

[54] FAN GUARD

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[22] Filed: **May 1, 1972**

[21] Appl. No.: **249,272**

[52] U.S. Cl. **416/247**

[51] Int. Cl. **F04d 29/70**

[58] Field of Search **416/247**

[56] **References Cited**

UNITED STATES PATENTS

2,259,853	10/1941	Koch.....	416/247
2,617,583	11/1952	Kemler	416/247
2,624,504	1/1953	Viewegh	416/247

FOREIGN PATENTS OR APPLICATIONS

771,894	4/1957	Great Britain.....	416/247
836,626	6/1960	Great Britain.....	416/247

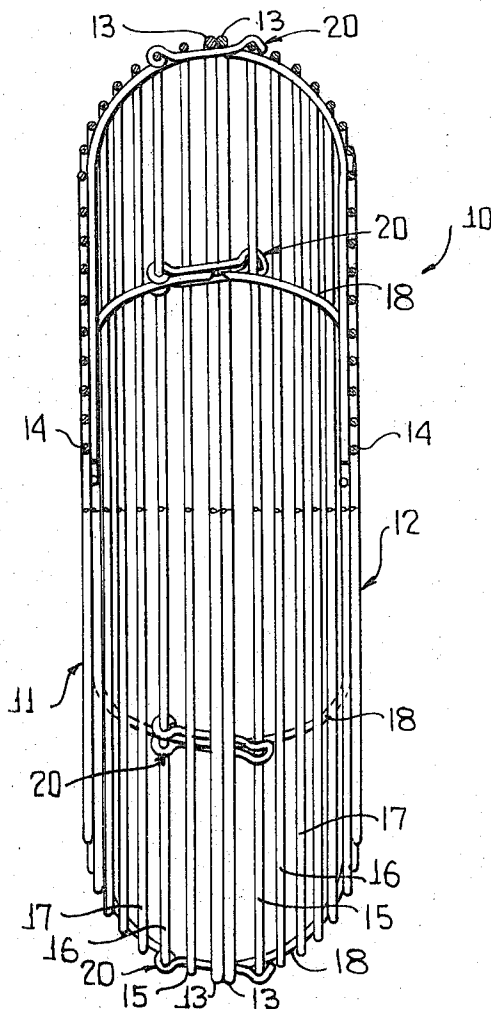
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[57] **ABSTRACT**

This disclosure relates to fan guard which includes a pair of guard halves each including a plurality of peripheral wires circumscribing progressively reduced areas from a first peripheral wire toward a most remote and smaller second peripheral wire with at least an additional peripheral wire therebetween, the guard halves being disposed with the first peripheral wires adjacent each other and means in the form of hooks pivotally connected to the additional peripheral wire of a first of the pair of guard halves and hooked upon the additional peripheral wire of a second of the pair of guard halves for maintaining the same in assembled relationship. Each hook includes an eye and a hooking nose at opposite ends of a spanning portion and the spanning portions are disposed inboard of, in contact with, and in spanning relationship to the first peripheral wires of both the first and second guard halves.

