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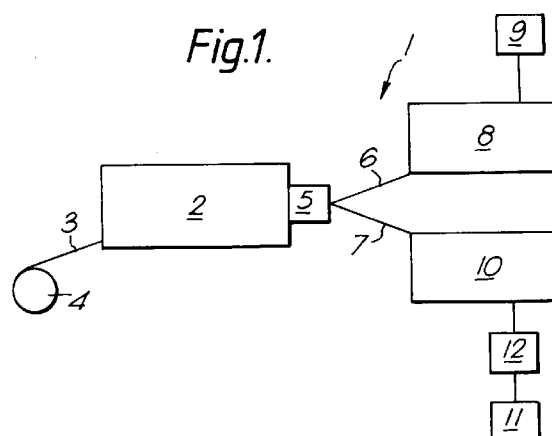
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(54) **Improvements relating to the manufacture of cigarettes.**

(57) High speed cigarette making machines capable of producing at least 9,000 cigarettes per minute may be too fast for the current filter tip assembling machines. Alternatively, it may cause problems if a manufacturer produces several different brands from one tobacco rod blend, in terms of the downtime required to adapt printer heads or to change the filter element supply.

This invention provides means, such as modified spiders (5,3), to divide the output of such high speed machines, for example, in order to supply two further machines (8,10 ; 6,8).



The present invention relates to the manufacture of cigarettes. The cigarettes may be plain cigarettes or filter tipped cigarettes.

Plain cigarettes or tobacco rods are produced by forming a shower of tobacco particles in a chimney, the shower of tobacco particles commonly being upwardly directed, depositing the shower of tobacco particles on a rod-forming surface through which vacuum is applied by a suction box. The wrapping mechanism of a cigarette rod making machine employs a first endless belt conveyor (known as a garniture) which co-operates with stationery guide means to convert a continuously supplied web of cigarette paper or other suitable wrapping material into a tube and to simultaneously drape the web around a tobacco rod of filler material which is deposited onto the web from the rod-forming surface after suction is withdrawn therefrom. This basic principle is utilised in most cigarette making machines, such as the Protos cigarette maker manufactured by Korber A.G. and the Mark IX cigarette maker manufactured by Molins, for example. Descriptions, in part, of these machines and modifications thereto can be found in US Patent No. 4,867,180, and European Patent Application, Publication No. 0 202 874.

The continuous tobacco rod produced by cigarette making machines is severed to produce rod lengths of wrapped tobacco filter material. These lengths are usually double a unit length of tobacco rod utilised in a filter tipped cigarette. The longitudinally provided rods are supplied to a filter tip attacher, such as the Max 100S produced by Korber A.G. Reference to Max filter tipping machines can be found in UK Patent Specification Nos. 1 499 881 and 2 199 799A and US Patent No. 4,051,947. These patent specifications describe various ways of converting a longitudinal movement of tobacco rods into a movement transverse to that longitudinal movement, in order that the tobacco rods can be deposited about the periphery of a drum rotating about, for example, an axis parallel to the longitudinal axis of the tobacco rods. Such devices are colloquially known as 'spiders'.

Once on a filter tip attaching drum, the double unit length tobacco rods are severed in their centre and a double unit length filter element is introduced between the now unit length tobacco rods and interattached thereto by tipping paper. The interattached double length filter element and tobacco rod lengths are severed at the mid-point of the double length filter element to produce two filter tipped cigarettes.

Heretofore, cigarette making machines have been able to produce up to about 10,000 cigarettes (tobacco rods) per minute. Recently, however cigarette making machine manufacturers have been able to provide machines which can produce about 14,000 cigarettes per minute (c.p.m.) and there are expectations of machines which will be able to provide 16,000 and possibly 20,000 c.p.m. These machines run at in-

credibly fast speeds to produce such high output. Whilst there are filter tip attaching machines which can match these speeds or cope with the output of such making machines, it is not always convenient to the cigarette manufacturer to have to produce only one type of cigarette from their making machine.

For example, some factories produce many different brands of cigarette and, hence, such high speed making machines would be restricted in their performance because, once production of the requisite number of cigarettes of a particular brand was completed, the filter tip attacher and/or the maker itself would have to be modified to produce a different brand of cigarette. In the case of the filter tipping machine, the supply of filter rods would have to be changed to the new brand filter tip required, and the printer utilised to print particular brand details, e.g. insignia, onto the tipping paper would also have to be adapted to the new brand requirements. In the case of the maker, the tobacco blend may need to be modified for different cigarette brands and also the printer for printing brand details onto the cigarette paper would also have to be adapted. Thus, whilst cigarette production may be high, the downtime involved during changeover occurs more frequently.

