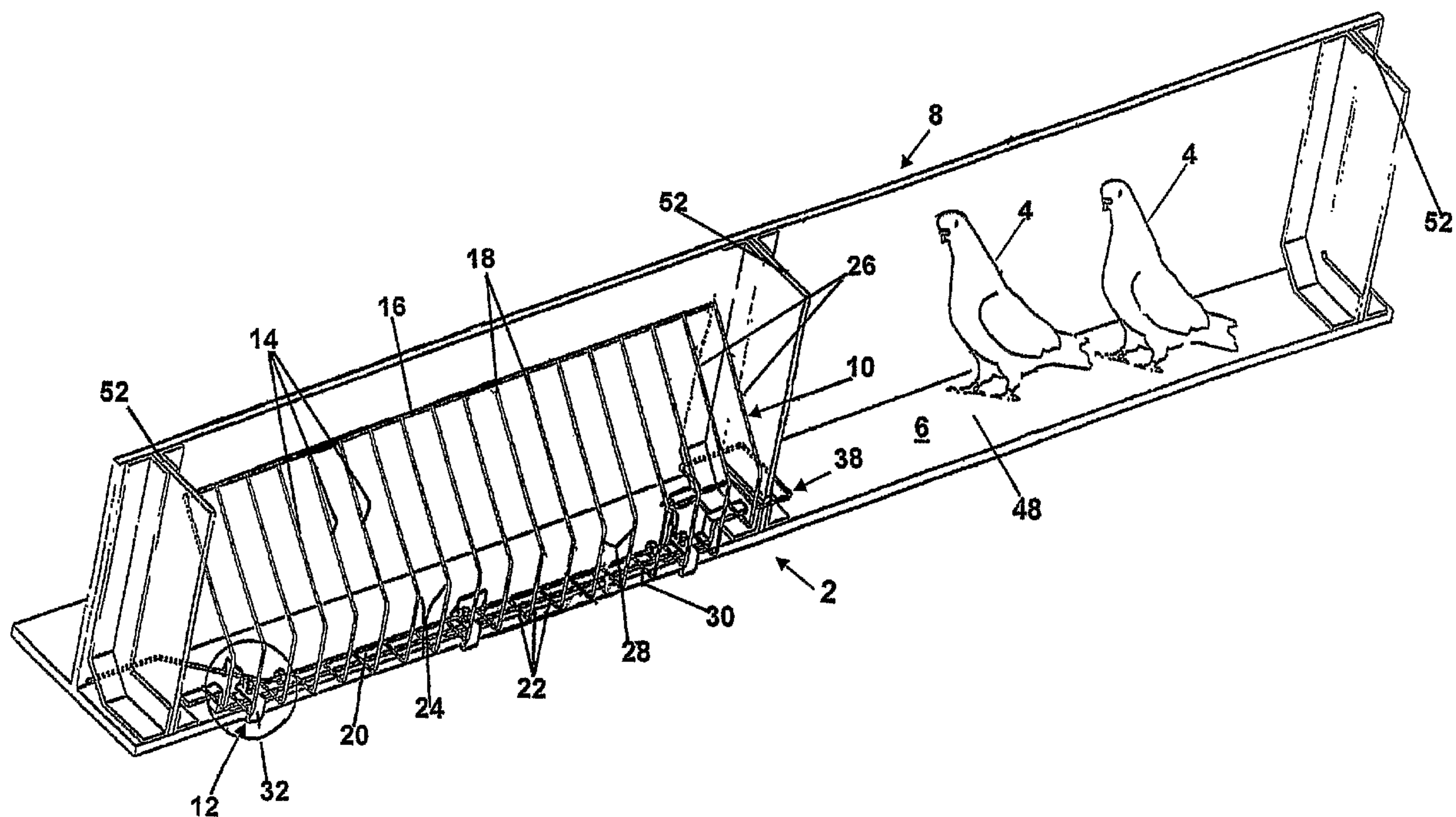




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 (54) Title: APPARATUS FOR PREVENTING BIRDS ACCESSING A HABITABLE PART OF A STRUCTURE



(57) Abrégé/Abstract:

Apparatus (2) for preventing birds (4) accessing a habitable part (6) of a structure (8), which apparatus (2) comprises barrier means (10) for preventing the birds (4) accessing the habitable part (6) of the structure (8), and securing means (12) for securing the barrier means (10) to the structure (8), characterised in that the barrier means (10) comprises a plurality of barrier bars (14) which are arranged side by side, a first connecting bar (16) which is connected to a first part (18) of the barrier bars (14), and a second connecting bar (20) which is connected to a second part (22) of the barrier bars (14), the barrier bars (14) being such that they are spaced apart by a distance which prevents the birds (4) getting between the barrier bars (14), the barrier bars (14) being such that in use they extend both vertically and inwardly towards the structure (8) in order to be able to extend over and cover the width of the habitable part (6) of the structure (8), and the barrier bars (14) being such that in use they extend vertically sufficiently steeply to prevent the birds (4) remaining on the barrier bars (14).



