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Larroche

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[54] **STORING MECHANISM FOR TOBACCO-GATHERING MACHINE**

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July 19, 1972 France 72.25959

[52] **U.S. Cl.** **214/5.5;** 56/27.5; 214/519

[51] **Int. Cl.²** **A21B 1/06**

[58] **Field of Search** ..... 214/83, 83.1, 519, 5.5, 214/1 PB; 56/27.5

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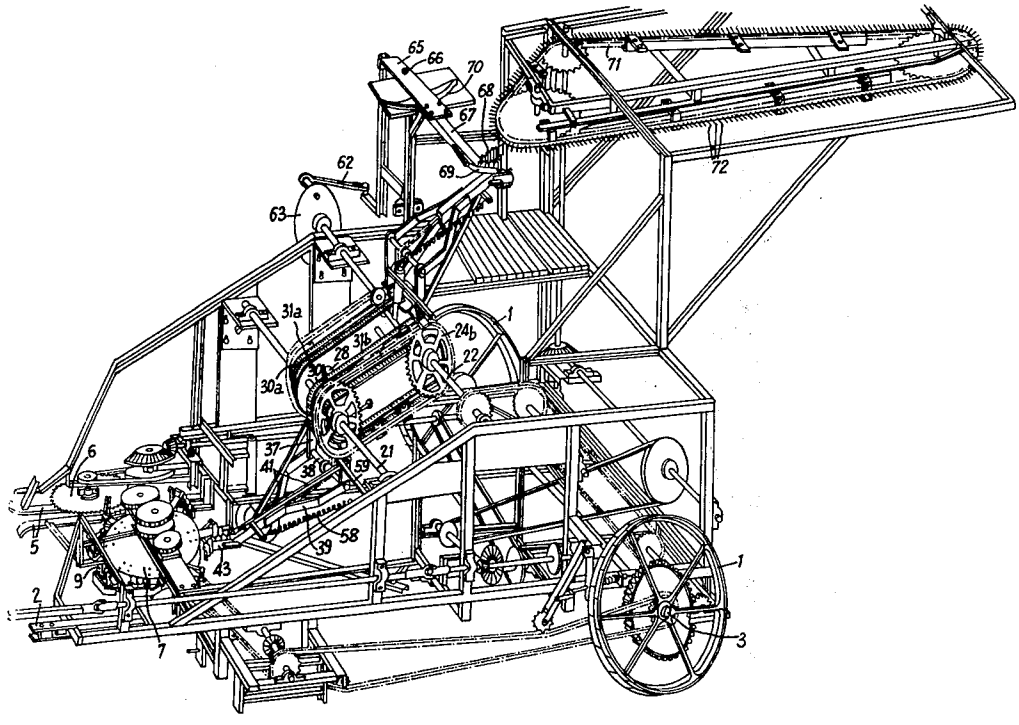
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Attorney, Agent, or Firm—Pierce, Scheffler & Parker

[57] **ABSTRACT**

The tobacco heads caught and cut by the machine are carried along through a pin extending across their stalks towards a succession of similar rotary pusher members urging the tobacco heads along overlapping paths, so as to fill in succession a horizontal tube which is thenafter caused to drop onto collecting means. The tubes to be thus filled are brought in succession in an operative filling position as provided by their lying horizontally in adjacent relationship on a sloping plane.