The present invention seeks to provide a solution to this problem whereby a high cigarette production rate can be achieved whilst keeping the number of brand changeovers, when running a particular tobacco blend, to a minimum.

The present invention provides cigarette making apparatus comprising a cigarette making machine, said making machine being provided with means to divide the output of said machine, thereby to supply tobacco rods to at least two further machines.

The cigarette making machine apparatus may be a filter tipped cigarette making machine.

As used herein, the term 'high speed' defines a machine, such as a cigarette making machine, capable of producing an output of tobacco rods, for example, of at least 9,000 cigarettes per minute. The output of the machine may be as high as about 14,000 cigarettes per minute and may even be as high as about 20,000 cigarettes per minute. The phrase 'cigarettes per minute' means lengths of tobacco rod, i.e. tobacco filler wrapped in a wrapper material, which may also be known as plain cigarettes.

As used herein, the term 'low speed' defines a machine capable of handling, for example, at least 4,000 cigarettes per minute. The machine may be capable of handling at least about 7,000 cigarettes per minute.

Preferably the cigarette making machine is a high speed cigarette making machine. Advantageously the cigarette making machine has an output of at least 9,000 cigarettes per minute, and more advantageously, at least about 14,000 cigarettes per minute, a Protos 100 cigarette maker, for example, or a GD 1-2-1

cigarette maker. The cigarette making machine may be a single rod maker or a twin rod maker.

Preferably the further machines comprise at least one filter tip assembling machine. Advantageously, all of the further machines are filter tip assembling machines, although this is not essential. Suitably these machines are capable of handling at least 4,000 cigarettes per minute, such as the Hauni Max 100S filter tip assembling machines. More advantageously, the further machines have an output lower than the cigarette making machine. Suitably, if two further machines are used, the output of each machine is half that of the output of the cigarette making machine. If three further machines are used, suitably the output of each machine is one third that of the output of the cigarette making machine.

Advantageously the passage of the output from the cigarette making machine proceeds directly to the further machine(s).

Suitably one or more of the further machines may be provided with a laser perforator for perforating the tipping wrapper to the required degree of ventilation for a particular brand.

The further machines which are filter tip assembling machines may be provided with pre-printed tipping paper which negates the need for printing onto the tipping paper on the filter tip assembling machine itself. In the case where the cigarette paper is pre-printed on the maker, this may not be necessary. In such cases, the print head for the cigarette paper is advantageously adapted for use according to the present invention.

Suitably the filter elements supplied to the filter tip assembling machines have the specification appropriate for a particular cigarette brand. The specification of filter elements provided to each of the further machines may suitably be different. For example, the pressure drop of the filter elements supplied to each machine may be different or the filter elements provided to one or more of the further filter assembling machines may be grooved at the circumference thereof.

In the alternative, if the further machines have an output similar to that of the making machine, the output of the making machine may be run into a buffer store, which then feeds the further machines at a supply speed suited to their output.

The output speed of each of the further machines may be different. Supply means may be provided for each further machine to supply cigarettes at the desired matched speed.

The further machines may comprise mouthpiece attaching machines, the mouthpiece being a device other than a filter element, for example, a flow impedance device or hollow tube.

In an alternative, the present invention provides a filter tipped cigarette making apparatus comprising a cigarette making machine, the output of said making

machine being fed to the input end of a filter tip assembly machine, the filter tip assembly machine being provided with means to divide the output of said filter tipped assembly machine, thereby to supply filter tipped cigarettes to at least one further machine.

The further machine may be a laser perforator, such as to provide a ventilated filter tipped cigarette. The remaining output from the filter tip assembly machine may be fed to a store or to another machine for further treatment, such as printing of a brand name, or the like, or to a packing machine, for example.

In order that the invention may be easily understood and readily carried into effect, reference will now be made, by way of example, to the diagrammatic drawings hereof, in which:

Figure 1 shows a filter tipped cigarette making apparatus incorporating a cigarette making machine according to the present invention, and

Figure 2 shows another filter tipped cigarette making apparatus incorporating a further cigarette making machine according to the present invention.

Figure 1 shows a filter tipped cigarette making apparatus 1 comprising a GD twin rod cigarette making machine capable of supplying up to about 14,000 cigarettes per minute. The cigarette paper 3 supplied to the making machine 2 from the supply bobbin 4 is of a double width. The cigarette paper 3 passes a printing head (not shown), which head is provided with two print indicia of two different brand names. The cigarette paper 3 is printed upon with the two different brand names and then passed by a cutter to divide the cigarette paper 3 longitudinally into two single widths, each suitable for wrapping around a tobacco column. The output end of the cigarette making machine 2 is provided with means 5 to divide the output thereof. The means 5 may be a spider modified to provide cut rod to two separate sources, or the means 5 may be two spiders arranged to accept cut rod from each rod line. The output of the making machine 2 is thus divided to supply lines 6 and 7.

