

Dec. 25, 1951

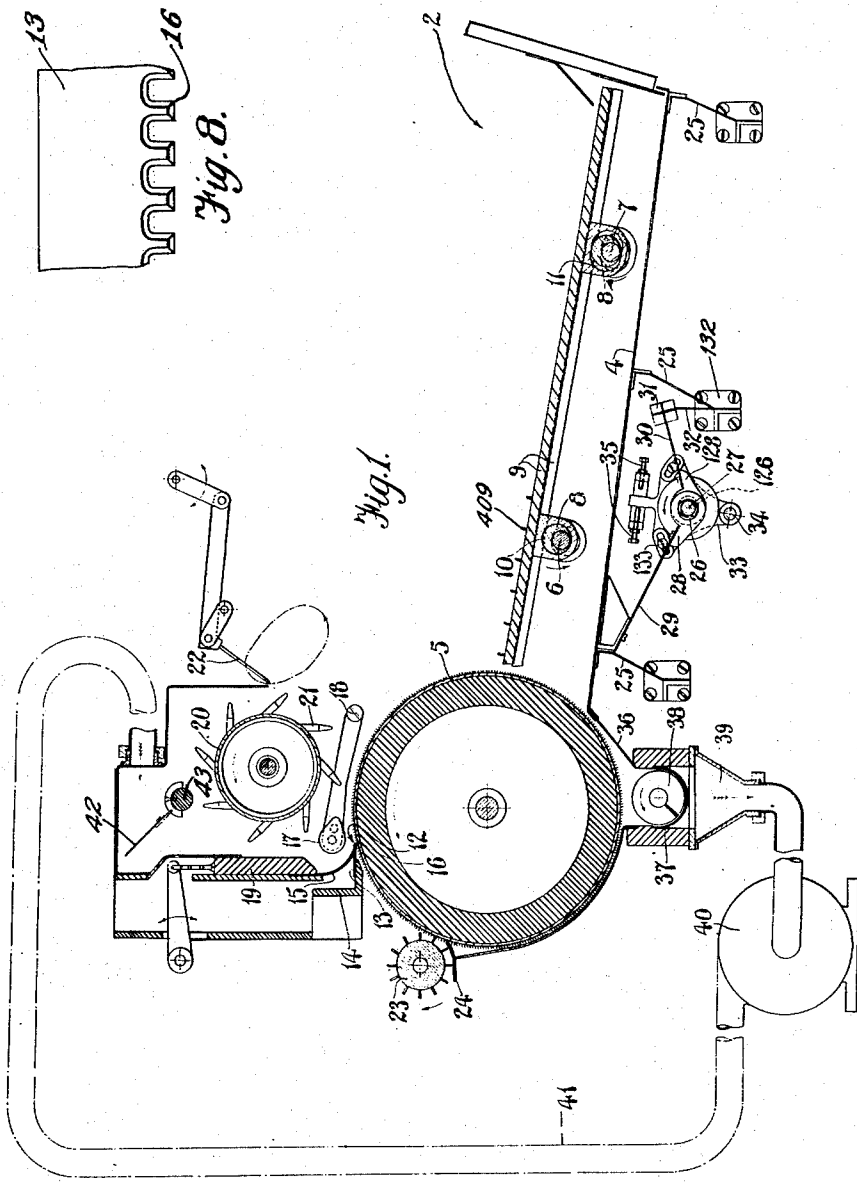
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2,579,950

APPARATUS FOR FEEDING CUT TOBACCO

Filed Sept. 9, 1946

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

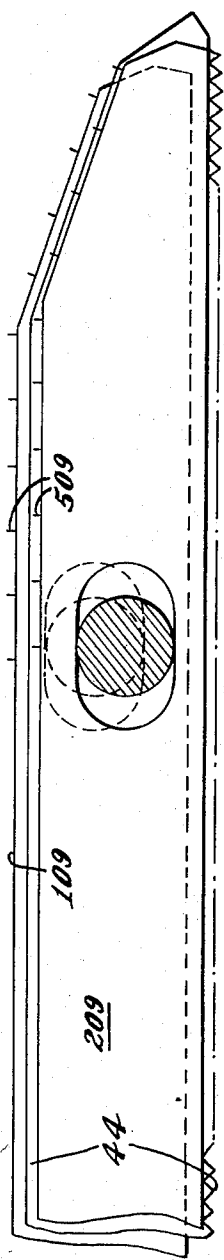


Fig. 7.