6 Claims, 6 Drawing Figures



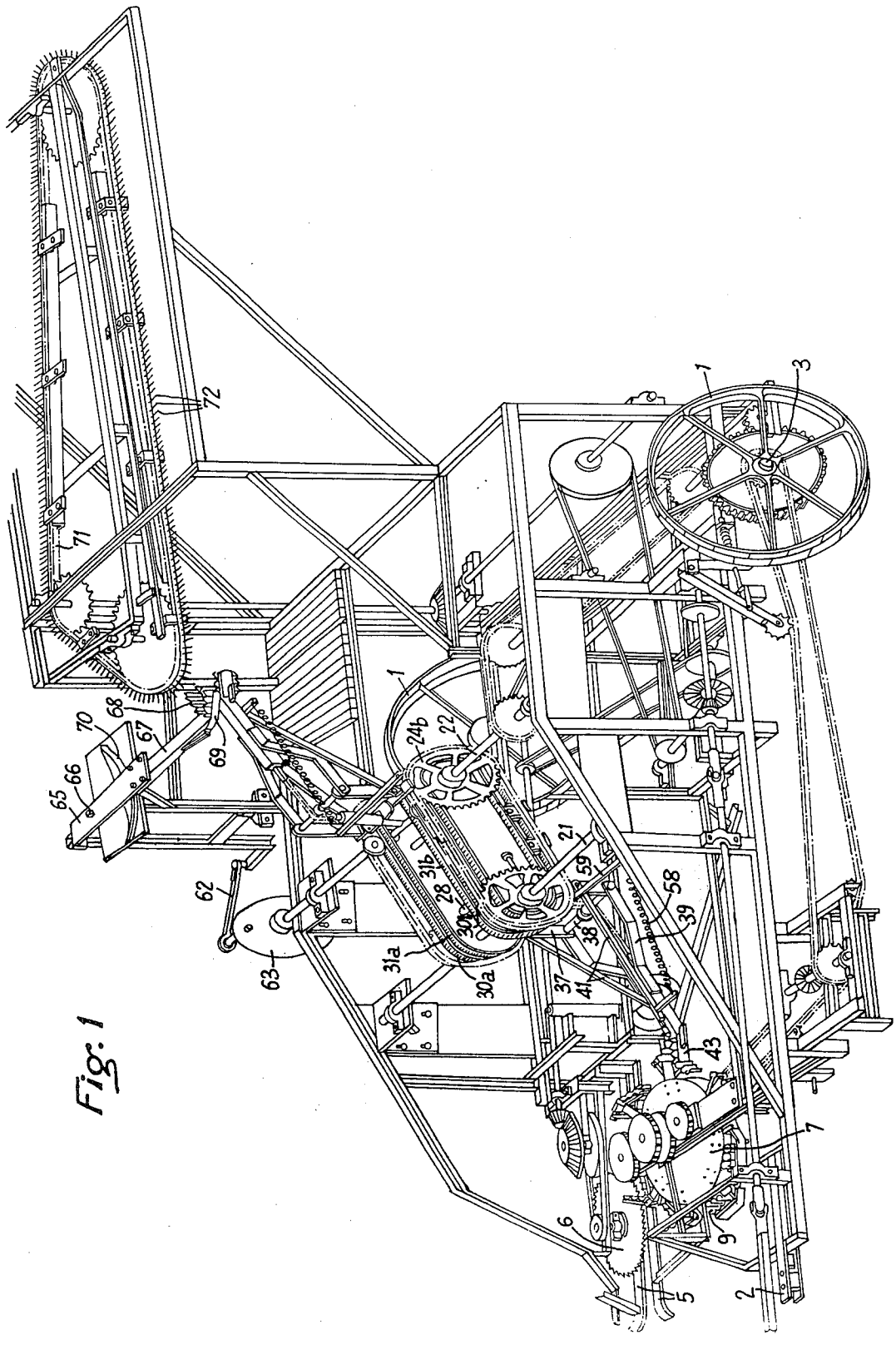

1
3
72
71
68
70
67
69
65
66
62
63
1
24b
22
21
31b
28
30
59
58
39
38
31a
30a
37
41
43
7
6
9
5
2

