Nov. 18, 1941. C. MacGREGOR 2,262,898

HEATER ATTACHMENT FOR FANS

Filed May 20, 1940 2 Sheets-Sheet 1

Fig. 1

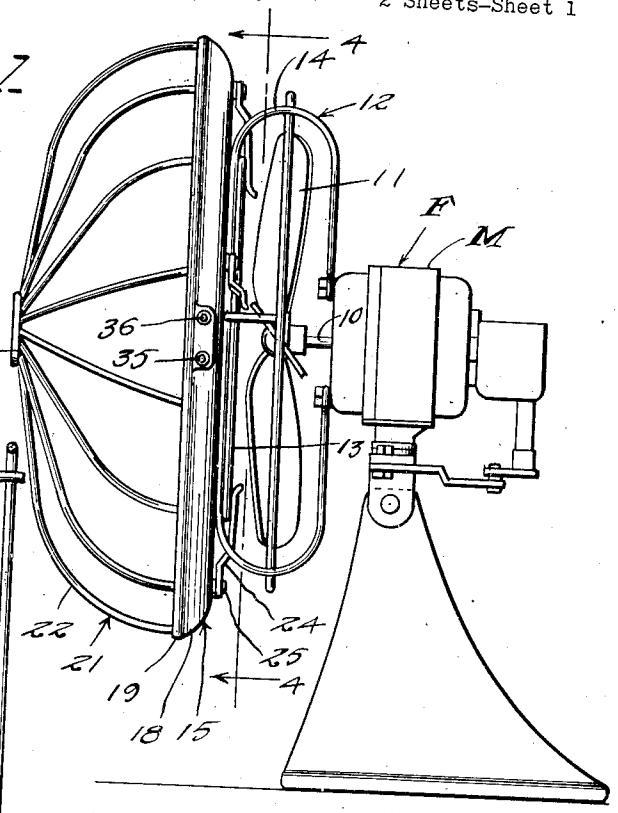


Fig. 2

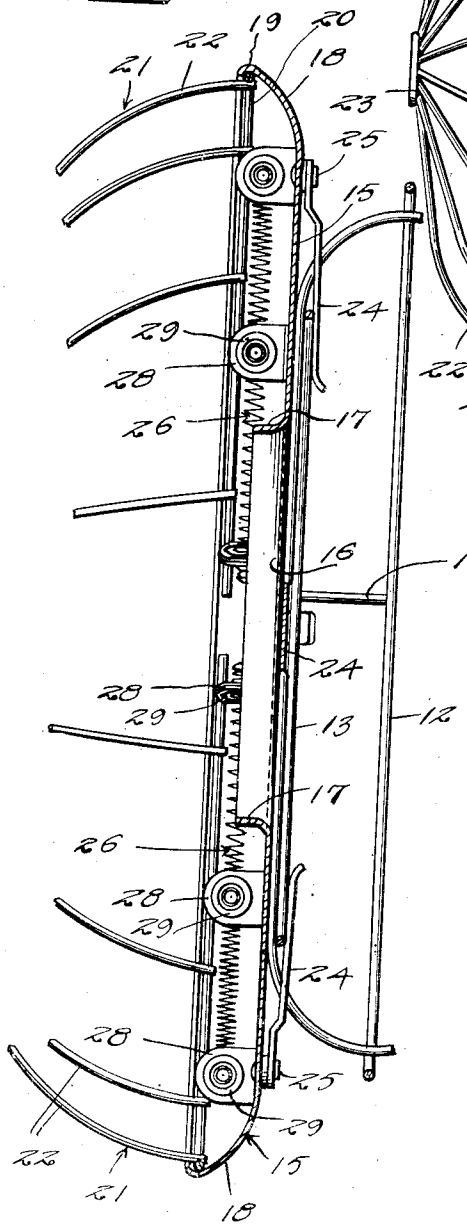


Fig. 5

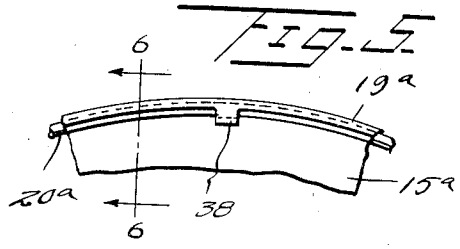
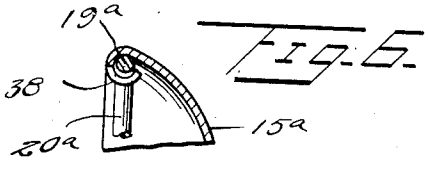


Fig. 6



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HEATER ATTACHMENT FOR FANS

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Fig. 3.