12 Claims, 7 Drawing Figures



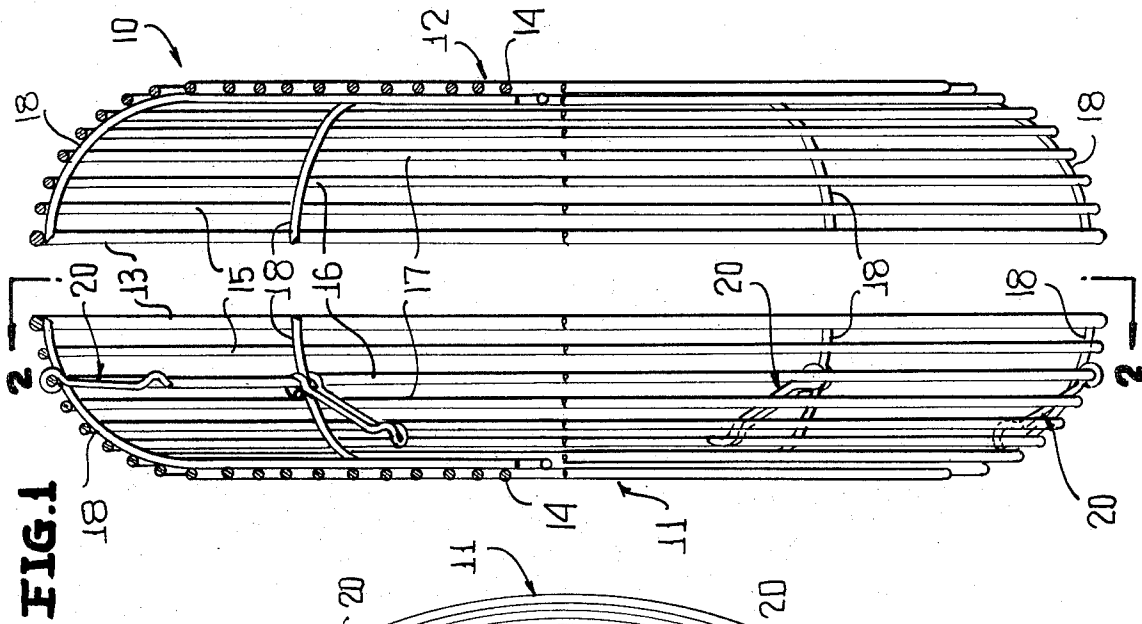
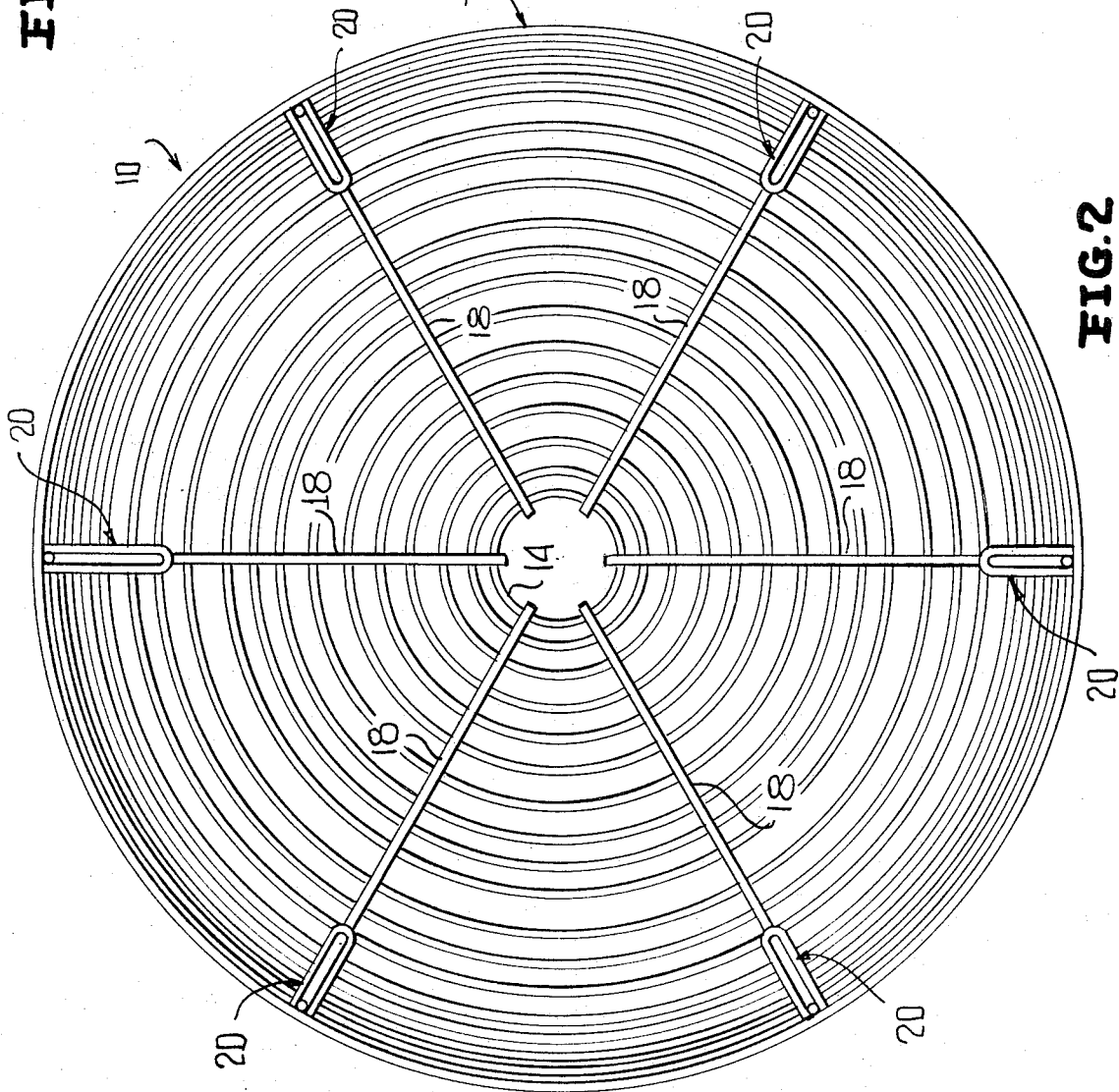


