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54 **Tipping assembly for an elongate smoking article, and method for making the same.**

57 A cigarette filter plug (12) and a wrapper (14) intended for the plug contain fibres that are bondable by a plasticiser. The plug (12) is sprayed with the plasticiser, preferably during manufacture, and is then wrapped with the plug wrapper (14). Adherence of the plug wrapper (14) to the plug (12) is provided by the plasticiser in the plug. This method is found not to cause blockage of any perforations provided in the plug wrapper (14) for ventilation purposes.

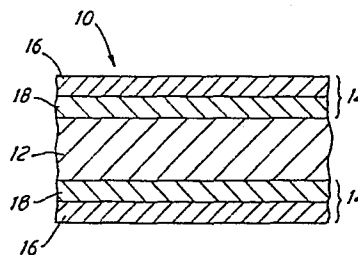


FIG.1

TIPPING ASSEMBLY FOR AN ELONGATE SMOKING ARTICLE,
AND METHOD FOR MAKING THE SAME.

This invention relates to a tipping assembly for an elongate smoking article. In particular, it relates to a wrapped filter plug suitable for attachment to a cigarette or similar smoking article, and to a method of making such a wrapped filter plug.

Filter plug wrapping paper is commonly attached to a filter plug by means of an adhesive such as polyvinyl acetate emulsion between the wrapping paper and the plug to avoid the plug becoming detached when suction is applied by the smoker.

Low tar yields in cigarettes are usually achieved by providing high levels of filter ventilation, usually in excess of 60%. One way of doing this is to use highly permeable plug wrapping paper enclosing the fibrous web of filter material. A disadvantage of this is that when such wrapping paper is used on conventional filter making machines the adhesive may bleed through the pores or perforations in the wrapping paper and contaminate the machine, thus reducing running efficiency. This bleed through may also result in unpredictable variations in the overall level of ventilation obtained for a given combination of plugwrap and plug, which in turn would render unreliable the achievement of low tar yields.

It is an object of the present invention to overcome the above disadvantage.

According to a first aspect of the present invention there is provided a tipping assembly for an elongate smoking article comprising,

- (a) a filter plug containing a plasticiser and a
5 proportion of fibres bonded by the plasticiser, and
- (b) a permeable plug wrapper containing a proportion of
fibres bondable by the plasticiser,
the plasticiser-bonded fibres of the plug being in contact
with the plasticiser-bondable fibres of the plug wrapper
10 whereby adherence of the plug wrapper to the plug is
provided by the plasticiser in the plug.

According to a second aspect of the invention there is provided a method of making a tipping assembly for an elongate smoking article, the method comprising,

- 15 (a) providing a plasticiser,
- (b) providing a permeable plug wrapper containing a
proportion of fibres bondable by the plasticiser,
- (c) providing a filter plug containing a proportion of
fibres bondable by the plasticiser,
- 20 (d) applying the plasticiser to the fibres of the plug
so that fibres at least on the surface of the plug
are bonded by the plasticiser, and
- (e) applying the plug wrapper to the plug so that the
bondable fibres of the plug wrapper are bonded to
25 the fibres of the plug by the plasticiser.

The bonded fibres of the plug and the bondable fibres of the plug wrapper are preferably of identical composition.

5 The plug wrapper is preferably a multi-phase web including the bondable fibres as one phase, and is preferably a two-phase web.

The bonded fibres and the bondable fibres are preferably composed of cellulose acetate, and the plasticiser is preferably triacetin (glycerol triacetate).

10 A or the second phase of the plug wrapper is preferably cellulosic fibre.

In the plug wrapper the cellulosic fibres and the cellulose acetate component are preferably discrete phases, the cellulose acetate phase being adjacent the
15 surface of the plug.

The plasticiser may be applied to the filter plug by spraying during filter manufacture.

It is found with the invention that the wrapping paper effectively adheres to the plug by virtue of the
20 plasticiser used for bonding the cellulose acetate fibres of the plug bonding with the cellulose acetate component of the plug wrapper, and consequently there is no necessity for additional adhesion between plug and plug wrap.

25 The invention will now be described by way of example only with reference to the accompanying drawing and the examples.

The drawing, Figure 1, which is not to scale, shows a longitudinal cross-section through a portion of a wrapped filter plug 10 according to the invention.

The wrapped filter plug 10 comprises a plug 12 of
5 cellulose acetate fibres that has been sprayed with triacetin (glycerol triacetate) which bonds together the cellulose acetate fibres. The plug 12 is wrapped in a highly porous plug wrapper 14 comprising a fibrous sheet made of two components, which are, an outer layer 16
10 (relative to the plug 12) of cellulosic fibre, and an inner layer 18 of cellulose acetate fibres. The wrapper 14 adheres to the plug 12 by virtue of the triacetin which enables the cellulose acetate fibres of the plug to bond to the cellulose acetate fibres of the inner layer 18 of
15 the wrapper.