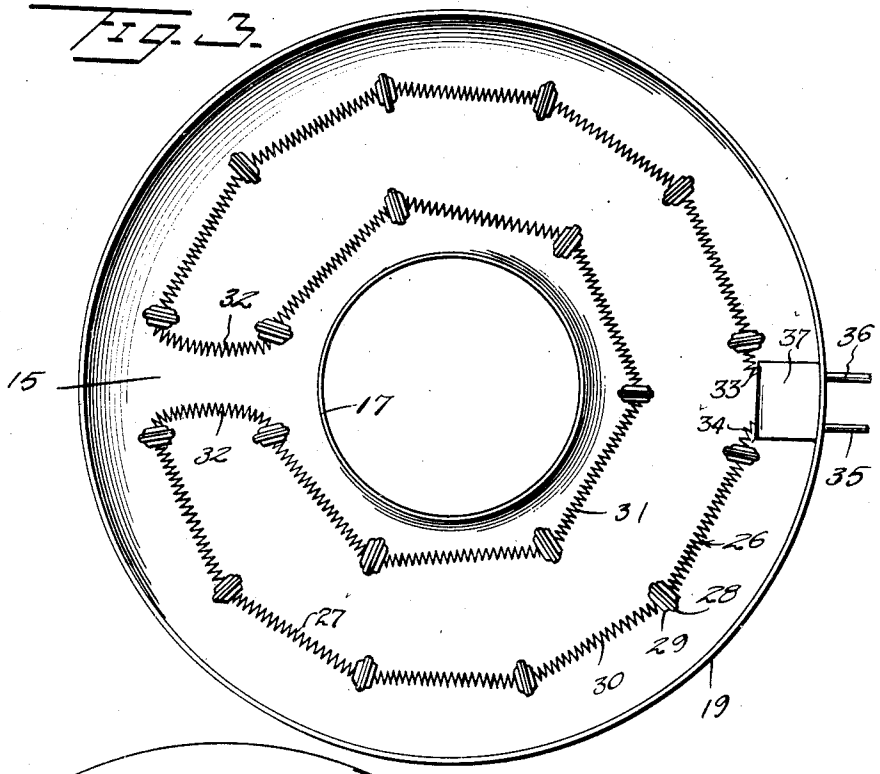
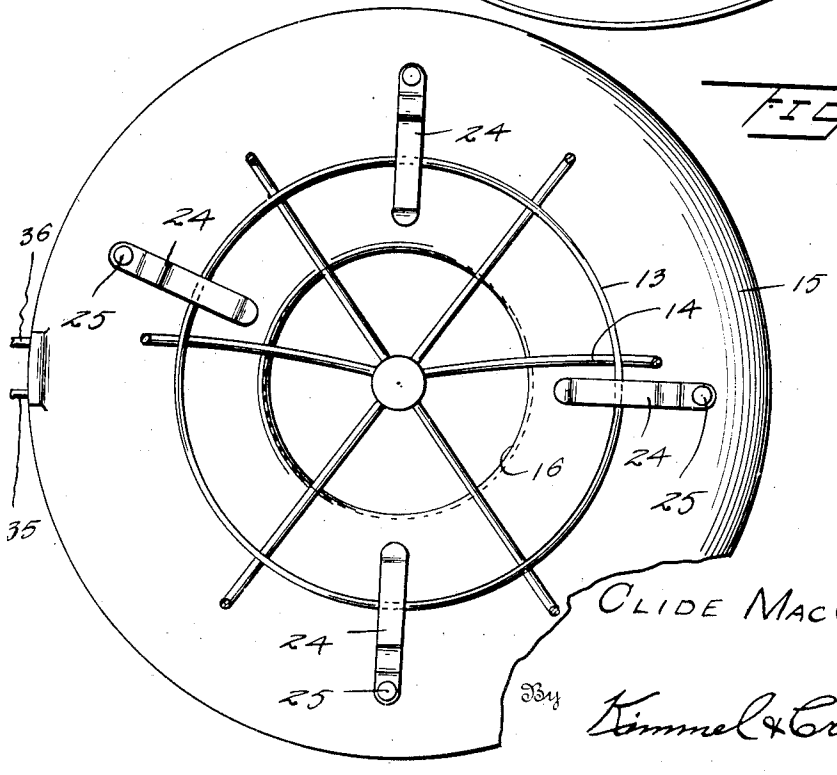