FIG.3

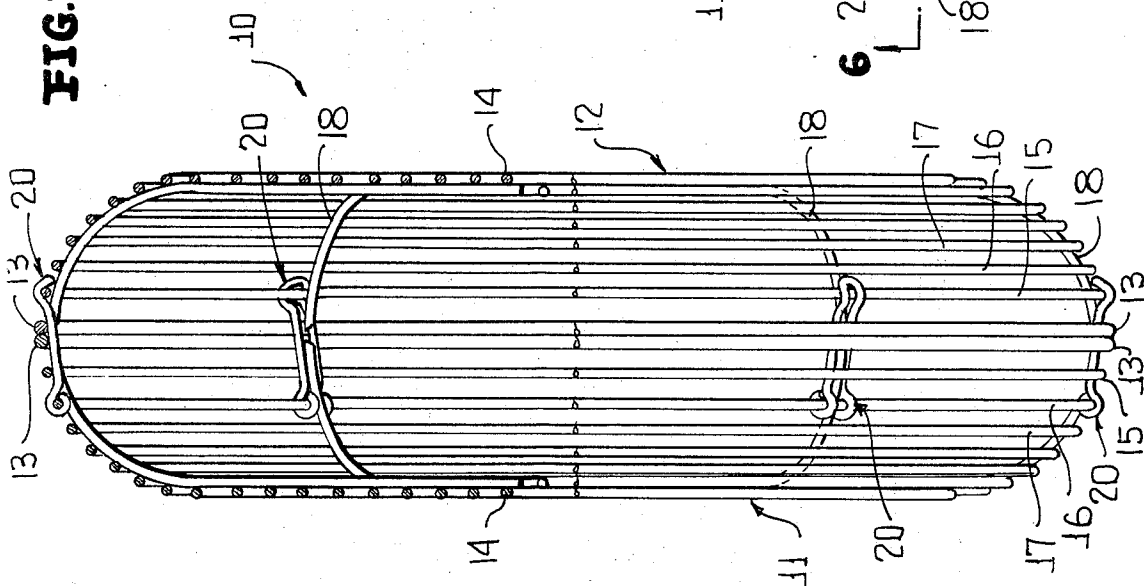


FIG.4

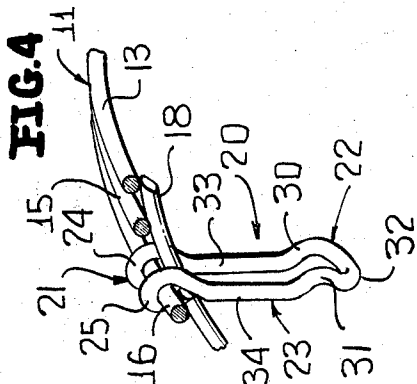


FIG.6

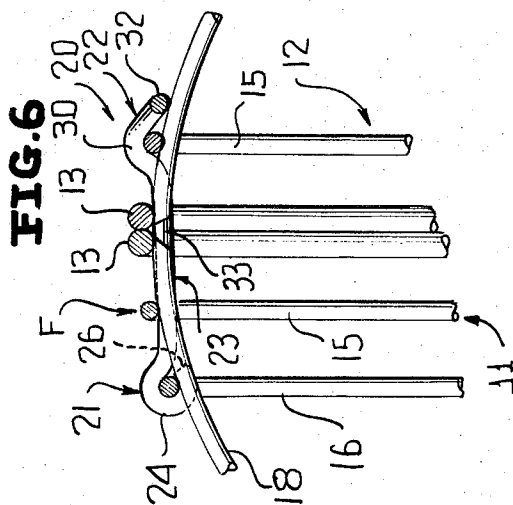


FIG.5

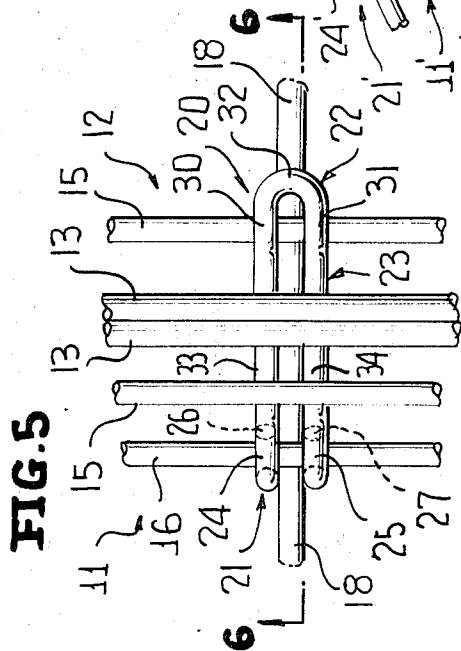
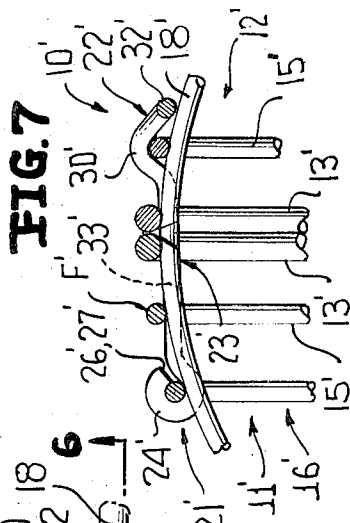


FIG.7



FAN GUARD

A primary object of this invention is to provide a novel fan guard which is readily inexpensively manufactured, can be rapidly assembled and disassembled and most importantly includes a pair of guard halves which when secured in assembled relationship are virtually vibration-free thus precluding rattling and other noise when in assembled relationship to an energized fan.

A further object of this invention is to provide a novel fan guard of the type heretofore described wherein the anti-rattling feature heretofore noted is achieved by forming the fan guard of a pair of guard halves, each including a plurality of peripheral wires circumscribing progressively reduced areas from a first peripheral wire toward a most remote and smaller second peripheral wire with the first peripheral wires being in adjacent relationship to each other, and means for removably securing the guard halves to each other, the securing means being a plurality of hooks each having first and second ends and a spanning portion therebetween, the first ends being pivotally connected to the additional peripheral wire of a first of the pair of guard halves, the second ends being hooked upon the additional peripheral wire of a second of the pair of guard halves, and the spanning portions being disposed inboard of and in spanning relationship to the first peripheral wires of both the first and second guard halves and drawing the latter into intimate contacting relationship thus precluding chatter, vibration, noise, etc. when the guard is in assembled relationship to an energized fan.