It is believed that the triacetin, when sprayed onto the fibres, adheres to the surfaces of the fibres, does not exist to any substantial extent in a flowable liquid form between the fibres, and hence has no tendency to
20 block pores or perforations in the plug wrapper.

With reference to the drawing it will be understood that it is not practicable to show the plasticiser, for the reason indicated in the foregoing paragraph. Further, the layers 16, 18 of the plug wrapper will be understood
25 to be highly porous (e.g. above 100 K Filtrona units). Again, this cannot easily be shown in the drawing.

In an alternative embodiment, not illustrated, the wrapper comprises a single phase mixture of cellulose fibres and cellulose acetate fibres, as will be described.

Example 1

- 5 A single phase wrapper sheet containing 30% by weight cellulose acetate in a blend of Abaca Hemp and softwood pulps was prepared. Non-wrapped acetate filter rods were sprayed with triacetin to plasticise the surface material. Strips of the single phase wrapper sheet were manually
- 10 wrapped around the sprayed filter rods at various time intervals after spraying. The wrapped rods were then examined for any evidence of adhesion between plug wrap and filter rod. The results were as follows:

TABLE 1

15	<u>Time</u>	<u>Observations</u>
	2 minutes	No observed adhesion
	30 "	Surface of filter rod slightly tacky. Some adhesion of sheet material
	60 "	- - - ditto - - -
20	120 "	Surface of filter rod sticky. Evidence of contraction and collapse of filter rod. Adhesion of sheet material.

Heating and compression were found to accelerate the plasticising effect and hence the adhesion.

Example 2

As for Example 1 except that, instead of non-wrapped acetate filter rods, conventionally formed filter rods (with existing plug wrap removed) were sprayed with triacetin. The remainder of the procedure of Example 1 was carried out. The results were similar to those of Example 1 except that the adhesion appeared to be stronger.

Example 3

Samples of dual phase bobbins of plug wrapping paper containing 70% by weight cellulose acetate fibres were prepared according to the following values of weight and porosity:

TABLE 2

Sample	Weight	Porosity (Filtrona units)
A	22 gsm	650 K
B	28 gsm	600 K
C	22 gsm	300 K
D	22 gsm	300 K

Sample D contained no binder in the plug wrap. Cellulose acetate filter rods were produced containing 6, 8, 10, 13% by weight (wet tow) triacetin respectively, to a specification similar to that of a conventional leading king-size cigarette. The samples of dual phase plug wrapping paper were applied to the filter rods. The degree of adhesion was assessed by slitting the rods and

subjectively assessing the relative degree of adhesion when pulling the plugwrap off the filter plug. The rating is given on a subjective scale of 0 - 10, a rating of 10 denoting a definite tearing of fibres on pulling the plugwrap from the filter (i.e. a strong bond), and a rating of 5 denoting a definite adhesion but without tearing of fibres (i.e. a weak bond). The ratings for samples A - D are given in Table 3.

TABLE 3

10

Sample	Plasticiser Level (% wet tow)			
	6	8	10	13
A	5	5	7	9
B	7	8	10	10
C	7	8	8	10
D	6	7	8	9

15

Example 4

A two phase wrapper sheet consisting of a web formed from long fibre cellulose derived from hemp, with cellulose acetate fibre deposited on top, was produced on an inclined wire paper making machine (known in the art) modified to allow the use of a dual headbox system. A laboratory trial with two phase based sheets containing at least 30% by weight cellulose acetate fibre indicated that the papers bonded satisfactorily to cellulose acetate filter rods sprayed with triacetin, the cellulose acetate phase of the paper being in contact with the filter.

25

The invention is found not to cause blockage of perforations in the plug wrap and therefore provides for excellent adhesion of the plug wrap to the filter plug in combination with reliable ventilation of the
5 cigarette. Further, there is no bleed through of adhesive which could otherwise cause contamination and stoppage of filter and cigarette making machinery,

Plasticisers other than triacetin, such as triethylene glycol diacetate, and fibres bondable by
10 the plasticiser, other than cellulose acetate, may be utilised in alternative embodiments within the scope of the invention. The bondable fibres of the plug and the bondable fibres of the plug wrapper need not necessarily be of the same composition.

15 The cellulose fibre of the plug wrapper may be derived from a variety of sources, such as wood, hemp, flax, or bagasse.

CLAIMS

1. A tipping assembly (10) for an elongate smoking
article, characterised by the combination of,
(a) a filter plug (12) containing a plasticiser
5 and a proportion of fibres bonded by the
plasticiser, and
(b) a permeable plug wrapper (14) containing a
proportion of fibres bondable by the
plasticiser,
10 the plasticiser-bonded fibres of the plug being in
contact with the plasticiser-bondable fibres of the
plug wrapper whereby adherence of the plug wrapper
(14) to the plug (12) is provided by the plasticiser
in the plug.
- 15 2. A tipping assembly as claimed in claim 1 characterised
in that the bonded fibres of the plug (12) and the
bondable fibres of the plug wrapper (14) are of
identical composition.
3. A tipping assembly as claimed in claim 1 characterised
20 in that the plug wrapper (14) is a multi-phase web
including the bondable fibres as one phase.
4. A tipping assembly as claimed in claim 3 characterised
in that the plug wrapper (14) is a two-phase web.
5. A tipping assembly as claimed in claim 2 characterised
25 in that the bonded fibres and the bondable fibres
are composed of cellulose acetate.

