

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in Cigarettes

We, THE IMPERIAL TOBACCO COMPANY (OF GREAT BRITAIN AND IRELAND), LIMITED, a British Company of East Street, Bedminster, in the City and County of Bristol, 3, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to cigarettes of the kind comprising a tobacco portion encased in paper, and a stub portion, joined together in abutting relation by a band that encircles at least a portion of both the tobacco portion and stub, and is adhesively secured thereto, to provide a composite cigarette. It also relates to cigars or cigarillos manufactured in a similar manner. Such cigarettes, cigars or cigarillos are hereinafter referred to as cigarettes of the kind described.

In such a composite cigarette a narrow strip of the encircling band coincides with the butt joint between the tobacco portion and the stub. Hereinafter in this specification said narrow strip is referred to as the "line corresponding to the butt joint between the tobacco portion and stub".

The stub portion may be constituted by any of the well known materials, e.g. crimped paper, cellulose acetate, tobacco, or a hollow mouthpiece, or a composite stub comprising say a section of activated charcoal and a section of crimped paper, and the stub or composite stub itself may be secured within a paper, or like, sheath.

object

It is an object of the present invention to provide a cigarette of the kind described wherein means are provided to permit air to be drawn into the cigarette adjacent the stub.

The present invention consists in a cigarette of the kind described, wherein the

encircling band is rendered more permeable at an area or areas on or a continuous area along the line corresponding to the butt joint between the tobacco portion and stub of the composite cigarette, whereby air may be drawn in through said line, the volume of said air being controlled by the permeability of the band where it is more permeable in conjunction with the extent of the periphery of the butt joint that is disposed behind said area or areas.

The encircling band may comprise a web of substantially impermeable material secured to a web of more permeable material, the former being perforated at one or more areas along the line corresponding to the butt joint between the tobacco portion and stub of the composite cigarette, whereby air may be drawn in through said line at said area or areas, the volume of said air being controlled by the permeability of the band at said area or areas in conjunction with the extent of the periphery of the butt joint that is disposed behind it or them.

The band of substantially impermeable and more permeable material may encircle the whole length of the stub.

In an alternative the web of substantially impermeable material may encircle the whole length of the stub with the web of more permeable material secured near one edge thereof so that the latter is secured only adjacent the perforations.

In a further modification the band of substantially impermeable and more permeable material is secured to the cigarette and stub as a narrow band.

According to a modification the encircling band may be rendered more permeable at an area or areas on or a continuous area along the line corresponding to the butt joint between the tobacco portion and stub of the

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substantially





composite cigarette by thinning the material of the band at said area or areas.

The material may be thinned by shaving material off a surface of the band.

It is to be understood that in the present specification the word areas has been used to indicate that they are not mere pin-holes, and the expression "rendered more permeable" means that the line of abutment is not exposed.

Embodiments of the present invention will now be described with reference to the accompanying drawings in which:—

Fig. 1 shows a cigarette joined to a stub with an encircling band comprising a narrow web of substantially impermeable material secured to a narrow web of more permeable material.

Fig. 2 shows a cigarette joined to a stub with an encircling band comprising a wide web of substantially impermeable material secured to a wide web of more permeable material.

Fig. 3 shows a cigarette joined to a stub with an encircling band comprising a narrow web of substantially impermeable material secured along one edge of a wide web of less permeable material, said wide web extending to the end of the stub.

In Figs. 1, 2 and 3 the composite webs of substantially impermeable and more permeable materials are shown curled back in places to illustrate the construction.

Figs. 4 to 6 are examples of different patterns of perforations that may in some instances be preferred.

Referring first to Fig. 2,—The normal method of manufacturing a cigarette as shown is to roll two cigarettes, with an intervening double length stub, in a gummed double length encircling band, and then cut the stub through the encircling band at its mid point thus providing two single composite cigarettes each comprising a cigarette 1, a stub 2 and an encircling band 3. The stub 2 may be unsheathed in its own paper sleeve 4. 5 is the butt joint between cigarette and stub.

It is generally considered desirable to be able to provide means for drawing in air with the smoke of a cigarette, in order to reduce the "tar" passing through it and many suggestions have been made concerning perforating a cigarette or stub with this object in view. Hitherto one of the chief difficulties encountered in reducing and controlling tar is to maintain control of the amount of extra air drawn in. In accordance with the present invention the encircling band for joining a stub and cigarette together is constructed in the following manner, so as to maintain control of air intake and tar reduction.

A web 3 of substantially impermeable paper, for example the well known imitation

cork tipping material, is apertured at one or more areas with circular perforations 6, e.g. perforations of about 2 m.m. diameter spaced at a convenient distance apart so as to provide, say, four perforations around the circumference of a cigarette at equal distances. The line on which the perforations are made is the line corresponding to the butt joint between the tobacco portion and stub, i.e. it is such that in the finished composite cigarette the perforations lie with their diameters coincident with the butt joint 5 between the tobacco portion 1 and stub 2.