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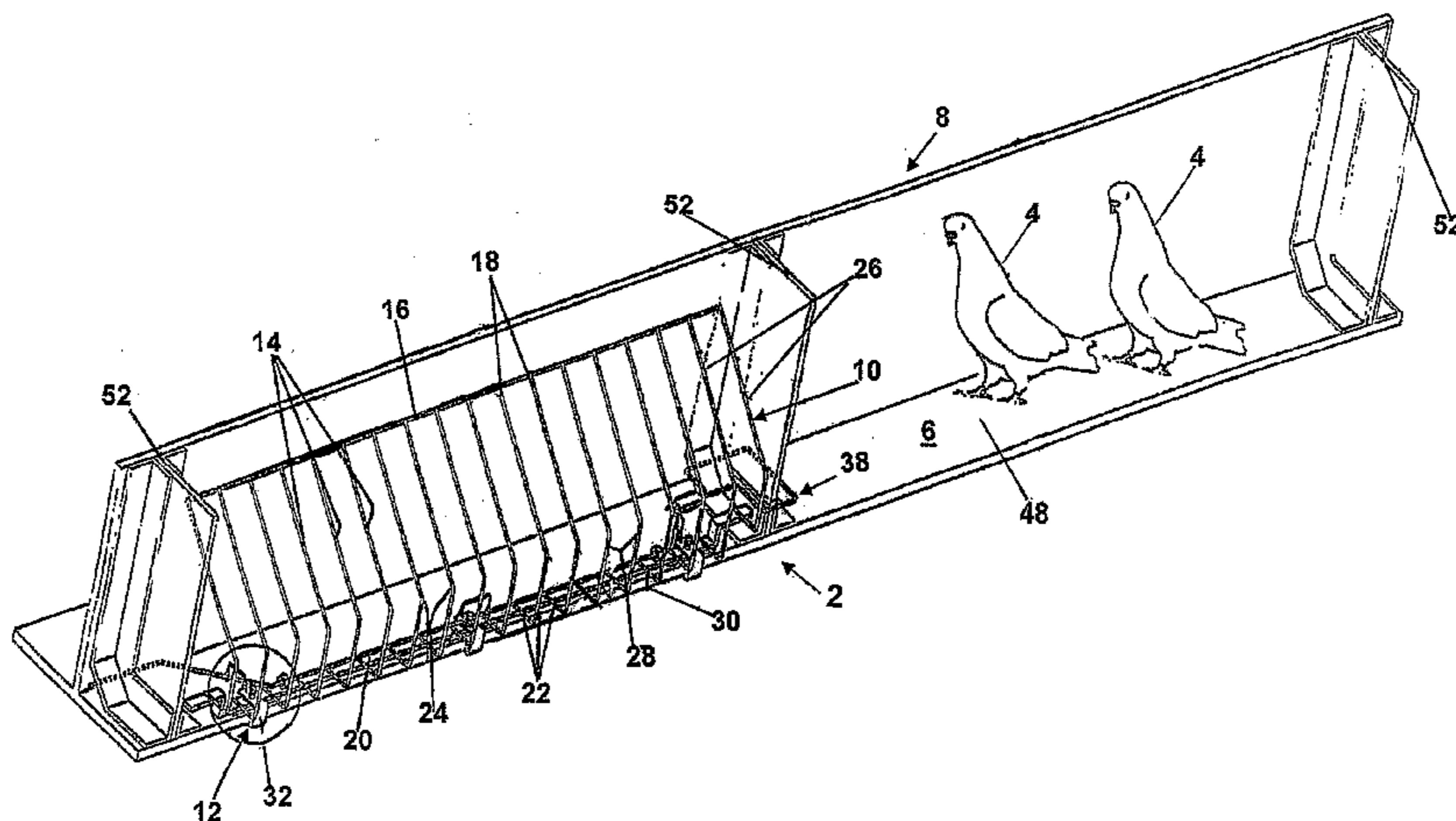
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(54) Title: APPARATUS FOR PREVENTING BIRDS ACCESSING A HABITABLE PART OF A STRUCTURE



(57) Abstract: Apparatus (2) for preventing birds (4) accessing a habitable part (6) of a structure (8), which apparatus (2) comprises barrier means (10) for preventing the birds (4) accessing the habitable part (6) of the structure (8), and securing means (12) for securing the barrier means (10) to the structure (8), characterised in that the barrier means (10) comprises a plurality of barrier bars (14) which are arranged side by side, a first connecting bar (16) which is connected to a first part (18) of the barrier bars (14), and a second connecting bar (20) which is connected to a second part (22) of the barrier bars (14), the barrier bars (14) being such that they are spaced apart by a distance which prevents the birds (4) getting between the barrier bars (14), the barrier bars (14) being such that in use they extend both vertically and inwardly towards the structure (8) in order to be able to extend over and cover the width of the habitable part (6) of the structure (8), and the barrier bars (14) being such that in use they extend vertically sufficiently steeply to prevent the birds (4) remaining on the barrier bars (14).

WO 2005/104837 A1

APPARATUS FOR PREVENTING BIRDS**ACCESSING A HABITABLE PART OF A STRUCTURE**

This invention relates to apparatus for preventing birds accessing a habitable part of a structure.

