Jan. 28, 1958 G. LAKOS 2,821,238

PROCESS FOR MANUFACTURING SELF-IGNITING CIGARETTES

Filed Nov. 22, 1955 2 Sheets-Sheet 1

Fig. 1

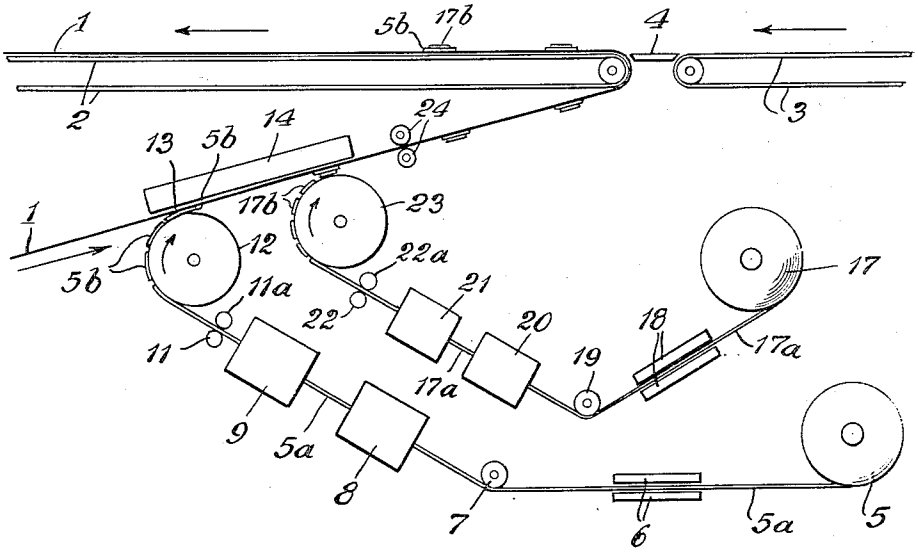
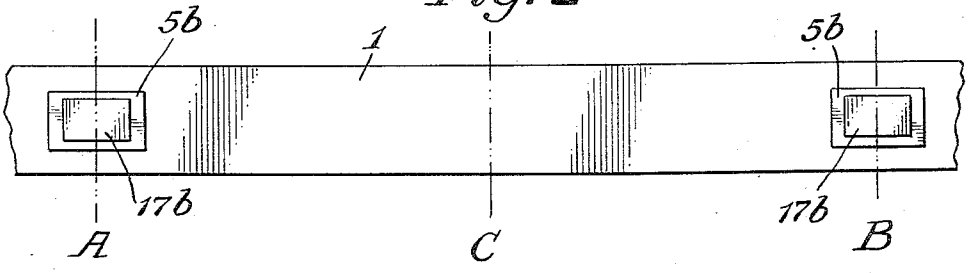


Fig. 2



INVENTOR:
Georg Lakos,
BY
Singer, Stern & Carlberg,
Attorneys.

