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Pietrucci et al.

[11] **3,769,866**

[45] **Nov. 6, 1973**

[54] **DEVICE FOR TRANSFORMING STRIPS OF MATERIAL INTO DIMENSIONED PIECES**

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[21] Appl. No.: **171,959**

Related U.S. Application Data

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[30] **Foreign Application Priority Data**

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Mar. 31, 1966 France 6655929

[52] **U.S. Cl.** **83/302,** 83/1, 83/337, 83/343, 83/408, 83/424, 83/906

[51] **Int. Cl.** **B26d 1/36**

[58] **Field of Search** 83/302, 337, 343, 83/408, 424, 43, 44, 45, 920, 500, 430, 425, 339, 678, 676, 673, 663, 664, 1, 906; 225/100

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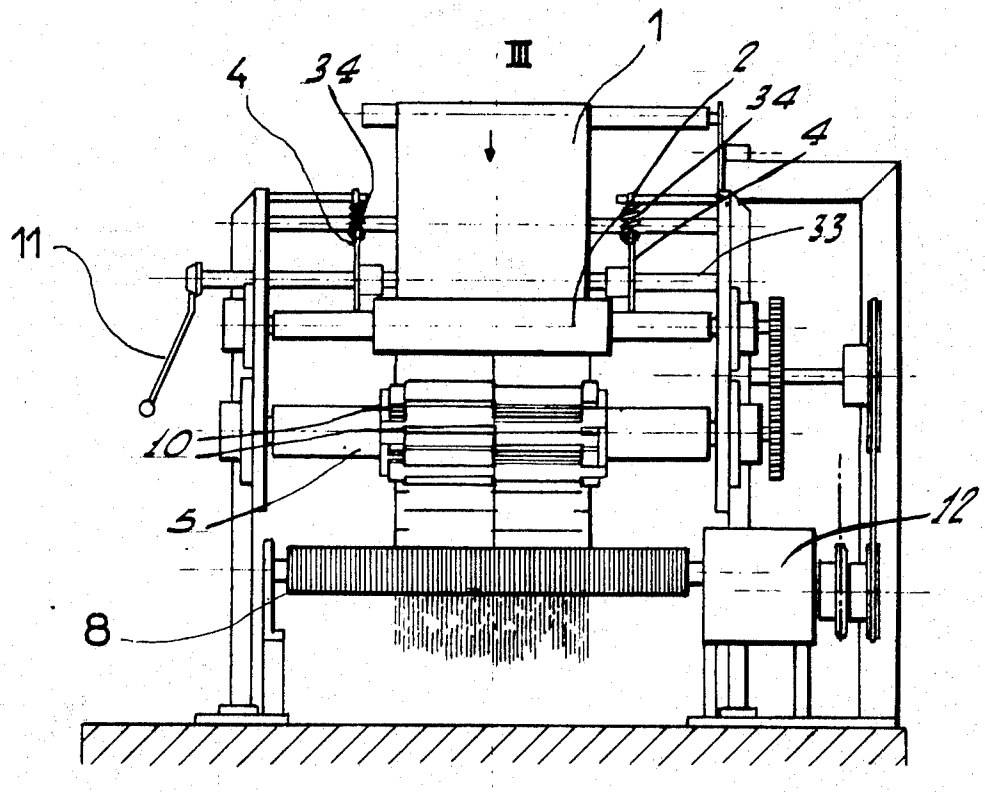
Primary Examiner—Frank T. Yost
Attorney—Maxwell E. Sparrow et al.

[57] **ABSTRACT**

A device for transforming strips of material into dimensioned pieces comprising means to make transverse cuts in the strip so as to define substantially the length of the short pieces to be obtained and means to recut the fragments so obtained in a direction which is different from that of the initial cut in order to obtain short pieces having the requisite dimensions.