Birds access habitable parts of structures for the purpose of nesting, roosting or simply alighting during their daily travels. In places where there is a large bird population, the accessing of the birds to the habitable parts of the structures can cause public nuisance and/or health and safety problems. The problem is especially acute in towns and cities where structures such as bridges and buildings are often frequented by large numbers of pigeons. In coastal towns, a similar problem may be caused by seagulls. The public nuisance may manifest itself in parts of the structures covered with bird guano and/or persons walking under the structures receiving the bird guano on their clothes. The public health and safety problems may manifest themselves in a variety of diseases including respiratory diseases such as psittacosis. These diseases are likely to be transferred from the birds to humans via the bird guano. The transfer risk is substantial if there is a lot of the bird guano in a confined space and the confined space is visited frequently by humans.

Known attempts to provide apparatus for preventing birds accessing a habitable part of a structure have included the use of galvanised mesh and/or netting. Both mesh and netting are very visually obtrusive, and once

accessed allow birds to create a build up of guano. Additionally, birds frequently become trapped in the mesh and netting, causing them to die in distressed circumstances. Further, the mesh and netting often prevent access by workmen for purposes of maintenance of the structure or, for example, electrical installation. In such cases, workmen often simply cut the netting or damage the mesh, and leave a hole for the birds to gain access. In addition, the combined weight of galvanised mesh panels may be too heavy for some parts of some structures, thereby creating unnecessary weight loadings for the structure plus Health and Safety issues.

It is an aim of the present invention to obviate or reduce the above mentioned problems.

Accordingly, the present invention provides apparatus for preventing birds accessing a habitable part of a structure, which apparatus comprises barrier means for preventing the birds accessing the habitable part of the structure, and securing means for securing the barrier means to the structure, the apparatus being such that the barrier means is a rigid elongate barrier means comprising a plurality of barrier bars which are arranged side by side, a first longitudinal-extending connecting bar which is connected to a first and top part of the barrier bars and which defines a top part of the barrier means, a second longitudinal-extending connecting bar which is connected to a second and bottom part of the barrier bars and which defines a bottom part of the barrier means, and a plurality of openings which are each defined by an adjacent pair of barrier bars and the first and second longitudinally-extending connecting bars, the barrier bars being such that

they are spaced apart by a distance which prevents the birds getting between the barrier bars, the barrier bars being such that in use they extend from the bottom part of the barrier means upwardly and then inwardly towards the structure in order for the barrier means to extend over and cover the width of the habitable part of the structure, the barrier bars being such that in use they extend upwardly sufficiently steeply to prevent the birds remaining on the barrier bars, the first longitudinally-extending connecting bar being such that it is situated at one longitudinal edge of the barrier means, and the barrier bars being such that they are spaced apart by a distance which is from 10 - 100mm.

The apparatus is such that the spacing between the barrier bars ensures that the barrier bars do not unduly obscure visual access to the structure behind the barrier bars. Thus the apparatus does not unduly obscure or detract from the appearance of the structure. This is of particular importance in respect of structures (including bridges) which are Listed Buildings. The spacing between the barrier bars also allow access for cable installation and simple maintenance work.

Preferably, the barrier bars are of a small cross sectional size in order to make it difficult for birds to perch on the barrier bars.

Preferably, the barrier bars are each cranked to form a sloping portion which slopes at an angle which is less than 90° but which causes the sloping portion to slope too steeply for the birds to remain on the sloping portion.

The barrier bars may just have the sloping portion but preferably the barrier bars are each cranked to form the sloping portion and a vertical portion, the sloping portion extending from the first connecting bar downwardly to the vertical portion, and the vertical portion extending downwardly towards the second connecting bar.

The vertical portion may be attached to the second connecting bar but preferably the apparatus is one in which the vertical portion extends into a horizontal portion which is connected to the second connecting bar.

The barrier bars are spaced apart by a distance of from 10 – 100mm. Such a distance is especially suitable for use of the apparatus with pigeons and seagulls. Generally, the distance between the barrier bars will be chosen in dependence upon the particular type of birds mainly intended to be prevented from accessing the structure. Smaller birds than those birds to be excluded may often be able to get between the barrier bars but these smaller birds will not be birds that cause the problems requiring the presence of the apparatus of the invention.

Preferably, the barrier bars are welded to the first and second connecting bars. Other methods for fixing the barrier bars to the first and second connecting bars may be employed. The first and second connecting bars enable the entire apparatus to be rigid. They prevent the barrier bars having loose ends which might be prised apart by repeated and prolonged efforts of birds trying to get between the connecting bars. Usually, the first and second connecting bars will be connected to first and second ends of

the barrier bars, but the first and second connecting bars may be connected to the barrier bars inwardly of the ends of the barrier bars if desired.

Preferably, the securing means secures the barrier means to the structure such that the barrier means is able to be moved for maintenance purposes.

The securing means may secure to the habitable part of the structure. In this case, the securing means is preferably a clamp. The clamp is preferably a G-clamp. Advantageously, the securing means such as the securing clamp is able to be undone so that the entire apparatus can be temporarily removed and resituated if unfettered access should be required to the structure, for example for maintenance or repair purposes. With securing means that secures to the habitable part of the structure, then the habitable part of the structure will usually be a ledge, for example on a bridge or on a building.