Still another object of this invention is to provide a novel fan guard of the type heretofore described including a further peripheral wire between the first and additional peripheral wires of the first guard half, and the spanning portions are likewise disposed inboard of and span the further peripheral wire.

Yet another object of this invention is to provide a novel fan guard wherein the axial distance between the first and additional wire of the first guard half is greater than the axial distance between the first and additional wire of the second guard half thereby providing one or more fulcrum points which maintain hooking noses of the hooks in relatively tight engagement with the additional peripheral wire of the second guard half.

A final object of this invention is to provide a novel hook particularly adapted for association with one of a pair of fan guards, the hook being composed as a single piece of wire bent to form a pair of adjacent aligned side-by-side eyes, each eye including one terminal end of the single piece wire, a pair of adjacent aligned side-by-side hook-shaped noses remote from the eyes, the noses being joined to each other by a bight portion, and a pair of adjacent aligned side-by-side spanning portions one each between an associated eye and nose.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description and the several views illustrated in the accompanying drawings.

IN THE DRAWINGS

FIG. 1 is a side elevation view of a novel fan guard of this invention illustrated in unassembled condition, and illustrates a pair of guard halves one of which includes a plurality of hooks for securing the halves in assembled relationship.

FIG. 2 is a front elevational view taken along line 2—2 of FIG. 1, and illustrates the manner in which one of two identically constructed fan guard halves includes a plurality of peripheral wires circumscribing progressively reduced areas, and the manner in which each hook is associated with a radially disposed wire.

FIG. 3 is a side elevational view similar to FIG. 1, and illustrates the manner in which the cage halves are secured to each other by the plurality of hooks.

FIG. 4 is a fragmentary perspective view of one of the plurality of hooks, and illustrates the manner in which the same is pivoted to a peripheral wire while being in spanning relation to a radial wire.

FIG. 5 is an enlarged fragmentary top plan view of the uppermost hooks of FIG. 3 looking downwardly, and illustrates the manner in which the hook is in underlying spanning relationship to two contacting peripheral wires of the guard halves and in overlying hooking relationship to an additional peripheral wire of one of the guard halves.

FIG. 6 is a fragmentary sectional view taken generally along line 6—6 of FIG. 5, and more clearly illustrates the relationship of the components of FIG. 5.

FIG. 7 is a fragmentary sectional view similar to FIG. 6, but illustrates a hook whose eye is bent opposite to that of the hook of FIG. 6.

Referring specifically to the drawings, a novel fan guard constructed in accordance with this invention is generally designated by the reference numeral 10 (FIGS. 1 through 3) and includes a pair of substantially identical guard halves 11, 12. Each of the guard halves 11, 12 is constructed from a plurality of peripheral wires which in the preferred embodiment of the invention are circular and circumscribe progressively reduced areas from a first peripheral wire 13 (FIG. 1) of each guard half 11, 12 toward a most remote and smaller second peripheral wire 14 with additional or further peripheral wires 15, 16, 17, etc. therebetween. Each guard half 11, 12 further includes a plurality of radially oriented wires 18 (FIG. 2) inboard of, spanning and welded to the peripheral wires 13 through 17. The radial wires 18 terminate at one end adjacent the peripheral wire 13 of each guard half 11, 12 and at an opposite end adjacent the peripheral wire 14 to permit a fan motor shaft (not shown) to pass through the generally circular opening defined by the peripheral wire 14 of the guard half 12 which additionally includes conventional means (not shown) for securing the latter to the fan motor housing.

