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(56) Documents Cited

GB 2340035 A GB 1531309 A CA 001256284 A
CH 000669116 A JP 110056673 A JP 030207363 A
US 4941270 A

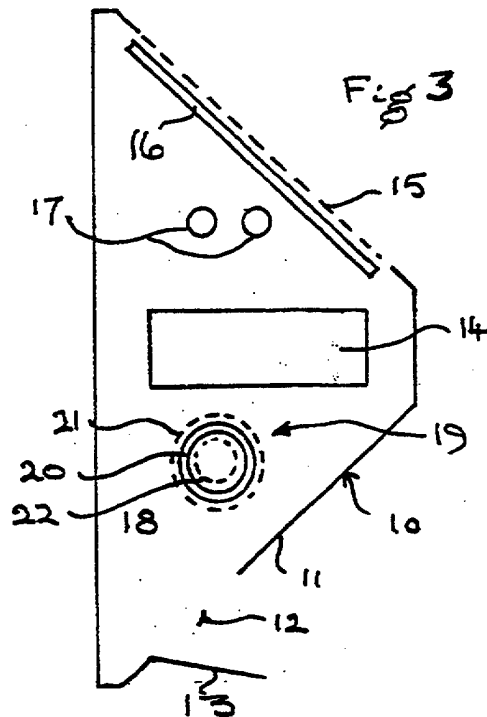
(58) Field of Search

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(54) Abstract Title

Hand drier with ozone producing electrostatic field

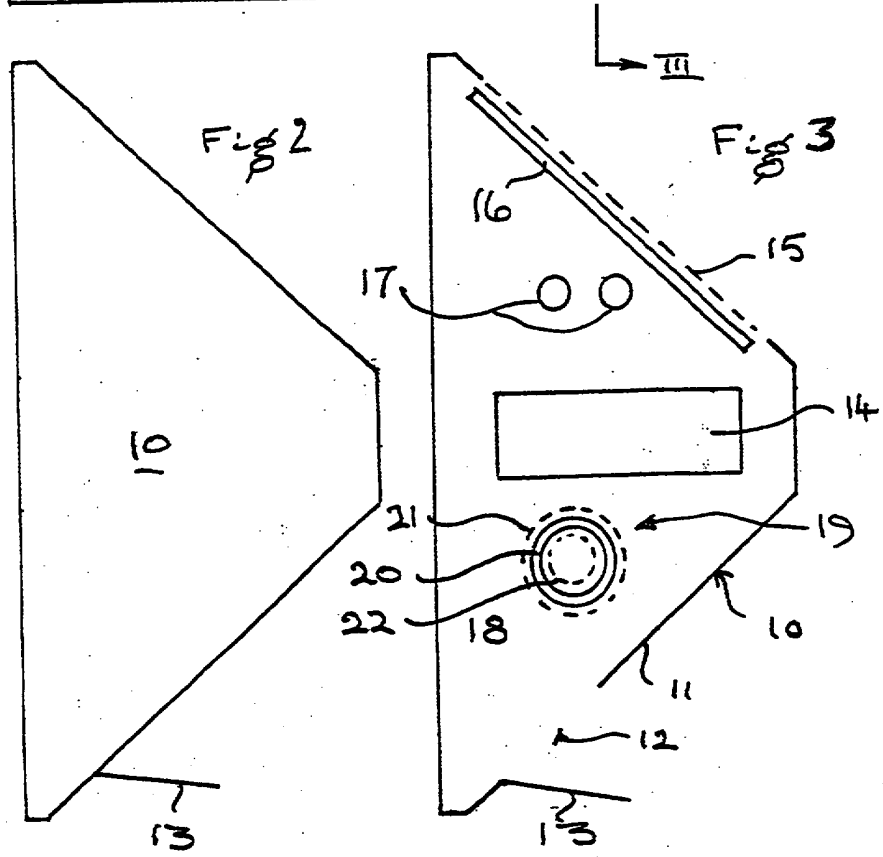
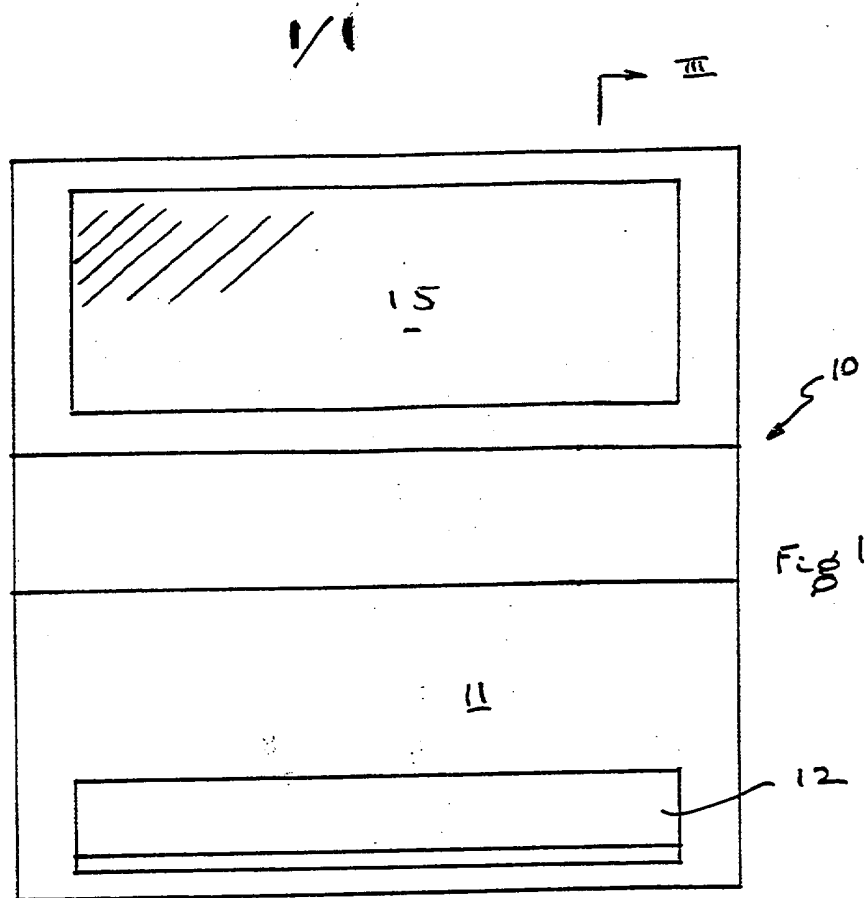
(57) An electrostatic field within the hair drier converts some of the oxygen passing through it in to ozone. The electrostatic field is produced, between a filter 16 and the outlet 12, by a corona unit 19. The corona discharge unit 19 comprises a tube of quartz glass 20 sandwiched between tubes of stainless steel mesh 21, 22. The bimodal filter 16 has electrostatic and activated carbon components. The drying ozone has bactericidal properties.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