Alternatively, the securing means may secure to a part of the structure other than the habitable part. In this case, the securing means may be a pivotable securing means so that the barrier means is able to be pivoted between a closed position for preventing the birds accessing the habitable part of the structure, and an open position for permitting access for maintenance purposes. Typically, the habitable part of the structure will be a gutter, with the securing means then typically being fixed to a fascia or other vertical face of the structure.

The apparatus of the present invention may include auxiliary securing means for securing the apparatus in position in the event of a failure of part

of the structure. The use of the auxiliary securing means may be especially advantageous for health and safety reasons when the apparatus of the present invention is secured to structures such as bridges which occasionally receive substantial blows as a result of vehicle accidents.

The auxiliary securing means preferably comprises a cable. Other types of auxiliary securing means may however be employed.

The apparatus of the present invention advantageously includes a spacer material on a face of the second connecting bar that is adjacent the structure, the spacer material being such as to prevent any long term adverse chemical reaction between the material of the second connecting bar and the material of the structure. Such long term adverse chemical reactions may occur when, for example, the second connecting bar is made of a metal which is different to the metal of a bridge structure to which the apparatus is attached. The spacer material may be provided on the face of the second connecting bar in the form of strips or pads. The spacer material is preferably a plastics material. A presently preferred plastics material is polyethylene or polypropylene.

The apparatus of the present invention may be made from any suitable and appropriate materials. Where the apparatus is made of a metal, then the metal is preferably stainless steel. Where the metal is stainless steel, then the stainless steel is preferably that known as grade 316. Where the apparatus is made of a plastics material, then the plastics material may be polyethylene, polypropylene or unplasticised polyvinyl chloride.

The connecting bars may be, for example, 3mm stainless steel rods. The first connecting bar may be a 3mm rod. The second connecting bar may be of greater cross sectional size than the first connecting bar because the second connecting bar is the one that is unusually connected to the structure. The connecting rod and the first connecting bar may typically be of circular cross section. The second connecting bar may typically be flat sided for giving a good connecting area to the structure. The second connecting bar may thus be rectangular or square in cross section. Where the auxiliary securing means in the form of a cable are employed, then the cable may be stainless steel wire rope, for example of the above mentioned grade 316. Where the securing means are clamps, then they are preferably help in position using threaded bolts and Nylok (Registered Trade Mark) nuts, in order to be able to withstand vibration from traffic. This is especially desirable where the apparatus of the present invention is attached to bridges which will be subject to a certain amount of vibration from passing trains.

The sloping angle may range from 45° - 90° and more preferably 60° - 75° . The sloping angle may thus typically be 60° . In order to achieve any predetermined sloping angle, the length of the connecting bars may need to be varied in dependence upon the width of the habitable part of the structure to be protected.

Embodiments of the invention will now be described solely by way of example and with reference to the accompanying drawings in which:

Figure 1 is a perspective view of first apparatus in use for preventing birds accessing a habitable part of a structure;

Figure 2 is an enlarged view of part of the apparatus shown in Figure 1;

Figure 3 is an exploded view of the apparatus shown in Figure 1;

Figure 4 shows second apparatus in use for preventing birds accessing a habitable part of a structure; and

Figure 5 is an end view of the apparatus as shown in Figure 4.

Referring to Figures 1 – 3, there is shown apparatus 2 for preventing birds 4 accessing a habitable part 6 of a structure 8. The apparatus 2 comprises barrier means 10 for preventing the birds 4 accessing the habitable part 6 of the structure 8. The apparatus 2 also comprises securing means 12 for securing the barrier means 10 to the structure 8.

The barrier means 10 comprises a plurality of barrier bars 14 which are arranged side by side. The barrier means 10 also comprises a first connecting bar 16 which is connected to a first end 18 of the barrier bars 14. The barrier means 10 further comprises a second connecting bar 20 which is connected to a second end 22 of the barrier bars 14. The barrier means 10 further comprises an open side which in use faces the structure 8, which extends the entire length of the barrier means 10, and which is defined by the barrier bars 14, the first connecting bar 16, and the second connecting bar 18.

The barrier bars 14 are such that they are spaced apart by a distance which prevents the birds getting between the barrier bars 14. The barrier

bars 14 are also such that in use as shown in Figure 1 they extend both upwardly and inwardly towards the structure 8. This is in order to be able to extend over and cover the width of the habitable part 6 of the structure 8 with the open side of the barrier means 10 facing the structure 8. The barrier bars 14 are further such that in use as shown in Figure 1 they extend upwardly sufficiently steeply to prevent the birds 4 remaining on the barrier bars 14. The barrier bars 14 are thin so that it is difficult and/or uncomfortable for the birds 4 to perch on the barrier bars 14 for long periods.

The apparatus 2 is such that the spacing between the barrier bars 14 enables the structure 8 still easily to be seen. Easy visibility of the structure 8 is also assisted by the fact that the barrier bars 14 do not have to extend the entire height of the structure 8. Thus the apparatus 2 does not unduly obscure or detract from the appearance of the structure 8. The spacing between the barrier bars 14 also allows for work such for example as cable installation for lighting to be conducted without the need for removing the apparatus 2.

