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2,820,460

FILTER PLUGS FOR CIGARETTES

Filed Dec. 28, 1953

3 Sheets-Sheet 1

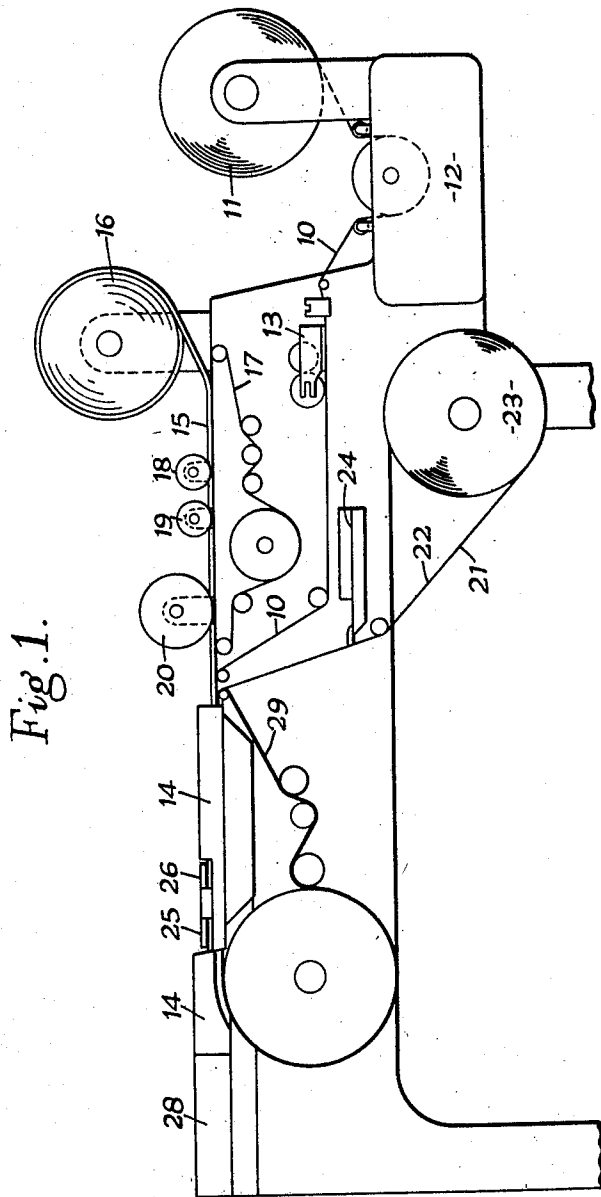


Fig. 1.