9 Claims, 12 Drawing Figures



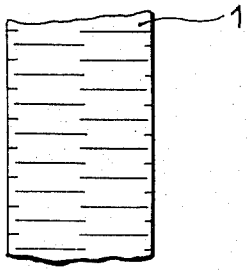


Fig.1

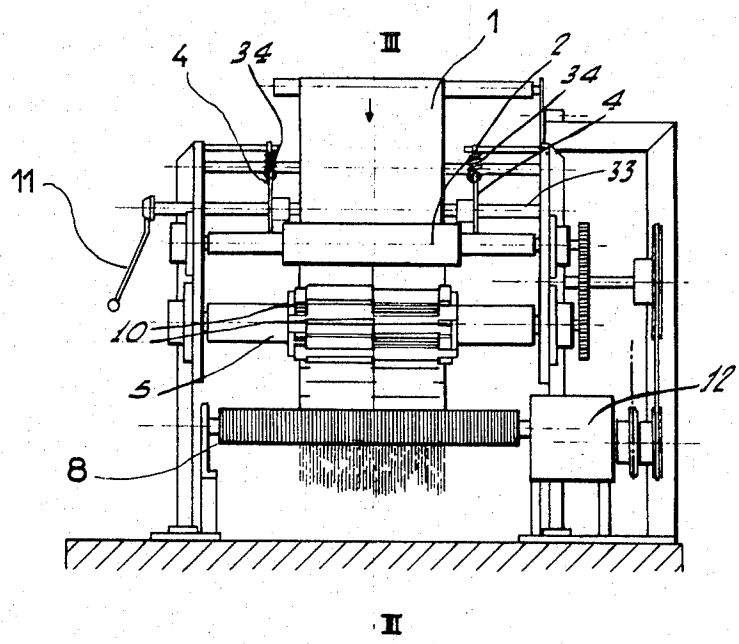


Fig.2

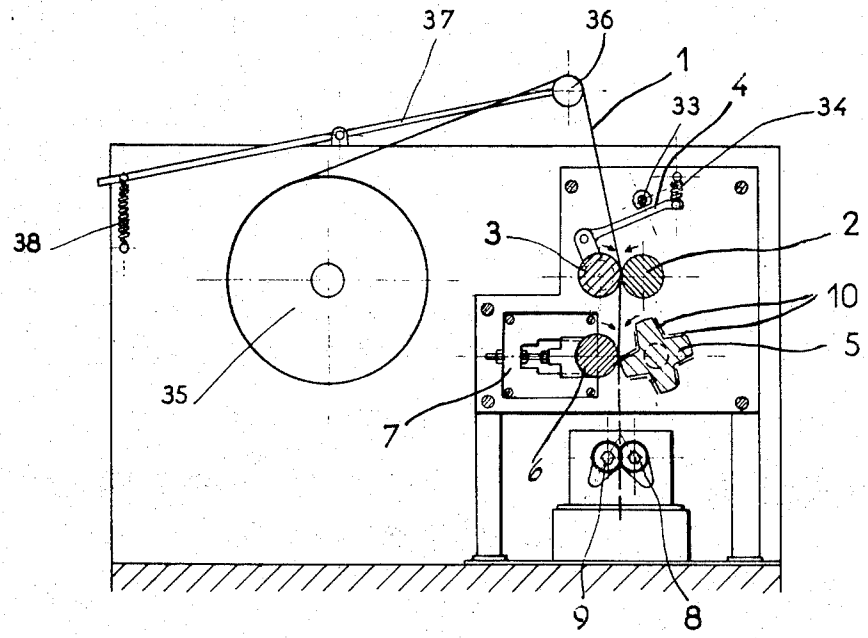

37
36
1
4
33
34
38
3
2
10
5
35
7
6
9
8

Fig. 3

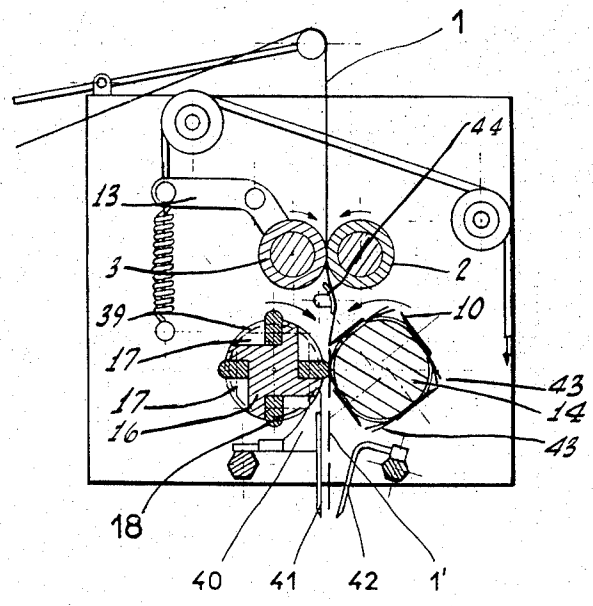

1
44
13
3
2
39
10
17
43
17
14
16
43
18
40
41
42
1'