As shown in Figures 1 and 3, the barrier bars 14 are cranked at position 24. The cranking forms a sloping portion 26 which slopes at an angle which is less than 90° . As shown in Figures 1 and 3, this angle is 60° . This angle is such that it causes the sloping portion 26 to slope too steeply for the birds 4 to remain on the sloping portion. The cranking is also such that the barrier bars 14 also have a vertical portion 28. The sloping portion 26 extends from the first connecting bar 16 downwardly to the

vertical portion 28. The vertical portion 28 extends downwardly towards the second connecting bar 20. The vertical portion 28 extends into a horizontal portion 30 which is connected to the second connecting bar 20.

The barrier bars 14 are spaced apart by a distance of 10 – 100mm. This distance spacing is suitable for birds 4 in the shape of the illustrated pigeons, or also for seagulls. The barrier bars 14 are welded to the first and second connecting bars 16, 20. As can best be appreciated from Figure 3, the welding of the barrier bars 14 to the first and second connecting bars, 16, 20 enables a rigid structure to be formed.

The securing means 12 secures the barrier means 10 to the structure 8 such that the barrier means 10 is able to be moved for maintenance purposes. More specifically, the securing means 12 secures to the habitable part 6 of the structure. The securing means 10 comprises a clamp 32 as best shown in Figure 2. The clamp 32 is a G-clamp. When the clamp 32 is undone, then the entire apparatus 2 can be removed from the structure 8. The clamp 32 clamps over the second connecting bar 20 and under the habitable part 6 in order to clamp the second connecting bar 20 to the habitable part 6 of the structure 8. The habitable part 6 of the structure 8 is a ledge and the structure 8 is a bridge with only an outside girder part of the bridge being shown for simplicity of illustration. The bridge may be a railway bridge, a road bridge or any other desired type of bridge. The clamp 32 is held in position by a tightening bolt 34 and a nut 36. The nut 36 is preferably

a Nylok (Registered Trade Mark) nut which helps to avoid the bolt 34 coming undone if it is subjected to vibration as may be the case if the structure 8 is a railway bridge.

The apparatus 2 includes auxiliary securing means 38 for securing the apparatus 2 in position in the event of failure of part of the structure. The use of the auxiliary securing means 38 is especially advantageous where the structure 8 is a bridge which may be subject to vehicle crashes and thus forces that would not normally be encountered. The auxiliary securing means 38 includes a cable 40 which is connected to the apparatus 2 by passing through nuts 42 welded to the second connecting bar 20. The cable 40 is also connected to the clamp 32 by a wire 44 as shown in Figure 2.

The barrier bars 14 are typically 3mm stainless steel bars of circular cross section. The first connecting bar 16 is also typically a 3mm stainless steel bar of circular cross section. The second connecting bar 20 is also made of stainless steel but it is typically rectangular in cross section, being for example 15mm x 5mm. The second connecting bar 20 thus has a lower face 46 which is adjacent an upper face 48 of the habitable part 6 of the structure 8. The girder shown in Figure 1 as the part of the bridge structure 8 may typically be made of mild steel. In order to prevent any long term possible adverse reaction between the mild steel and the stainless steel, spacer material in the form of spacer pads 50 is employed. The spacer pads 50 are positioned as shown between the lower face 46 and the upper face 48. The spacer pads 50 are made of polyethylene or polypropylene.

The apparatus 2 is able to give effective protection from the pigeons 4 for many years without adding significant loadings to the structure 8. In addition, the apparatus 2 is such that it enables both partial and full access easily to be had to the structure 8. As shown in the drawings, the apparatus 2 is made in sections to fit between wall parts 52 of the structure 8. The apparatus 2 can be made in any appropriate lengths suitable for installation in required structures.

Referring now to Figures 4 and 5, there is shown second apparatus 54 for preventing birds (not shown) accessing a habitable part 56 of a structure 58. Similar parts as in Figure 1 have been given the same reference numerals for ease of comparison and understanding. In Figure 4 it will be seen that both of the first and second connecting bars 16, 20 are of circular cross section. The first connecting bar 16 is of a larger diameter than the barrier bars 14. The second connecting bar 20 is of the same diameter as the barrier bars 14. The vertical portions 28 of the barrier bars 14 connect directly to the second connecting bar 20 and there are no horizontal portions 30. The habitable part 56 is shown as a gutter and the structure 58 represents a building.

As shown in Figures 4 and 5, the securing means 12 secures the apparatus 54 to a face 60 of the structure 58. This face 60 is thus a part of the structure 58 other than the habitable part 56. The securing means 12 is a pivotable securing means so that the barrier means 10 is able to be pivoted between a closed position as shown in full lines in Figures 4 and 5 for preventing the birds accessing the habitable part 56 of the structure 58,

to an open position shown in dotted lines in Figure 5 for permitting access for maintenance purposes. The securing means 12 comprises a spacer plate 62 which abuts against the face 60, and a front plate 64 which abuts against the spacer plates 62. The front plate 64 is formed to have a concave recess 66 which contains the first connecting bar 16. The spacer plate 62 and the front plate 64 are held together by bolts 68 which extend into the structure 58 and which receive nuts 70. Thus the barrier means 10 is able to be secured to the structure 58 by the securing means 12, and the securing means 12 is such that at the same time it enables the barrier means 10 to be pivoted between the closed and open positions. In the open position, cleaning of the habitable part 56 in the form of the gutter is easily able to be effected. As shown in Figure 5, the habitable part 56 is connected to the structure 58 by a bolt 72 and a nut 74.