Jan. 28, 1958 G. LAKOS 2,821,238

PROCESS FOR MANUFACTURING SELF-IGNITING CIGARETTES

Filed Nov. 22, 1955 2 Sheets-Sheet 2

Fig. 3

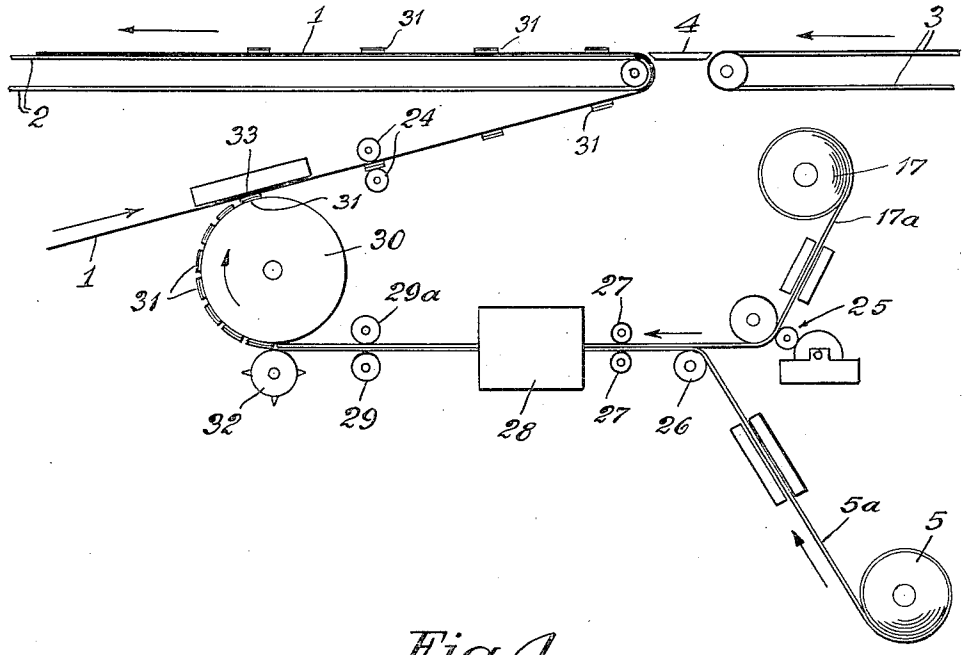


Fig. 4

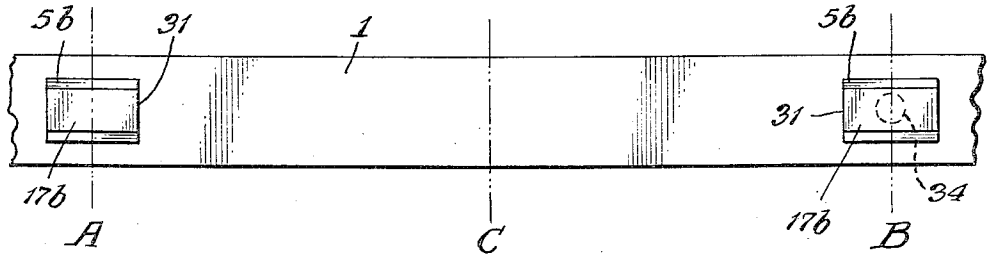
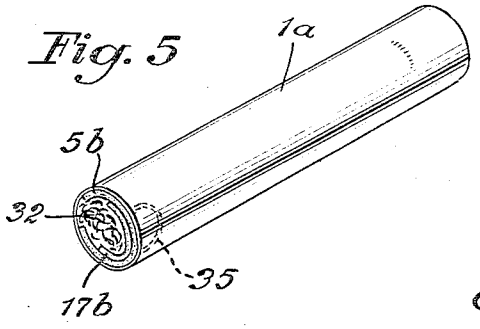


Fig. 5



INVENTOR:
Georg Lakos,
BY
Singer, Stern & Carlberg
Attorneys.

United States Patent Office

2,821,238

Patented Jan. 28, 1958

2,821,238

PROCESS FOR MANUFACTURING SELF-IGNITING CIGARETTES

Georg Lakos, Hamburg-Lohbrugge, Germany, assignor to Kurt Korber & Co. K. G., Hamburg-Bergedorf, Germany

Application November 22, 1955, Serial No. 548,499

Claims priority, application Germany February 5, 1955

1 Claim. (Cl. 154—36)

This invention relates generally to cigarette manufacturing processes and more particularly to a process for manufacturing self-igniting cigarettes.

The application of combustible materials to one end of a cigarette is well known and numerous processes have been developed for applying the combustible materials. All of these employ materials which are raised to ignition temperatures either by friction or by chemical action.

With both types of ignition materials it has been suggested that the material be applied directly to the cut end of the cigarette. Usually this was done by means of a roller coated with the ignition material in the form of a heavy viscous fluid. In accomplishing this the ends of the cigarettes were moved past the coated rollers which were usually rotated so that the tangential velocity of the roll surface corresponded to the linear velocity of the cigarette as it moved past the roll, the end of the cigarette lightly touching the heavily coated roll on its way past the roll. Usually an endless band or belt carried the cigarettes.