Supply line 6 supplies cut tobacco rods, the cigarette paper of which bears one brand name, to a Max 100S filter tip assembling machine 8 made by Korber A.G. The Max 100S machine 8 is supplied with conventional non-printed tipping wrapper from a supply bobbin 9.

Supply line 7 supplies cut tobacco rod, the cigarette paper of which bears a different brand name from the cut tobacco rod supplied by supply line 6, to a further Max 100S filter tip assembling machine 10. The Max 100S machine 10 is supplied with conventional non-printed wrapper from a supply bobbin 11. The tipping wrapper supplied from supply bobbin 11 may be perforated, if desired, by a laser perforator 12.

Each of the filter tip assembling machines 8 and 10 operate to interattach the required filter element to a tobacco rod supplied from the same making ma-

chine 2 to provide tipped cigarettes of two different brands.

It is, of course, to be understood that one of the supply lines may supply a hopper, should the brand to be produced be a plain cigarette.

The tipping paper supplied by supply bobbins 9 and 11 may be printed upon with further brand details. It is furthermore, to be understood that such printing may be effected on-line as the tipping wrapper is supplied from one of the supply bobbins to one of the filter tip assembling machines.

Figure 2 shows a filter tipped cigarette making apparatus 1 comprising a Protos 100 cigarette making machine 2 capable of supplying up to about 14,000 cigarettes per minute. The cigarette making machine 2 is provided with means to divide the output of the making machine 2. The means is a spider 3 such as described in US Patent Specification 4,051,947 which has been modified to divide the output of the making machine into two further supply lines 4 and 5.

Supply line 4 supplies cut tobacco rods to a Max 100S filter tip assembling machine 6 made by Korber A.G. The Max 100S machine 6 is supplied with pre-printed paper tipping wrapper from a supply bobbin 7. The supply bobbin has paper tipping wrapper printed with the insignia of the cigarette brand.

Supply line 5 supplies cut tobacco rods to a further Max 100S filter tip assembling machine 8. The Max 100S machine 8 is supplied with pre-printed paper tipping wrapper from a supply bobbin 9. The Max 100S machine 8 is also supplied with a laser perforator 10 which perforates the tipping wrapper supplied from supply bobbin 9. The brand produced from the Max 100S machine 8 is a ventilated product.

Each of the filter tip assembling machines 6 and 8 operate to interattach the required filter element to a tobacco rod supplied by making machine 2 with the appropriate brand tipping wrapper to provide whole cigarettes. Both machines 6 and 8 can handle about 7,000 cigarettes per minute. Such an arrangement reduces the number of down times required for changing a cigarette making and filter tip assembly combination to a new cigarette brand.

## Claims

1. Cigarette making apparatus comprising a cigarette making machine, said making machine being provided with means to divide the output of said machine, thereby to supply tobacco rods to at least two further machines.
2. Cigarette making apparatus according to Claim 1, wherein said apparatus is a filter tipped cigarette making machine.
3. Cigarette making apparatus according to Claim 1
4. Cigarette making apparatus according to any one of Claims 1 to 3, wherein the further machines comprise at least one or more filter tip assembling machines.
5. Cigarette making apparatus according to any one of Claims 1 to 4, wherein the further machines have an output lower than said cigarette making machine.
6. Cigarette making apparatus according to any one of the preceding claims, wherein one or more of the at least two further machines is provided with a laser perforator.
7. Cigarette making apparatus according to Claim 4, wherein the specification of the filter elements fed to any one of said further machines is different from the specification of the filter elements fed to another of said further machines.
8. Cigarette making apparatus according to any one of the preceding claims, wherein the output of said cigarette making machine is run into a buffer store.
9. Cigarette making apparatus according to Claim 8, wherein said buffer store feeds said further machines at a supply speed suited to their output.
10. Cigarette making apparatus according to any one of the preceding claims, wherein the further machines comprise mouthpiece attaching machines.
11. A filter tipped cigarette making apparatus comprising a cigarette making machine, the output of said making machine being fed to the input end of a filter tip assembly machine, the filter tip assembly machine being provided with means to divide the output of said filter tipped assembly machine, thereby to supply filter tipped cigarettes to at least one further machine.
12. A filter tipped cigarette making apparatus according to Claim 11, wherein at least one further machine is a laser perforator.

Fig.1.

