April 24, 1956 H. POLICANSKY 2,742,907

MEANS FOR THE PRODUCTION OF FILTER-TIP CIGARETTES

Filed Aug. 19, 1950 2 Sheets-Sheet 1

Fig. 1.

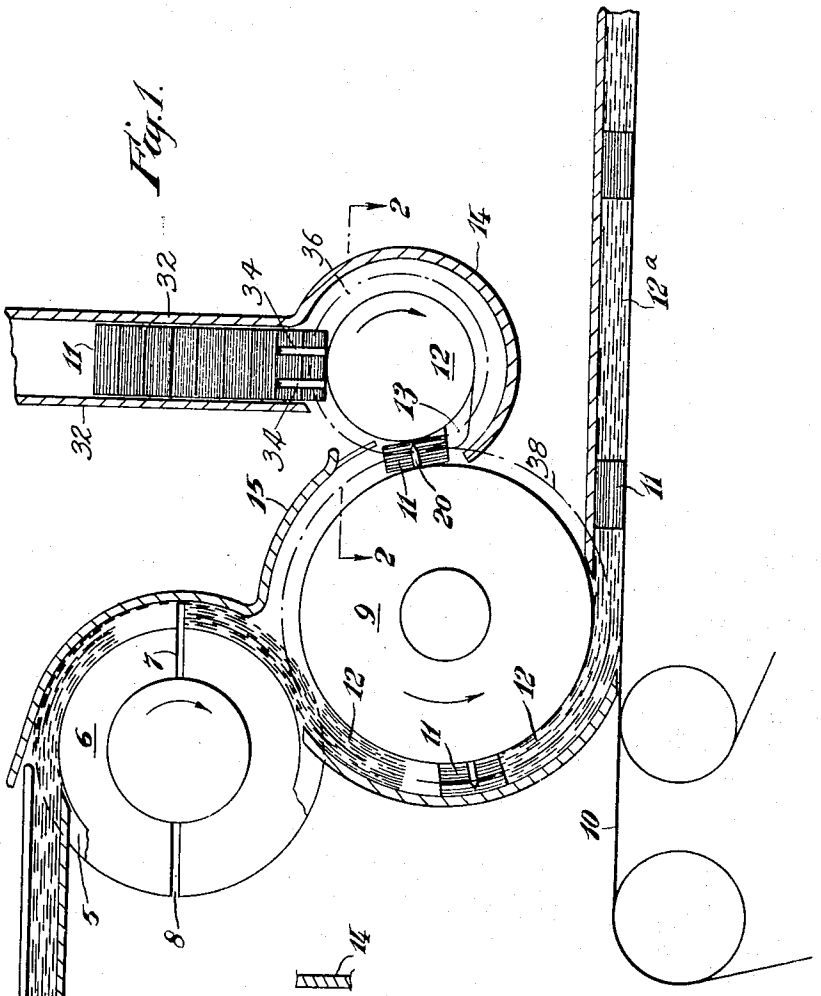
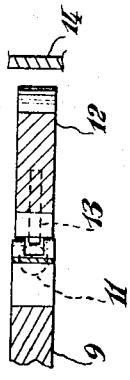


Fig. 2.



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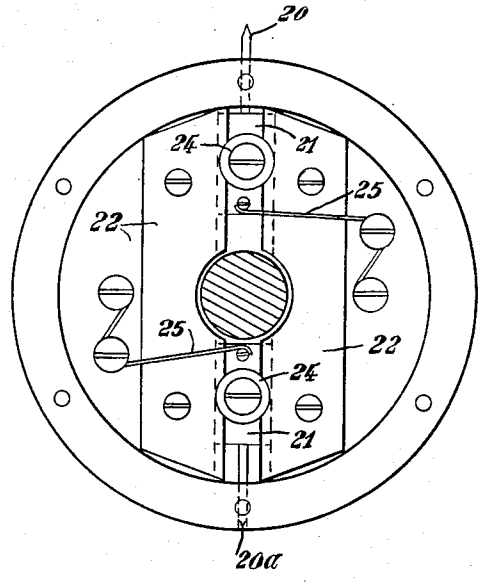


Fig. 3.