Fig 4

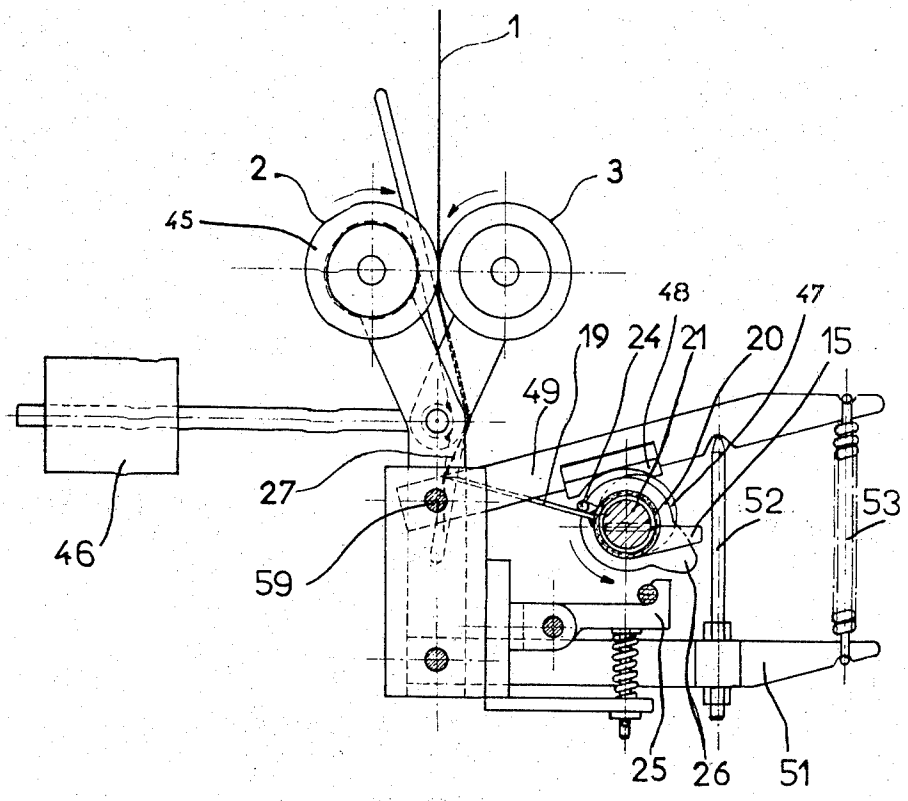

1
2
3
45
48
47
19
24
21
20
15
49
27
52
53
46
59
25
26
51

Fig. 5

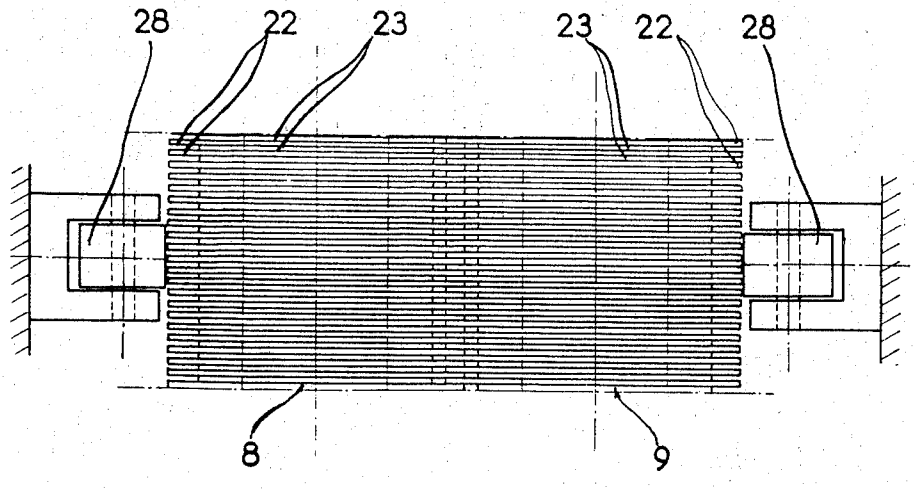

28
22
23
23
22
28
8
9

Fig. 6

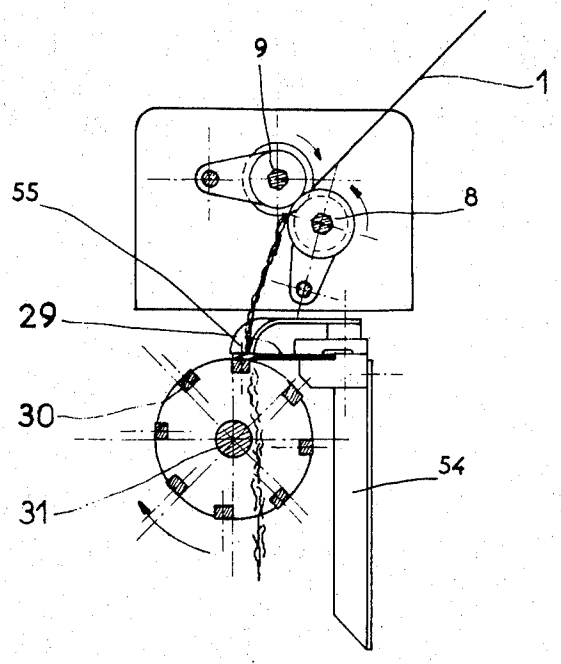


Fig.7

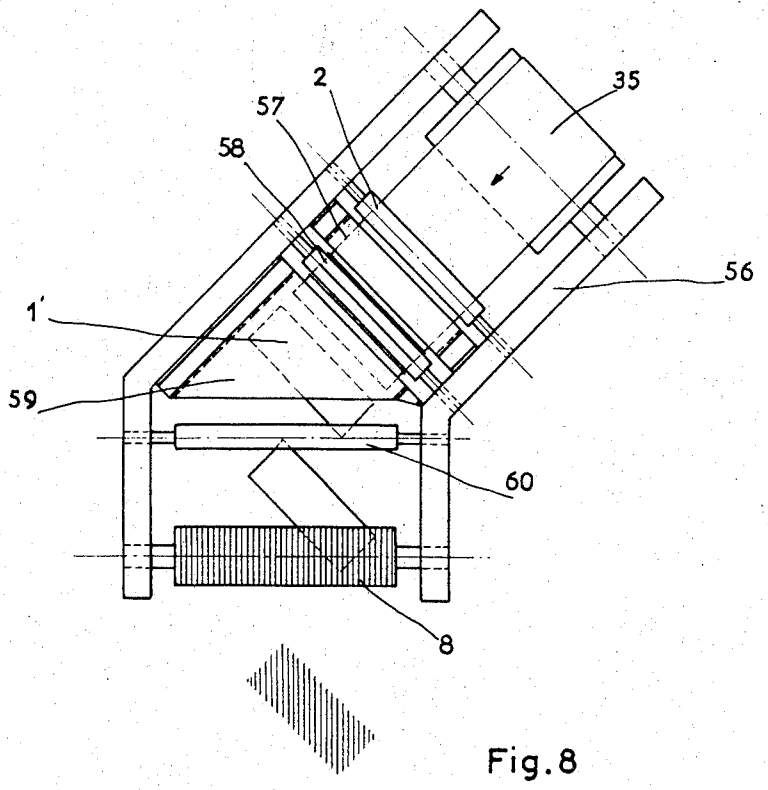


Fig.8

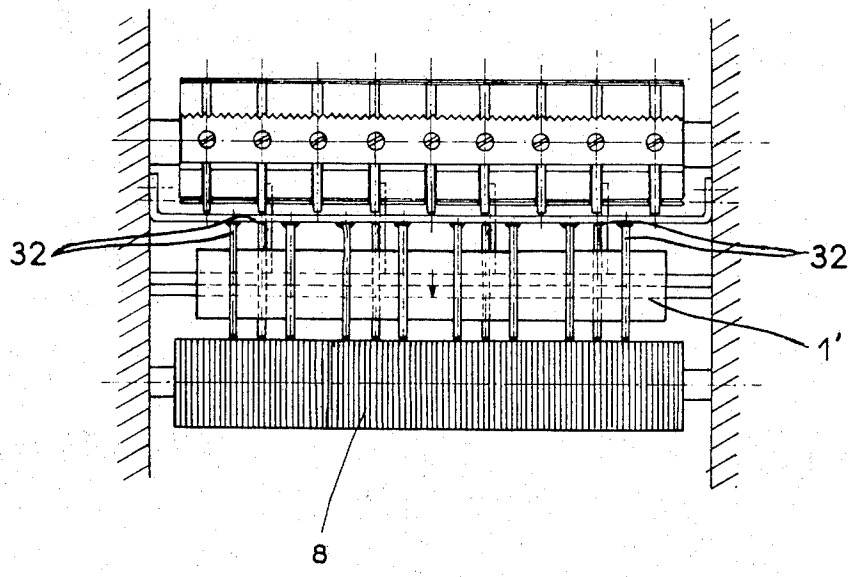


Fig. 9

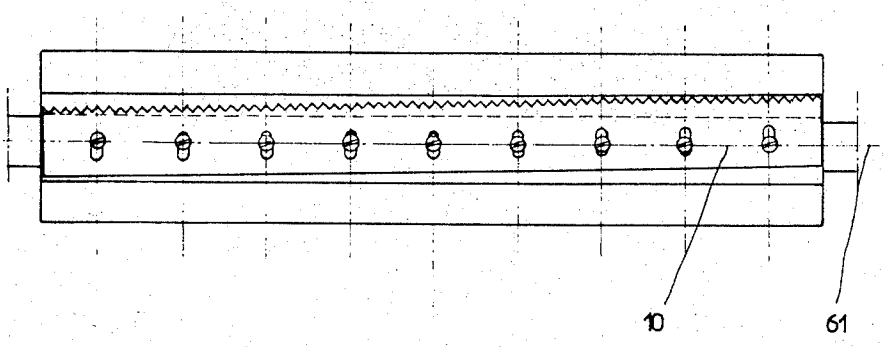


Fig. 10

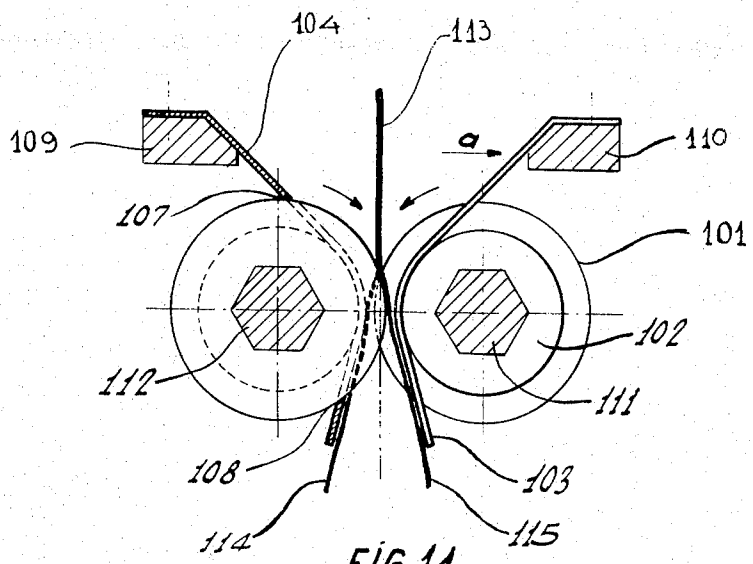


FIG. 11

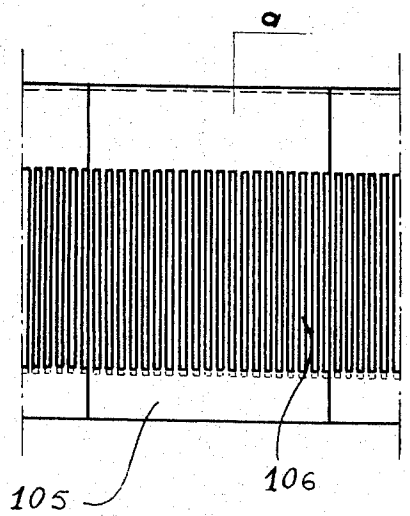


FIG. 12

DEVICE FOR TRANSFORMING STRIPS OF MATERIAL INTO DIMENSIONED PIECES

This application is a continuation of my application Ser. No. 871,726 filed Aug. 13, 1969.

This invention relates to a method and device whereby continuous strips of material which is mainly presented in rolls is cut into pieces of predetermined length and width by a double cutting process.

The method and device referred to are specifically designed to reduce to sections in the form of either cut rods or so-called "short pieces" a strip of material which has small thickness as well as a low degree of rigidity and compactness. Said method and device may be applied to any material which is comparable with paper, and in particular to reconstituted tobacco-leaf material which is intended to be incorporated in the smoking product in the form of short pieces.

Whether the starting material is employed alone or blended with natural tobacco leaves or fragments of leaves, it is possible to transform such material into short pieces by means of conventional manufacturing processes. These processes consist in subjecting a relatively substantial mass of tobacco to the action of a chopping-knife under high compression. However, the high degree of compression which is exerted on the reconstituted tobacco is conducive to the adhesion of short pieces to each other and this in turn leads to a number of disadvantages, all of which affect the quality of the manufactured product. For these reasons, it can be found preferable to perform a separate chopping operation and to bring the reconstituted tobacco to the chopping-knife in a small number of superposed layers, thereby requiring only a low degree of compression and consequently ensuring that the short pieces no longer display any tendency to stick together.

