July 2, 1940. R. E. BURK 2,206,220

SHIELD FOR RADIATORS

Filed March 8, 1938

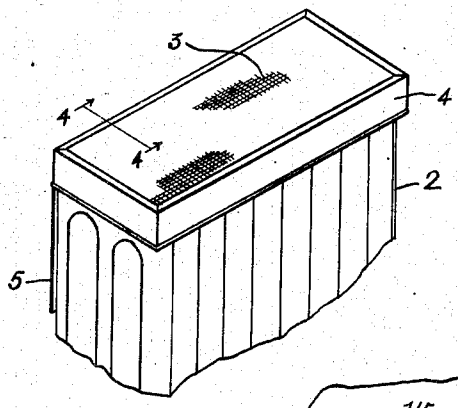


Fig. 1

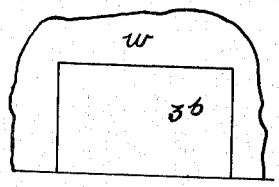


Fig. 3

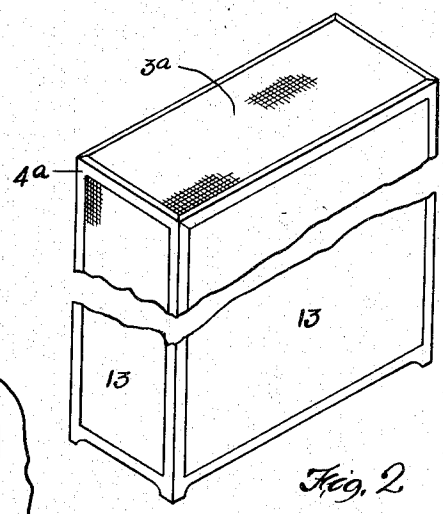


Fig. 2

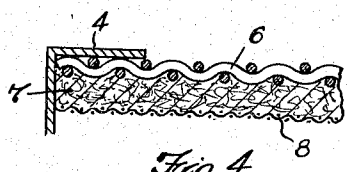


Fig. 4

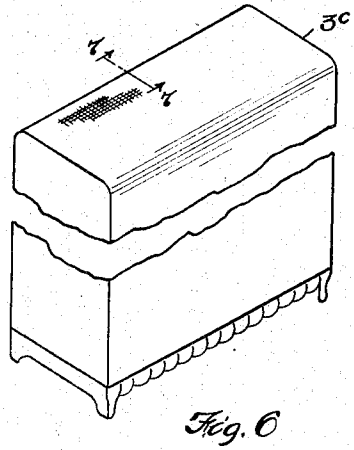


Fig. 6

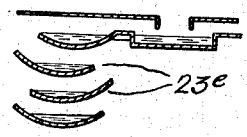


Fig. 10

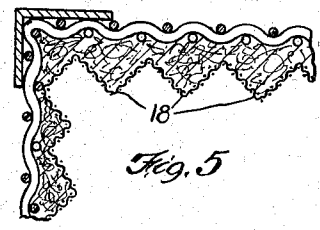


Fig. 5

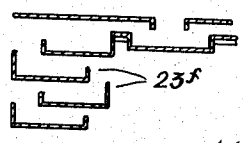


Fig. 11

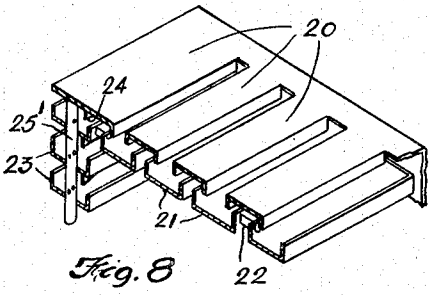


Fig. 8

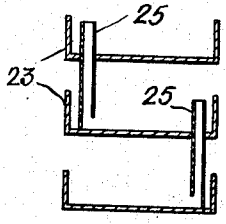


Fig. 9

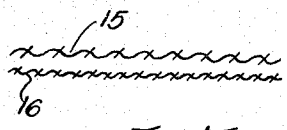


Fig. 7

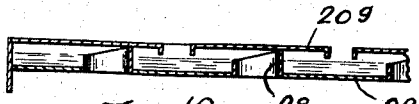


Fig. 12

BY

INVENTOR.
Robert E. Burk

Fraser, Oberlin & Fraser
ATTORNEYS

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SHIELD FOR RADIATORS

Robert E. Burk, Cleveland, Ohio

Application March 8, 1938, Serial No. 194,631

3 Claims. (Cl. 183—69)

Where heating means such as radiators occasioning some localized air drafts are employed, it is common complaint that the walls and ceilings which are impinged upon by the air currents generated, soon become disfigured and soiled from the excessive deposits of dust or soot which are inevitable. It thus becomes necessary to clean walls or redecorate with undesirable frequency. The radiators also, on account of the accentuated dust currents against their surfaces, become grimy and also require frequent redecoration. In an effort to mitigate this, various forms of radiator covers or deflectors have been introduced, these customarily depending upon the arrangement of a closed deflecting top or cover member for the radiator such as to divert the rising air currents away from the wall and out more in a horizontal direction into the room. While lessening the streaks and soiling immediately adjacent the radiator, such devices have been ineffective to prevent more diffuse widespread soiling, and the necessity for cleaning or redecorating has not received much assistance. Furthermore, all such deflector devices merely change the direction of the air currents somewhat, without particularly diffusing their intensity and without in anywise removing the large amount of dust and germs thus forcibly circulated around and around in the room. A construction which will facilitate proper heating by radiator equipment or the like and will allow proper air circulation without too great concentration of drafts, and which can at the same time remove the dust from circulation and with the germs, pollen and other objectionable materials, is as important desideratum and highly desired.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description and the annexed drawing setting forth in detail certain illustrative embodiments of the invention, these being indicative however, of but a few of the various ways in which the principle of the invention may be employed.

In said annexed drawing—

Fig. 1 is a perspective view, partly broken, showing an embodiment of the invention; Fig. 2 is a similar view of another form; Fig. 3 is a front elevational view of another form; Fig. 4 is a fragmentary sectional detail on enlarged scale, as at line 4—4, Fig. 1; Fig. 5 is a fragmentary sectional detail of another form; Fig. 6 is a perspective view, partly broken, showing another embodiment, and Fig. 7 is a sectional detail thereof, as at line 7—7, Fig. 6; Fig. 8 is a perspective view, partly broken, of another form of the invention; and Figs. 9, 10, 11 and 12 are sectional details of other forms.