Fig. 1

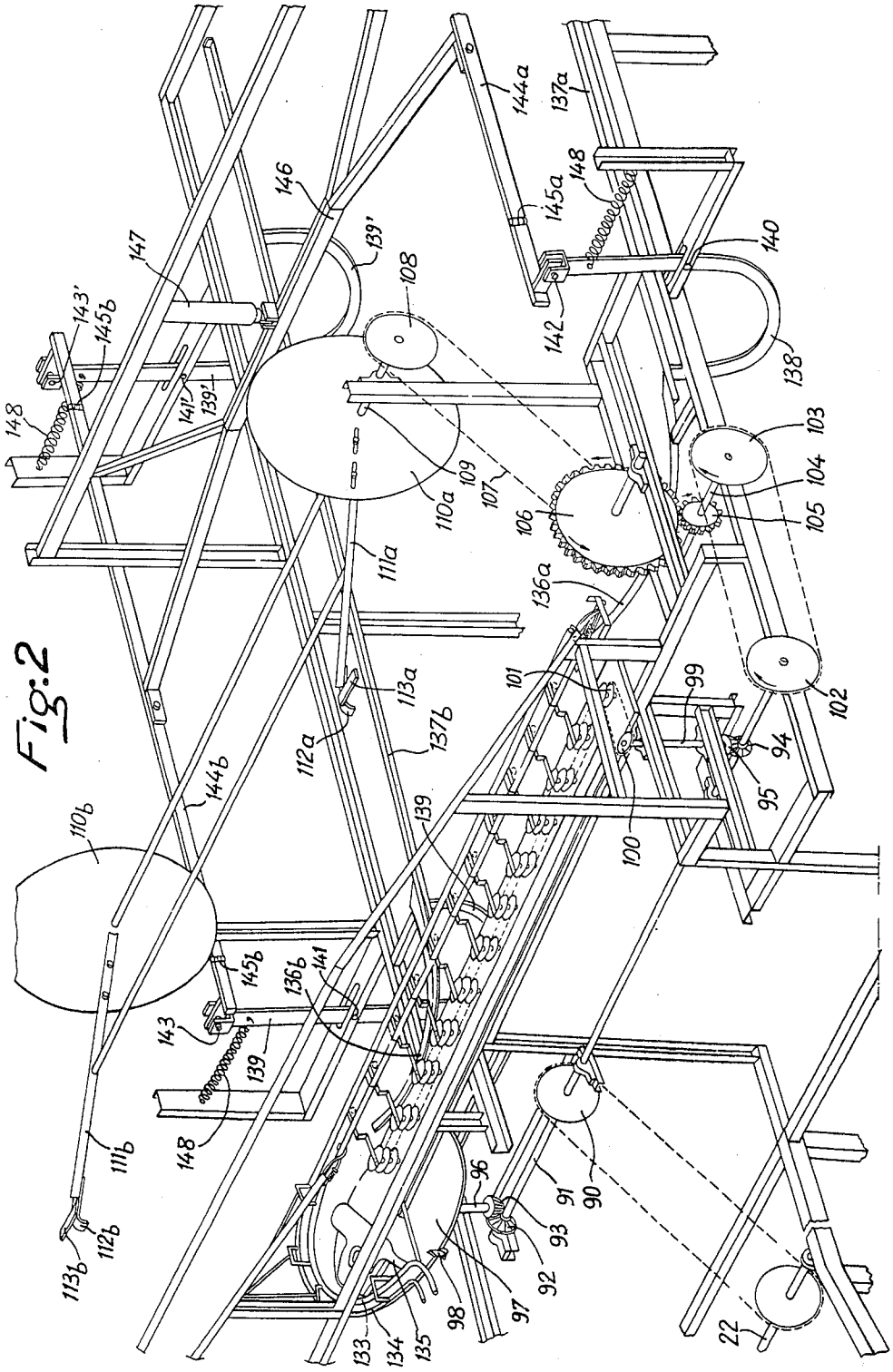

144a
137a
146
148
145a
147
139'
108
140
143'
145b
142
138
148
141'
139'
103
109
104
110a
107
105
106
111a
136a
101
99
113a
137b
102
112a
94
95
144b
139
100
110b
145b
136b
141
143
139
148
111b
96
91
90
112b
113b
93
92
97
98
133
134
135
22

Fig. 2

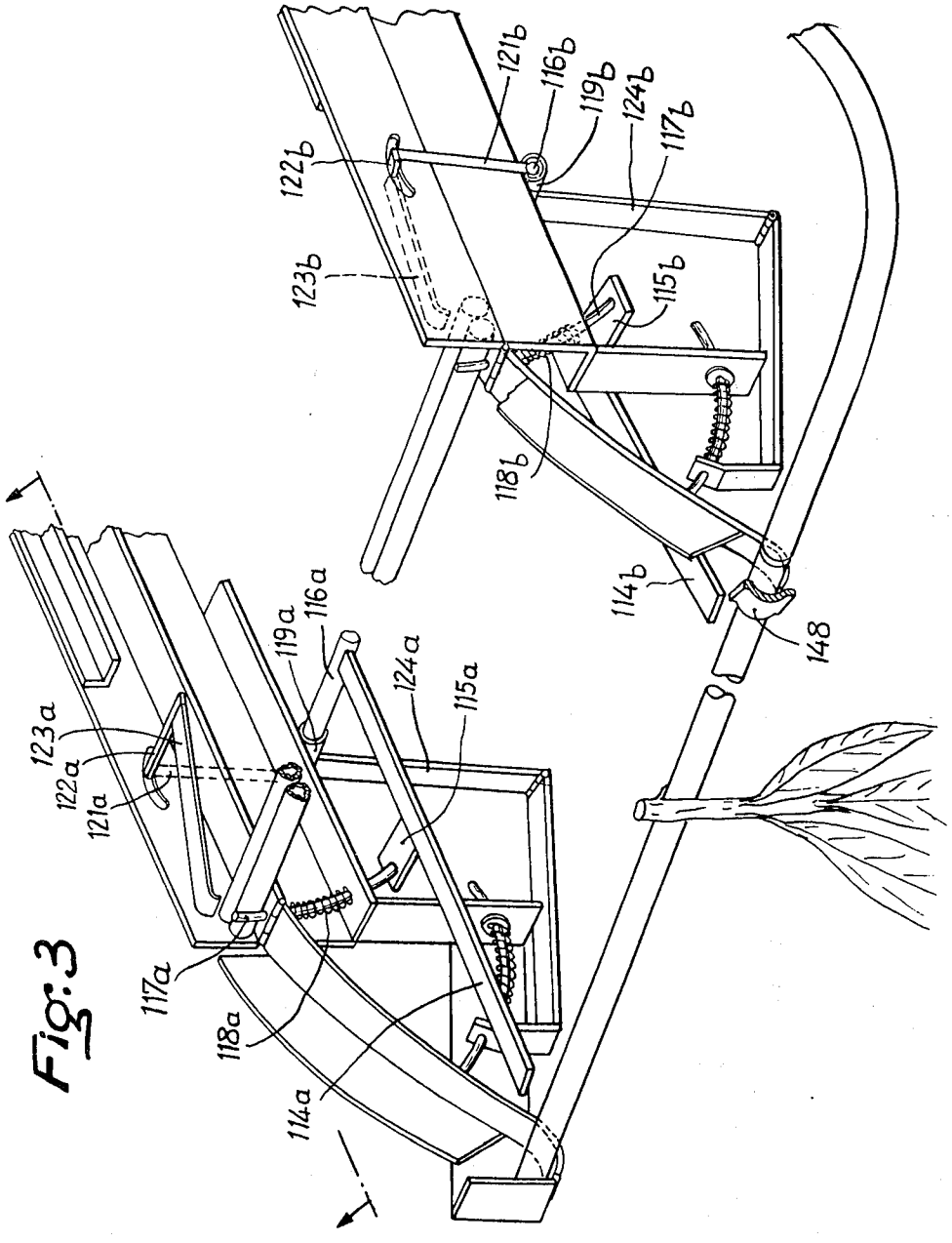

121b
116b
119b
124b
117b
122b
123b
115b
118b
114b
148
119a
116a
124a
115a
123a
122a
121a
117a
118a
114a

