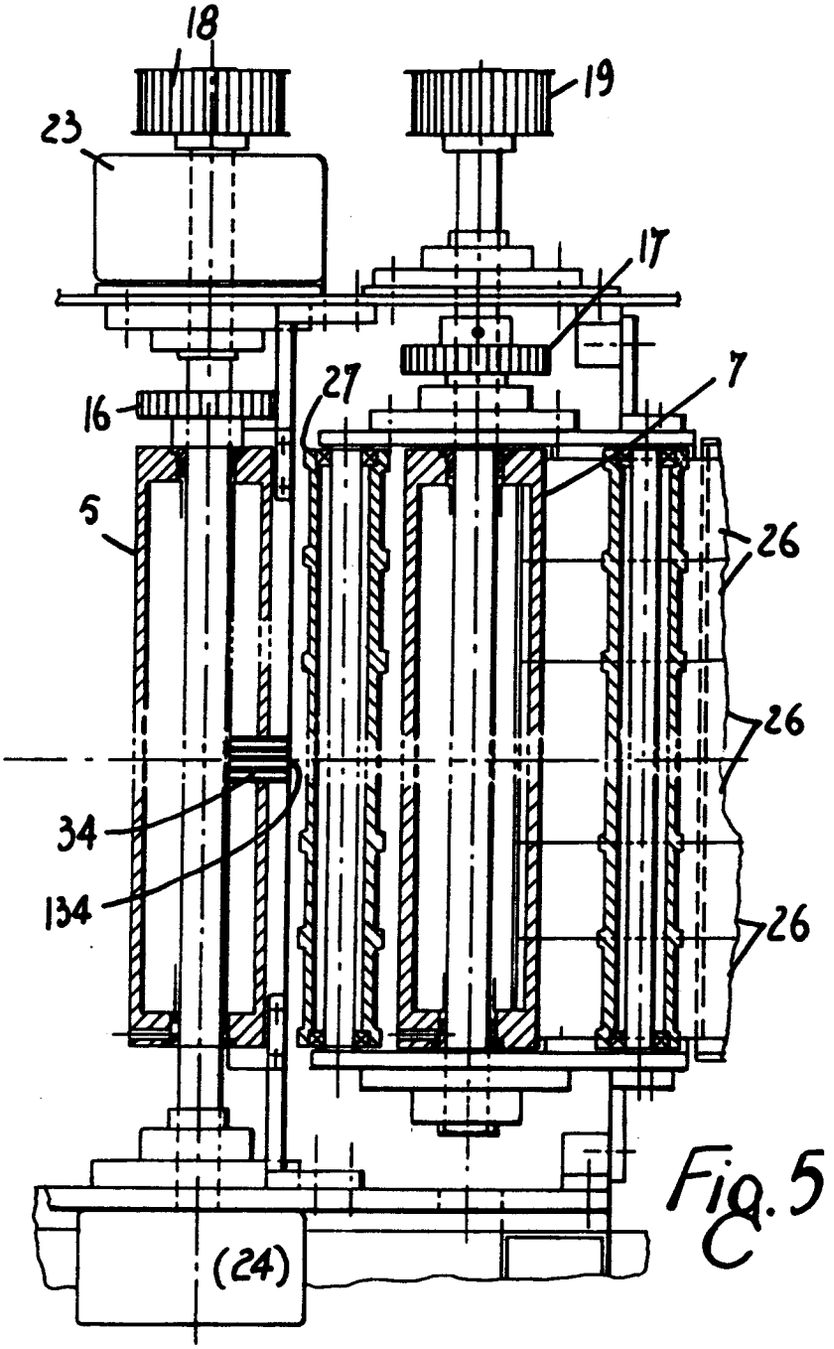

Fig. 5
C