The present invention is thus more especially applicable to the continuous manufacture of short pieces of reconstituted tobacco which are cut from a strip fed from a roll.

The strips of so-called "reconstituted tobacco" which are usually employed have dimensions which are substantially greater than those of the short pieces to be obtained, with the result that the cutting must be double in order to produce pieces of suitable length and width.

This invention relates to a method of double-cutting of continuous strips of material into pieces of predetermined length and width whereby transverse cuts are made in the strip so as to define substantially the length of the short pieces to be obtained, the fragments thus obtained being then re-cut in a direction which is different from that of the initial cut in order to obtain short pieces having the requisite dimensions.

The method of the invention is characterized in that the transverse cuts consist of non-continuous incisions.

The transverse cuts can either be at right angles to the edge of the strip or not and may or may not be made at a distance from each other which corresponds to the requisite length of each short piece.

The cuts made by re-cutting may or may not be located at right angles to the cutting line.

The present invention is also concerned with a device for cutting continuous strips of material into short pieces of predetermined length and width, said device being additionally capable of carrying out the aforesaid method in continuous operation and comprising two rolls for conveying the strip or superposed strips of material which are fed from one or a number of rolls towards rotary cutting units associated with rotary recutting units which produce action in a direction which is different from that of the cutting units, characterized in that it comprises transverse-cutting units which are adapted to produce a non-continuous cutting line.

Either one or a number of rotary units which generate a cylinder of revolution are adapted to pass in close proximity to the cutting edge of a stationary blade and to apply the strip against this latter.

The counterpart against which the strip is applied can consist of bars rotating about one or a number of axes which are in parallel relation thereto.

The cutting blade or blades and the counterpart can be rotary.

During the cutting operation, the layer of material can be held in position by rotary units which are placed on each side of the cutting line in such a manner that the penetration of the rotary blade or blades into the strip of material does not entail the need of any counterpart.

Conveyor rollers or cylinders which are adapted to grip the strip on the upstream and/or downstream side of the cutting line are adapted to apply tension to the strip while the cutting operation is in progress.

A guide can be placed between the units which serves to hold the strip with a view to reducing the span of said strip.

The units employed for holding the strip during the cutting operation can consist on the upstream side of a pair of feed rolls and on the downstream side of thrust-bars which may or may not be mounted radially on a rotary shaft and which apply the strip against an inactive portion of the rotary blade-carrier unit.

Retractable elements can be disposed in said inactive portion.

The cutting blades can have serrated edges.

The speed of the rotary units which initiate the transverse-cutting operation and/or apply tension to the strip during the cutting operation can be higher than the speed of the strip at the input end of the device.

The transverse cut can be made by one or a number of cutting blades which are subjected to a non-continuous movement of rotation with an acceleration which facilitates the penetration of the cutting blade or blades into the strip.

The rotary blades can be inclined tangentially to the direction of displacement thereof with respect to the axis of rotation.

The positions of the cutting blades can be such that their cutting edges are displaced at the moment of engagement with the strip and relatively to said strip in a direction parallel to their paths on a transverse sectional plane of the device.

The rotary cutting blades can be spaced over the useful length of the transverse-cutting unit in such a manner that each cut consists of non-continuous incisions.

The length, number and arrangement of the cutting blades about the axis of rotation can be such that the incisions resulting from one cutting operation correspond to the uncut spaces of the previous cutting operation.

The arrangement of the cutting blades which make the non-continuous incisions can be such that only one edge of the strip is cut during each cutting operation.

The short pieces which are derived from the transverse-cutting operation can be conveyed to the longitu-

dinal re-cutting unit through a substantially vertically passageway.

Said passageway can be constituted by two rows of rods, the axes of which can be parallel to the direction of displacement of the short pieces.

Feed rolls which rotate at the appropriate speed can cooperate with the passageway.

The axis of rotation of the re-cutting units can be located so that the cutting edges thereof make oblique cuts with respect to the direction of feed.

The fragments of strips which are derived from the transverse-cutting operation can be conveyed to the longitudinal re-cutting unit by virtue of the position and oblique location of the axis of said longitudinal re-cutting unit with respect to the axis of the transverse-cutting unit in such a manner that the extremity of one strip is taken by the re-cutting unit prior to its release by the cutting unit.

The transverse-cutting units can be disposed at equal distances from the axis of rotation in an asymmetrical manner.

The system which controls the motion of the rotary units, initiates the transverse-cutting operation and applies tension to the strip during the cutting operation can be so arranged as to vary the speed of rotation thereof at predetermined intervals.

The speed of said units vary in a continuous manner.

Rolls can be applied against the longitudinal-cutting discs at the mid-point of the span of the shaft on which said discs are supported in a position which is substantially diametrically opposite to the cutting line.

The longitudinal-cutting unit can comprise two stacks of discs mounted on two parallel shafts and held in position by spacer members, said discs being disposed in interjacent relations to a predetermined and adjustable extent. The disc can be provided with a plane cutting edge and so designed that the strips which are introduced therein are cut to the thickness of a disc or of a spacer member.

However, by means of an arrangement of this type, the ribbons or dimensioned pieces which are thus cut to size have a tendency to wind around the spacer members and to remain between the discs and to result in clogging.

In order to forestall any danger of winding or clogging of the ribbons or pieces which are cut around the spacer members between the cutting discs, provision can be made for guides which occupy the bottom of each channel substantially in the zone of interengagement between discs and which extend on each side of said zone in such a manner as to define passageways for the material which is to be cut or which has been cut.