In accordance with yet another process the ignition material was deposited on a small web which in turn was adhesively applied to the end of the cigarette.

With each of the above processes the ignition material was secured to the end of the cigarette by adhesion to the ends of the strands of tobacco, in the first case by direct application to the ends of the strands and in the second case by adhesion of the web section to the ends of the strands. Both of these approaches to the problem proved unsatisfactory because of the delicate nature of the mechanical connection which usually failed in normal handling of an open cigarette package through loosening of the tobacco strands permitting the ignition material to fall off. These processes were also unsatisfactory from the viewpoint of production speed since satisfactory application of the ignition material required production line operation at speeds which were much lower than the output of modern strand cigarette machines.

The process according to the present invention overcomes the aforesaid disadvantages through the application of devices and principles which correspond generally to those employed in the manufacture of filter tip cigarettes and which can be applied with facility to any conventional strand cigarette machine and operated successfully at normal production speed.

The description of the process and two embodiments of apparatus whereby the process may be practiced which follows relate to the application of an ignition material and a glow material to the end of a cigarette in a way that it can be removed only by destruction of the cigarette tip, the ignition being of a type which is ignited by chemical reaction through contact with a suitable contact substance provided externally of the cigarette package and available for ignition purposes only by removal of a cigarette from the package. By this expedient unwanted ignition even with rough handling is obviated. The present process, of course, is not limited to ignition materials depending upon

heat generated in a chemical reaction for ignition but may be practiced with equal success with materials depending upon the heat of mechanical friction for ignition. This is feasible not only from the process point of view, but also from the viewpoint of practical usage, the latter in view of the strong mechanical assembly of the ignition and glow material with the end of the cigarette.

One object of this invention is to provide a process for the manufacture of self-igniting cigarettes which may be mechanized to provide ignition tip application at cigarette production line speeds.

Another object of this invention is to provide a process for applying ignition materials and/or glow materials to the ends of cigarettes which may be mechanized with a novel organization of conventional devices available for example in the manufacture of filter-tip cigarettes.

A further object of this invention is to provide a process for the application of combustible materials for self-ignition purposes to the ends of cigarettes which results in a mechanically strong product which retains its self-ignition properties in the presence of rough handling.

These and other objects and advantages will become apparent from a study of the following specification when considered in conjunction with the accompanying drawings, in which:

Figure 1 schematically illustrates a portion of a strand type of cigarette machine embodying arrangements for practicing the process of this invention,

Fig. 2 is a view of a portion of a cigarette paper band prior to wrapping and cutting illustrating the application of ignition and glow materials thereto in accordance with the present process,

Fig. 3 illustrates a modified arrangement of the type shown in Fig. 1 wherein the process steps are modified while yet producing a corresponding finished product,

Fig. 4 is a view of a portion of a cigarette paper band prior to wrapping and cutting showing the appearance and position of the ignition and glow materials resulting from the modified process, and

Fig. 5 illustrates a finished cigarette showing the position of the ignition and glow materials at the end of the cigarette.

Very generally stated the process herein disclosed embodies the steps of superimposing ignition and glow materials at spaced points along the inner face of a cigarette paper band so that when the band is wrapped about a tobacco strand and thereafter glued and cut centrally of said materials and intermediate said materials separate cigarettes are formed, each having a self-igniting tip comprised of concentric cylinders or concentric partial cylinders disposed between the tobacco strand and the wrapped paper band at the end of the cigarette.

Fig. 1 illustrates one arrangement for practicing a specific process embodied within the generic process outlined above. In this arrangement a strip or band 1 of cigarette paper passes about the end of an endless band type of conveyor 2 to its top surface and is moved with the conveyor in the direction of the arrow. A second conveyor 3, again of the endless band type, feeds a strand of cigarette tobacco across a bridge 4 onto the cigarette paper 1 on conveyor 2. The conveyors 2 and 3 are synchronized so that their endless bands have the same linear velocity. The cigarettes are formed by wrapping and gluing the transverse dimension of the band of cigarette paper about the continuous strand of cigarette tobacco coming from conveyor 3. Thereafter the paper wrapped tobacco strand is cut into standard cigarette lengths. Since the devices for wrapping and cutting the tobacco strand form no part of this invention, they are not illustrated in the interest of simplicity.