Reference is now particularly made to the fan guard half 11 and particularly the manner in which the same is provided with a plurality of means, generally designated by the reference numeral 20, for removably securing the guard halves to each other with the peripheral wires 13, 13 being in intimate contacting and thus anti-vibrating relationship, in the manner best visualized in FIGS. 5 and 6 of the drawings. The securing means are a plurality of hooks each having first and second ends 21, 22, respectively, and a spanning portion 23 therebetween. Each hook 20 is constructed

from a single piece of wire bent to form at the first end 21 a pair of adjacent aligned side-by-side eyes 24, 25 with each eye including one terminal end 26, 27, respectively, of the single piece of wire. The second end 22 of each hook 20 includes a like pair of adjacent aligned side-by-side hook-shaped noses 30, 31 which open radially inwardly and downwardly in the assembled condition thereof (FIG. 6) with the noses being joined to each other by a bight portion 32. The eyes 24, 25 are joined to the respective hooking noses 30, 31 of the hook 20 by respective spanning arms 33, 34.

Prior to the hooks 20 being assembled to the guard half 11 the eyes 24, 25 are opened a sufficient extent to permit the same to encompass the peripheral wire 16 while at the same time sandwiching therebetween one of the associated radial wires 18 in the manner best illustrated in FIGS. 4 and 5, after which the eyes are closed by simply bending the same to bring the terminal ends 26, 27 more closely adjacent the respective spanning arms 33, 34. Due to this arrangement the hooks 20 are precluded from sliding along the peripheral wires 16 when the guard halves are unassembled due to the radial wires 18 sandwiched between the eyes 24, 25 of each hook 20.

In order to assemble the guard halves 11, 12 the same are merely brought together with the peripheral wires 13, 13 being initially in adjacent though spaced relationship. The bight portion 32 of each wire is then guided beneath the peripheral wire 13 of the guard 12 and into the gap (unnumbered) between the wires 13, 15 of the guard 12. As is best visualized in FIG. 6, as each bight portion 32 passes over the outboardmost point of the wire 15 of the guard half 12 the natural inclination of the hooking noses 30, 31 draw the hooks 20 to the right as viewed in FIG. 6 by a camming action thus drawing the peripheral wire 13 of the guard half 11 into intimate contacting relationship with the wire 13 of the guard half 12. Particular attention is directed to the fact that the eyes 24, 25 are pivotally secured to the peripheral wire 16 of the guard half 11 which is spaced axially and radially inwardly further from the peripheral wire 13 of the guard half 11 than is the wire 15 of the guard half 12. In other words, and as best visualized in FIG. 6, the wire 16 of the guard half 11 is disposed more radially inwardly than the wire 15 of the guard half 12. Accordingly, during the hooking of the noses 22 upon the peripheral wire 15 of the guard half 12 the spanning portion 23 of each hook 20 is bent to a slightly upwardly opening concave position, as viewed in FIG. 6, due to the bearing engagement of the spanning arms 33, 34 against the underside of the wire 15 of the guard half 11 which in effect serves as a fulcrum point F. When the spanning elements 33, 34 rebound under their natural resilience to the position shown in FIG. 6 the spanning arms 33, 34 still bear against the wire 15 of the guard half 11 due to the difference in the radial dimensions heretofore noted with respect to the wires 16, 15 of the guard halves 11, 12. Accordingly, even in the latched position the natural resilience of the wires 20 maintains an extremely high hooking force between the hooking noses 30, 31 and the wire 15 of the guard half 12 to the extent that the inboardmost surfaces (unnumbered) of the peripheral wires 13 of the guard halves 11, 12 are contacted by the spanning arms 33, 34. Thus the guard halves are precluded from axial movement away from each other by virtue of the hooks 20, axial movement toward each

other by virtue of the hooks 20 and the contact between the peripheral wire 13, 13 of the guard halves 11, 12, and radial movement toward or away from each other by the contact of the spanning arms 33, 34 with the inboard sides of the peripheral wires 15, 13 of the guard 11 and the peripheral wire 13 of the guard 12 in conjunction with the fulcrum F maintaining such contact in the manner heretofore described. Peripheral motion is, of course, precluded by the fact that each radial wire 18 of each guard half 11, 12 passes between the eyes 24, 25, the spanning arms 33, 34, and the hooking noses 30, 31 in the assembled or securing position of the guard halves 11, 12, as is most readily apparent from FIG. 5. In this manner, the fan guard 10 is not only readily assembled but once assembled vibration, chattering, etc. which might otherwise result in conventional structures from the vibratory motion of an energized fan are essentially totally precluded.