Fig. 3

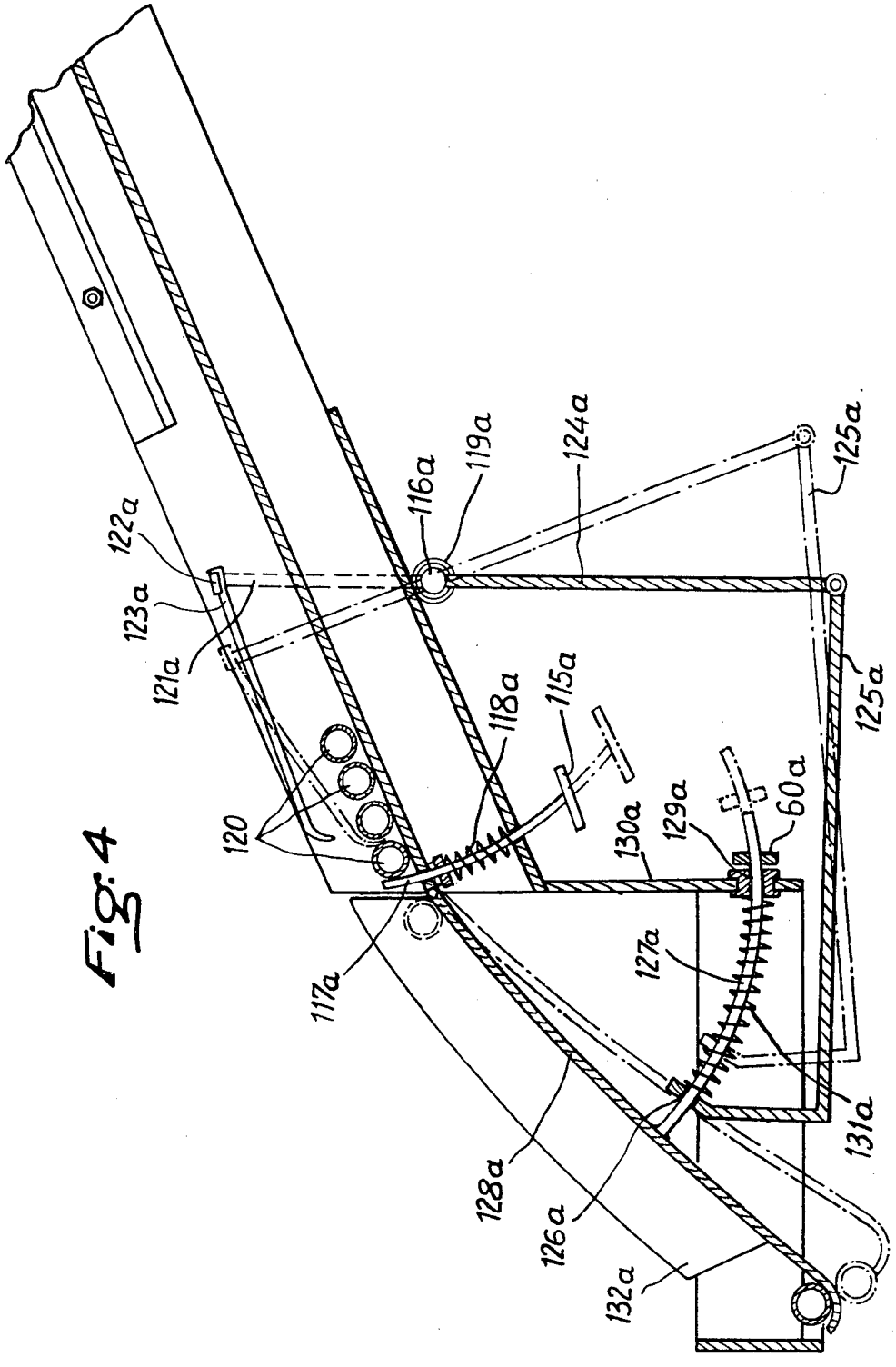

122a
123a
121a
116a
119a
124a
125a
125a
118a
115a
120
130a
129a
60a
117a
127a
131a
128a
126a
132a

