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PATENT SPECIFICATION

(11) 1 453 268

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 (31) Convention Application Nos. 47316/74 and 47317/74
 (32) Filed 25 April 1974 in
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 (52) Index at acceptance F4V A1A A1B A1C A1E A2B



(54) VENTILATOR

(71) We, YOSHIDA KOGYO K.K., a corporation duly organized under the laws of Japan and existing at No. 1, Kanda Izumicho, Chiyoda-ku, Tokyo, Japan, 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 ventilators and more particularly to a ventilator for use with window assemblies, doors or other building components.

There have heretofore been known various kinds of ventilators of the type described. However, these ventilators have suffered from the shortcomings that they permitted stormy wind or rain of high velocity to enter directly into the interior of a building in which they are installed, because a screen is provided merely on the exterior side of the air vent to prevent the admission of dust carried by wind into the building interior. Furthermore, the prior art ventilators were not effective to completely remove the dust from the flow of air which is directed only once through the filter screen of the ventilator.

With the above-mentioned prior art shortcomings in mind, the present invention seeks to provide a ventilator for use with windows, doors and the like that prevents wind of high velocity from entering directly into the building interior.

The invention further seeks to provide a ventilator which further prevents rain accompanied by winds of substantial velocity to enter the building interior through the ventilator, even under storm conditions.

The invention further seeks to provide a ventilator so constructed as to direct an air flow at least twice through a given filter, thereby substantially removing dust completely from the air within the ventilator.

The invention further seeks to provide a ventilator which can be prefabricated in a single unit to facilitate its installation in windows, doors and the like.

According to the invention, there is provided a ventilator for use with windows, doors or other building components comprising: an inner plate having a plurality of air vents formed therein; and outer plate spaced apart a predetermined distance from said inner plate in the transverse direction of the ventilator and providing an opening displaced from said air vents in the inner plate; a filter fixedly positioned between said inner and outer plates; and a deflector member extending from said inner plate toward said outer plate and abutting against said filter thereby directing a flow of air at least twice through said filter.

Other objects and advantages of the invention will become more apparent from the following description when read in conjunction with the accompanying drawings in which like reference numerals denote like parts through several views, and wherein;

Figure 1 is an elevational view of a ventilator embodying the invention which is attached to a window assembly of the horizontally movable type and shown as viewed from the interior of a building;

Figure 2 is a vertical cross-sectional view taken along the line II—II of Figure 1;

Figure 3 is a horizontal cross-sectional view taken along the line III—III of Figure 1;

Figure 4 is an enlarged fragmentary elevational view of the ventilator; and

Figure 5 is an enlarged fragmentary perspective view of a side cap of the ventilator.

Referring now to the drawings and Figure 1 in particular, a pair of ventilators 10 constructed in accordance with the invention are shown applied to a window assembly 11 of the horizontal sliding or rolling type that generally comprises a fixed frame 12 and a pair of relatively movable sashes 13 and 14 mounted within the fixed frame 12 in parallel, closely spaced planes. As is conventional in the art, the fixed frame 12 comprises a header 15, a sill 16 and side jambs 17 and 18. The sashes 13 and 14 are each

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provided with upper and lower rails 19 and 20, stiles 21 and 22, and a window glass pane 23. There is provided at the upper portion of each sash an additional rail 24 which is spaced downwardly from and in parallel with the upper rail 19 and fixedly connected at both ends to the stiles 21 and 22. Interposed between the upper rail 19 and the additional rail 24 is the ventilator 10 of which structural details will hereinafter described.

As shown in Figures 2 and 3, the ventilator 10 includes in general an inner plate 25 and an outer plate 26 which are preferably made of a plastics material and are spaced apart a predetermined distance from each other in the transverse direction of the ventilator 10 to provide a hollow interior therebetween. The inner plate 25 is provided at its upper portion with a plurality of longitudinally spaced-apart air vents 27 (figures 1 and 4). The topmost end of the inner plate 25 has a flange 28 extending outwardly at substantially right angles to the inner plate 25 and a mounting fin 29 extending upwardly from the outer end of the flange 28 in substantially parallel with the inner plate 25. Provided immediately beneath the flange 28 is a socket 30 for receiving therein a screw (not shown) to assemble the ventilator 10 in the manner later explained. The inner plate 25 is further provided at its lowermost end with a flange 31 extending outwardly therefrom. The upper surface of the flange 31 is slanted downward from the inner plate 25 towards the frontal end of the flange 31. A hole 32 is formed in the flange 31 for receiving therein a screw (not shown) for purposes to be described. Reference numeral 33 denotes a mounting fin centrally projecting downwardly from the bottom of the flange 31 and substantially parallel with the inner plate 25. Projected outwardly from the inner plate 25 and immediately above the air vents 27 is a flange 34 of an inverted-L configuration which together with the plate 25 defines a downwardly opening groove 35. An L-shaped deflector member 36 also projects outwardly from the inner plate 25 and is located under the position of the air vents 27. It further extends outwardly toward the outer plate 26 to an extent later described. The L-shaped deflector member 36 cooperates with the plate 25 in defining an upwardly opening groove 37. Slidably mounted in the grooves 35 and 37 is an elongated adjustment plate 38 which is provided at its upper region with a plurality of slits 39 formed in registration with the air vents 27 in the inner plates 25. Numeral 40 indicates a handle passing loosely through an oblong hole 41 in the inner plate 25 and fixedly attached to a lower portion of the adjustment plate 38. The handle 40 is

adapted to slide the adjustment plate 38 horizontally so as to control the degree of opening of the air vents 27.