Fig. 4.



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HEATER ATTACHMENT FOR FANS

Clide MacGregor, Flint, Mich.

Application May 20, 1940, Serial No. 336,240

2 Claims. (Cl. 219—39)

This invention relates to electric heaters and more particularly to a heater attachment for a fan.

An object of this invention is to provide in combination a heater device and a fan structure wherein the heat generated by the heater is adapted to be circulated by means of the draft created by the fan.

Another object of this invention is to provide a combination of this kind in which the heater may be detachably mounted on the fan guard so that the draft of air created by the fan will be forced through the heater.

A further object of this invention is to provide as a new article of manufacture, a heater attachment which is adapted to be removably mounted on any type of fan guard, the heater having a nozzle in the center thereof through which the draft of air created by the fan is adapted to pass.

A still further object of this invention is to provide an attachment of this kind including a reflecting or radiant heater which is so constructed that the heating element thereof is mounted on a combined guard and reflector, the guard providing a means whereby the draft of air created by the fan will be held out of direct contact with the heating element.

A further object of this invention is to provide an attachment of this kind which will function both as a radiant or reflecting heater and as an air nozzle for a fan so as to produce a Venturi action for the draft of air.

A further object of this invention is to provide a heater attachment for a fan which when in applied position is attractive in appearance and which will efficiently heat a room at small cost.

A further object of this invention is to provide a heater attachment for a fan which when removed from the fan may be used as a toaster or cooker.

To the foregoing objects and to others which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically referred to and illustrated in the accompanying drawings wherein are shown embodiments of the invention, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawings—

Figure 1 is a detail side elevation of a heating device constructed according to an embodiment of this invention mounted on a fan structure.

Figure 2 is a fragmentary side elevation of the device partly in section.

Figure 3 is a detail front elevation of the device with the guard removed.

Figure 4 is a fragmentary rear elevation of the device.

Figure 5 is a fragmentary front elevation of a modified form of this invention.

Figure 6 is a sectional view taken on the line 6—6 of Figure 5.

Referring to the drawings, the character F designates generally a fan structure including a motor M provided with a shaft 10 on which a fan blade 11 is mounted. A guard structure 12 is secured to the motor housing 10 and it will be understood that the guard structure 12 is here shown as only one type of guard structure and fan with which the hereinafter described invention is adapted to be combined. In the present instance the guard structure 12 includes a series of concentric rings 13 which are connected to spacing bars 14 so that the blade 11 will be properly protected.

In order to provide a means whereby the fan structure F may be used in combination with a radiant or reflecting heater structure, I have provided an electrical heating element holder in the form of a circular plate 15 which at the axial center thereof is provided with a permanently open circular air passage or opening 16. The plate 15 is formed with a forwardly directed flange 17 engaging about the marginal edges of the air passage 16 and this air passage 16 is adapted to be positioned concentric to the shaft 10 and is of such a size as to permit the current of air generated by the blade 11 to pass therethrough. The inner portion of the plate 15 is substantially flat and the outer portion of the body of this plate 15 is bent outwardly or forwardly on an arc or curvature as at 18. The cross sectional length of the said flat inner portion is of a length materially greater than the cross sectional length of the curved outer portion of the plate 15. The outer marginal edge of the plate 15 is formed with a bead or reverted portion 19 forming an arcuate flange or socket within which the base ring 20 of an outer guard member 21 is adapted to engage.