Fig. 4

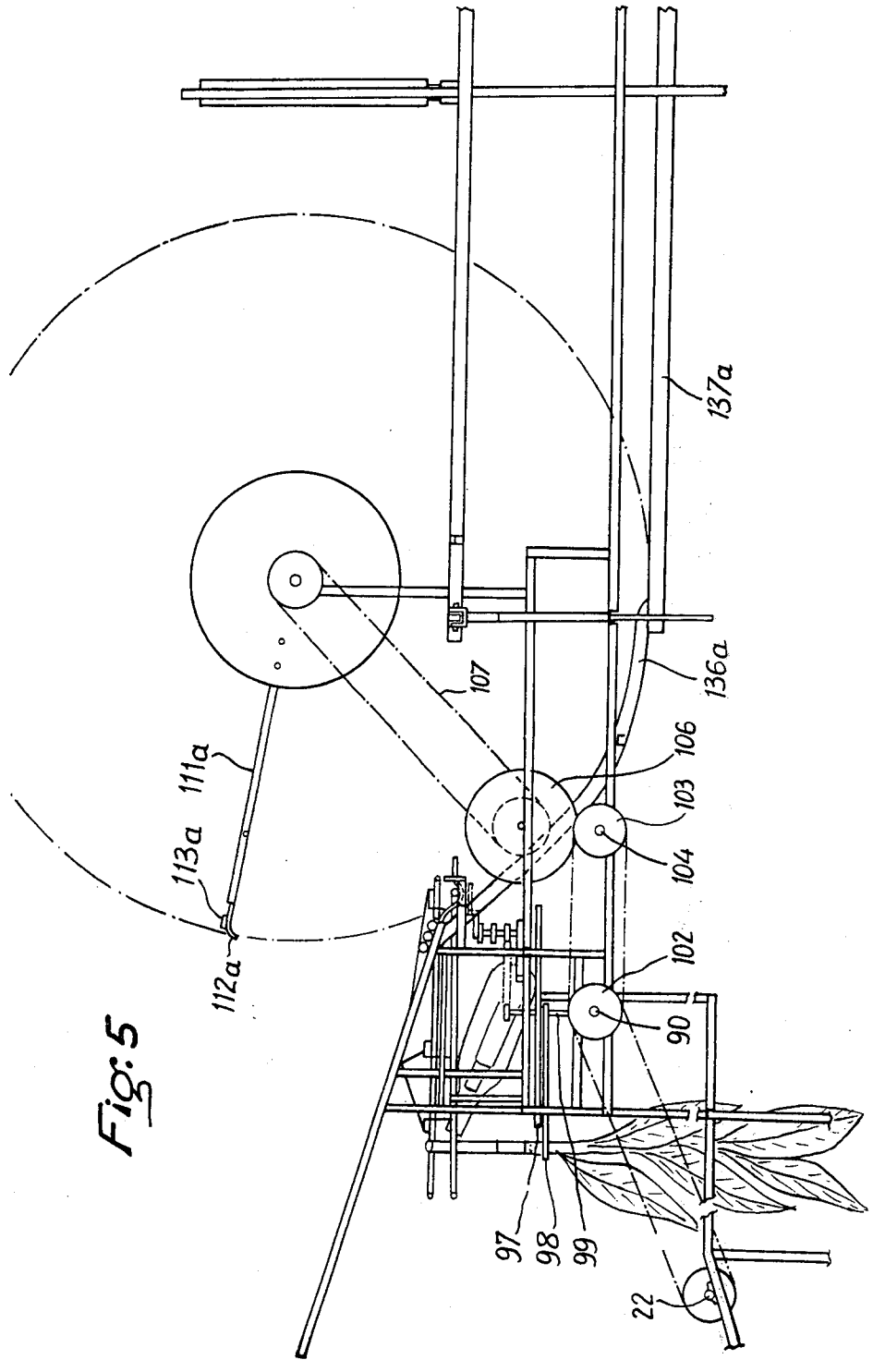


Fig. 5

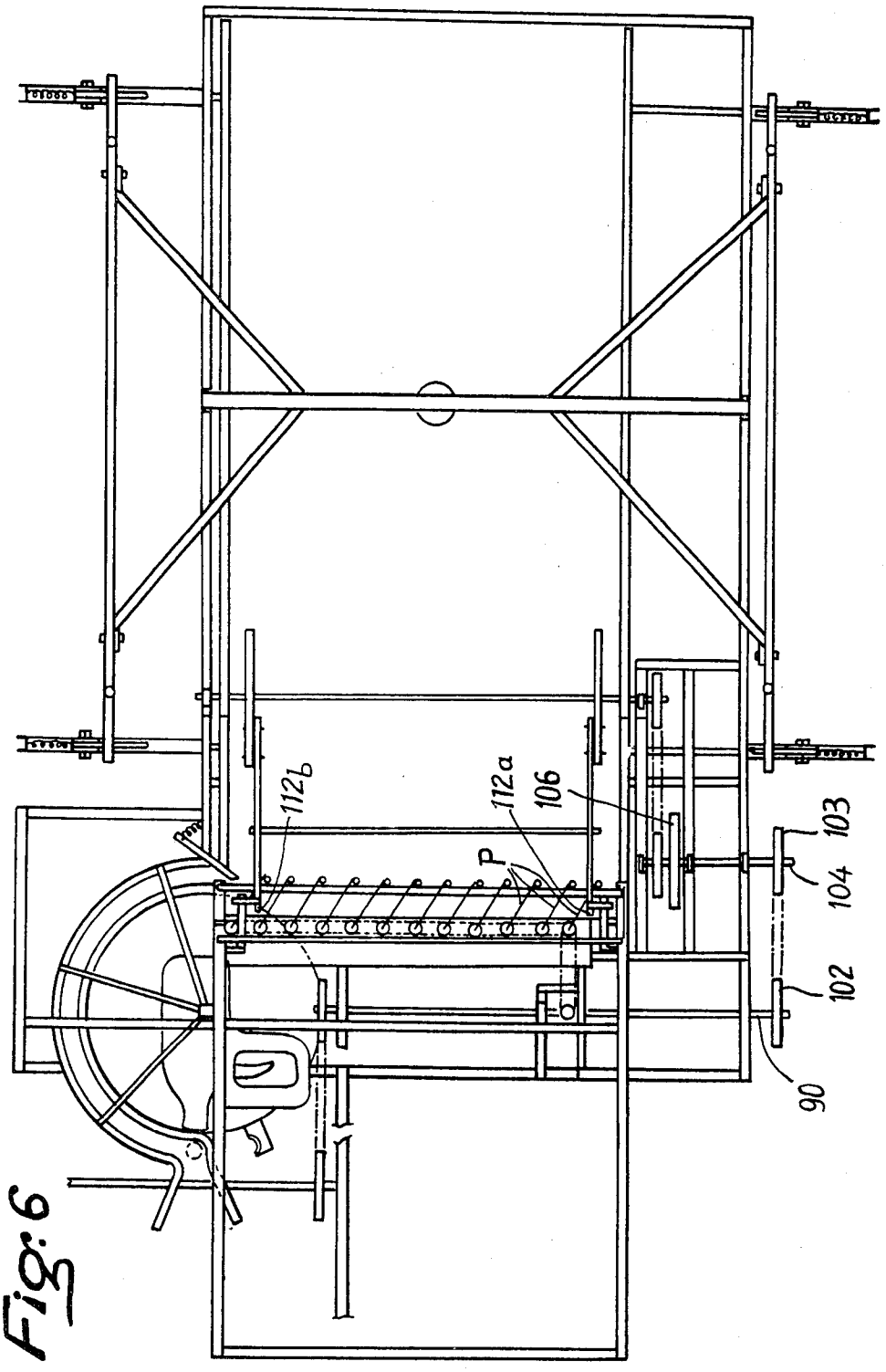


Fig. 6

STORING MECHANISM FOR TOBACCO-GATHERING MACHINE

My invention has for its object an apparatus for the storing of tobacco stalks cut off by a tobacco-gathering machine of the type disclosed in the French Patent No. 1,582,549 filed on July 3, 1968.

Such a machine includes means for catching individually each tobacco stalk; means for cutting the tobacco stalks which have been thus caught and means constituted by one or more pivoting arms adapted to convey the cut stalks towards the rear end of the machine and to simultaneously turn them over through 180°, so that the stalks may be fed separately in a reversed upside down position into the storing means.

According to a prior embodiment, it has been proposed to provide storing means including an endless belt carrying horizontal pins adapted to hold fast the stalks fed by the pivoting arms; it has been found however that such storing means do not work satisfactorily and my invention has for its object storing means to be substituted for those precedingly in use.

Said storing means are designed so as to arrange the tobacco-stalks, fed upside down, in side by side relationship on horizontal bars which are then set in their turn side by side in parallelism on supports located at the rear end of the machine, so that they may be conveyed in groups and finally housed in drying sheds.

By way of example and in order to further the understanding of my invention, I have illustrated in the accompanying drawings:

FIG. **1**, a general perspective view of a tobacco-gathering machine of a known type incorporating storing means, also of a known type.

FIG. **2** is a perspective view at three-quarters from the front of my improved storing means.

FIG. **3** is a perspective view at three-quarters from the rear of a portion of the mechanism illustrated in FIG. **2**.

FIG. **4** is a side elevational view corresponding to FIG. **3**.

FIG. **5** is a simplified side elevational view of the mechanism illustrated in FIG. **2**.

FIG. **6** is a view from above of last-mentioned mechanism.

Turning to FIG. **1**, it is apparent that the machine resting on the wheels **1** is coupled with a tractor, which is not illustrated, through a pole **2**, said wheels being provided with means adapted to drive all the mechanisms incorporated with the machine. It is possible, without modifying the operation of the machine, to substitute for such a drive through the wheels **1**, a drive operated by an auxiliary engine.