The outer plate 26 is provided at its topmost end with an inwardly directed flange 42 extending at substantially right angles to the plate 26 and an inverted-L shaped mounting fin 43 extending upwardly in parallel with the outer plate 26. The inverted-L shaped mounting fin 43 is adapted to mate complementarily with the mounting fin 29 of the inner plate 25. The lowermost end of the outer plate 26 terminates short of the flange 31 of the inner plate 25, leaving an opening 44 therebetween, and is bent inwardly at substantially right angles to the plate 26 to provide a flange 45. Importantly, the opening 44 is displaced transversely from the air vents 27 in the inner plate 25, so that the opening 44 is faced in opposed relation to the inner plate 25 under the L-shaped deflector member 36.

Formed immediately below the flange 42 and above the flange 45 are flanges 46 and 47, respectively, extending inwardly from the outer plate 26. It is to be noted that the flange 47 is spaced downwardly from the L-shaped deflector member 36 by a distance required to guide unobstructedly the flow of air. As seen in Figure 1, there is provided a filter 48 which is constructed of a screen, a sheet of porous material or any other suitable material and extends between the flanges 46 and 47. To maintain the filter 48 in the proper position, a pair of retainers 49 and 50 are provided between the flanges 42 and 46 and between the flanges 45 and 47, respectively, for frictional engagement with the upper and lower ends of the filter 48. A close inspection of Figure 2 indicates that the aforementioned L-shaped deflector member 36 extends outwardly toward the outer plate 26 until it abuts against the filter 48 for the reasons later described. Designated at numeral 51 is a socket adapted to receive a screw (not shown) for the assemblage of the ventilator 10.

As best shown in Figure 3, there are employed a pair of sides caps 52 and 53 to clampingly fit over and connect the inner and outer plates 25 and 26 at their lateral sides for assembling the ventilator 10. In order to hold the caps 52 and 53 securely to the inner and outer plates 25 and 26, respectively, there are provided screws (not shown) which pass through openings formed in the caps, one of which openings is shown in Figure 5 at 54, and threadedly engage the sockets 30, 51 and the hole 32 to thereby secure the caps 52 and 53 to the plates 25 and 26 to form an integral body. The upper and lower ends of the caps 52 and 53 are each provided with a slot as at 55 in Figure 5 formed in the longitudinal direction

TABLE

Example No.	R ₁	R ₂	Shade
3	-CH ₃	-CH ₃	yellow
4	-Cl	-CH ₃	greenish yellow
5	-OCH ₃	-OCH ₃	reddish yellow
6	-OCH ₃	-Cl	yellow
7	-OC ₂ H ₅	-OC ₂ H ₅	reddish yellow
8	-Br	-Br	greenish yellow
9	-Br	-CH ₃	greenish yellow

APPLICATION EXAMPLE.

0.5 Parts of the pigment produced according to Example 1 and 5 parts of titanium dioxide white pigment are intimately mixed with 100 parts of moulding material consisting of:

63 parts of a polyvinyl chloride emulsion
32 parts of a dioctyl phthalate plasticizer
3 parts of a commercial epoxide plasticizer

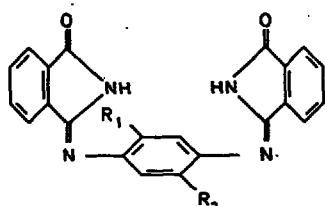
1.5 parts of a commercial stabilizer (barium-cadmium complex)

0.5 parts of a commercial chelator.

For improved pigment distribution, the mixture is worked for 8 minutes on a roller mill set at 160°, with one roller rotating at 20 r.p.m. and the other at 25 r.p.m. to exert friction. Subsequently it is extruded as film of 0.3 mm thickness. The film is pigmented in a greenish yellow shade which has very good light and migration fastness and is heat stable.

WHAT WE CLAIM IS:—

1. A compound of formula I,



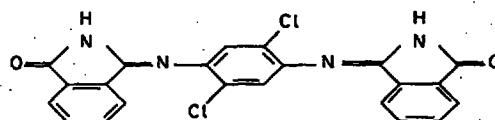
in which R₁ and R₂, which may be the same or different, each signifies a fluorine atom, a chlorine atom, a bromine atom, a methyl radical, a methoxy radical or an ethoxy radical.

2. A compound according to Claim 1, wherein R₁ and R₂, which may be the same or different, each signify a chlorine atom, a bromine atom, a methyl radical, a methoxy radical or an ethoxy radical.