6. A tipping assembly as claimed in claim 5 characterised in that the plasticiser is glycerol triacetate.
7. A tipping assembly as claimed in claim 3 or 4 characterised in that a or the second phase of the
5 plug wrapper is cellulosic fibre (16).
8. A tipping assembly as claimed in claim 4 characterised in that the two phase of the plug wrapper (14) are respectively cellulosic fibres (16) and cellulose acetate fibres (18), the cellulose acetate phase (18)
10 being adjacent the surface of the plug (12).
9. A tipping assembly as claimed in claim 1 characterised in that the permeability of the plug wrapper (14) is at least 100 K Filtrona units.
10. A tipping assembly as claimed in claim 9 characterised
15 in that the permeability of the plug wrapper (14) is in the range 100 - 650 K Filtrona units.
11. A tipping assembly as claimed in claim 5 or 8 characterised in that the plug wrapper (14) contains at least 30% by weight cellulose acetate.
- 20 12. A tipping assembly as claimed in claim 11 characterised in that it has a dual phase plug wrapper containing about 70% by weight cellulose acetate.
13. A tipping assembly as claimed in claim 6 characterised in that the glycerol triacetate content is in the
25 range 6 - 13% by weight.

14. A method of making a tipping assembly (10) for an elongate smoking article, characterised in that the method comprises,

- (a) providing a plasticiser,
- 5 (b) providing a permeable plug wrapper (14) containing a proportion of fibres bondable by the plasticiser,
- (c) providing a filter plug (12) containing a proportion of fibres bondable by the plasticiser,
- (d) applying the plasticiser to the fibres of the
10 plug (12) so that fibres at least on the surface of the plug are bonded by the plasticiser, and
- (e) applying the plug wrapper (14) to the plug (12) so that the bondable fibres of the plug wrapper (14) are bonded to the fibres of the plug (12) by the
15 plasticiser.

15. A method as claimed in claim 14 characterised in that the plasticiser is applied to the plug (12) during filter manufacture, by spraying.

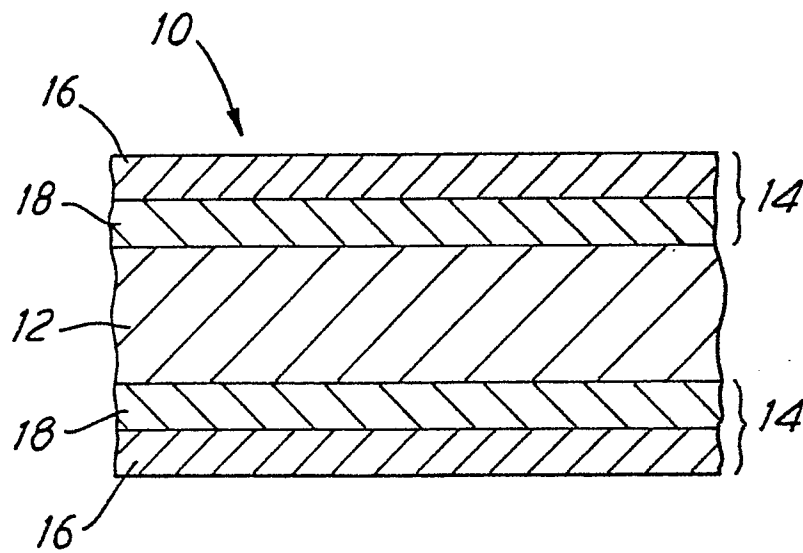


FIG. 1



DOCUMENTS CONSIDERED TO BE RELEVANT			EP 83302308.8
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 7)
X	<u>US - A - 3 079 930</u> (COBB, JR. et al.) * Claims 1,2,4 * --	1,2,5, 6,13, 14	A 24 D 3/18 A 24 D 3/02 A 24 D 3/06 A 24 D 3/10
X	<u>EP - A2 - 0 016 333</u> (MARTIN BRINK-MANN AKTIENGESSELLSCHAFT) * Claims 1-4 * --	1,2,5, 6,11, 14	A 24 C 5/56
A	<u>CH - A - 426 593</u> (EASTMAN KODAK COMPANY) * Page 4, lines 93-100; page 5, lines 14-17 * --	1,6,14	
A	<u>GB - A - 2 012 553</u> (SOCIETE JOB ANCIENS ETABLISSEMENTS BARDOU - JOB ET PAUILHAC) * Totality * ----	1,3,4, 6-8,11, 14	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 7)
			A 24 D A 24 C
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 30-06-1983	Examiner WOLF
CATEGORY OF CITED DOCUMENTS			
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		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 & : member of the same patent family, corresponding document	