For convenience in manufacture, a web of, say, cork tipping material is perforated as above described before slitting into widths suitable for joining two cigarettes together. For example the web may be wide enough to be subsequently slit into say fifteen double length encircling bands.

This impermeable web is preferably pre-gummed with an adhesive that becomes tacky when moistened. The web thus perforated is then moistened and laminated to a similar web of more permeable paper.

It will be appreciated that by this laminated construction the volume of air that is drawn in with each puff of a cigarette through the areas at which the web 3 is perforated, is controlled by the permeability of the more permeable web 7 at said areas in conjunction with the extent of the periphery of the butt joint 5 that is disposed behind the perforations.

In the event that a paper manufacturer cannot provide a paper of a given degree of permeability, he can at any rate provide paper of a substantially constant permeability.

It is then only necessary to test a batch of cigarettes to ascertain the volume of air drawn in per puff, and assuming too much is drawn in, then the line of perforations can be offset somewhat from the butt joint to cover a greater length of the said joint and so reduce air intake. If too little is drawn in then perforations larger in diameter may be provided.

It has been found convenient to perforate the substantially impermeable web on a perforating machine, that is to say a machine in which the paper web is moved between circular pegs carried in and protruding slightly from a rotating cylindrical arbor, and a high speed cylindrical cutting head that acts to shave off material from the web coincident with the pegs.

In an alternative arrangement for varying the control of air intake, pegs shaped to produce perforations as illustrated in Figs. 4 to 6, which for convenience can be referred to as lozenge shaped, may be used.

Thus, referring to Fig. 4, which shows a web of permeable paper 7 laminated to a web of lesser permeable paper 3, the perforations 6 are made by pegs which are 3



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m.m. diameter ground on both sides to provide two parallel flats 8 and 9, two m.m. apart.

5 If the perforations are then arranged around the cigarette parallel as shown in Fig. 4, then four times 2 m.m. of the length of periphery of the butt joint is exposed through the more permeable paper. This shape of perforation allows for the case when
10 the perforations become slightly offset from the joint—if circular they will shorten the length of periphery exposed, but if lozenge shaped as shown, a slightly offsetting does not alter the length exposed.

15 While a greater length of the periphery of the joint behind the more permeable paper can be provided by perforating larger holes, e.g. 3 m.m. diameter, if four lozenge shaped
20 pegs are turned through an angle of 37°, perforations as shown in Fig. 5 will result, whereby the length of the periphery of the butt joint exposed through the more permeable paper is increased by 25% for the four perforations, increasing the air intake by a
25 like amount.

If the pegs are turned through an angle of from 60° to 90°, perforations as shown in Fig. 6 will result. In this case the length of periphery for each perforation is 3 m.m.,
30 resulting in an increase of 50% for four perforations.

Naturally any shape, number, combination or angular relation of perforation may be used, but the use of a lozenge shape as shown
35 conveniently permits controlled variation of extent of the length of periphery exposed through the more permeable paper, without unduly weakening the joining band.

As previously mentioned, in practice the joining band is made double the width of those shown in Figs. 4 to 6 and is perforated close to both edges. The mid lines of the gaps between the sets of four perforations illustrated are the positions at which
45 the web is cut to join two cigarettes and an intermediate double length stub and the double length web is subsequently cut mid-way of its width to provide two composite cigarettes.

50 The only difference between Fig. 1 and Fig. 2 is that the encircling band does not extend to the end of the stub, while in Fig. 3 the web 3 of less permeable material encircles the whole length of the stub 2 and
55 the web of more permeable paper 7 is secured near the edge of the web 3 that encircles the butt joint 5.

Normally when joining two cigarettes with an intervening stub by an encircling band, the majority of the inside surface of the band is gummed by leading it across a gumming roller whose periphery is ground down to provide a shallow reservoir containing the gum. The word majority above is used because the reservoir does not usually extend

right to the mouth end 10 (see Figs. 1, 4 and 5) of the band to avoid gum on the band where the knife severs the double length stub to provide two cigarettes.

When using an encircling band as above
70 described, it is desirable in the second gumming operation, i.e. to secure the band to the tobacco portion and stub, to avoid applying gum to the inner surface of the more permeable paper at positions too near the
75 perforations so that permeability at the perforations is unaffected by the adhesive.

Chain lines 16 and 116 and dotted lines 11, 12, 13 14 and 15 have been superimposed on Fig. 4 to assist in indicating the extent
80 of the gumless areas found suitable. The chain lines 16 and 116 indicate where the individual laminated encircling bands 3 and 7 are severed. The narrow strip between line 10 and dotted line 11 is a gumless area.
85 The other gumless area is bounded by the lines 12, 13, 14 and 15. The area between lines 13 and 16, but extended across the width of the encircling band, illustrates the extent of the overlap of the ends of the encircling band when the composite cigarette
90 has been completed.

