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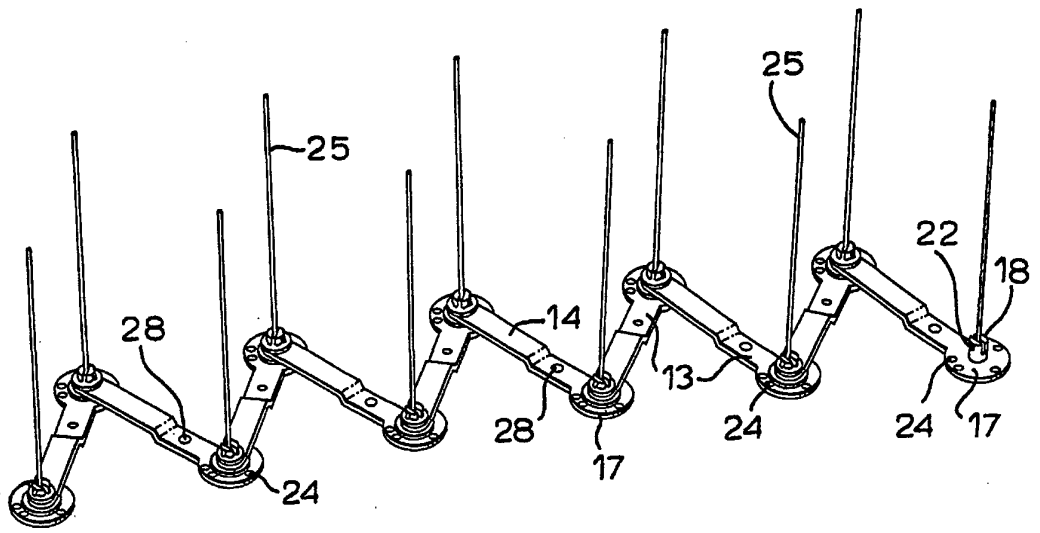

(57) Abstract

Apparatus to deter birds from alighting on an external surface of a building has a plurality of similar elongate links (10) arranged end-to-end with a hinged connection between each link. At each hinged connection, there is a boss (18) from which projects a spike (25). The spike may be of stainless steel wire and have its lower end (26) turned over to be entrapped within the hinged connection. Alternatively, a moulded plastics material spike may be employed. A detent arrangement (23, 24) is provided at each hinged connection, to allow pre-setting of the angle between adjacent links.

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BIRD DETERRENT APPARATUS

This invention relates to apparatus for deterring birds from alighting on a surface, such as a window-sill, coping or other more or less horizontal surface of a building or other structure.

In many circumstances, it is desirable to discourage birds from alighting on a generally horizontal surface of a building. Occasional use of a surface by a bird is unlikely to give rise to problems, but in many towns flocks of birds may nest or roost on certain surfaces of one building. When there, defecation by the birds is unsightly and may lead to structural damage on account of the chemicals within the bird faeces, which will be activated and distributed when it rains.

There have been various proposals to deter birds from alighting on certain surfaces of buildings. For example, it is known to spread jelly-like material over the surface, so that any bird alighting thereon will feel unstable and so move elsewhere. Another solution has been proposed in International Patent Specification No. WO 93/07744. Here, rigid strips of a plastics material are fitted at intervals with upstanding spikes, the strips being used by being cut to the required length and then being secured to the surface of a building to be protected. Yet another proposal is described in British Patent Specification No. 2153644; in this proposal, U-shaped metal wires are secured at intervals along a plastics material strip, the wires being interlinked to give stability thereto.

With both of these prior proposals, and having regard to the frequently elevated sites at which such strips are to be secured, the act of cutting a number of strips to the required length and then securing all of those strips to the surface so as to protect an

extended area may not be particularly easy to perform.

It is a principal aim of the present invention to provide apparatus intended to deter birds from alighting on a surface of a building, which apparatus is relatively easy to install, so as to cover a given area with a sufficient number of upstanding projections wholly to discourage birds from alighting on that surface.