Referring more particularly to the drawing, there is shown a radiator 2 such as is customary in heating installations, and thereon is an air-pervious member 3, with suitable horizontal framing 4 which may be of sheet metal. A deflector 5 extends downwardly therefrom at the rear. The air-pervious member 3 may be of multi-perforated sheet metal, or desirably of wire mesh work. If of heavy or thick gauge, it may be secured to the framing 4 suitably, as for instance by welds, and the entire top may be of considerable rigidity and strength. In some instances, lighter or thinner gauge wire mesh may be used. Inside or as a lower layer there is preferably provided a mass of air-pervious material involving finer air passageways and with more or less devious directions, as provided for instance by a layer of steel wool, rock wool, glass cloth, cotton, wool, rayon or cotton cloth, or the like having suitable finely pervious air passages. Such layer, providing in effect a filter or dust catching means, may complete the construction; or in some cases it may be backed up by an inner mesh work, preferably of finer wire than the exterior mesh work. Thus, a desirable construction, as illustrated in section in Fig. 4, may embody the sheet metal framing or body 4, with the heavy mesh work or metal wicker work panel 6 secured thereto, as by welding, soldering, brazing, etc.; and therewithin is a removable pervious portion or filter made up of steel wool or the like 7 and the backing or retaining wire mesh work element 8. The rear deflector portion 5, Fig. 1, may be non-pervious, or by constructing it as just mentioned with an inner filtering layer it may likewise be pervious while protecting the wall from soiling. In some instances the inner layer 7 of steel wool or such filtering material may be substituted by several thicknesses of mesh work, as wire. The trapping of dust particles is preferably promoted by coating the inner portion with a non-drying sticky material to retain the dust particles impinging thereon. Thus, the pervious backing 7 may be coated with dust-retaining sticky material, and while a non-odorous oil may be employed, or a non-vaporizing liquid such as glycerine, chlorinated diphenyls, alkylated aromatic compounds, tricresyl phosphate, and the like, a non-drying asphaltic material, thinned for the purpose of application, with a volatile solvent,

as for instance carbon tetrachloride, light naphtha, etc., is especially desirable, and in similar manner non-drying resinous materials of synthetic character, not highly polymerized. With the sticky material there is advantageously incorporated an agent which is toxic to germs, as for instance zinc chloride, phenols and the like.

The air-pervious construction as for the top 3 may advantageously be extended to form an enclosure for as much of the radiator as desired, or in fact for the entire radiator, and thus as illustrated in Fig. 2, there may be the top pervious member 3*a*, and a similar pervious front and ends 13. The back may be non-pervious, or pervious since the wall is protected by the construction as shown.