Reel 5 comprises a wound strip coated with ignition

material. The ignition material strip 5*a* is threaded through a guide 6 and over an idler pulley 7 to a gluing station 8, the details of which are not shown being conventional. From the gluing station the strip 5*a* passes through a cutter 9 which cuts the strips into lengths double that required in a single cigarette. The cut ignition sections 5*b* are then guided between guide rollers 11 and 11*a* (shown only symbolically) to a suction drum 12 which is tangent to the cigarette paper strip at point 13. A support 14 backs up the cigarette paper strip 1. Thus each ignition material section 5*b* is positively applied at a precise point to the cigarette paper strip. If desired, an intermittent type of gear drive such as a Geneva gear synchronized with the cigarette paper strip 1 may be used to drive the suction drum 12 to provide the necessary intermittent operation and correct peripheral speed for the suction drum so that the ignition material sections 5*b* are properly spaced with the length of two cigarettes between their centerlines and properly secured to the cigarette paper strip.

A second reel 17 is wound of a strip coated with a suitable glow material. The glow material strip 17*a* is threaded between guides 18 and about an idler pulley 19 to a gluing station 20 from which it passes to a cutter 21. The cut glow material sections 17*b* are then guided between symbolically illustrated guide rollers 22 and 22*a* to a suction drum 23 corresponding to drum 12, and similarly driven, and indexed to apply the glow material sections 17*b* substantially centrally of the ignition material sections 5*b*. Cigarette paper strip 1 passes between pressure rolls 24 which apply firm pressure to the laminated sections and paper strip to assume positive adhesive bonding.

Fig. 2 on an enlarged scale shows the glow material section 17*b* applied to the ignition material section 5*b* in turn applied to the paper cigarette strip 1. The equal longitudinal dimensions between lines A and C, and B and C indicate the length of a standard cigarette. It will be noted that the ignition material and the glow material superimposed sections are cut into two substantially equal axial parts, half being on each cigarette. The dimensions of the ignition and glow materials 5*b* and 17*b* are determined experimentally and will vary depending upon the igniting material which is used. The brand of tobacco which is used will also have some bearing upon the size of the ignition and glow material used to obtain self-ignition.

In the modification of the invention shown in Fig. 3, the strips of ignition and glow material are laminated prior to cutting. In accomplishing this the glow material strip 17*a* is engaged by a liquid adhesive roller 25 which coats the strip with adhesive. The ignition material strip 5*a* is approximately aligned with glow material strip 17*a* by an idler pulley 26 after which both strips pass through a pair of pressure rollers 27 which apply the bonding pressure. At gluing station 28 adhesive is applied to the bottom side of the laminated strip, as viewed. From the gluing station the laminated strip passes between guide rollers 29 and 29*a* to a suction drum or roller 30. The laminated strip is cut into sections 31 by means of a rotary knife 32 or other corresponding cutting device. These sections 31 are held in place by suction pressure on the suction drum and applied to the cigarette paper strip at point 33 where the path of movement of the section 31 on the suction roll or drum is substantially tangent to the cigarette paper strip. The circumferential spacing of the sections 31 on the suction roll may correspond to the length of two cigarettes. Thus if the peripheral speed of the suction roll is matched to the linear speed of the cigarette paper strip, the laminated ignition and glow sections 31 will be properly spaced on the cigarette paper strip 1. This requires feeding the laminated strip to the cutter 32 at a speed somewhat lower than the peripheral speed of the suction roll so that the required spacing between the sections 31 is obtained. An intermittent gear drive of the type proposed in connection with Fig. 1 may also be employed to drive suction roll 30. Pressure rollers 24 through which the cigarette paper strip with the sections 31 thereon passes, apply bonding pressure to secure the assembly.