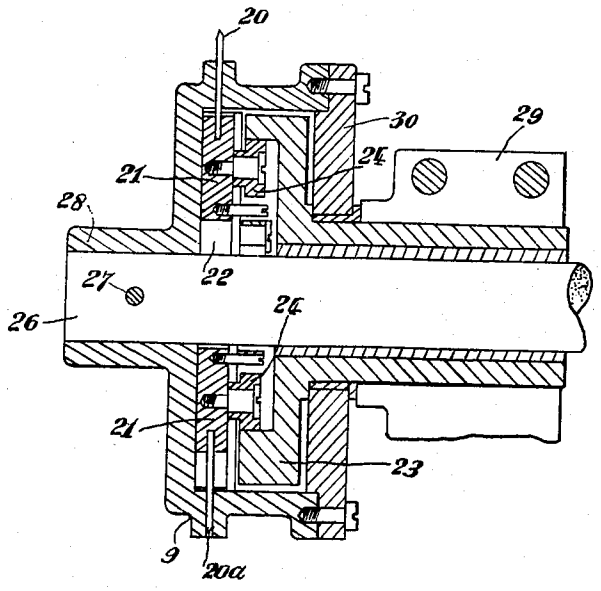


Fig. 4.

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2,742,907

MEANS FOR THE PRODUCTION OF FILTER-TIP CIGARETTES

Hyman Policansky, Salt River, Cape Town, Union of South Africa, assignor to Industrial Machinery Company Limited, London, England

Application August 19, 1950, Serial No. 180,344

10 Claims. (Cl. 131—61)

This invention relates to the manufacture of filter tip cigarettes and more particularly to improvements in or modification of the type machine shown and described in the specification copending application S. N. 696,206 now Patent 2,604,099 filed September 11, 1946, by Hyman Policansky and is directed specifically to a means for feeding filter plugs to the transfer wheel forming part of the aforesaid invention.

In the aforesaid application, mechanism has been described for feeding filter plugs, already cut to the desired length, from a hopper in single file one above the next, the column being disposed vertically above the transfer wheel in such a manner that the lowermost filter plug is picked up by retractable conveyor pins thereof, and introduced between the severed tobacco sections fed from the section wheel, the pins engaging the trailing end of the filter plug to push it forward and cause it to abut the tobacco length, said pins being subsequently withdrawn. It has been found that the presence of these pins and their subsequent withdrawal tends to hinder a proper abutment of the succeeding tobacco length with the filter plug.

One of the primary objects of the present invention is to overcome the above difficulty, and to this end mechanism for feeding filter plugs to the transfer wheel is provided to present them to said transfer wheel and mechanism operative upon rotation of said transfer wheel in timed relation to said pins whereby the presented plug is impaled upon said pins.

In order that the invention may be clearly understood, reference is directed to the accompanying drawings, wherein:

Figure 1 is a semi-diagrammatical elevation of a preferred form of apparatus and shown partly in section.

Figure 2 is a section on the line 2—2, Figure 1.

Figure 3 is a sectional elevation of the transfer wheel shown in Figure 1.

Figure 4 is a longitudinal section of the transfer wheel at right angles to Figure 3.

With reference to the drawings particularly Figure 1, tobacco issuing from the hopper of a continuous rod cigarette making machine, and having been compressed into rope form enters the peripheral groove **5** of a section wheel **6**. The section wheel **6** is rotated and cutting knives **7**, operating in transverse slots **8** cut through the tobacco rope and carry forward the severed tobacco length to present it to a transfer wheel **9** which is rotated, and ultimately deposits the tobacco length upon a continuously moving paper web **10**, a filter plug **11** being interposed between the adjacent ends of the cut sections **12***a* of tobacco rope by apparatus hereinafter described.