Referring to FIG. 7 of the drawings, identical reference numerals have been placed thereon to indicate identity of structure in not only the guard halves 11', 12' of the fan guard 10', but also the hook 20' with the only difference being in the construction of the eyes 24', 25' in the sense of being oppositely bent to that of the eyes 24, 25 of the hook 20. Otherwise, the embodiment of the invention illustrated in FIG. 7 is identical to that heretofore described relative to the fan guard 10.

While preferred forms and arrangement of parts have been shown in illustrating the invention, it is to be clearly understood that various changes in details and arrangement of parts may be made without departing from the spirit and scope of the invention as defined in the appended claimed subject matter.

What is claimed is:

1. A fan guard comprising a pair of guard halves each including a plurality of peripheral wires circumscribing progressively reduced areas from a first peripheral wire toward a most remote and smaller second peripheral wire with at least an additional peripheral wire therebetween, said guard halves being disposed with said first peripheral wires adjacent each other while said second peripheral wires are remote from each other, and means for removably securing said guard halves to each other, said securing means being a plurality of hooks each having first and second ends and a spanning portion therebetween, said first ends being pivotally connected to the additional peripheral wire of a first of said pair of guard halves, said second ends being hooked upon the additional peripheral wire of a second of said pair of guard halves, and said spanning portions are disposed inboard of and span said first peripheral wires of both said first and second guard halves.

2. The fan guard as defined in claim 1 wherein said spanning portions contact inboard surface portions of said first peripheral wires.

3. The fan guard as defined in claim 1 including a further peripheral wire between said first and additional peripheral wires of said first guard half, and said spanning portions are likewise disposed inboard of and span said further peripheral wire.

4. The fan guard as defined in claim 1 wherein the axial distance between said first and additional wire of said first guard half is greater than the axial distance between said first and additional wires of said second guard half.

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5. The fan guard as defined in claim 1 wherein said first ends are eyes and said second ends are radially inwardly opening noses in the second positions thereof.

6. The fan guard as defined in claim 1 wherein the diameter of the additional wire of said first guard half is less than the diameter of the additional wire of said second guard half.

7. The fan guard as defined in claim 1 wherein said first ends are eyes and said second ends are radially inwardly opening noses in the second positions thereof, and each hook includes two aligned eyes, noses and spanning portions constructed from a single piece of bent wire.

8. The fan guard as defined in claim 1 wherein said first ends are eyes and said second ends are radially inwardly opening noses in the second positions thereof, and each hook includes two aligned eyes, noses and spanning portions constructed from a single piece of bent wire with ends of the bent wire located at said eyes.

9. The fan guard as defined in claim 3 wherein the axial distance between said first and additional wire of said first guard half is greater than the axial distance between said first and additional wires of said second

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guard half.

10. The fan guard as defined in claim 3 wherein said first ends are eyes and said second ends are radially inwardly opening noses in the second positions thereof, and each hook includes two aligned eyes, noses and spanning portions constructed from a single piece of bent wire with ends of the bent wire located at said eyes.

11. The fan guard as defined in claim 4 wherein said first ends are eyes and said second ends are radially inwardly opening noses in the second positions thereof, and each hook includes two aligned eyes, noses and spanning portions constructed from a single piece of bent wire with ends of the bent wire located at said eyes.

12. The fan guard as defined in claim 9 wherein said first ends are eyes and said second ends are radially inwardly opening noses in the second positions thereof, and each hook includes two aligned eyes, noses and spanning portions constructed from a single piece of bent wire with ends of the bent wire located at said eyes.

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