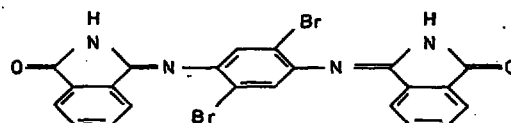
3. A compound according to Claim 2, wherein R₁ and R₂, which may be the same or different, each signifies a chlorine or bromine atom.

4. A compound of any one of the foregoing Examples 1 to 9.

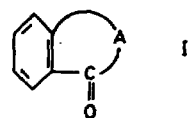
5. A compound of formula



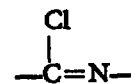
6. A compound of formula



7. A process for the production of a compound of formula I, stated in Claim 1, characterised by condensing a compound of formula II,



in which A signifies a structure (a)



(a)

or a structure (b),



(b)

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TABLE

Example No.	R ₁	R ₂	Shade
3	-CH ₃	-CH ₃	yellow
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8	-Br	-Br	greenish yellow
9	-Br	-CH ₃	greenish yellow

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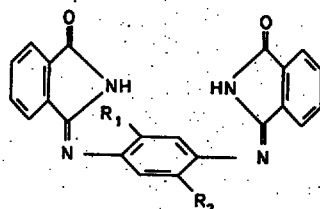
1.5 parts of a commercial stabilizer (barium-cadmium complex)

0.5 parts of a commercial chelator.

For improved pigment distribution, the mixture is worked for 8 minutes on a roller mill set at 160°, with one roller rotating at 20 r.p.m. and the other at 25 r.p.m. to exert friction. Subsequently it is extruded as film of 0.3 mm thickness. The film is pigmented in a greenish yellow shade which has very good light and migration fastness and is heat stable.

WHAT WE CLAIM IS:—

1. A compound of formula I,



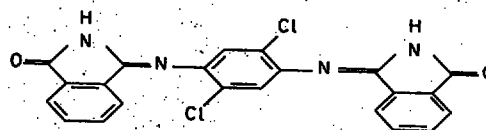
in which R₁ and R₂, which may be the same or different, each signifies a fluorine atom, a chlorine atom, a bromine atom, a methyl radical, a methoxy radical or an ethoxy radical.

2. A compound according to Claim 1, wherein R₁ and R₂, which may be the same or different, each signify a chlorine atom, a bromine atom, a methyl radical, a methoxy radical or an ethoxy radical.

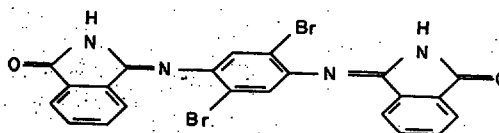
3. A compound according to Claim 2, wherein R₁ and R₂, which may be the same or different, each signifies a chlorine or bromine atom.

4. A compound of any one of the foregoing Examples 1 to 9.

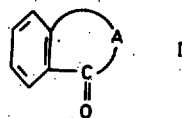
5. A compound of formula



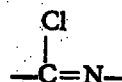
6. A compound of formula



7. A process for the production of a compound of formula I, stated in Claim 1, characterised by condensing a compound of formula II,



in which A signifies a structure (a)



(a)

or a structure (b),



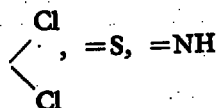
(b)

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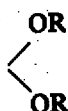


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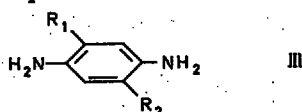
in which X signifies



or



- 5 in which R signifies an alkyl radical, with a compound of formula III,



- 10 in which R₁ and R₂ are as defined in Claim 1 or with a neutral salt of the compound of formula III.

8. A process according to Claim 7, wherein, in the compound of formula II, A signifies structure (b) and X signifies =NH.

- 15 9. A process for the production of a compound of formula I, stated in Claim 1, substantially as hereinbefore described, with reference to any one of the foregoing Examples 1 to 9.

- 20 10. A compound of formula I, stated in Claim 1, whenever produced by a process according to any one of Claims 7 to 9.

- 25 11. A process for pigmenting synthetic polymeric material in the mass comprising using, as pigment, a compound according to any one of Claims 1 to 6 and 10.

12. A process according to Claim 11, wherein said synthetic polymeric material is polyethylene, polystyrene, polyvinyl chloride, a synthetic rubber latex or a synthetic leather.

13. A process for pigmenting synthetic polymeric material in the mass, substantially as hereinbefore described, with reference to the foregoing Application Example.

14. Synthetic polymeric material, whenever pigmented by a process according to any one of Claims 11 to 13.

15. A surface coating composition comprising a compound according to any one of claims 1 to 6 and 10 in an oil, water or solvent base.

16. A printing ink comprising as pigment component a compound according to any one of claims 1 to 6 and 10.

17. A process for the production of spun-dyed filaments of viscose or cellulose acetate, comprising incorporating in the spinning solution a compound according to any one of claims 1 to 6 and 10.

18. Spun-dyed filaments of viscose or cellulose acetate, whenever produced by a process according to claim 17.

19. A process for dyeing paper, comprising adding to the stock, prior to sheet formation, a compound according to any one of claims 1 to 6 and 10.

20. Paper, whenever produced by a process according to claim 19.

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