The ring 20 is preferably a split resilient ring and a plurality of radial and longitudinally arcuate bars 22 are secured at their outer ends to the split ring 20 and the inner ends of the bars 22 are secured to a central ring 23. The ring 23

is concentric to the opening or air passage 16 and to the shaft 10.

In order to provide a means whereby the plate 15 may be detachably secured to the guard structure 12, I have provided a plurality of pivoted clips or clamping members 24 which are pivotally carried by pivot members 25. The pivot members 25 extend through the plate 15 and engage the outer ends of the clip members 24. The clip members 24 are longitudinally bent so that they may be yieldably engaged with a ring 13 of the guard 12. The depth of the inner flange or nozzle forming member 17 is substantially less than the depth of the arcuate portion 18 and the bead or arcuate flange 19, the purpose for which will be hereinafter described.

A heating element 26 is disposed on the forward reflecting face of the plate 15 and this heating element 26 comprises an electrical resistance coil 27 which is held in spaced relation to the forward reflecting face of the plate 15 by means of a plurality of forwardly extending supporting members 28 which are secured as by welding or other suitable fastening means to the plate 15. An insulated bushing 29 is carried by each supporting member 28 and the resistance coil 27 is adapted to extend loosely through the bushings 29. The coil or heating element 26 is formed with a pair of substantially circular coil members 30 and 31, the coil 30 extending adjacent the outer portion of the plate 15 and the coil 31 being smaller in diameter and disposed closely adjacent the flange 17.

The two coil members 30 and 31 are connected together as at 32 and the heating element 26 is connected to a pair of terminals 33 and 34 which are fixed to the outer portion of the plate 15. A pair of plugs 35 and 36 are connected to and form a part of the terminals 33 and 34, respectively, so that a connector plug or socket member may be connected to the plugs 35 and 36 for connection to a source of electric current supply. Preferably the split ring 20 has the free ends thereof spaced apart and positioned on opposite sides of the terminals 33 and 34. A cover or terminal protector member 37 is disposed about the terminals 33 and 34 and in practice the free ends of the guard ring 20 abut against the adjacent sides of the cover 37. It will be understood that the terminals 33 and 34 and the plugs or terminal posts 35 and 36 are suitably insulated from the plate 15. In Figures 5 and 6 there is disclosed a slightly modified form of this invention wherein the plate member 15a is formed with a returned flange or arcuate guard holding member 19a at its outer marginal edge and a plurality of lugs 38 are formed with the flange 19a and are adapted to be bent inwardly about the ring 20a so as to securely hold the guard structure 21 on the plate 15a. In other respects the structure shown in Figures 5 and 6 is the same as that shown in Figures 1 to 4.

In the use and operation of this attachment, the heater structure is adapted to be mounted on the guard 12 of the fan structure by swinging the attaching clips 24 inwardly over the guard ring 13. In this manner the plate 15 is held concentric to the fan 11 and the shaft 10. When the fan F is operated and the heating element 26 is connected to a source of electric current supply, the heating element 26 will turn red and the reflecting forward face of the plate 15 will radiantly direct the heat forwardly. With the fan blade 11 rotating, a draft of air will pass through the opening 16 and the inner flange 17 is of such a depth that the stream of air passing through the flange 17 will not be permitted to strike the heating element 26. It will also be understood that a portion of the draft of air created by the fan 11 will pass about the outer rear portion of the plate 15 and this outer portion of the plate 15 is curved forwardly so as to facilitate the flow of the air forwardly and about the outer edges of the plate. The draft of air flowing through the flange 17 will cause a suction to be created about the outer marginal edges of the plate 15 and thus draw this air from about the marginal edges of the plate 15 through the radiantly heated stream of air on the forward side of the plate 15.