Each laminated section 31 comprises a short length of ignition strip material 5*a* and a corresponding length of glow material strip 17*a*. Unlike the process of Fig. 1 which produced a glow material section 17*b* which was smaller in length and width than the ignition material section 5*b*, this arrangement results in ignition and glow sections 5*b* and 17*b* which are of the same length, the glow material section again however being of lesser width than the ignition material section 5*b*.

Although in each case the ignition material section has been applied to the cigarette paper strip, it will be appreciated that the glow material may be applied to the cigarette paper strip and the ignition material applied to the glow material. In this case the glow material section is preferably made larger than the ignition material section. As a rule, therefore, the larger section, whether of ignition or glow material is secured to the cigarette paper and the smaller section secured to the larger section.

In Fig. 3 as in Fig. 1 the length of the sections 31 is double that required for a single cigarette. This will be seen by reference to Fig. 4 which shows an enlarged view of the cigarette paper strip 1 with the sections 31 applied thereto. Lines A, B and C again indicate the places where the strip 1 is cut after rolling and gluing about the tobacco strand. The distance between lines A and C represents the length of one cigarette and the distance between lines B and C represents a cigarette of equal length. It will be noted that lines A and B divide each combustible material section into two equal parts, the centerline spacing of each section 31 being the length of two cigarettes.

Fig. 5 shows an assembled cigarette 1*a* manufactured according to the processes herein disclosed wherein the partial cylindrical configuration of the section 31 is apparent. The laminated section 31 as was the case with the combustible laminate of Fig. 1, being deposited on the inner face of the cigarette paper strip, is wrapped up inside the cigarette paper about the tobacco strand 32. Although the arrangement shown results in a partial concentric cylinder of ignition and glow material, it will be obvious that the widths of both ignition and glow material sections can be selected to form complete cylinders when the cigarette is wrapped.

In the event the exposed edges of the ignition and glow materials are insufficient to provide igniting action by friction or by chemical action brought about by contact with a suitable contact material, the cigarette paper may be suitably punched as shown at 34 to provide a hole in the paper exposing the ignition material. These holes are spotted with their centers on the cutting lines such as B so that each completed cigarette will have a semicircular paper cut out at its ignition end, as shown at 35 in Fig. 5, exposing the ignition material 5*b* so that it may be conveniently engaged with the friction or contact surface provided as previously described.

It will be appreciated that single lengths of combustible material sections may be applied and spaced apart the length of one cigarette with substantially equal facility.

I claim as my invention:

In a process for manufacturing self-igniting cigarettes, the steps comprising continuously feeding a strip of cigarette paper to a conveyor pathway from the underside of said pathway and over one end thereof so that the lower face of said strip beneath said pathway is uppermost during its travel along said pathway, continuously feeding a band of ignition material and a band of glow material of a smaller width than said ignition band material from separate rolls beneath said conveyor pathway, applying adhesive to one side of each of said bands during their continuous feeding movement, guiding said bands separately in spaced relation toward the underside of said

continuously moving strip of cigarette paper before it passes over the end of said conveyor pathway, cutting said bands into sections of different length, the sections of ignition material being of a greater length than the cut sections of said glow material, applying a section from said ignition material band with its adhesive side to the continuously moving strip of cigarette paper at spaced intervals equal to the length of two cigarettes, and applying a cut section of said glow material band after said cut ignition section has traveled the distance of two cigarettes centrally to the area of said ignition material band section, said ignition and glow material sections being applied to the cigarette paper strip before it passes over the end

of said conveyor pathway whereby said sections will be uppermost during the travel of said cigarette paper along said pathway and will be arranged internally of a completed cigarette.

References Cited in the file of this patent

UNITED STATES PATENTS

1,723,068	Parsons	Aug. 6, 1929
1,942,899	Parsons	Jan. 9, 1934
2,080,536	Durden	May 18, 1937
2,384,231	Bamford	Sept. 4, 1945
2,644,461	Witt	July 7, 1953