The apparatus 54 is able to protect the habitable part 56 of the structure 58 without being either heavy or visually obtrusive. In addition, it is easily installed and easily opened for maintenance purposes. The apparatus 54 is preferably made of the same material as the apparatus 2.

It is to be appreciated that the embodiments of the invention described above with reference to the accompanying drawings have been given by way of example only and that modifications may be effected. Thus, for example, the apparatus 2, 54 may be made of metals other than stainless steel, or they may be made of plastics materials. Securing means 12 other than those illustrated may be employed. The apparatus 2, 54 may be used in situations other than those illustrated. Means other than welding

may be employed for connecting the connecting bars 16, 20 to the barrier bars 14.

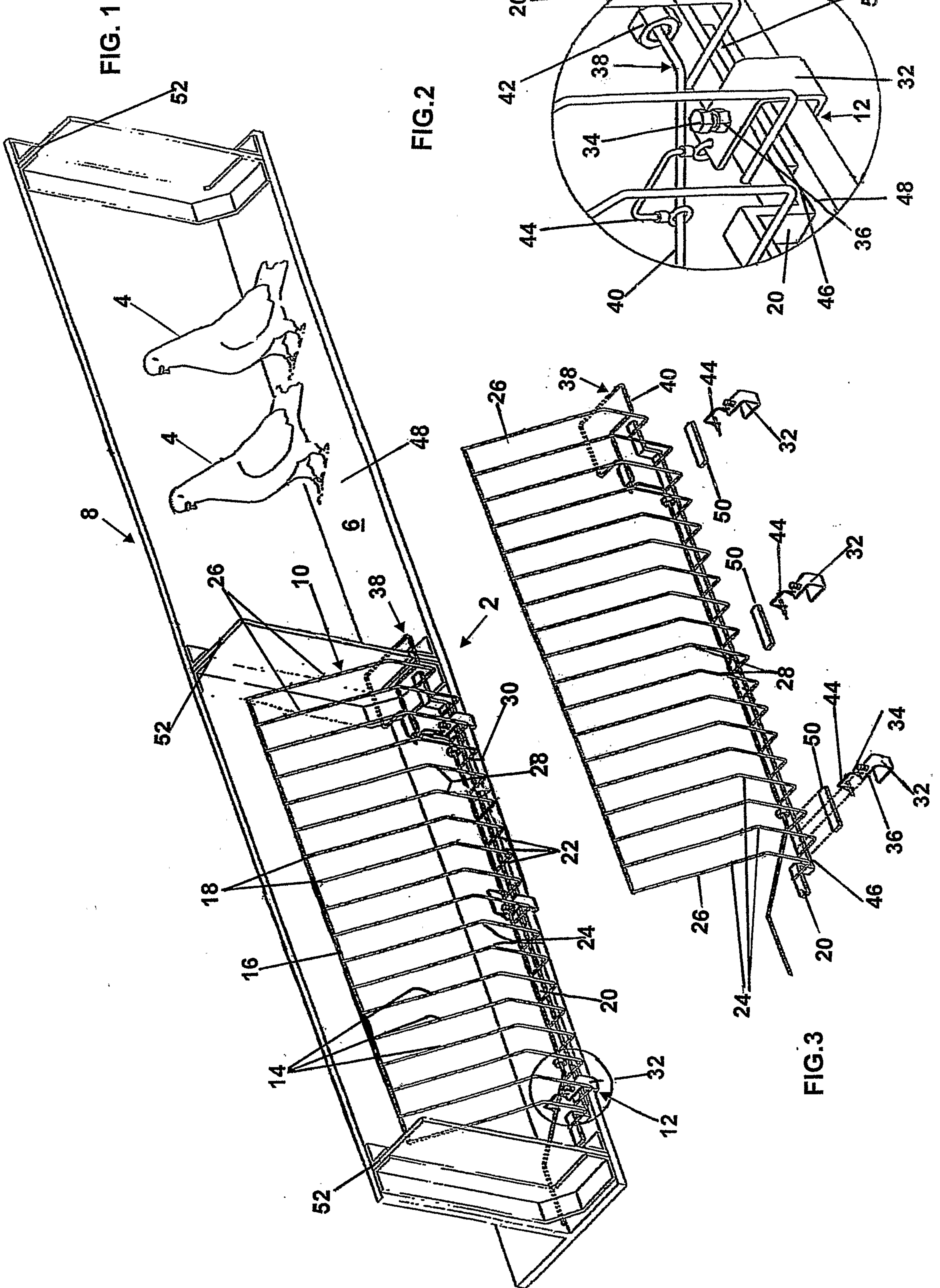
CLAIMS

1. Apparatus for preventing birds accessing a habitable part of a structure, which apparatus comprises barrier means for preventing the birds accessing the habitable part of the structure, and securing means for securing the barrier means to the structure, the apparatus being such that the barrier means is a rigid elongate barrier means comprising a plurality of barrier bars which are arranged side by side, a first longitudinal-extending connecting bar which is connected to a first and top part of the barrier bars and which defines a top part of the barrier means, a second longitudinal-extending connecting bar which is connected to a second and bottom part of the barrier bars and which defines a bottom part of the barrier means, and a plurality of openings which are each defined by an adjacent pair of barrier bars and the first and second longitudinally-extending connecting bars, the barrier bars being such that they are spaced apart by a distance which prevents the birds getting between the barrier bars, the barrier bars being such that in use they extend from the bottom part of the barrier means upwardly and then inwardly towards the structure in order for the barrier means to extend over and cover the width of the habitable part of the structure, the barrier bars being such that in use they extend upwardly sufficiently steeply to prevent the birds remaining on the barrier bars, the first longitudinally-extending connecting bar being such that it is situated at one longitudinal edge of the barrier means, and the barrier bars being such that they are spaced apart by a distance which is from 10 - 100mm.