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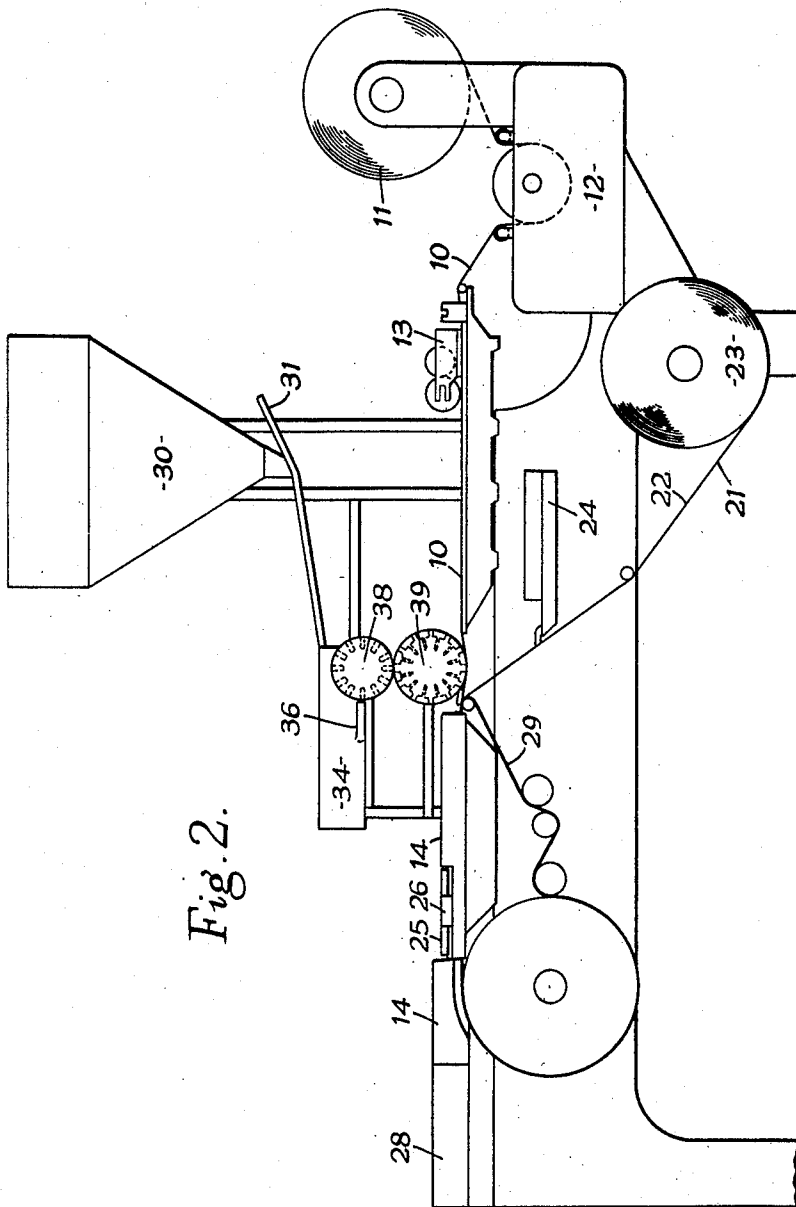


Fig. 2.

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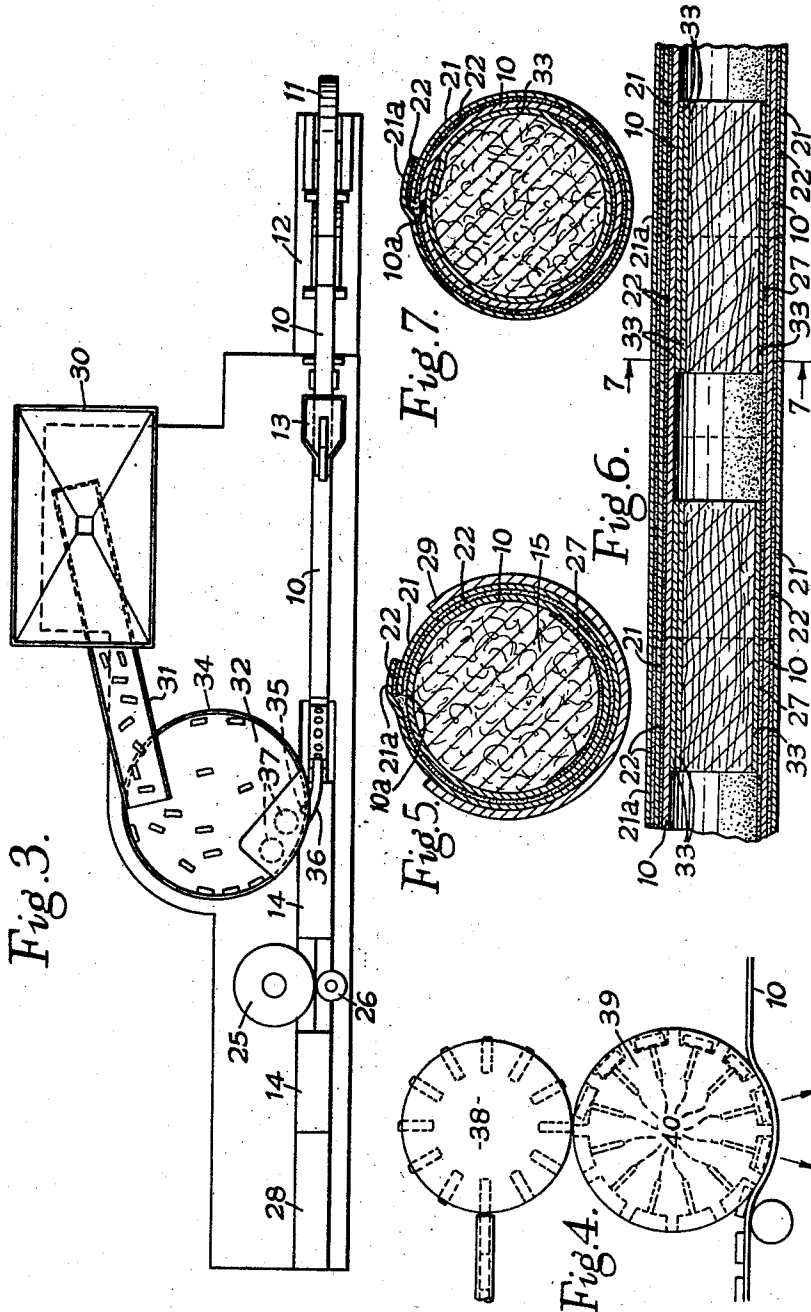
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FILTER PLUGS FOR CIGARETTES