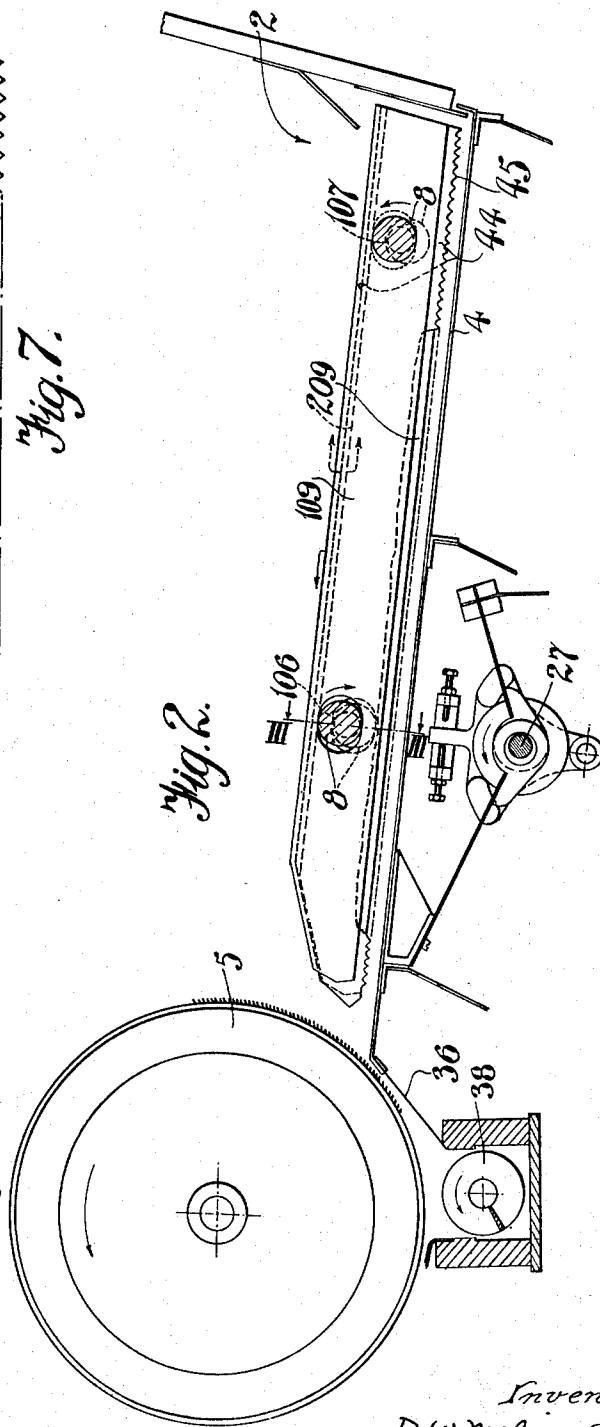


Fig. 6.

