

26th September 1967.

Dr. V.C. Runeckles,
P.O. Box 6500,
Montreal 30,
Canada.

Dear Vic,

Ventilated Cigarette

The papers which you left with us on the leakproof ventilated cigarette have now been considered and discussed by a number of people in R. & D.E. and I will attempt to summarise the views that have been expressed. They can best be stated under the following headings.

Ventilation and Sealing

In examining the proposals we are not at all sure that the designs suggested would achieve the stated objective of ventilating the cigarette during the puff and sealing to prevent leakage during the shoulder period. The problem rests on the requirement for the valves to be sufficiently sensitive to react to the small pressure differences which will be produced by the puff and yet be strong enough to seal the ventilation passage during the shoulder period. In view of this, Henry Horsewell has proposed an alternative form of the device which is shown in the attached sketch. This would not rely on a seal to prevent leakage through the ventilation passage and yet would permit a proportion of air to be bled into the mouth when the cigarette was smoked. It suffers from the possible disadvantage that it does not provide any mixing before reaching the mouth of the smoker. The idea is similar to that of the Davis patent which you show as Fig.12 and it also overcomes the leakage deficiency of the form shown in Fig.14.

Effect of Ventilation on the Smoke

Sam Evelyn has illustrated this problem by means of an electrical analogy and makes two points:-

- (a) The air flow through the cigarette rod will be dependant on the balance between the impedance of the cigarette, the filter and the bypass, and this could lead to a variable smoke delivery.
- (b) The introduction of a ventilated mouthpiece could have the effect of reducing the puff volume to between 10 and 15 ml. per puff which could, biologically, tend to off-set the reduction in tar delivery.

Manufacture

The manufacture of these mouthpieces as a continuous rod in production quantities would require considerable development effort. The form shown in Fig.1, with modifications, might be the best to tackle initially, but

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it is estimated that it would require, as a minimum, £20,000 in terms of graduate effort and capital expenditure to achieve a prototype machine, and at a guess, the production equipment needed to provide an output of 1 million mouthpieces per day would cost around £100,000. There would also, of course, be a combining job which it is thought could be undertaken on an adapted P.T.C. machine.

The H.G.H. proposal, and possibly a modified form of Fig.1 might be produced in the form of a plastic mouthpiece. Naturally that of the H.G.H. type would be simplest and this might well be the best solution to the problem. In round figures, the part tooling cost for a production mould would be about £3,000 and the cost of plastic mouthpieces of the order of £1 per thousand.

On balance, I think we feel that the ventilated mouthpiece is a doubtful starter unless the market value of the relatively expensive plastic ventilated mouthpiece could be established, and the biological effect of the 15 mm. puff is not regarded as outweighing the effect of the reduced tar delivery from the cigarette.

I enclose the notes of those concerned which presents their views more fully and of course we shall be pleased to have your thoughts when you have had an opportunity to consider what has been said.

Yours sincerely,

N.E. Willis

Enc.

c.c. 46B-7.

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