In order to ensure that the material to be cut is correctly conveyed and that the cut material is correctly discharged, the guides can be associated on each side thereof with solid plates which are brought level with the volume described by each stack of discs and designed to extend the passageways over at least the full length of the stacks.

The guides can be selected from any suitable material; it appears preferable to select a material which has lower strength than the discs and spacer members in order that said guides may thus be readily replaced in the event of rapid wear.

A number of practical modes of application of the invention are illustrated in the accompanying drawings, in which:

FIG. 1 is an exemplified illustration of incisions which are formed in a strip of material in accordance with the method herein described.

FIG. 2 is a front view of the device and corresponding to one mode of application of the invention.

FIG. 3 is a vertical sectional view taken along line III—III of FIG. 2.

FIG. 4 is a sectional view of a device showing a different mode of application of a transverse-cutting operation.

FIG. 5 is a sectional view of another mode of application.

FIG. 6 is an overhead plan view of the central portion of the longitudinal-cutting unit.

FIG. 7 is a sectional view of a device in which the longitudinal cutting operation is carried out prior to the transverse cutting operation.

FIG. 8 is a diagram showing a particular relative position of two devices for successive cutting.

FIG. 9 shows an example of the system of interconnection of two successive-cutting devices.

FIG. 10 shows a particular arrangement of a cutting blade on a transverse-cutting drum.

FIG. 11 is a transverse sectional view of an alternative form of the longitudinal-cutting unit fitted with guides constituted by plates in which specially designed openings have been cut.

FIG. 12 is a partial view in elevation in the direction of the arrow *a* of FIG. 11.

As shown in FIG. 1, incisions are made transversely in the strip 1 which will then be cut lengthwise. The incisions are complementary from one cutting line to the other and are formed on only one edge in each line.

As shown in FIGS. 2 and 3, there are disposed from the upstream and to the downstream and the roll 35 of strip to be cut, the roller 36 at the extremity of the arm 37 which is capable of absorbing variations in tension of the layer of material by virtue of the spring 38, feed rolls 2 and 3, the blade-carrier cylinder 5 and its counterpart 6 or backing roll which is coupled to the regulating unit 7, the stacks of discs 8 and 9 for the longitudinal cutting operation. The cutting blades 10 are mounted lengthwise along the blade-carrier cylinder 5 so as to form the incisions shown in FIG. 1. The level 11 permits the separation of the rolls 2 and 3 for the introduction of the strip by producing the rotation of the shaft 33 to which the arm 4 is rigidly fixed, said arm 4 being adapted to apply the roll 3 against the roll 4 in the normal position thereof under the action of the restoring spring 34. The drive to the complete assembly is effected by the unit 12 which produces the rotation of the different shafts by means of transmission belts, chains or gearings.

The transverse-cutting unit of FIG. 4 comprises from the upstream end to the downstream end the feed rolls 2 and 3 which can either be separated or held applied against each other by means of a tensioning device which produces action on the member 13, the rotary blade-carrier cylinder 14 and the thrust-bar carrier 16 which is located in oppositely facing relation thereto. The blade-carrier 14 and the thrust-bar carrier 16 rotate substantially at the same speed and in opposite directions. The cutting blades 10 are mounted lengthwise along the cylinder 14 in such a manner as to penetrate during their movement of rotation into the recesses 17 of the thrust-bar carrier 16 without coming into contact with the counterpart. Retractable pushers or thrust-

bars 18 are applied against the cylinder 14 so as to bear on the portions of said cylinder which are located between the cutting blades.

The thrust-bars 18 are retractable by virtue of the assembly (not shown in the drawings) of the cylinder 16 which is supported at the shaft ends by means of link-arms. The cylinder 16 is provided with channels 39 in which is engageable the top portion of the plate 40 for the purpose of guiding the short pieces within the passageway which is formed by the two elements 41 and 42.

Flexible tongues 43 are mounted on the cylinder 14 between the cutting blades. A guide 44 is disposed between the feed rolls 2 and 3 and the cutting unit 14 – 16.

The tangential velocity at the point of contact of the cylinders 14 and 16 is higher than the tangential velocity at the point of contact of the rolls 2 and 3.

Referring now to FIG. 5, a serrated cutting blade 19 is mounted on a hollow cylinder 20 within which a shaft 21 is adapted to rotate. The rotary cylinders 2 and 3 are fed rolls for conveying the strip 1 and are applied against each other under the action of balance-weights 48.

A coil spring 24 is attached at one end of the cylinder 20 and at the other end to the shaft 21. A retractable stop 25 is capable of arresting the cutting blade 19 by means of a lug 15 which is integral with the cylinder 20. The cam 26 is made fast for rotation with the shaft 21 and serves to withdraw the stop 25 at the proper moment. Stationary bars 27 are additionally adapted to penetrate into the channels 45 which are formed in the roll 2. Said bars are spaced in such a manner as to enable the serrated cutting edge to pass through and perform the function of a counterpart, thereby preventing the strip from retracting under the impact. Provision is additionally made on the apparatus for a braking system which is designed to slow down the movement of the cutting blade 19 at the end of travel. Said braking system is made up of a cam 47 which is integral with the cylinder 20 and adapted to brake said cylinder by frictional contact within the rounded cavity of the shoe 48 which is fitted on the oblique arm 49. Said arm 49 is capable of performing a pivotal movement about the pin 50 in such a manner that the minimum spacing which is provided with respect to the arm 51 by virtue of the adjustable rod 52 can be increased to the extent which is necessary in order that the cam 47 may be freed from the obstruction formed by the shoe 48 as a result of the elongation of the spring 53.