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Application December 28, 1953, Serial No. 400,622

Claims priority, application Great Britain December 31, 1952

3 Claims. (Cl. 131—10)

The present invention relates to improvements in or modifications of the method of making filter plugs for cigarettes forming the subject of earlier U. S. Patent No. 2,685,344 issued August 3, 1954 and of filter plugs made by that method.

The method of making filter plugs for cigarettes according to the above-mentioned specification includes the steps of feeding simultaneously to a garniture a sliver of wool, a strip of relatively stout paper, such as cartridge or parchment paper, having a width such that it is formed in the garniture into an inner tube having a longitudinal butt joint, and a strip of relatively thin paper such as cigarette paper having a width such that it is formed in the garniture into an outer tube surrounding the butt jointed tube and having a longitudinal lapped and stuck seam.

In the method as described in the above-mentioned specification the maintenance of the tubular form of the body constituted by the inner and outer strips is entirely dependent upon a glued seam formed by the application of glue to one overlapping edge of the outer thin paper forming that seam.

Furthermore in the method described in the above-mentioned specification the filter material is applied as a continuous strip, i. e. a sliver of wool.

In accordance with the present invention a method of making filter plugs for cigarettes includes the steps of feeding simultaneously to a garniture filter material in the form of a sliver or a rod, e. g. a sliver of cotton wool or a rod of crepe paper with the creping disposed longitudinally of the rod, a strip of relatively stout paper having a width such that it is formed in the garniture into an inner tube surrounding the sliver or rod and having a longitudinal butt joint, and a strip of thinner paper having a width such that it is formed in the garniture into an outer tube surrounding the butt-jointed tube and having a longitudinal lapped joint, an adhesive being applied over the whole or the greater part of the external surface of the butt-jointed inner tube or over the whole or the greater part of the internal surface of the lap-jointed outer tube or over the whole or the greater part of both said surfaces.

By the improved method, filter plugs may be produced offering greater resistance to deformation than filter plugs in which no adhesive is provided between the inner and outer tubes.

The adhesive between the inner and outer tubes is preferably a heat-setting adhesive, said adhesive offering the advantage of great stiffness and usually being waterproof.

According to a further feature of the invention the filter material instead of being fed in a continuous strip as in the case of the continuous sliver of cotton wool described in the above-mentioned specification is fed to the garniture as a succession of short lengths, for example, of cotton wool or cotton wool plugs or short lengths of crepe paper rod with the creping longitudinally of the rod, the short lengths corresponding to those of individual filter plugs for single cigarettes or convenient multiples of individual filter plugs.

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The feeding of the filter material in a succession of short lengths as described above may readily be effected in conjunction with the formation of a butt-jointed inner tube of relatively stout material and an outer tube of thinner material having a lapped and stuck longitudinal seam, whether adhesive is provided between the inner and outer tubes or not, the short lengths of filter or baffle material being dropped onto the strip of relatively stout material at a point where it has been shaped to channel form, the strip of stout material being provided if necessary with a line of adhesive for engagement with the filter material.