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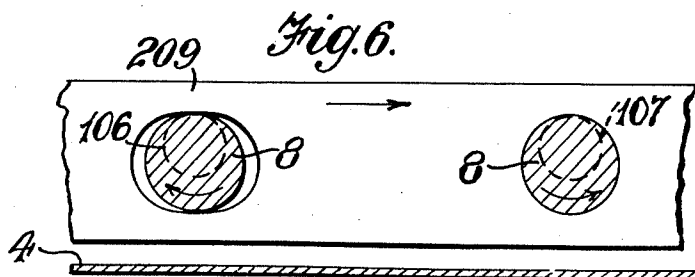
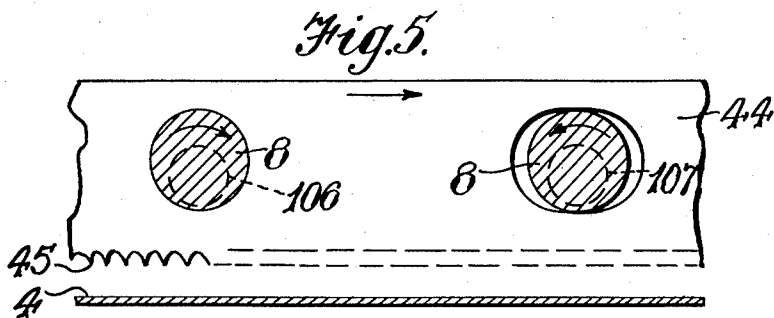
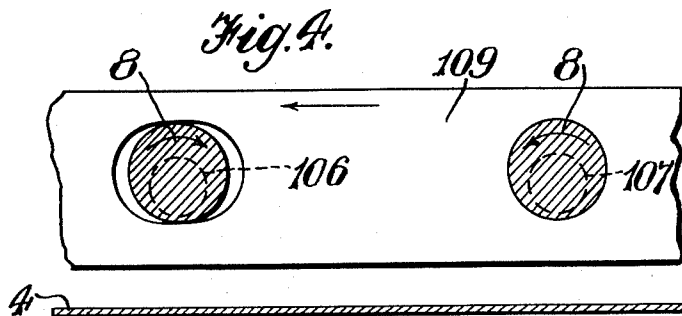
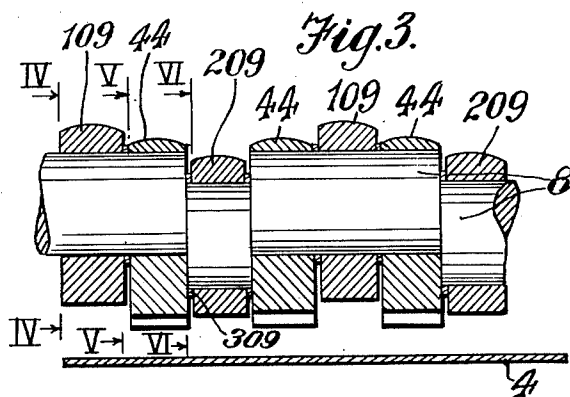
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APPARATUS FOR FEEDING CUT TOBACCO

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,579,950

APPARATUS FOR FEEDING CUT TOBACCO

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Application September 9, 1946, Serial No. 695,730
In Great Britain September 17, 1945

9 Claims. (Cl. 131—109)

1

This invention concerns improvements in or relating to apparatus for feeding cut tobacco, for example apparatus for feeding cut tobacco to cigarette making or tobacco packing machines of the kind in which a mass of cut tobacco is placed in a hopper or box from which it is removed by a carded conveyor or a combing member such as a carded roller (and hereinafter called a combing member) and in which a feeding device is provided to urge the tobacco towards such combing member. Such apparatus is referred to hereinafter as apparatus of the kind described.

As is well-known, cut tobacco contains numerous short fragments of leaf which are included in the trade term "shorts." In manipulating and feeding cut tobacco, these shorts tend to fall away from the main tobacco mass and it is important for commercial reasons and in order to obtain satisfactory cigarettes that they should be incorporated within the finished product of the machine.

According to the present invention there is provided apparatus of the kind described, comprising a plurality of members arranged side by side and adapted to receive tobacco on their upper surfaces and to permit shorts to fall between them, said members being adapted to move upwardly and forwardly to provide a feeding stroke to feed tobacco towards the combing member and to move downwardly and rearwardly in a return stroke, some of said feeding members being adapted to effect a feeding stroke whilst others are making a return stroke.