It should be explained that the periphery of the gumming roller corresponds to a multiple of the area between the lines 16 and 116 and of double width, symmetrical about the line 10. The periphery is patterned by machining it to provide a shallow reservoir for gum except at the areas bounded by lines 10 and 11, and 12, 13, 14 and 15.
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To improve the security of the adhesion of the tobacco portion and the stub to the encircling band, additional gummed areas 17, 18 and 19 may be provided as illustrated in Fig. 5.
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It will be appreciated that although four perforations are shown in the Figs. 1 to 6, the number and shape may be varied to suit any particular requirement.

According to a modification, instead of securing substantially impermeable and more permeable material together, the former being perforated, substantially impermeable material alone is used. In this case material is shaved off the surface of substantially impermeable material to thin it at one or more areas on or a continuous area along the line that corresponds with the butt joint between the tobacco portion and stub of the composite cigarette, thus rendering it more permeable at said areas.
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In this respect it should be explained that a perforating machine as hereinbefore described can be set so as to completely perforate a web at spaced positions or it may be set so as to shave material off the surface at spaced intervals, thus rendering the material more permeable at said positions according to the thickness of material shaved off.
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non pre-
shaved

In other respects the considerations in this modification as to shape, size, angular relation and number of more permeable areas, apply in a similar manner to the case, hereinbefore described, where more permeable material is secured to substantially impermeable material, the latter being perforated.

If pre-gummed substantially impermeable material is used, material may be shaved from the gummed surface or the surface that becomes the outer surface, while if a nonpre-gummed material is used, it is desirable to avoid applying adhesive to the inner surface at positions too near the shaped portions. This of course is avoided in a similar manner to that previously described, i.e. by using a patterned gumming roller.

In this modification, instead of shaving the line that corresponds to the butt joint between the tobacco portion and stub of the composite cigarette at one or more areas, the line may be thinned continuously by shaving a surface to provide an area, all around the butt joint, that is thinned and is thus more permeable.

These modifications, in which substantially impermeable paper is thinned to provide a more permeable area, areas or continuous area are not illustrated in the drawings because modifications of the drawings would be so slight since it is only necessary to omit the more permeable material 7 and to explain that the perforations 6 are not complete perforations but comprise thinned areas.

WHAT WE CLAIM IS:—

1. A cigarette of the kind described wherein the encircling band is rendered more permeable at an area or areas on or a continuous area along the line corresponding to the butt joint between the tobacco portion and stub of the composite cigarette, whereby air may be drawn in through said line, the volume of said air being controlled by the permeability of the band where it is more permeable in conjunction with the extent of the periphery of the butt joint that is disposed behind said area or areas.

2. A cigarette as claimed in claim 1 in which the encircling band comprises a web of substantially impermeable material secured to a web of more permeable material, the former being perforated at one or more areas along the line corresponding to the butt joint between the tobacco portion and stub of the composite cigarette, whereby air may be drawn in through said line at said area or areas, the volume of said air being controlled by the permeability of the band at said area or areas in conjunction with the extent of the periphery of the butt joint that is disposed behind it or them.

3. A cigarette as claimed in claim 2, in which the band of substantially impermeable and more permeable material encircles the whole length of the stub.

4. A cigarette as claimed in claim 2 in which the web of substantially impermeable material encircles the whole length of the stub with the web of more permeable material secured near one edge thereof so that the latter is secured only adjacent the perforations.

5. A cigarette as claimed in claim 2 in which the band of substantially impermeable and more permeable material is secured to the cigarette and stub as a narrow band.

6. A cigarette as claimed in any one of claims 2 to 5 in which the webs of substantially impermeable and more permeable material are secured together by applying adhesive to the former so that no adhesive is applied to the more permeable material coincident with the area or areas, thereby preventing any modification of air permeability of the more permeable material thereat.

7. A cigarette as claimed in claim 1 in which the encircling band comprises a band of substantially impermeable material that is rendered more permeable at an area or areas on or a continuous area along the line corresponding to the butt joint between the tobacco portion and stub of the composite cigarette by thinning the material of the band at said area or areas.

8. A cigarette as claimed in claim 7 in which the material is thinned by shaving material off a surface of the band.

9. A cigarette as claimed in any one of claims 1 to 8 in which the more permeable area or areas are circular.

10. A cigarette as claimed in any one of claims 1 to 9 in which the highly permeable area or areas are lozenge-like in shape so that, according to their angular relationship with respect to the butt joint between the cigarette and stub, so more or less of the periphery of said butt joint is disposed behind it or them.

11. A cigarette as claimed in any one of the preceding claims in which adhesive securing the inner surface of the band to the tobacco portion and stub is omitted at positions too near that or those where the band is rendered more permeable.