As shown in FIG. 6, the discs 22 and spacer members 23 which are mounted on two parallel shafts have a flat edge and are placed in interfitting relation. Rolls 28 are provided for the purpose of supporting the center of the span.

FIG. 7 shows a stationary cutting blade 29 which is mounted on a frame 54 and against which the strip 1 is applied periodically under the action of bars 30 which are arranged as on a squirrel cage which is rotatable about the shaft 31. That portion of the bars which is located at the greatest distance from the center describes a circumference which passes close to the cutting edge of the knife-blade. A ledger-plate 55 is disposed above the cutting blade 29.

FIG. 8 is a drawing which shows an alternative form of the invention in which the transverse-cutting and longitudinal-cutting axes are oblique relative to each other. There are mounted on the frame 56 from the upstream end to the downstream end the roll 35 of strip material to be cut, the feed rolls 2 and 3 (only the roll 2 being shown in the figure), a guide passage 57, the transverse-cutting cylinder 56, a guide passage 59, a pair of feed rolls 60 and the cutting cylinders 8 and 9, only one of which is shown in the figure. The axes of the units 60, 8 and 9 are oblique with respect to the other rotating members.

As shown in FIG. 9, the strips of material are conveyed between the transverse-cutting and the longitudinal re-cutting units by means of a passageway which is defined by rods 32 disposed on each side of the path followed by the strips 1'.

FIG. 10 shows a particular arrangement of a cutting blade 10 which is fixed on the cutting cylinder in such a manner that its cutting edge is located at an oblique angle with respect to the axis of rotation 61.

The device which is represented in FIGS. 2 and 3 operates as follows:

The continuous strip 1 which is conveyed by the rolls 2 and 3 is subjected to transverse-cutting operations between the cylinders 5 and 6. The cutting blades 10 are so arranged as to form incisions as shown in FIG. 1. These incisions have been made in such a manner that the strip retains sufficient strength and rigidity between the transverse-cutting operation performed between the cylinders 5 and 6 and the longitudinal-cutting operation which is performed between the cylinders 8 and 9. Accordingly, the cutting blades 10 of the cylinder 5 have been disposed in such a manner that the incisions of one cutting operation correspond to the uncut spaces of the previous cutting operation and that an incision is made in only one edge of the strip at the time of each cutting operation. As is readily apparent, the length and number of segments of cutting blades can be other than those shown in the drawing. It is not essential to ensure that the cutting blade segments should make incisions which are equidistant in the longitudinal direction. It may even prove an advantage to distribute the cutting blades 10 over the blade-carrier cylinder 5 in such a manner as to obtain short pieces having different lengths in predetermined proportions, in which case the length, number and arrangement of the incisions of one cutting operation are determined as a function of the size distribution of the product which it is desired to obtain and of the incisions made at the time of previous cutting operations.

The device which is constructed in accordance with FIG. 4, can be designed according to the composition of the layer of material in order to facilitate the cutting and conveying of the cut strips. The strip 1 which is conveyed by the rolls 2 and 3 at a given speed is cut transversely by the cutting blades 10 while at the same time the downstream portion of the strips 1' is applied by the thrust-bar 18 against the cylinder 14 along a rounded portion which is located between consecutive cutting blades.

By means of this system, the strip is supported and maintained under tension by virtue of a tangential velocity of the unit 14 – 16 at the point of contact which is higher than the tangential velocity which is imparted to the strip by the rolls 2 and 3. The cutting of the strip is accordingly accompanied by tearing at the points of least resistance. In accordance with this form of embodiment, the cutting blades can be provided with serrated cutting edges. In this case, the cutting operation

becomes a perforating operation performed in a broken line, followed by tearing away along this line.

The operation is carried out in a more satisfactory manner by reducing the span of the layer of material between the units **2 – 3** and **14 – 16** by means of a guide **44.** The operation can be made even more effective by means of the tongues **43** which serve to discharge in the direction of the guide **40** the pieces which have been cut within the passageway which is formed by the two elements **41 – 42.**

The velocity which is imparted by the unit **14 – 16** to the cut strip **1'** can be varied over a higher range of values than that of the strip **1.** THe variation can be effected by known means at predetermined time intervals or in a continuous manner. Such variations make it possible to obtain strips having different widths and consequently short pieces having different lengths. The circumstances can be turned to profitable account by obtaining a distribution of short pieces in lengths which conform to a pre-established standard. Such a result can also be achieved by means of an asymmetrical distribution of the cutting blades and thrust-bars over the peripheries of the cylinders **14** and **16.**

In accordance with another form of embodiment of the invention, it is also possible to obtain a predetermined distribution of the lengths of short pieces by virtue of the oblique position of the axis of the longitudinal-cutting unit with respect to the transverse cutting line and by virtue of a suitable choice of the spacing between two successive transverse cuts. This position can correspond to FIG. **8,** which offers a further advantage in that it can be usefully employed for the purpose of engaging one corner of the strip so as to draw this latter into the longitudinal cutting unit **8 – 9** prior to its release by the transverse-cutting unit.

The device which is constructed in accordance with FIG. **5** operates as follows:

The strip **1** which is conveyed by the rolls **2** and **3** passes beneath a "flying" cutter of the periodic action type. During one portion of the cycle, the serrated knife or cutting blade **19** which is attached to the hollow cylinder **20** is maintained stationary by the action of the stop **25** on a lug **15** whilst the continuously rotating shaft **21** tightens the coil spring **24.** When the cam **26** which is integral with the shaft **21** withdraws the retractable stop **25,** the spring is released, thereby initiating the rapid rotation of the hollow cylinder and consequently the cutting blade **19,** whereupon the teeth of the cutting blade penetrate into the strip and tear this latter in a zig-zag line. During the cutting operation, the strip is supported by the bars **27** which perform the function of a counterpart.