According to the present prevention, there is provided apparatus to deter birds from alighting on a surface, comprising a substantially co-planar array of a plurality of similar elongate links hingedly connected end-to-end about axes substantially perpendicular to the plane of the array of the links, a multiplicity of projections each upstanding from a respective hinged connection between two adjacent links, and means to secure the links to a surface, whereby the links of the array may be relatively hinged such that the array may be arranged to extend over an area to be protected, with said projections upstanding from and distributed over said area.

It will be appreciated that the array of links of the apparatus of this invention allows an assembly of a sufficient number of the links and projections to be prepared at some safe place, and then for that array of links to be spread out over the surface of a building to be protected. No cutting locally at that site is required and only one assembly need be secured to the surface with just sufficient fasteners to ensure stability of the entire array.

For convenience of fitting the array, it is advantageous to provide detent means between at least some (but preferably all) of the hinged connections of adjacent links which detent means serves to resist relative hinging movement between the adjacent links when set to a predetermined relative position. For

example, such detent means may define predetermined positions where two adjacent links extend at right angles (in either sense), or are arranged linearly.

Each said projection may upstand substantially co-axially with the axes of the hinged connection between two adjacent links. In this case, each projection conveniently takes the form of a spike, defined for example by a length of stainless steel wire. Alternatively, each projection may comprise a moulded plastics material spike, for example of a polycarbonate material.

Preferably, each link has at one end an upstanding boss and at its other end a socket, the boss of one link and the socket of another link being able to interfit so as to define the hinged connection between the links. So that the links may extend generally in a co-planar array, said other end of a link defining the socket is preferably cranked, so that the under surface in the region of the socket is on the level of the upper surface of the part of the link in the region of the boss.

With a hinged connection as defined above, the surface of the link in the region of a boss is preferably relieved on the under side thereof, for example by forming a groove therein, whereby a turned-over part of the wire projection may be accommodated therein. In this way, each projecting wire is locked in the required upstanding position when the apparatus is in use.

By way of example only, one specific embodiment of apparatus constructed and arranged in accordance with this invention will now be described in detail, reference being made to the accompanying drawings in which :-

Figure 1 is a longitudinal section through an assembly of three links of an entire array of the

embodiment of bird deterrent apparatus;

Figure 2 is a sectional view through the hinged connection between two of the links;

Figure 3 is a perspective view of a series of links of this embodiment arranged in a zig-zag array;

Figures 4A and 4E diagrammatically show five different array configurations for apparatus of this invention, comprising a series of conjoined links; and

Figure 5 is a view similar to that of Figure 2, but of an alternative design using a moulded plastics spike.

In Figure 1 of the drawings, there is shown in longitudinal section one complete link 10, assembled together with second and third links 11 and 12, both of which are shown in part. However, the second and third links are of the same profile and configuration as said one link 10, and in turn interfit with further like links, whereby an elongated chain-like assembly may be constructed from the links.

Each link has an elongate first portion 13 intended to lie against a surface (not shown) to which the bird deterrent apparatus is to be attached, and an elongate second portion 14 extending generally parallel to the first portion 13, but stepped upwardly therefrom through a distance substantially equal to the thickness of the material of the link. Thus, the upper surface 15 of the first portion 13 is substantially co-planar with the lower surface 16 of the second portion 14.

Adjacent the free end of the first portion 13, there is formed a disk-like head 17 and an upstanding boss 18, disposed centrally of the head 17. A bore 19 extends through the boss 18 and a groove 20 is formed in the underside of the head 17, which groove runs radially of the boss 18, along the length of the first portion 13 for a short distance. The width of the groove 20 is substantially equal to the diameter of the

bore 19.

At the other end of the link, and so at the free end of the second portion 14, there is formed a socket 21 the internal diameter of which is equal to the external diameter of the boss 18, whereby the socket 21 of one link may receive the boss 18 of the next adjacent link, as shown in Figures 1 and 2. The boss 18 has a greater axial length than that of the socket 21, and there is formed a pair of nibs 22 on the upper part of the boss 18, which nibs fit over the upper surface of the socket 21 (as shown in Figure 2), whereby a socket may be snap-fitted over a boss 18 but subsequent removal of the socket therefrom is resisted by the nibs 22.