Further according to the present invention there is provided apparatus of the kind described wherein the said feeding device comprises a plurality of feeding members disposed side by side in the hopper and arranged to receive tobacco on their upper surfaces and to permit shorts to fall between them on to the base of the hopper, said feeding members being adapted to feed tobacco by means of their upper surfaces towards the combing member. The feeding members may comprise oscillatably mounted bars.

Means may be provided for collecting the shorts which fall between the said members, and to deliver the shorts to the combing member (e. g. a combing roller) in the vicinity of the area at which surplus tobacco is removed therefrom.

In the apparatus as set forth above the surplus tobacco may be removed by a toothed member reciprocating transversely to the direction of movement of the surface of the combing roller, and presser means may be arranged to press the tobacco in the region where surplus is removed

2

by the said toothed member and the shorts may be delivered to the tobacco removed by the said toothed member so as to mingle therewith.

The tobacco engaging surfaces of the bars may be toothed. Some of the bars may move forwards while others are moving backwards so as to provide a continuous feed of tobacco towards the combing member.

The base of the hopper may itself comprise a shaking or vibrating conveyor adapted to urge the shorts towards the combing member. The shorts may be urged by said vibrating conveyor into the carding of the combing member or collected for redistribution over the mass of tobacco in the hopper in any known manner.

Further according to the invention there is provided apparatus of the kind described wherein the said feeding device comprises a plurality of feeding members disposed side by side in the hopper and arranged to receive tobacco on their upper surfaces and to permit shorts to fall between them on to the base of the hopper, some of said feeding members being adapted to feed tobacco by means of their upper surfaces towards the combing member, while the other feeding members are adapted to engage by means of their under surfaces shorts lying on the base of the hopper which may be in the form of a vibrating conveyor and feed them towards the combing member.

The feeding members may comprise oscillatably mounted bars, the tobacco-feeding bars being arranged to oscillate in a direction opposite to that of the shorts-feeding bars. Tobacco-feeding and shorts-feeding bars may be arranged alternately side by side. The tobacco-engaging surfaces of the tobacco-feeding bars may be toothed and the shorts-engaging surfaces of the shorts-feeding bars may be toothed or carded.

Apparatus in accordance with the invention will be described by way of example with reference to the accompanying drawings which show apparatus for feeding cut tobacco to a cigarette-making machine.

In the drawings:

Figure 1 is a cross-sectional elevation of one form of the apparatus.

Figure 2 is a cross-sectional elevation of a modified form of the lower part of the apparatus shown in Figure 1.

Figure 3 is a fragmentary section on the line III—III of Figure 2.

Figure 4 is a view of Figure 3 in the direction of the arrows IV—IV but not to scale for length,

3

Figure 5 is a section of Figure 3 on the line V—V but not to scale for length.

Figure 6 is a section of Figure 3 on the line VI—VI but not to scale for length.

Figure 7 is a view showing a modified form of a part of the apparatus shown in Figure 2.

Figure 8 is a fragmentary plan view of part of the apparatus shown in Figure 1.

Referring to Figure 1 of the drawings, the tobacco is placed in a hopper 2 of the apparatus having a base which consists of a plate or support 4 forming a vibrating conveyor, similar to that disclosed in United States Patent No. 2,367,060, granted January 9, 1945 to Felix Frederic Ruau, and described in more detail later, which extends towards a carded combing member which in the present instance consists of a carded combing roller 5. Above the base there are mounted two shafts 6 and 7 parallel to the axis of the combing roller, each of which carries along its whole length a row of eccentrics 8. These shafts are arranged to be rotated in opposite directions.