As the machine progresses, the tobacco-stalks set in rows with a uniform spacing pass between the rails **5** and are caught in succession by the gripper **9** carried by the rotary member **7**, after which, they are cut by a circular saw **6** and conveyed again by the same gripper **9** towards the jaws **43–44** of a further gripper carried by an arm **41**. Said gripper **43–44** closes over each stalk while the gripper **9** opens; this being done, the arm **41** rises through a rearward tilting by 180°, so that the tobacco-stalk is fed upright to the storing means.

In the precedingly used machines, the stalk was caught by a third gripper **69** carried at the end of an arm **65** assuming a reciprocatory movement, so as to set the stalks on pins **72** carried by an endless conveyor

belt **71**. The stalks were thus fed rearwardly and grouped into sheaths.

Such means for removing and storing the stalks did not prove satisfactory and it has been found necessary to substitute for them the novel arrangement illustrated in FIGS. **2** to **6**. The chassis **4** shown in said figures extends rearwardly so as to carry the said arrangement which is driven by a pinion keyed to the driving shaft **22** controlling the operation of the rocking arm **41**. Said pinion on the shaft **22** drives through a chain a pinion **90** keyed to a shaft **91** carried by the chassis and carrying two bevel wheels **92** and **94**. The bevel pinion **92** drives a further bevel pinion **93** keyed to a vertical shaft carrying a horizontal plate **97** provided at its periphery with a stud **98**. At the opposite end of the shaft **91**, the bevel pinion **94** drives a further bevel pinion **95** rigid with the vertical shaft **99** the upper end of which carries a pinion **100** operatively connected through a chain with a pinion **101**.

Said pinion **101** is keyed to a shaft carrying a pusher member P, which is the first of a row of say, 12 pushers members, all similar and arranged along a line perpendicular to the line of progression of the machine. These pusher members are carried and driven by a series of similar chains and pinions so as to all move simultaneously at the same speed.

By way of a modification, the series of pinions identical with the pinion **101**, which are interconnected two by two by means of chains, may be replaced by a worm engaging the different pinions carrying the pusher members P.