2. Apparatus according to claim 1 in which the barrier bars are of a small cross sectional size in order to make it difficult for birds to perch on the barrier bars.
3. Apparatus according to claim 1 or claim 2 in which the barrier bars are each cranked to form a sloping portion which slopes at an angle which is less than 90° but which causes the sloping portion to slope too steeply for the birds to remain on the sloping portion.
4. Apparatus according to claim 3 in which the barrier bars are each cranked to form the sloping portion and a vertical portion, the sloping portion extending from the first connecting bar downwardly to the vertical portion, and the vertical portion extending downwardly towards the second connecting bar.
5. Apparatus according to claim 4 in which the vertical portion extends into a horizontal portion which is connected to the second connecting bar.
6. Apparatus according to any one of claims 1 - 5 in which the barrier bars are welded to the first and second connecting bars.
7. Apparatus according to any one of claims 1 – 6 in which the securing means secures the barrier means to the structure such that the barrier means is able to be moved for maintenance purposes.

8. Apparatus according to claim 7 in which the securing means secures to the habitable part of the structure.
9. Apparatus according to claim 8 in which the securing means is a clamp.
10. Apparatus according to claim 7 in which the securing means secures to a part of the structure other than the habitable part.
11. Apparatus according to claim 10 in which the securing means is a pivotable securing means so that the barrier means is able to be pivoted between a closed position for preventing the birds accessing the habitable part of the structure, and an open position for permitting access for maintenance purposes.
12. Apparatus according to any one of claims 1 – 11 and including auxiliary securing means for securing the apparatus in position in the event of a failure of part of the structure.
13. Apparatus according to claim 12 in which the auxiliary securing means comprises a cable.
14. Apparatus according to any one of claims 1 – 13 and including a spacer material on a face of the second connecting bar that is adjacent the

structure, the spacer material being such as to prevent any long term adverse chemical reaction between the material of the second connecting bar and the material of the structure.