The tobacco-feeding bars 9, which are made of wood or other suitable material, are adapted to be mounted on the eccentrics on the shaft, and for this purpose each bar is provided at one end with a hole 10 into which fits an eccentric of one shaft, while towards the other end of the bar is a slot 11 to accommodate an eccentric of the other shaft, so that when the bar is driven by the one eccentric, the other, which rotates in the opposite direction, is free to move along the slot at the other end of the bar, but will at the same time co-operate with the eccentric on the other shaft in raising and lowering the bar.

The feeding stroke of a tobacco-feeding bar carries the bar upwardly and forwardly so as to feed forward the tobacco resting on the bars, and the upper surfaces of the bars may be smooth, although as shown in Figure 1 they are provided with teeth as will be mentioned later.

The combing roller 5 together with the arrangements for controlling the amount of tobacco removed by it from the hopper and picking the tobacco from the carded member are substantially the same as those shown and described in United States Patent No. 2,326,793, granted August 17, 1943 to Desmond Walter Molins and Felix Frederic Ruau, to which reference should be made for full details.

The carded combing roller 5 conveys the tobacco towards a wedge-shaped tobacco separating device generally indicated by 12 and comprising an endwise reciprocating toothed blade 13 (see Figures 1 and 8), as in the earlier patent, a support 14 and a guide 15. The edge 16 of the blade constitutes a tobacco engaging surface and the reciprocation of the blade assists in separating the surplus tobacco from tobacco between the carding and also tends to cause an even distribution of the tobacco.

Surplus tobacco passes over the edge 16 and the guide surface 15. A presser 17 pivoted at 18 presses on the tobacco in the neighbourhood of the edge 16 and a reciprocating tamper 19 co-operates therewith.

A roller 20 having pins 21 removes tobacco from the passage between the guide 15 and presser 17 and deposits it on the roller 5 at a position in advance of the edge 16. A trimming device 22, moving in the path shown, rakes tobacco backwards on to the tobacco mass in the hopper.

The tobacco on the comb 5 after passing the separating device is picked from the carding by

4

a picker roller 23 operating in a concave 24 whereafter it is manipulated by other mechanism in any known manner, according to the design of the machine on which the apparatus is fitted.

The base plate 4 is supported on springs 25. An eccentric 26 on a rotatable shaft 27 has a sheave 28 on it to which is attached a plate 29 and another eccentric 126 has a sheave 128 to which is attached a plate 30. The plate 29 is fixed to the plate 4 and the plate 30 has fixed thereto a balance weight 31 which is also attached to a spring 32 mounted on a bracket 132. The weight is provided to balance the weight of the plate 4 and the parts movable therewith.

The eccentrics 26 and 126 and shaft 27 are supported on brackets 33 which are pivoted at 34 to the sides of the hopper and adjustable by screws 35 so that the end of the plate which adjoins the combing roller can be adjusted relatively thereto. The shorts urged towards the combing roller by the vibrating plate 4 slide down a spring plate 36 into the trough 37 of a conveyor comprising a worm 38 which feeds them along the trough until they fall down a chute 39 which leads to a blower or the like 40 whereby they are raised upwards in a pipe 41 which discharges them on to a baffle 42 supported on a rod 43 and are thereby spread out over the roller 20. The right-hand screw 35 in the position shown allows the bracket 33 to be swung back to a definite position after locking screws 133 have been released. This is convenient when an excess of shorts has accumulated as the space between the end of the plate 4 and the combing roller can be enlarged to allow the shorts to be rapidly moved over the plate 36 whose flexibility permits the adjustment to be made. The bracket 33 can then be moved back to the normal position against the left-hand screw 35.

In the construction described with reference to Figure 1, it has been stated that the tops of the feeding bars 9 may be smooth. It is found, however, that possibly better results are obtained when the bars are roughened, for example by pins 409, Figure 1, arranged to extend about one third or one quarter of the length of the bars from the end nearest to the combing roller 5. In such an arrangement it is believed that with the mass of tobacco in the hopper only the front portion is urged by the roughened portions of the bars whereas the rear portion of the tobacco in the hopper tends to slide. This may or may not be so, but it is definitely found very satisfactory to provide pins on only the first quarter or one third of the bar nearest to the combing roller.