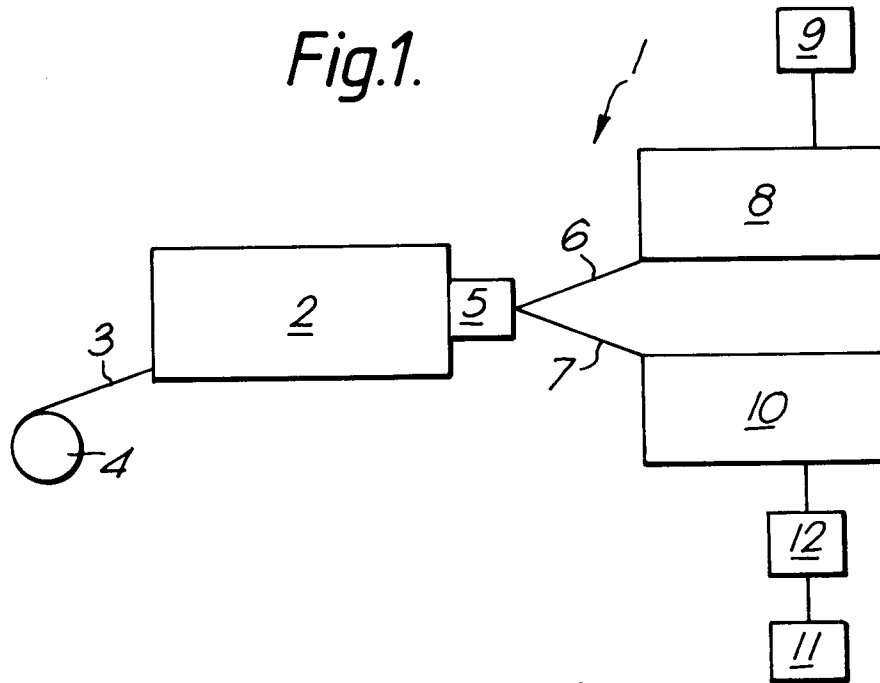
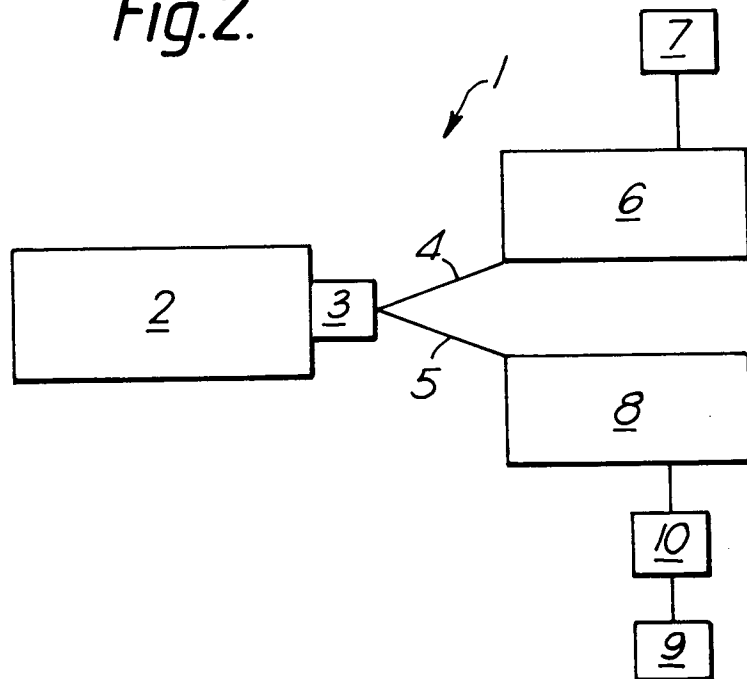


Fig.2.





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# EUROPEAN SEARCH REPORT

Application Number

EP 93 30 4379

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	EP-A-0 426 069 (JAPAN TOBACCO INC.) * the whole document * ---	1-3,5,6, 11,12	A24C5/35 A24C5/00 A24C5/47
X	FR-A-2 072 686 (HAUNI-WERKE KORBER) * the whole document * ---	1,2,11	
X	GB-A-1 211 001 (DOERMAN) * the whole document * ---	1,3	
A	GB-A-2 068 875 (HAUNI-WERKE KORBER) * page 3, line 50 - page 4, line 86 * ---	1,11	
A	DE-A-3 335 955 (HAUNI-WERKE KORBER) * page 12, line 1 - page 14, line 20 * ---	1,11	
A	FR-A-2 298 968 (MOLINS LIMITED) * claims 1,2 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A24C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29 SEPTEMBER 1993	Examiner RIEDEL R.E.
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone  Y : particularly relevant if combined with another document of the same category  A : technological background  O : non-written disclosure  P : intermediate document</p> <p>T : theory or principle underlying the invention  E : earlier patent document, but published on, or after the filing date  D : document cited in the application  L : document cited for other reasons  .....  &amp; : member of the same patent family, corresponding document</p>			

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