Other forms of filter material than cotton wool or crepe paper may be used e. g. other vegetable fibre material, mineral fibre material such as asbestos, animal fibre material, artificial silk and other synthetic fibres, plastic foam materials and the like, and where the filter material is introduced in a succession of short lengths they may be spaced from one another in the produced rod-like structure so that the structure may be subsequently divided to provide filter plugs with tubular extensions, the plugs constituting mouthpieces for cigarettes and consisting of a length of filter plug with a length of hollow tube at the mouth end of the cigarette. The lengths of filter plug portion and hollow tube portion of the mouthpieces may be varied, e. g. a 15 mm. long mouthpiece may consist of a 12 mm. long filter plug and a 3 mm. long hollow tube or of a 10 mm. long filter plug and a 5 mm. long hollow tube; an 11 mm. long mouthpiece may consist of an 8 mm. long filter plug and a 3 mm. long hollow tube or a 7 mm. long filter and a 4 mm. long hollow tube, and so on.

Again short lengths of two or more different kinds of filter material may be introduced onto the strip of relatively stout material in alternating succession to enable alternative forms of filter plug to be produced at the same time.

Pieces of filter material of different kinds may be fed so as to be located close to or in contact with one another so that when the produced structure is subsequently divided filter plugs or filter plugs and mouthpieces are produced embodying more than one kind of filter material in each.

Embodiments of the invention will now be described by way of example, with reference to the accompanying diagrammatic drawings wherein:

Figure 1 is a view partly in section and partly in elevation of a machine for forming filter plug elements in accordance with this invention, the filter material being applied as a continuous strip,

Figure 2 is a view partly in section and partly in elevation of a machine for forming filter plug elements in accordance with this invention, the filter material being applied in a succession of short lengths.

Figure 3 is a plan view of the machine shown in Figure 2,

Figure 4 is a view in elevation of a detail of the machine shown in Figures 2 and 3 and drawn to a larger scale,

Figure 5 is a transverse section through a filter plug element in accordance with the invention,

Figure 6 is a longitudinal section through a filter plug element in accordance with the invention, and

Figure 7 is a section taken on the line 7—7 in Figure 6 and drawn to a larger scale.

In the machines shown in Figures 1 to 4, the means for driving the various parts of the machine are not illustrated, but their arrangement will be apparent to those skilled in the art. Similar parts have the same reference numeral in all the figures of the drawing.

Referring now to Figures 1 and 5, a strip 10 of relatively stout paper, e. g. parchment paper, is passed from a storage roll 11, through a tensioning device 12, against the

glueing wheel of a glueing device 13 and into a garniture 14. Simultaneously a sliver 15 of cotton wool is unreeled from a storage roll 16 and is laid onto the top surface of an endless tape 17 which pulls the sliver under wheels 18, 19 and 20. The tape 17 travels in a slot in the top surface of the machine, the wheels 18, 19 and 20 pressing on the sliver to compact it against the tape, which has been bent to a U-section by the walls of the slot, and form the sliver into a rod of approximately circular cross section. Simultaneously a strip 21 of thinner paper, e. g. cigarette paper, having one face coated with a layer 22 of moisture-able adhesive is unreeled from a storage roll 23, passed over a moistening device 24 with the adhesive covered face in contact therewith and laid on to the underside of the strip 10 as it enters the garniture 14 with the layer of adhesive interposed between the two strips.

In the garniture the strip 10 is bent around the wool sliver 15 until its two edges meet and form a butt joint 10a (Figure 5). The cigarette paper strip 21 is wrapped around the strip 10 leaving one border 21a projecting more or less radially upwards, which thereafter engages a moistening wheel 25 and a cooperating press wheel 26, the portion 21a subsequently being pressed down by the garniture to form a longitudinal lapped and stuck seam. The adhesive layer 22, and a layer 27 (Figures 5 and 6) of adhesive applied by the device 13, are set and dried by passing the resulting continuous filter plug rod through an electrically-operated heater 28 maintained at the required setting temperature. The two strips 10 and 21 and the sliver 15 are pulled through the garniture in known manner by a flexible tape 29 which wraps around the outside of the strip 21 (see Figure 5). A continuous rod of crepe paper having the creping disposed longitudinally of the rod can be used in place of the sliver 15.