The lower surface 16 of the second portion 14 of each link is formed with a downwardly-directed peg 23, which peg may be received in any one of five corresponding recesses 24, formed in the upper surface of the head 17 of an adjacent link. The interengagement of the peg with a selected recess thus serves to hold two adjacent links at 60° to one another, at right angles to one another, or with the two adjacent links in a straight line, but the links may instead be set at any intermediate angle, should the site of fitting so require.

The bore 19 in each boss 18 receives an elongate stainless steel wire 25, which wire upstands from lower surface of the head 17 by typically 100 to 150mm or thereabouts. The wire may simply be cropped off to the required length, and does not require any special treatment at its upper (free) end. The lower end of the wire has its end portion 26 turned through 90°, and that end portion 26 is received in groove 20. A pair of lugs 27 project partially across the groove, so that the end portion 26 must be snapped thereinto, and is held in the groove, thereafter. When a link has been

secured to a surface, it is no longer possible to withdraw a wire from a boss 18, by virtue of the end portion 26 being trapped in the groove 20. The axial length of each boss 18 is sufficient adequately to support the wire passing therethrough.

Each link is formed with a through-bore 28, in the first portion 14 thereof. Using these bores, at least some of the links may be fastened (for example by screws or nails) to a surface which is to be protected by the apparatus of this invention. It will be appreciated that a large number of links as described above may be assembled together to form a continuous chain, with a wire 25 projecting from each junction between adjacent pairs of links, as shown in the Figure 3. The assembly of links may then be spread over a surface to be protected so as to cover that surface at sufficiently close intervals with upstanding wires 25, sufficient to deter a bird from landing on that surface. The wires need be only sufficiently close to one another to interfere with a bird spreading its wings in order to serve as an adequate deterrent, since a bird then will not be able comfortably to land on or take off, from that surface.

Lines of weakness (not shown) may be moulded into each link, to extend across the width of first portion 13 adjacent head 17 and across the width of second portion 14 adjacent socket 21. These permit a chain assembled from the links to be snapped to a required length, without the need to separate a socket of one link from a boss of an adjacent link.

Figures 4A to 4E show five different patterns which may be used, in spreading an array of links over a surface to be protected. Of course, the links may be arranged in any other desired configuration. Equally, any number of links may be conjoined end-to-end to form an array of a size sufficient fully to protect a

surface on which birds may wish to land.

Figure 5 shows a part of an alternative link design, for use with a moulded polycarbonate spike 30. This link design is essentially the same as that shown in Figure 2, and like parts are given like reference numbers, except that the boss 18 is extended upwardly to define a shaft on to which is fitted the spike 30. Conveniently, the spike is secured in position by an adhesive, such as a polyacrylate material. In all other respects, the apparatus is similar to, and used in the same manner as, the assembly of Figures 1 to 3. As a yet further alternative, the spike could be moulded integrally with the boss 18, and so with the link itself.

CLAIMS

1. Apparatus to deter birds from alighting on a surface, comprising a substantially co-planar array of a plurality of similar elongate links hingedly connected end-to-end about axes substantially perpendicular to the plane of the array of the links, a multiplicity of projections each upstanding from a respective hinged connection between two adjacent links, and means to secure the links to a surface, whereby the links of the array may be relatively hinged such that the array extends over an area to be protected with said projections upstanding from and distributed over said area.

2. Apparatus as claimed in claim 1, wherein detent means are provided between at least some of the hinged connections of adjacent links which detent means serve to resist relative hinging movement between the adjacent links when set to a predetermined relative position.

3. Apparatus as claimed in claim 2, wherein said detent means defines more than one predetermined relative position between adjacent links.

4. Apparatus as claimed in any of the preceding claims, wherein each said projection upstands substantially co-axially with the axis of the hinged connection between two links.

5. Apparatus as claimed in any of the preceding claims, wherein each said projection comprises a moulded plastics material spike.

6. Apparatus as claimed in any of the preceding claims, wherein each said projection comprises a metallic wire.

7. Apparatus as claimed in any of the preceding claims, wherein each link has at one end an upstanding boss and at the other end a socket, the boss of one

link and the socket of another link interfitting, so as to define the hinged connection between the links.

8. Apparatus as claimed in claim 6 and claim 7, wherein a groove is formed on the underside of a link in the region of the boss so as to accommodate a turned-over part of the wire projection, whereby the wire is locked in the required upstanding position when the apparatus is in use.