The sliding of the tobacco on the smooth portions of the bars enables widely different amounts of tobacco to be accommodated in the hopper with little variation in the pressure of the tobacco against the carding of the combing roller, since the bars urge the tobacco forwardly with a yielding pressure.

It will be observed that by the arrangement shown in Figure 1 the bars have considerable strength, and consequently can be made relatively long so that a large amount of tobacco can be placed in the hopper at a time.

Referring now to Figures 2 to 6, most of the parts shown in Figure 2 which are the same as those shown in Figure 1 have the same references and need no further description. The feeding bars shown and described below, are operated by shafts bearing eccentrics as before, but in the present case there are bars for feeding the shorts towards the combing roller as well as the tobacco-

5

feeding bars. A tobacco-feeding bar 109 is arranged next to a shorts-feeding bar 44, shown broken in Figure 2, and next to that is another tobacco-feeding bar 209 which is 180° out of phase with the bar 109.

The tobacco-feeding bars 109 and 209 are arranged to be driven by a shaft 107, the shorts-feeding bars 44 by a shaft 106, the eccentrics being marked 8 as before. All adjacent bars 44, 109 and 209 are separated by washers 309, Figure 3.

The arrangement will be better understood from Figures 4, 5 and 6. Thus the tobacco-feeding and shorts-feeding bars, which are mounted alternately along the shafts, are oscillated in opposite directions. The feeding stroke of a tobacco-feeding bar carries the bar upwardly and forwardly so as to feed forward the tobacco resting on the bars, while the shorts-feeding bar has a downward and forward movement in its feeding stroke, so as to engage shorts on the hopper base and urge them towards the combing roller so that they fall down the plate 36 as before though they might be pressed into the carding roller.

The shorts-feeding bars are provided on their undersides with pins, carding or the like, or serrated as shown at 45 so as to engage the shorts on the base 4 of the hopper, and are disposed a suitable distance above the base to be able to engage such shorts and feed them forward. The tobacco-feeding bars do not extend quite so far down towards the hopper base as do the shorts-feeding bars, (see Figure 3), but are of a sufficient depth to prevent any excessive building-up of shorts in the spaces between the shorts-feeding bars. The tobacco-feeding bars may be provided with pins 509 on their upper surfaces as shown in Figure 7.

In the example shown in Figure 2 all the shorts-feeding bars perform the same stroke simultaneously, so that they feed the shorts intermittently, although the shorts are, of course, being continuously fed forward by the vibrating conveyor 4 which forms the base of the hopper, and the purpose of the shorts-feeding bars is to assist this continuous feed. In the case of the tobacco-feeding bars both in Figures 1 and 2, the arrangement is such that alternate tobacco-feeding bars perform opposite strokes, so that while one set of tobacco-feeding bars performs a feeding stroke, alternate bars are returning, and thus a continuous feed for the tobacco is provided. The arrows in Figures 4 and 6 show the direction of movement of the three bars above described.

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

1. Apparatus for feeding cut tobacco, comprising a hopper for the tobacco, a combing member to remove tobacco from the hopper, and a feeding device to support the mass of tobacco in the hopper and urge tobacco against the combing member, the said feeding device comprising a plurality of feeding members each of which extends lengthwise of the direction of feed and which are disposed side by side in the hopper and arranged to receive tobacco on their upper surfaces and to permit shorts to fall between them, said feeding members being supported for bodily orbital movement lengthwise of the hopper, and means to move some of said members upwardly and forwardly to urge tobacco by means of their upper surfaces against the combing member and concurrently to move other of said members downwardly and rearwardly in a return stroke, where-

6

in the said feeding members have smooth portions on their upper surfaces on which tobacco being fed can slide, for the purpose of reducing variations in the pressure of tobacco against the carding of the combing member with widely differing amounts of tobacco in the hopper.