Each pusher member P is made of two parts located at two different levels, which prevents them hitting one another during their rotation.

The shaft **91** carries at one end a further pinion **102** connected through a chain with the pinion **103**, which latter drives a shaft **104** to which is keyed a pinion **105** meshing with a larger diameter pinion **106** which revolves consequently at a slower rate than the pinion **102** and in a reversed direction.

The large pinion **106** drives through a chain **107** a pinion **108** keyed to a shaft **109** carrying two further plates **110*a*** and **110*b*** facing each other symmetrically. To said further plates are secured rods **111*a*** and **111*b*** carrying at their outer ends flat rounded parts **112*a*** and **112*b*** associated with stops **113*a*** and **113*b***.

Said arms **111*a*** and **111*b*** are adapted to grasp, for each revolution of the plates **110*a*** and **110*b***, tubes **120** adapted to carry tobacco heads, which tubes are held fast, between successive revolutions by suitable means disclosed hereinafter with reference to FIGS. **3** and **4**. FIG. **3** illustrates such means as seen at three quarters from the rear. It shows two sloping flat iron bars **114*a*** and **114*b*** carried by corresponding transverse pivots **116*a*** and **116*b*** revolvably fitted in their bearings **119*a*** and **119*b*** rigid with the chassis **4**. At about midlength, each flat bar **114*a*–114*b*** carries laterally a plate **115*a*–115*b*** provided with a stud **117*a*–117*b*** slidingly engaging two ports extending through both flanges of a sloping channel iron forming part of the chassis **4** against the pressure of a spring **118*a*–118*b*** bearing against said chassis. The upper ends of said studs **117*a*–117*b*** project above the channel iron and form thus collapsible abutments for the successive tubes **120** resting on a sloping surface incorporated with the chassis.

Each pivot or spindle **116*a*–116*b*** carries also an arm **121*a*–121*b*** rigid through a transverse rod **122*a*–122*b***

with a stop **123***a*–**123***b* constituted by a flat iron bar, the end of which is bent so as to form a hook.

The pivots or spindles **116***a* and **116***b* also carry in alignment with the arms **121***a*–**121***b* and in the opposite direction, a flat iron bar **124***a*–**124***b* to the end of which is pivotally secured another flat iron bar **125***a*–**125***b*, the outer part of which is bent twice through 90° and includes at the upper end of its extreme folded part a port **126***a*–**126***b* (FIG. **4**) forming a bearing for an arcuate rod **127***a*–**127***b* rigid with a slightly bent flat iron bar **128***a*–**128***b* extending across the end of said arcuate rod. The upper end of each flat iron bar **128***a*–**128***b* is pivotally secured to the end of the channel iron already referred to as forming part of the chassis, while its lower end is bent into hook-shape. The arcuate rod **127***a*–**127***b* slidingly engages a port **129***a*–**129***b*, extending through a plate **130***a*–**130***b* rigid with the chassis, against the pressure of a spring **131***a*–**131***b*.

The outside of the flat iron bars **128***a*–**128***b* form slideways for the guiding metal sheets **131***a*–**132***b*.

In FIGS. **3** to **6**, there is shown, on the one hand, how the series of 12 pusher members is positioned underneath the above-described retaining means and, on the other hand, how the tubes **120** resting in the hook-shaped ends of the slideway bars **128***a*–**128***b* are aligned with a tubular guiding rail **133** extending over the plate **97** along an arc of 180° having the same radius. Another rail **134** lies in parallelism with the rail **133** and both rails are bent at their ends through 90° so as to enter the path of the horizontal reciprocatory arm **65.**

Between the plate **97** and the rails **133–134** there is provided a clamping or nailing mechanism **135** of a well-known type extending upwardly in an oblique direction.

Beyond the retaining means the grouping system (FIG. **5**) includes two incurved slideways **136***a*–**136***b* extending into horizontal rectilinear slideways **137***a*–**137***b* located at a slightly lower level and welded each to J-shaped supports **138–138′** and **139–139′** (FIG. **2**). Said supports subjected to the pressure of the springs **148** are pivotally carried at **140, 140′** and **141, 141′** and are also pivotally secured at **142, 142′** and **143, 143′** to the rods **144***a* and **144***b* respectively. Said rods **144***a*–**144***b* are provided with two joints **145***a*–**145***b* having vertical axes while an X-shaped stay **146** interconnecting the rods **144***a*–**144***b* is carried by the end of the operative rod of a jack **147** carried by the chassis **4.**

The operation of the machine described hereinabove is as follows:

At the end of the stroke, the horizontal arm **65** (FIG. **1**) sets the tobacco stalk caught by the gripper-jaw **43** at the input end of the guiding rails **133** and **134.** As it impinges against the bent rail **133,** the stalk actuates a switch which is not illustrated for sake of clarity and which controls the nailing mechanism **135.** Said nailing mechanism sets a nail partly through the stalk, said nail projecting beyond the stalk downwardly at an angle of about 45°.

This being done, the stud **98** on the plate **97** (FIG. **2**) pushes the nail in the stalk resting on the rail **133** towards the input end of a tube **120.**

At the same time, the 12 pusher members P execute each a complete revolution and the first pusher member causes, during its next revolution, the tobacco-stalk to enter the tube **120** while the next stalk is fed along the rail **133** by the stud **98.**

When a third stalk is fed between the rails **133** and **134,** the second pusher member P engages the first stalk while the first pusher member P pushes the second stalk along and so on.