The foregoing mechanism forms part of the invention disclosed in copending application Serial No. 696,206 now Patent 2,604,099 to which the present invention is particularly applicable.

The mechanism for feeding the filter plugs **11** comprises a rotatable member **12** of disc form having a radial abutment **13** which converts the member **12** into a conveyor, an enclosing casing **14** being furnished and conveniently as part of a guide member **15** embracing the section and transfer wheels **6** and **9** respectively.

The abutment **13** upon rotation of the conveyor **12** engages the lowermost of a column of filter plugs **11**. The filter plugs **11** are stacked in a suitable chute **32**, the bottom end of which is provided with suitable spring retaining fingers employed for the purpose of keeping the last plug slightly above the periphery of rotating conveyor **12**.

It is conventional in the art of dispensing to position a number of articles in a vertical column within a housing in such a manner as to facilitate the release of individual articles as a pusher member is moved in position to engage such article for moving the same to another location as shown in many U. S. patents, such as 2,077,896 granted to C. E. Quick on April 20, 1937, and 740,998 granted October 6, 1903 to J. A. Williams.

The conveyor **12** and the transfer wheel **9** are driven in timed relationship with one another by suitable gears **36** and **38** respectively. As indicated in the drawings by comparison of the diameters of the plug conveyor gear and the transfer wheel gear, it is apparent that the ratio of the gears is 1:2. The abutment **13** conveys the plug to a point where it is presented to the periphery of the transfer wheel **9**, the casing of the conveyor being broken at this part (see Figure 2) to permit the passage of the abutment **13** and feed of the plug. The transfer wheel **9** is fitted with retractable pins as hereinafter described, which at the moment of presentation of the filter plug **11** are protruded to engage in the plug and carry it around the transfer wheel **9** until it is introduced between successive tobacco segments **12***a*, as delivered from the section wheel **6**, the pin remaining in position to a predetermined point in the circle of rotation of the transfer wheel where it is retracted to an inoperative position, again to be protruded to pick up the next filter plug presented.

Figures 3 and 4 show the transfer wheel **9** seen in Figure 1, the transfer wheel **9** is provided with two sets of rectilinearly retractable conveyor pins **20**, **20***a*, one set shown in its retracted or inoperative position and the other in its protruded or operative position. The pins **20**, **20***a* are mounted in slide blocks **21**, which are restrained by slide block guides **22**. The slide blocks are actuated by a cam **23** and cam follower rollers **24** and by springs **25**. The cam **23** has an elongated boss which may be bushed to provide a bearing for drive shaft **26** to which the transfer wheel is pinned at **27** through the transfer wheel boss **28**. The cam **23** is non-rotatably clamped in a bracket stand **29** and the transfer wheel revolves about the stationary cam. A cover plate **30** completes the seal against escape of lubricant and entry of dust.

The invention hereinbefore described may be varied in construction within the scope of the claims, for the particular device selected to illustrate the invention is but one of many possible embodiments of the same. The invention, therefore, is not to be restricted to the precise details of the structure shown and described.

The foregoing construction is similar to that disclosed in the aforesaid copending application Serial No. 696,206 now Patent 2,604,099.

What is claimed is:

1. A machine for making filter-tip cigarettes comprising, a continuous source of cigarette rod filler, a transfer wheel for receiving and conveying said filler around the periphery of said wheel, cutting knives mounted in said transfer wheel for severing said filler into individual lengths of filler as it is conveyed around said periphery, a curved housing spaced from said transfer wheel for confining said filler for travel with the periphery of said

transfer wheel, means for rotating the periphery of said transfer wheel at a faster speed than the cigarette filler is delivered thereto to thereby form a space between each severed filler length and the succeeding end of the following filler rod, a second transfer wheel for receiving said individual lengths of cigarette filler from said first transfer wheel, retractable impaling pins carried by said second transfer wheel, a filter plug feeding drum moving in synchronism with said second transfer wheel for delivering one plug at a time to said impaling device, means for extending one of said pins into each plug while it is held by and being delivered from said drum to said second transfer wheel, said second transfer wheel then carrying said impaled plugs one at a time around with the periphery of said second transfer wheel to insert an impaled plug in each space formed between the severed lengths of cigarette filler up against the end of the preceding filler, means for retracting each of said pins along the length of the pin when discharging said plug and filler from said second transfer wheel, and a collecting conveyor positioned tangentially with said second transfer wheel for receiving therefrom a composite rod of cigarette filler and filter plugs.