2. Apparatus as claimed in claim 1 wherein the feeding members comprise oscillatably mounted bars.

3. Apparatus as claimed in claim 1 wherein the tobacco engaging surfaces of the feeding members are partly toothed.

4. Apparatus for feeding cut tobacco, comprising a hopper for the tobacco, a combing member to remove tobacco from the hopper, and a feeding device to support the mass of tobacco in the hopper and urge tobacco against the combing member, the said feeding device comprising a plurality of oscillatably mounted bars which extend lengthwise of the direction of feed and which are arranged side by side in the hopper so as to support the mass of tobacco in the hopper and are supported for oscillation in orbital paths to impart a feeding motion to the tobacco to urge the latter towards and press it against the combing member, mechanism for concurrently imparting to some of said bars a feed stroke and to other bars a return stroke, the upper surfaces of the said bars having smooth portions on which tobacco in that portion of the hopper, remote from the combing member, can slide.

5. Apparatus for feeding cut tobacco comprising a hopper for the tobacco, a combing member to remove tobacco from the hopper, and a feeding device to support the mass of tobacco in the hopper and urge tobacco against the combing member, the said feeding device comprising a plurality of feeding members each of which extends lengthwise of the direction of feed and which are disposed side by side in the hopper and arranged to receive tobacco on their upper surfaces and to permit shorts to fall between them, said members being supported for movement in orbital paths so as to move alternately towards and away from the combing member to feed tobacco to the combing member, mechanism for concurrently moving some of said members in a feed stroke and others in a return stroke, wherein the feeding members have smooth upper surfaces which are unbroken along the greater part of their lengths and have projections at those parts near the combing member, whereby tobacco in the hopper near to the combing member can be engaged by the projections while tobacco in the hopper further away from the combing member can slide on the unbroken smooth parts of the feeding members due to an increase of pressure between the tobacco and the combing member.

6. Apparatus for feeding cut tobacco, comprising a hopper for the tobacco, a combing member to remove tobacco from the hopper, and a feeding device to support the mass of tobacco in the hopper and urge tobacco against the combing member, the said feeding device comprising a plurality of feeding members each of which extends lengthwise of the direction of feed of the tobacco and which are disposed in the hopper and arranged to receive tobacco on their upper surfaces and to permit shorts to fall between them on to the base of the hopper, some of said feeding members being positioned to feed tobacco by means of their upper surfaces against the combing member, while the other feeding members are positioned adjacent to the base of the

7

hopper to engage by means of their under surfaces shorts lying on the base of the hopper and feed them towards the combing member.

7. Apparatus as claimed in claim 6, wherein the feeding members comprise oscillatably mounted bars, the tobacco-feeding bars being arranged to oscillate in a direction opposite to that of the shorts-feeding bars.

8. Apparatus as claimed in claim 7, wherein the tobacco-feeding and shorts-feeding bars are arranged alternately side by side.

9. Apparatus as claimed in claim 6, wherein the tobacco-engaging surfaces of the tobacco-feeding bars are partly smooth and partly toothed and the shorts-engaging surfaces of the shorts-feeding bars are toothed.

DESMOND WALTER MOLINS.
FELIX FREDERIC RUAU.
ALBERT ERNEST FRANCIS.

8

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,774,478	Grupe	Aug. 26, 1930
1,781,239	Molins	Nov. 11, 1930
2,326,793	Molins et al.	Aug. 17, 1943
2,367,060	Ruau	Jan. 9, 1945
2,416,020	Ruau	Feb. 18, 1947

FOREIGN PATENTS

Number	Country	Date
564,619	Germany	of 1930
367,431	Great Britain	Feb. 22, 1932
506,615	Great Britain	June 1, 1939