The pinions **105** and **106** are designed in a manner such that the plates **110***a* and **110***b* and consequently the arms **111***a*–**111***b* execute only 1 revolution for each 12 revolutions of the pusher members P. During their rotation (FIGS. **2** and **5**) the ends **112***a*–**112***b* of the arms **111***a*–**111***b* push the tube **120** finally carrying 12 tobacco-heads onto the slidewayys **136***a*–**136***b* and simultaneously the stops **113***a*–**113***b* on said ends engage the flat iron bars **114***a*–**114***b* so as to make the pivots **116***a*–**116***b* rock whereupon the different parts enter the positions illustrated in dot-and dash lines in FIG. **4.**

The flat iron bars or stops **123***a*–**123***b* engage through their ends the last tube **120** but one resting on the chassis; the studs **117***a*–**117***b* collapse and release the last tube **120** which enters a position in which it is held by the hooks terminating the two slideways **128***a*–**128***b*.

Preferably, one or more stationary or movable stops such as **148** (FIG. **3**) prevent the released tube **120** from moving beyond the desired position.

The movements of the two arms **111***a*–**111***b* continue and the tube **120** carrying 12 heads of tobacco slides along the slideways **136***a*–**136***b*. When the arms **111***a*–**111***b* reach a vertical position, the tube **120** drops onto the horizontal slideways **137***a*–**137***b* which lie at a slightly lower level so as to allow the arms **111***a*–**111***b* to continue their rotation and to execute a further cycle.

The lengths of the slideways **137***a*–**137***b* are sufficient for said slideways to store about 50 to 60 tubes **120** carrying tobacco heads.

When the slideways are fully loaded, the hydraulic jack **147** is operated so as to lower the system including the X-shaped stay **146** and the rods **144***a* and **144***b*. This results in an inward rocking of the four J-shaped supports **138, 138′; 139, 139′** whereby the two slideways **137***a* and **137***b* are shifted apart, so that the loaded tubes **120** drop onto a metal support constituted by two parallel gantries carried by a trailer, not illustrated, which is brought for this purpose underneath the machine.

What I claim is:

1. A mechanism for storing tobacco stalks gathered by an automatic machine of the type having means for individually catching successive tobacco stalks, cutting said stalks, turning them upside down and presenting them to the rear of the gathering machine, said storing mechanism comprising

a sloping surface adapted to carry a plurality of horizontal tubes in parallelism;

two movable collapsible sloping supports situated at the lower extremity of said sloping surface, the ends of said supports being adapted to hold one tube in an operative position;

feeding means adapted to slide successive tobacco stalks along said tube;

means for collapsing said supports when said tube is loaded with a predetermined number of stalks, such collapse releasing said loaded tube;

means for allowing only one of the tubes carried in parallelism on said sloping surface to slide on said movable supports upon collapsing of said supports;

horizontal storing slideways, and

means for urging said loaded tube on said storing slideways when released.

2. A mechanism for storing tobacco stalks gathered by an automatic machine of the type having means for individually catching successive tobacco stalks, cutting said stalks, turning them upside down and presenting them to the rear of the gathering machine, said storing mechanism comprising

a sloping surface adapted to carry a plurality of horizontal tubes in parallelism;

two movable collapsible sloping supports situated at the lower extremity of said sloping surface, the ends of said supports being adapted to hold one tube in an operative position;

means controlling the shifting of the tubes in succession over said surface into said position upon collapsing of the supports and release of the foremost tube;

horizontal storing slideways and means for urging each successive foremost tube when released onto said storing slideways,

the feeding means being adapted to make the successive cut tobacco stalks slide along the foremost tube;

the mechanism further including means collapsing the supports when a predetermined number of stalks has entered said lowermost tube.

3. A mechanism as claimed in claim 2, wherein the feeding means include nailing means adapted to push a pin obliquely through each successive tobacco stalk, two parallel rails extending along half-circles, fed by the cutting means, means guiding the stalk-carrying pins along the half circular paths afforded by said nails, a plurality of pusher members adapted to execute each

one revolution to thereby shift in succession the successive stalks over overlapping paths along a horizontal tube set in an operative position.

4. A mechanism as claimed in claim 2, wherein the feeding means include nailing means adapted to push a pin obliquely through each successive tobacco stalk, two parallel rails extending along half-circles, fed by the cutting means, means guiding the stalk-carrying pins along the half-circular paths afforded by said nails, a plurality of pusher members adapted to execute each one revolution to thereby shift in succession the successive stalks over overlapping paths along a horizontal tube set in an operative position, said mechanism including furthermore a shaft adapted to execute one revolution each time the pusher members have executed a number of revolutions equal to their number, two plates carried by said shaft, an arm rigid with each plate, and means whereby said arms cause said supports to collapse when the operative tube has been filled with tobacco stalks, and a collecting slideway onto which the tube released upon collapse of its support drops.

5. A mechanism as claimed in claim 4, wherein the feeding means further include two levers normally engaging the tube adjacent the operative tube and released upon collapsing of the supports to allow said adjacent tube to enter in its turn the operative position.

6. A mechanism as claimed in claim 4, comprising a jack urging a loaded slideways rearwardly to allow the tubes to drop and be removed.

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