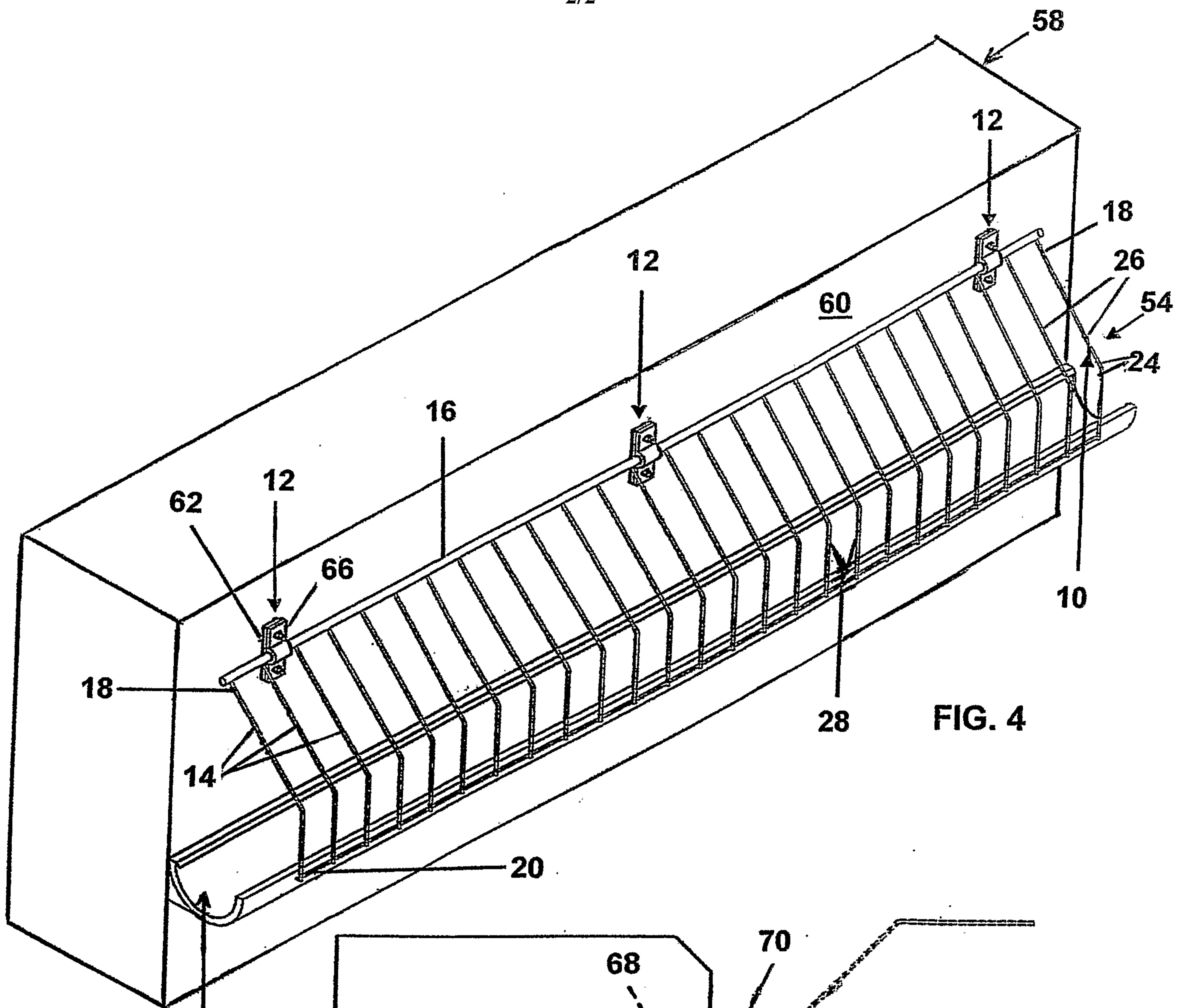


FIG. 4

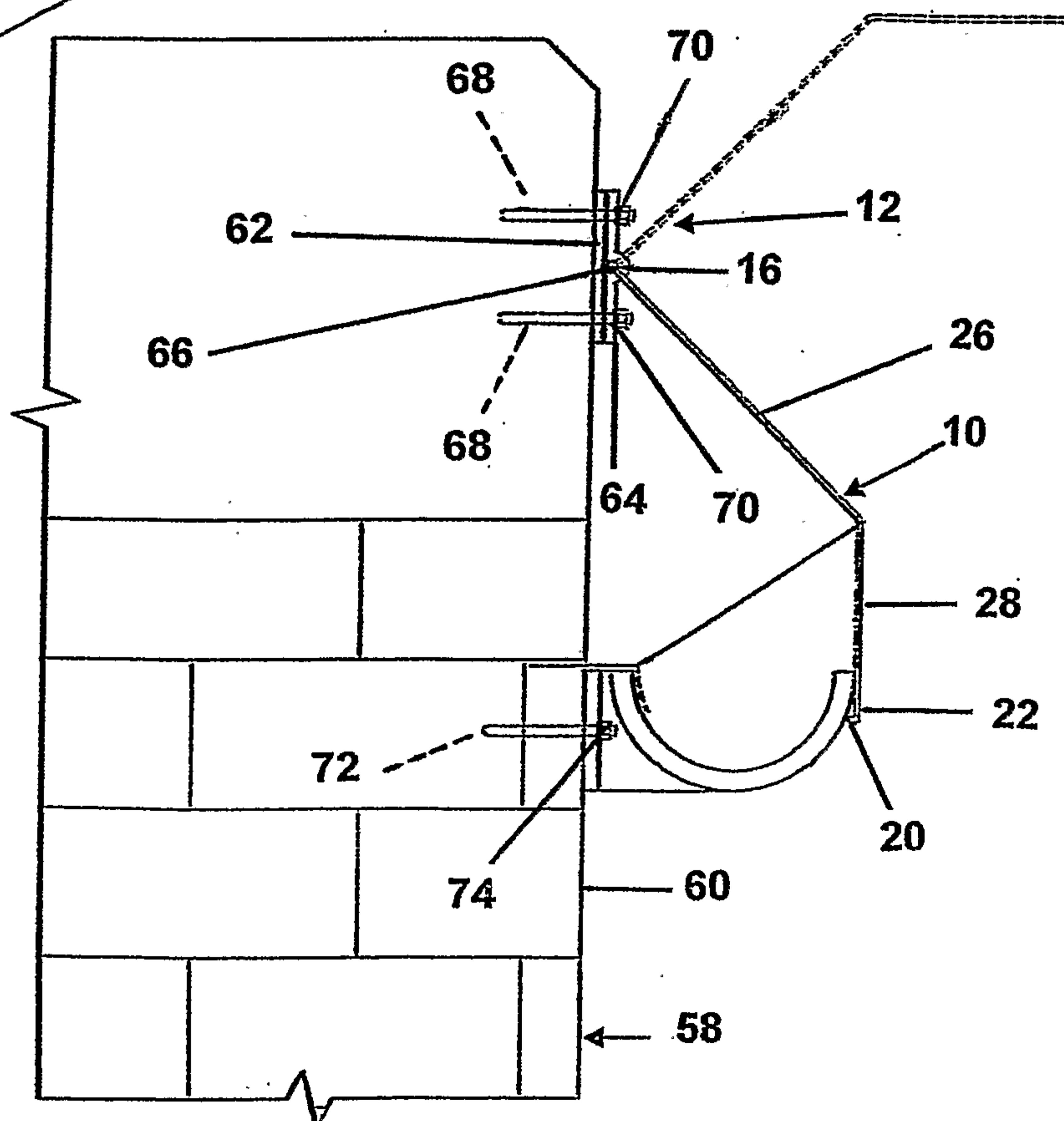


FIG. 5