9. Apparatus as claimed in any of the preceding claims, wherein said securing means comprises at least one bore formed through each link and permitting the attachment of the link to a surface by means of a screw-threaded fastener or a nail passing through said bore.

10. Apparatus as claimed in any of the preceding claims, wherein each said link comprises a moulding of a plastics material.

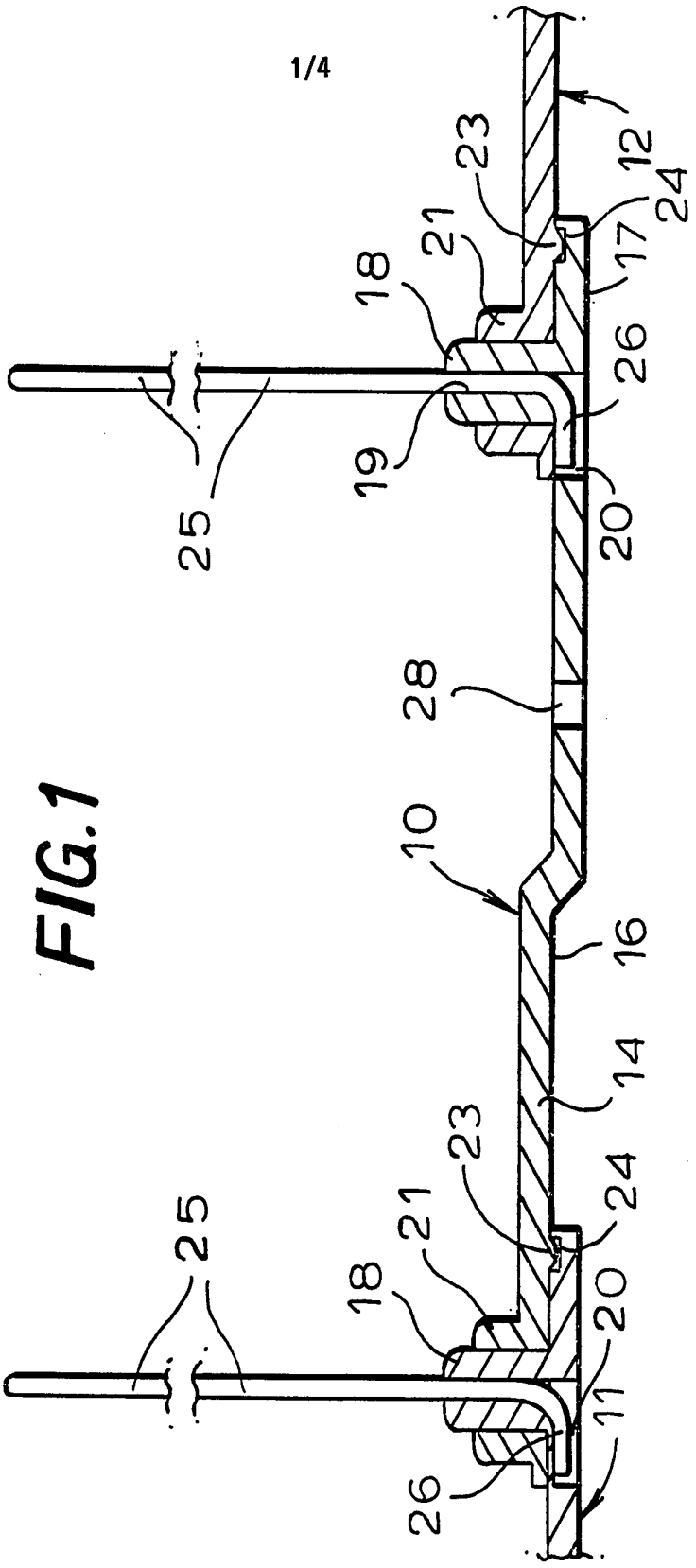


FIG.1

FIG.5

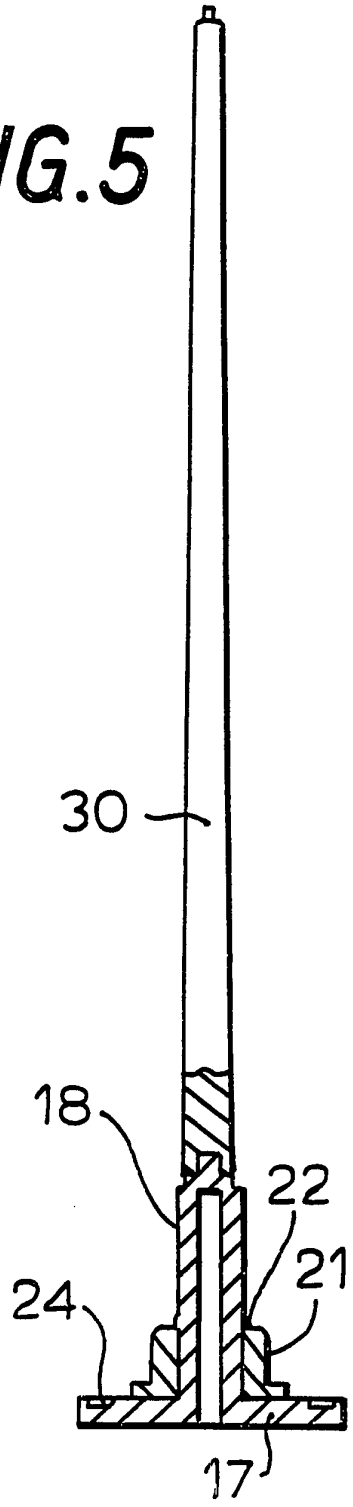
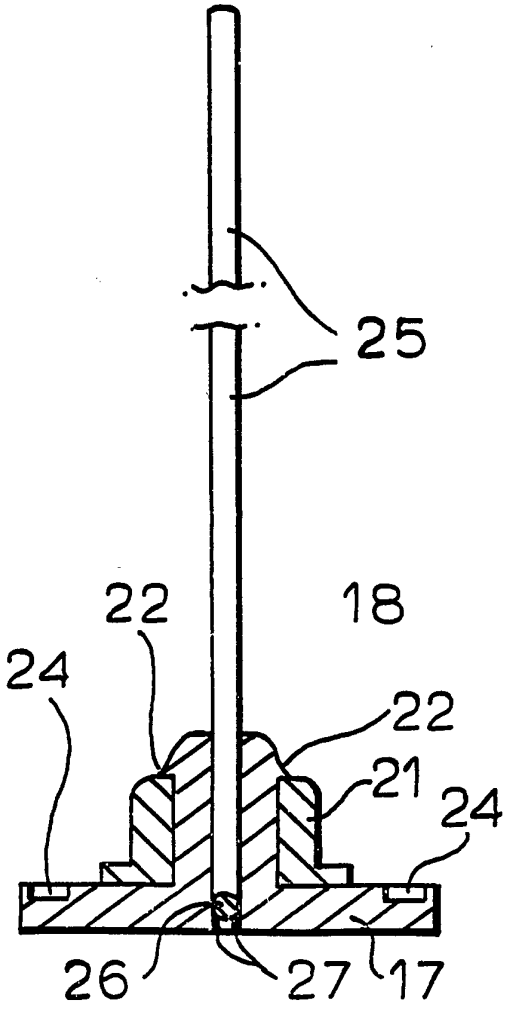