Where desired, the pervious covers of filter character may be arranged without the framing or body portion 4, Fig. 1, or 4*a*, Fig. 2, and the entire device may be relatively flexible and conformable to the radiator, as illustrated in Fig. 6. Such construction is particularly desirably made in structure which is resistant to heat-detriment and is non-corrodible so as to permit its being cleaned by immersion in strong solutions of acid or alkali or oxidizing agents, hot detergent agents, etc. Glass cloth is particularly advantageous. With such construction, the entire device is capable of being easily cleaned and sterilized by immersion in a cleaning solution, such as chromic acid sulphuric acid mixtures. Glass cloth may at the same time provide novel decorative effects in permanent color or artistic design, and its filtering properties are excellent. By employing an external layer of such glass cloth 15, Fig. 7, and a further inner layer 16, preferably of still finer mesh, dust-filtration of excellent thoroughness may be obtained, particularly if the inside be treated with a sticky dust-retaining material, asphalt, etc., as afore-described. Such inner layer may involve one or more woven cloths, preferably glass, or unwoven glass wool or the like with or without a woven interior surface. Such flexible construction of radiator cover may be made up in fine woven metallic screen where preferred, or in some instances of cloth fabric of adequate filtering and air-pervious properties. Thus, it may be made up of an outer layer of coarse material to resist wear and tear, and an inner layer more particularly of filtering character in woven or felted material, the latter in sufficiently thin layer to allow adequate air passage. Again, a coating of sticky dust-retaining material may be supplied for the inside.

Where the radiators are set in recesses or the heat outlet is flush with the wall surface *w*, as in Fig. 3, the air-pervious member 3*b* may be suitably mounted across the opening, its detail construction being as desired, foregoing.

By plicating or providing folds in the inner layer portion of structures as above-mentioned, a further increase in effective filtering area may be had, as indicated in the plications 18, Fig. 5.

Particularly active air circulation without obstruction, but with effective dust-retention may be realized by a construction shown in Fig. 8, in which the air-pervious top may take the form of a plurality of spaced apart cover strips 20 having down-turned margins. Tray-elements 21 are connected underneath, these having interconnecting portions or pipes 22 or equivalent end passages whereby liquid may be distributed throughout; and a plurality of superposed trays 23 are further provided in a vertical series, these having fins 24 to downwardly deflect air currents. Conveniently, the tray elements 23 may be supported from the top by tubular elements providing in effect a series of overflow tubes to distribute liquid on down from above, these being separated tubes 25, Fig. 9, or integral tubes 25', Fig. 8, as desired. In a device of this construction, it will be seen that the rising air current is deflected and distributed against the surface of the liquid in the various trays, and by having this of a suitable character, dust particles, germs, etc., are retained by the liquid. Water is not as effective in such relation as certain solutions. With a solution of material occasioning a low surface tension, excellent retention of impinging dust particles results. Suitable materials are wetting agents, as for instance salts of sulphated or sulphonated higher alcohols or sulphonated fatty acids or esters or mixtures, or the free fatty acids, or pyridine bases or cresols, cresylates, etc. The trays are filled by pouring the solution into an accessible top tray, and allowing it to distribute through the remainder of the series. Again, the trays may be of trough like character 23*e* staggeredly lower at one side in alternation, as illustrated in Fig. 10 for the vertical series, if desired, thereby giving overflow distribution with simpler structure. Similarly, the trays may be of form as indicated in Fig. 11 at 23*f*, one side of alternate trays being lower to permit overflow to the next. By providing the air passages through the top of the device in the form of tubes 28 with bevelled or slanting tops, Fig. 12, under the portions 20*g*, the trays 22*g* containing the dust-catching liquid may be particularly effectively exposed to the currents of warm air passing upwardly, and without interference with proper draft pressure. Constructions as in Figs. 8–12 may be applied to the radiator as such or where preferred a further cover as of Figs. 1, 2, or 6 may be superposed thereover.

The radiator protected as in accordance with the invention provides effective heating and at the same time the wall surfaces and the surfaces of the radiator itself are not subjected to the customary disfiguring accumulation of dirt. With the catching and retention of the dust, soot, germs, etc., thus brought to the radiator in the circulation of the air as occasioned by the thermal difference operating, a corresponding purification of the atmosphere in the room is the result. With those containing solutions, humidification of the air is likewise had, although this is readily achieved in any case by means of a receptacle for water which may be attached to the above devices or may be attached to the radiator separately.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:

1. As an article of manufacture, a heat radiator cover comprising a frame, said frame defining an opening, an outer, protective, air pervious screen of coarse perforations extending across said opening and supported by said frame, and an inner air pervious screen, of finer perforations than said outer screen, supported in spaced relation with respect to said outer screen, said inner screen being coated with a non-volatilizing dust-catching material.

2. As an article of manufacture, a heat radia-

tor cover comprising a frame, said frame defining an opening, an outer, protective, air pervious screen of coarse perforations extending across said opening and supported by said frame, an inner air pervious screen, of finer perforations than said outer screen, supported in spaced relation with respect to said outer screen, said inner screen being coated with a non-volatilizing dust-catching material and being composed of woven glass.

3. As an article of manufacture, a heat radiator cover comprising a rigid metallic frame adapted to be supported upon a radiator, said frame defining an opening, an outer, protective, air pervious, metal screen, of coarse perforations, permanently secured to said frame and bridging said opening, an inner, air pervious, glass cloth screen, removably secured to said frame, in spaced relation with respect to said outer screen, said inner screen being coated with a dust-catching sticky material.

ROBERT E. BURK.