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HAND DRYER

This invention concerns a hand dryer of the kind (hereinafter termed of the kind referred to) which emits a jet of heated air onto the hands of the user who will ordinarily rub his hands together in the jet. Usually a dryer of the kind referred to will have a manually adjustable flap to direct the jet upwardly to enable drying of the face.

Known hand dryers of the kind referred to generally have a nozzle of quite small dimension which becomes contaminated with bacteria deflected backwardly by the jet from the hands of a user, which bacteria can then be transferred to the hands of a subsequent user.

It is an object of the present invention to provide a hand dryer of the kind referred to, which overcomes, at least to some extent, the problem aforesaid.

According to the present invention, there is provided a hand dryer of the kind referred to wherein the air leaving the dryer is first passed through an electrostatic field to convert some of the oxygen therein to ozone.

Ozone has well-known bactericidal properties and also, surprisingly, is a most effective drying agent enabling the temperature of the jet to be lower than required for untreated air for similar effect.

The invention will be further apparent from the following description, with reference to the figures of the accompanying drawing which show, by way of example only, one form of hand dryer embodying same.

Of the drawing:-

- Figure 1 shows a front view of the dryer;
- Figure 2 shows a side view of the dryer; and
- Figure 3 shows a cross-section through the dryer on the line III - III of Figure 1.

Referring now to the drawing, it will be seen that the hand dryer comprises a prismatic housing 10 of generally triangular cross-section.