The continuous plug rod leaving the heater 28 is cut into lengths (by means which are not shown) and are passed to a packing station or to a cigarette-making machine.

Referring now to Figures 2 to 4 and 6 and 7, the strip 10 of relatively stout paper is fed past the glueing device 13 mounted on the machine table and into the garniture 14. Similarly, the strip 21 of cigarette paper is fed past the moistening device and is laid against the underside of the strip 10 with the layer 22 of adhesive interposed between the two strips.

The filter material in the form of short lengths of, for example, crepe paper rolled into cylindrical shape, is fed to a hopper 30, from whence the lengths are transferred by a shaking conveyor chute 31 to a rotating disc 32 (Figure 3). Each of the lengths is enclosed in a wrapper 33 (Figure 7) of cigarette paper having a longitudinal lapped joint, so that its external surface is smooth. The upper surface of the disc is also smooth with the result that the lengths are thrown radially outwards against a stationary wall 34. The radially outermost lengths are picked from the disc by a projection 35 and fed endwise down a tubular guide 36. Two rotating rollers 37 (Figure 3) prevent lengths passing directly from the chute 31 to the guide 36 without contacting the wall 34, and also prevent jamming of the mouth of the guide by lengths that are not "end-on" to the mouth.

The rate of delivery of lengths to the tubular guide 36 is sufficient for the guide to be kept full. From the guide the lengths pass into radial bores in the periphery of a rotating indexing wheel 38, which in turn feeds them into slots formed in the periphery of a rotating wheel 39, the lengths being held in the slots by suction applied through bores 40 in the wheel. The bores in the wheel 38 can be

inclined to the radial direction to facilitate delivery of the lengths from the bores to the slots in the wheel 39. The lower run of the periphery of the wheel 39 engages the band 10, and as the mouth of each slot is closed by the band the vacuum is released through the respective bore 40, so that the length is deposited on the strip 10. With the arrangement described a plurality of lengths that is thrown at random into the hopper 30 is fed in succession onto the upper side of the strip 10, the lengths being disposed at equally spaced intervals with their longitudinal axes parallel to the length of the strip 10. The lengths are held on the strip 10 by the adhesive 27 applied to its upper side by the device 13. The spacing between the lengths is determined by the peripheral distances that the slots in the wheel 39 are spaced from one another.

As with the machine illustrated in Figure 1, in the garniture the strip 10 is bent around the spaced lengths of filter material until its two edges meet to form a butt joint 10a. The cigarette paper strip 21 is wrapped around the strip with the layer 22 of adhesive interposed between the two strips and a longitudinal lapped joint is formed. After passing through the heater 28 the continuous plug rod is cut into lengths which are passed to a packing station or a cigarette making machine.

With the two machines illustrated the layer 22 of adhesive is applied to one side of the strip 21, but it can equally be applied to the appropriate side of the strip 10, or to the appropriate sides of both the strips 10 and 21.

We claim:

1. A multiple filter plug unit adapted for division into individual filter plugs for cigarettes by cutting comprising filter material of cylindrical cross section constituting a core and a tubular wrapper surrounding the filter material, adhesive material extending only partially around the filter material and constituting a holding means for the core to connect the core to the tubular wrapper, said wrapper comprising an inner tube of relatively stout paper surrounding the core and having a longitudinal butt joint, an outer tube of thinner paper of the same length as the inner tube, surrounding the inner tube and having a longitudinal lapped joint, and a layer of heat-setting adhesive interposed between the said inner and outer tubes and extending over at least the greater part of the external surface of the inner tube and the internal surface of the outer tube for stiffening the wrapper against deformation by cutting.

2. A multiple filter plug unit as claimed in claim 1, wherein the said filter material comprises a plurality of spaced lengths thereof.

3. A multiple filter plug unit as claimed in claim 2 and including a like plurality of innermost tubes of relatively thin paper and of the same length as the lengths of filter material, each innermost tube surrounding a respective length of filter material and having a longitudinal lapped joint.

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