2. A machine for combining filter plugs with a continuous rod of cigarette tobacco comprising, a conveyor for conveying a continuous stream of cigarette filler in rod form along a predetermined path of travel, a conveying wheel for receiving said cigarette filler, cutting knives reciprocably mounted in said conveying wheel for movement transverse to the axis of rotation of said wheel to sever said rod into cigarette lengths as it is moved along an arcuate path of travel by said conveying wheel, a drive for moving the periphery of said conveying wheel at a faster rate of speed than said conveyor to form a space between the severed cigarette length of filler and the succeeding rod, a transfer wheel for receiving said severed lengths of rod, retractable pins mounted on said transfer wheel, a traveling member traveling in synchronism with said transfer wheel for picking up and delivering a filter plug to a position adjacent said transfer wheel, means for advancing said retractable pins at said position to impale a plug thereon as it is held by said member and then advancing said plug with said transfer wheel into the space formed between the length of filler and the next succeeding length of filler, a collecting conveyor for receiving a composite cigarette rod made of cigarette filler and plugs interspersed therebetween, and means for retracting said impaling pins along the length of said pins when said plugs are delivered to said collecting conveyor.

3. A machine for combining filter plugs with lengths of cigarette filler tobacco comprising, an infeed conveyor, an outfeed conveyor, a first and second transfer wheel arranged tangentially to each other and positioned between said infeed and outfeed conveyors, confining walls surrounding each of said transfer wheels to cause cigarette filler to travel down one transfer wheel to the other along an S-shaped path of travel while being transferred from the infeed conveyor to the outfeed conveyor, cutting knives mounted on one of said transfer wheels for severing a continuous rod of cigarette filler received from said infeed conveyor into cigarette lengths as it travels around the periphery of said first transfer wheel, means for driving said first transfer wheel at a rate of speed greater than that of the cigarette rod being advanced thereto by said infeed conveyor to form a space between the severed length of cigarette filler and the succeeding end of the cigarette rod, a filter plug delivery drum positioned tangentially adjacent and traveling in synchronism with said second transfer wheel for delivering one plug at a time to said second transfer wheel, retractable impaling pins positioned on said second transfer wheel for moving each pin longitudinally along its length to impale one filter plug at a time when it is located between said drum and said transfer wheel and depositing a filter plug so impaled in each space formed in said cigarette filler rod, and a collecting belt for collecting a filler rod having plugs inserted therein at predetermined intervals.

4. A machine for combining filter plugs with a cigarette rod comprising, a conveyor for delivering a continuous rod of cigarette filler, a conveyor wheel positioned adjacent said conveyor for receiving said continuous cigarette filler, knives carried by said conveyor wheel for severing said rod into individual lengths as it is conveyed around said conveyor wheel, a second conveyor wheel positioned adjacent the first conveyor wheel for receiving lengths of cigarette filler therefrom to convey the tobacco around a winding path of travel, a traveling filter plug delivery device positioned tangentially adjacent and moving in synchronism with said second conveyor wheel for delivering one plug at a time thereto, retractable pins for impaling each plug while held against said device and moving said filter plugs one at a time around said second conveyor wheel, to deposit the plug in the space formed between two adjacent cigarette filler lengths and for retracting said pin along its length when the plug and preceding cigarette filler lengths have been delivered onto the collecting tape, housing structure surrounding said first and second conveyor wheels for maintaining said cigarette filler in contact with said conveyor wheels, and an off-take conveyor for receiving a composite rod of spaced lengths of cigarette filler and filter plugs from said second conveyor wheel and combining it with a paper tape to form a composite rod of cigarette filler interspersed at predetermined intervals with cigarette filter plugs.