The downwardly angled lower wall 11 of the housing 10 presents a slot-like nozzle 12 of extended length through which a heated jet may be emitted to dry the hands of a user which need not be bunched together as necessary with many conventional dryers in view of the extended length.

The nozzle 12 is provided with a manually adjustable flap 13 which can be moved to direct the jet upwardly for drying the face.

Within the housing 10 are two fans 14, which draw air through a grille 15 in the top wall 16 of the housing 10 and a filter 16 mounted behind the grille 15 and over heating elements 17 for discharge through the nozzle 12. The filter 16 is bimodal comprising an electrostatic filter and an activated carbon filter.

The fans 14 operate automatically in response to the presence of the hands or face adjacent the nozzle 12 as determined by proximity sensors (not shown).

Between the fans 14 and nozzle 12 is a chamber 18 containing a corona unit 19 which is operated, again by the proximity sensors, to establish a powerful electrostatic field to convert oxygen in the air stream into ozone.

The corona unit 19 comprises a tube 20 of quartz glass sandwiched between tubes 21 and 22 of stainless steel mesh. When the unit 19 is operating, typically a current of 9mA at 4kv flows between the tubes 21 and 22.

The ozone enriched jet has known bactericidal properties and has enhanced drying properties enabling the jet temperature to be reduced for similar effect when compared with a conventional dryer.

It will be appreciated that it is not intended to limit the invention to the above example only, many variations, such as might readily occur to one skilled in the art, being possible, without departing from the scope thereof.

CLAIMS

1. A hand dryer wherein the air leaving the dryer is first passed through an electrostatic field to convert some of the oxygen therein to ozone.
2. An electric hand dryer in which the air leaving the dryer when operating in a hand drying mode is first passed through an electrostatic field to convert some of the oxygen therein to ozone.
3. A hand dryer as claimed in Claim 1 or 2 in which the ozone enriched jet temperature is lower for similar effect when compared with a conventional dryer.
4. A hand dryer as claimed in any one of Claims 1 to 3 in which the electrostatic field is generated by a corona unit.
5. A hand dryer as claimed in any one of Claims 1 to 3 in which the electrostatic field is generated by a corona unit. located within the dryer in the path of a fan-induced air flow through the dryer.
6. A hand dryer as claimed in any one of Claims 1 to 5 in which air is drawn into the dryer and passes through a filter.
7. A hand dryer as claimed in Claim 6 when dependent on Claim 5 in which the filter is upstream of the corona unit.
8. A hand dryer as claimed in Claim 6 or 7 in which the filter is a bimodal filter comprising an electrostatic filter and an activated carbon filter.

9. A hand dryer as claimed in Claim 5 or 7 in which the corona unit comprises a tube of quartz glass sandwiched between tubes of stainless steel mesh.
10. A method of drying the hands using a hand dryer as claimed in any one of Claims 1 to 9.
11. A method of drying the hands at reduced temperature compared with conventional hand dryers, comprising using a hand dryer as claimed in any one of Claims 1 to 9.
12. A hand dryer substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.



INVESTOR IN PEOPLE

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Claims searched: 1-12

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Examiner: Robert Black
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Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.S): A4V V29F; A5G GAB
Int Cl (Ed.7): A47K 10/48; A61L 9/015, 9/16, 9/22, 2/20, 2/03; A45D 20/12; C01B 13/11
Other: Online: EPODOC, WPI, PAJ

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X, E	GB 2340035 A (OZONE) see figure 2 and page 4 lines 7-13	1-5, 10
Y	GB 1531309 A (BIENEK) see especially figure 1 and page 1 line 80 to page 2 line 1	1-7, 10, 11
Y	US 4941270 A (HOFFMAN) see column 2 line 61 to column 3 line 36 and figure 3	1-7, 10, 11
Y	CA 1256284 A (HOFFMAN) see page 4 paragraphs 2 and 3	1-7, 10, 11
Y	CH 669116 A5 (MULLER) see WPI abstract 1989-085941 and figure 3	1-7, 10, 11
Y	JP 11-056673 A (MASUMOTO) see PAJ abstract and figure 1	1-7, 10, 11
Y	JP 03-207363 A (MIHAMA) see WPI abstract 1991-307905	1-7, 10, 11

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.