In this manner the forwardly moving air on the forward side of the plate 15 will be heated from the heating element 26 and this forward moving air which is caused by the rotation of the blade 11 will not strike the heating element 26. By forming the heater structure with the plate 15 between the fan blade 11 and the heating element 26, the reflector plate 15 will serve as a guard which will prevent the heating element 26 from being cooled by the air stream caused by rotation of the blade 11. The protection of the heating element 26 by the radiant member 15 will prevent oxidation of the heating element 26 and at the same time the heating element 26 will at all times be properly heated and will have a red glow.

The inner flange 17 will function as a Venturi tube as the stream of air caused by rotation of the fan blade 11 will be constricted by the flange 17 and this stream of air after passing through the flange 17 will expand in a radial direction but this expansion will occur forwardly of the heating element 26 and will mix the air flowing through the passage 16 with the air which is drawn inwardly from the outer marginal edges of the plate 15 and which passes through the heated rays on the forward side of the plate 15.

The heater structure hereinbefore described may be used as an attachment for any conventional fan structure embodying the use of a conventional fan blade guard and if desired the heater structure hereinbefore described may be used as a toaster by removing the guard 21 and setting the plate 15 in a horizontal position. In this horizontal position the attaching clips 24 may be turned inwardly and will act as feet or supports for the plate 15. The heating element 26 may then be connected to a source of current supply and bread placed in a position to receive the heat from the heating element 26. If desired the guard 21 may be left on and the bread placed directly on the guard 21. In addition the heater structure hereinbefore described may be used as a cooker by placing the plate 15 in a horizontal position and removing the guard 21. A pan or other cooking dish may then be placed in contact with the coil supporting members 28. The reflecting surface of the plate 15 will assist in directing the heat rays against the bottom of the cooking dish so that the heating element will quickly heat the material in the cooking dish.

Where the device is used as a cooker or toaster, the clips or attaching members 24 will space the rear side of the plate 15 a sufficient distance from a table or other plane surface so that supporting surface for the heater will not be damaged by heat from the heating element 26. The air in the space between the rear or bottom side of the

plate 15 will act as an insulating means to prevent burning or scorching of the supporting surface. It will be understood that the fan F may be either a fan of the stationary type or may be of the oscillating type. By attaching the heater to the fan structure, a room may be quickly heated due to the circulation caused by operation of the fan in conjunction with the heating element attached to the front side of the fan. While it is well known that electric heating elements have been mounted in a position forwardly of a fan structure, such heating elements have been exposed to the air stream caused by the fan blades and this air stream has the effect of quickly cooling the heating element and preventing the heating element from being maintained in a proper heating condition. This heating condition is a red condition of the heating element and where the heating element or coil comes into direct contact with the air stream of the fan, the heating element cannot be maintained at the proper heating condition.

What I claim is:

1. An electrical heater for positioning against the front of and for connection to the guard for an electrically driven fan, said heater including a supporting plate having a flat inner portion and an outer portion bent outwardly and forwardly upon an arc, said inner portion being formed with a permanently opened axial opening constituting an air passage and a forwardly directed annular flange bordering the edge of said opening and having its forward edge spaced rearwardly of the outer edge of said outer portion, an electrical heating element surrounding said flange, spaced from and opposing the forward face of said inner portion and being formed with a pair of terminals for connection to an electric source, forwardly extending spaced apertured insulating members on the forward face of said inner portion for supporting said element, and shiftable means attached to the rear face of said inner portion for attaching said plate to the guard for the fan.

2. An electrical heater for positioning against the front of and for connection to the guard for an electrically driven fan, said heater including a supporting plate having a flat inner portion and an outer portion bent outwardly and forwardly upon an arc, said inner portion being formed with a permanently opened axial opening constituting an air passage and a forwardly directed annular flange bordering the edge of said opening and having its forward edge spaced rearwardly of the outer edge of said outer portion, an electrical heating element surrounding said flange, spaced from and opposing the forward face of said inner portion and being formed with a pair of terminals for connection to an electric source, forwardly extending spaced apertured insulating members on the forward face of said inner portion for supporting said element, shiftable means attached to the rear face of said inner portion for attaching said plate to the guard for the fan, said outer portion having its outer terminal part formed with an internal socket, and a forwardly directed skeleton guard including a resilient split annular member at its inner end mounted in said socket whereby said guard is connected to said plate.

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