5. Mechanism for inserting filter plugs at predetermined intervals into a continuous rod of cigarette filler comprising, a pair of transfer wheels for conveying cigarette filler around the periphery thereof, a source of cigarette filler arranged in continuous rod form and delivered continuously to the periphery of one of said transfer wheels, cutting knives mounted on said transfer wheel for severing the filler so received into individual lengths of cigarette filler, a drive moving the periphery of said transfer wheel at a faster rate than the source of supply of cigarette filler delivers filler thereto to form a plug receiving space between the severed cigarette length and the succeeding end of the following rod of cigarette filler, a filter plug delivery wheel positioned tangentially adjacent and traveling in synchronism with the second transfer wheel, pins extendable and retractable along their length mounted on said second transfer wheel for impaling a filter plug at the moment it is moved in front of said transfer wheel and conveying the plug around with the second transfer wheel to deliver it in the space formed between two lengths of cigarette filler up against the end of the preceding cigarette filler length to assist in pushing the cigarette filler length against the preceding filter plug, means for retracting said impaling pin along its length from said filter plug as the filter plug and cigarette length is discharged from the second transfer wheel, and a conveyor traveling at substantially the same speed as said second transfer wheel for receiving said filter plugs and cigarette lengths and combining the composite rod of cigarette filler and spaced filter plugs into a continuous rod.

6. Apparatus for placing filter plugs in a continuous rod of cigarette filler material at spaced intervals therein comprising, a transfer wheel driven at a constant rate of speed, a housing surrounding the periphery of said transfer wheel for confining cigarette filler carried on the periphery of said wheel to an arcuate path of travel with said wheel, a tobacco conveyor for delivering a continuous rod of cigarette filler to the periphery of said transfer wheel at a slower rate than the periphery of said transfer wheel rotates, cutting knives carried by said transfer wheel for severing said rod into individual lengths and forming a space between the ends of said severed rod as it is conveyed around said transfer wheel to form a plug receiving opening therebetween, a second transfer wheel moving in synchronism with the first trans-

fer wheel, a filter plug delivery drum moving in synchronism with the second transfer wheel for delivering one plug at a time to said second transfer wheel, pins movable in and out of the periphery of said second conveyor belt to impale a filter plug at the moment the plug is opposite the second transfer wheel while being supported by said drum and conveying the plug around with the second conveyor belt to deposit it up against the end of length of cigarette filler delivered from the first transfer wheel to the second transfer wheel in the space formed between the severed ends of the cigarette filler and to be withdrawn when the preceding length of cigarette filler and the filter plug are discharged from said second transfer wheel, and a receiving conveyor for receiving combined lengths of cigarette filler and filter plugs from said second transfer wheel, said receiving conveyor traveling at a rate of speed slower than the rate of travel of the second conveyor to cause the cigarette filler to be snugly compacted between preceding and succeeding filter plugs.

7. In a machine for making filter tip cigarettes, each having a tobacco length and a filter plug, a rotatable carrier, a conveyor for feeding tobacco lengths individually in spaced end to end relation to the carrier, a movable member moving in synchronism and tangentially positioned with respect to said conveyor for feeding filter plugs to the carrier, pins extendable along their length from said carrier for impaling said plugs at the moment said plugs are in position between said carrier and member and then carrying the impaled plugs into position between the adjacent ends of two tobacco lengths, means for advancing said pins, tobacco lengths, and impaled filter plugs with the carrier during rotation thereof onto a collecting conveyor belt, and means for withdrawing said pin from said filter plug after the filter plug and tobacco has been deposited on the collecting conveyor.