The lug **15** and the braking cam **47** are in a stationary relative position and are both fast with the cutting blade in such a manner that the braking action produced on the cam **47** by the shoe **48** commences as soon as the cutting blade has struck the layer of material.

THe longitudinal re-cutting unit of FIG. **6** receives the strip or strips between the two stacks **8** and **9** of discs **22.** Spacer members **23** serve to hold the discs together. The rolls **28** prevent any deflection of the blade-carrier shafts and thus make it possible to set the distance of penetration of the two discs between each other at a smaller value.

The cutting device of FIG. **7** operates by transverse cutting which is performed by the stationary blade **29** against which the strip is applied periodically by the bars **30.** In the example of the figure, the strip is first cut into ribbons by means of a unit of the type shown in FIG. **6** and the cutting blade **29** cuts said ribbons crosswise.

It is readily apparent that the order of operations of FIG. **7** can be reversed, in which case the connection can be established by means of a passageway which can be adapted to cooperate with feed rolls for reprocessing the strips after transverse cutting.

In accordance with any one of the embodiments hereinabove described, the cutting blade or blades can be mounted on the blade-carrier cylinder in such a manner as to make the transverse cutting operation more progressive; this result can be achieved in particular in the manner which is shown in FIG. **10** by inclining the cutting blades tangentially to the axis of rotation. The counterparts can also be inclined in a similar manner.

In the device of FIG. **4,** the cutting operation can also be improved by so determining the inclination of the cutting-blade path in the plane of the cross-section shown that, at the moment of engagement with the strip, the cutting edge is caused to beat the strip parallel to the direction which is materialized by the cutting path.

In the example of construction which is illustrated in FIGS. **11** and **12,** the rotary units for longitudinal cutting are constituted as shown in FIGS. **2** and **6** by discs **101** mounted on parallel shafts **111** and **112.** Said discs are separated by spacer members **102** of smaller diameter and are so arranged that one disc of one stack penetrates exactly and to a given variable distance between two discs of the second stack.

The two guides **103** and **104** are fixed on the cross-members **109** and **110** and the discs **101** penetrate into the openings **106** provided in the plates **105** which constitute the guides, the top edge **107** and bottom edge **108** of which provide a tight seal.

The strip or strips **113** are delivered from the apparatus at **114** or at **115,** depending on whether they have passed over the spacer members on the side corresponding to the guide **104** or **103** respectively.

It can now be visualized that, when the strip **113** passes between the cutting discs, said strip is carried along and cut into ribbons having a width equal to the width of the space member. The ribbons are pushed forward and, as a result of the movement of rotation of the discs, are also pushed towards the spacer members in front of which they encounter the guides which are inserted therein. Said ribbons are separated in this manner from the movement of rotation, slide over the full length of the guide and are then freely discharged.

As is understood, it would also be feasible to make use of a number of similar plates placed end to end by simple juxtaposition in such a manner as to facilitate their disassembly.

What is claimed is:

1. A device for cutting a strip of material into short pieces of predetermined lengths or widths, said device comprising transverse incision means for producing successive parallel spaced incision lines transverse to said strip, said transverse incision means comprising a first rotating member carrying a plurality of cutting blades, each of said blades having a cutting front edge and a rear edge, said blades being spaced around the lateral surface of said first rotating member, rotary lon-

gitudinal cutting means for producing parallel continuous cutting lines recutting said transverse incision lines, first rotating means located upstream of said transverse incision means for conveying said strip, and second rotating means located downstream of said transverse incision means for holding said strip in position during the action of said transverse incision means, said second rotating means being operable to permit said incision action without a counter member, said second rotating means comprising a second rotating member rotating in a direction opposite to the direction of rotation of said first rotating member, a plurality of thrust members on said second rotating member, each one of said thrust members having a free end and being spaced around the lateral surface of said rotating member, said thrust members being disposed whereby said free ends thereof may come into contact with said lateral surfaces of said first rotating member in the free spaces between said cutting front edges of said cutting blades and said rear edges of said following blades, said free ends of said thrust members pressing said strip against said lateral surfaces of said first rotating member.

2. The device as defined in claim **1,** wherein said strip is a continuous strip of material.

3. The device as defined in claim **2** wherein said short pieces have a length corresponding to said distance between said successive transverse incision lines and having a width corresponding to the distance between said longitudinal cutting lines.

4. The device as defined in claim **3** wherein said successive parallel spaced incision lines transverse to said continuous strip are non-continuous.

5. A device according to claim **1,** said cutting blades being mounted on said surface of said first rotating member with said cutting edges thereof moving at the instance of engagement with said strip and relatively thereto in a direction parallel to the paths thereof on a transverse sectional plane of said device.

6. The device as defined in claim **1,** wherein said second rotating means are driving means and said first rotating means are braking means, said first and said second rotating means being controlled for maintaining said strip under tension.

7. The device as defined in claim **6** wherein said driving means comprises thrust bar means.

8. The device as defined in claim **7,** wherein said braking means comprises roll means.

9. A device for cutting a strip of material into short pieces of predetermined length and width, said device comprising transverse incision means and rotary longitudinal cutting means arranged in juxtaposition for successive operation on said material, said transverse incision means being disposed for producing longitudinally spaced transverse incision lines across the width of said strip of material less than the total width thereof, but two successive incision lines together being disposed for covering said total width, and said longitudinal cutting means being disposed for producing parallel, continuous cutting lines substantially longitudinally of said strip.

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