12. The improved cigarette constructed and operating substantially as hereinbefore described with reference to Figs. 1 or 2 or 3 of the accompanying drawings.

13. The improved composite cigarette comprising a tobacco portion and a stub joined together with an encircling band constructed substantially as illustrated in Figs. 4 or 5 or 6 of the accompanying drawings.

14. The improved composite cigarette comprising a tobacco portion and a stub joined together with a band of substantially impermeable material rendered more permeable by shaving material off a surface of the band at an area or areas on or continuously along



non pre-
shaved

5 In other respects, the considerations in this modification as to shape, size, angular relation and number of more permeable areas, apply in a similar manner to the case, here-
inbefore described, where more permeable material is secured to substantially impermeable material, the latter being perforated.

10 If pre-gummed substantially impermeable material is used, material may be shaved from the gummed surface or the surface that be-
comes the outer surface, while if a nonpre-gummed material is used, it is desirable to avoid applying adhesive to the inner surface at positions too near the shaped portions.
15 This of course is avoided in a similar manner to that previously described, i.e. by using a patterned gumming roller.

20 In this modification, instead of shaving the line that corresponds to the butt joint between the tobacco portion and stub of the composite cigarette at one or more areas, the line may be thinned continuously by shaving a surface to provide an area, all around the butt joint, that is thinned and is thus more permeable.
25

These modifications in which substantially impermeable paper is thinned to provide a more permeable area, areas or continuous area are not illustrated in the drawings because modifications of the drawings would be so slight since it is only necessary to omit the more permeable material 7 and to explain that the perforations 6 are not complete perforations but comprise thinned areas.
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35 WHAT WE CLAIM IS:—

1. A cigarette of the kind described where-
in the encircling band is rendered more permeable at an area or areas on or a continuous area along the line corresponding to the butt joint between the tobacco portion and stub of the composite cigarette, whereby air may be drawn in through said line, the volume of said air being controlled by the permeability of the band where it is more permeable in conjunction with the extent of the periphery of the butt joint that is disposed behind said area or areas.
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2. A cigarette as claimed in claim 1 in which the encircling band comprises a web of substantially impermeable material secured to a web of more permeable material, the former being perforated at one or more areas along the line corresponding to the butt joint between the tobacco portion and stub of the composite cigarette, whereby air may be drawn in through said line at said area or areas, the volume of said air being controlled by the permeability of the band at said area or areas in conjunction with the extent of the periphery of the butt joint that is disposed behind it or them.
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3. A cigarette as claimed in claim 2, in which the band of substantially impermeable and more permeable material encircles the whole length of the stub.
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4. A cigarette as claimed in claim 2 in which the web of substantially impermeable material encircles the whole length of the stub with the web of more permeable material secured near one edge thereof so that the latter is secured only adjacent the perforations.
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5. A cigarette as claimed in claim 2 in which the band of substantially impermeable and more permeable material is secured to the cigarette and stub as a narrow band.
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6. A cigarette as claimed in any one of claims 2 to 5 in which the webs of substantially impermeable and more permeable material are secured together by applying adhesive to the former so that no adhesive is applied to the more permeable material co-incident with the area or areas, thereby preventing any modification of air permeability of the more permeable material thereat.
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7. A cigarette as claimed in claim 1 in which the encircling band comprises a band of substantially impermeable material that is rendered more permeable at an area or areas on or a continuous area along the line corresponding to the butt joint between the tobacco portion and stub of the composite cigarette by thinning the material of the band at said area or areas.
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8. A cigarette as claimed in claim 7 in which the material is thinned by shaving material off a surface of the band.
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9. A cigarette as claimed in any one of claims 1 to 8 in which the more permeable area or areas are circular.
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10. A cigarette as claimed in any one of claims 1 to 9 in which the highly permeable area or areas are lozenge-like in shape so that, according to their angular relationship with respect to the butt joint between the cigarette and stub, so more or less of the periphery of said butt joint is disposed behind it or them.
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11. A cigarette as claimed in any one of the preceding claims in which adhesive securing the inner surface of the band to the tobacco portion and stub is omitted at positions too near that or those where the band is rendered more permeable.
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12. The improved cigarette constructed and operating substantially as hereinbefore described with reference to Figs. 1 or 2 or 3 of the accompanying drawings.
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13. The improved composite cigarette comprising a tobacco portion and a stub joined together with an encircling band constructed substantially as illustrated in Figs. 4 or 5 or 6 of the accompanying drawings.
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14. The improved composite cigarette comprising a tobacco portion and a stub joined together with a band of substantially impermeable material rendered more permeable by shaving material off a surface of the band at an area or areas on or continuously along
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the line that corresponds to the butt joint
between the tobacco portion and stub, sub-
stantially as described.

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