8. Apparatus for producing filter tip cigarettes which comprises, a source of supply of a continuous rope of shredded tobacco, a cylindrical member for receiving said rope and conveying it around an arcuate path for approximately 180 degrees, a knife for severing said rope into sections as it travels around said arcuate path, a transfer wheel for receiving said severed sections of tobacco, means for driving said knife carrying wheel at a faster rate than tobacco is delivered thereto from said source of supply to thereby effect a separation of the tobacco lengths from one another, pins carried by said transfer wheel and extendable along their length from said transfer wheel, a traveling member moving in timed relation with said transfer wheel for delivering a filter plug to a point directly opposite said transfer wheel into the range of action of said pins to effect an impaling of the plug on said pin while supported by said member, and means for synchronizing said transfer wheel with said cylindrical member to cause the plug to be deposited behind the severed section, means for rotating said second transfer wheel past a plug and filler discharge area, a collecting tape for receiving plugs and fillers discharged from said second transfer wheel to form thereof a composite cigarette rod, and means for withdrawing said plug holding pins along their length from the plug when said plugs and severed sections of rod are deposited on said collecting tape.

9. In a machine for making from a rope of tobacco fed thereto filter tip cigarettes each having a tobacco length and a filter plug, said machine comprising, a rotatable member adapted to rotate at a uniform speed greater than that at which the tobacco rope is fed thereo, knife means movable with the rotatable member about the axis of rotation thereof for severing from said tobacco rope a tobacco length and positively moving said severed tobacco

length along with the movable member to provide a gap between the trailing end of the tobacco length and the leading end of the tobacco rope, said gap at the discharge point of the rotatable member being of a length sufficient to receive a filter plug, a rotatable transfer carrier, the peripheral surface of which is substantially tangential to the peripheral surface of the rotatable member, the transfer carrier being adapted to receive the spaced tobacco lengths from the rotatable member, a rotatable plug carrying member tangentially arranged with respect to said carrier and driven in synchronism therewith for delivering one plug at a time to said transfer carrier, and circumferentially spaced elongated members movable with the transfer carrier about the axis of rotation thereof and retractable and extendable along their length for positively impaling each filter plug as it is delivered opposite to said transfer carrier and then conveying and depositing the filter plug in the gap formed between said severed tobacco lengths at the point of tangency between said carrier and the rotatable member so that each filter plug will be positioned in the gap between the adjacent ends of two tobacco lengths, one of which has been and the other is being transferred to the carrier, the knife means being retractable after transferring a tobacco length to the transfer carrier, means for retracting said primary retractable members along their length after said lengths of cigarette filler with plugs interspersed therebetween have been deposited upon a collecting conveyor, the retractable means and the transfer carrier being operable for moving the tobacco lengths and filter plugs during rotation of the carrier.

10. Apparatus for making filter tip cigarettes comprising, a source of supply of continuous cigarette rod filler, a source of supply of individual filter plugs, a first transfer wheel for receiving said continuous cigarette rod material, knives coacting with said first transfer wheel for severing said cigarette rod into cigarette lengths while being conveyed on said transfer wheel, means for moving said severed sections of rod away from said continuous rod at a faster rate of speed than that at which the rod travels to form a space large enough to receive a filter plug between the severed section and the end of the rod, a second transfer wheel, elongated plug impaling members movable in and out radially from said second transfer wheel for impaling one plug at a time from said source of supply of individual filter plugs and carrying each plug around with the second transfer wheel and depositing it in said space up against the trailing end of the severed sections, a plug transfer drum tangentially arranged with respect to said second transfer wheel for delivering one plug at a time opposite to the plug impaling members and supporting said plug against radial movement as it is impaled thereby, means for rotating said second transfer wheel in time with said first transfer wheel and said plug transfer drum, a collecting tape for receiving plugs and fillers discharged from said second transfer wheel to form thereof a composite cigarette rod, and means for withdrawing each plug holding means along its length from the plug when said plugs and severed sections of rod are deposited on said collecting tape.

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