FIG.2



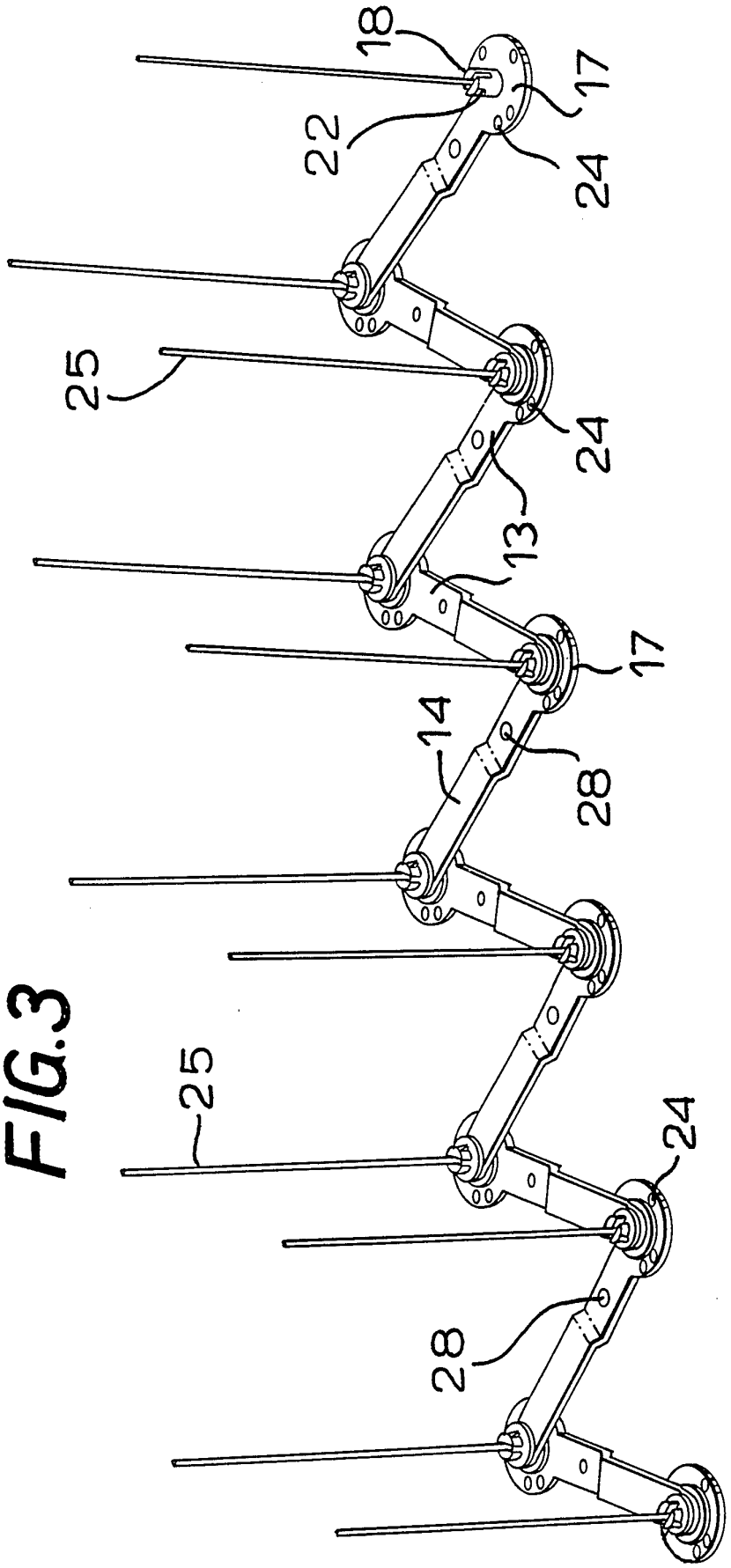


FIG.3

FIG 4A

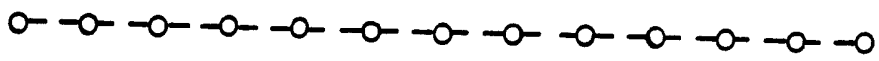


FIG.4B

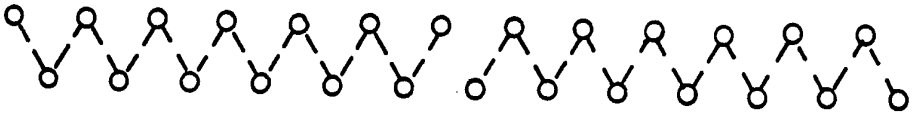


FIG.4C

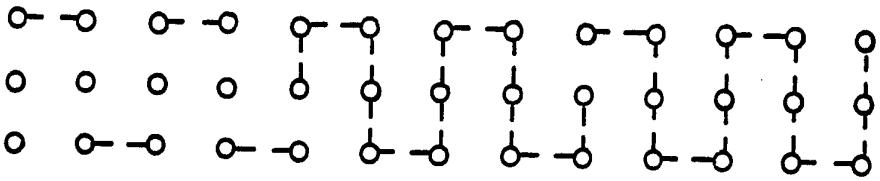


FIG.4D

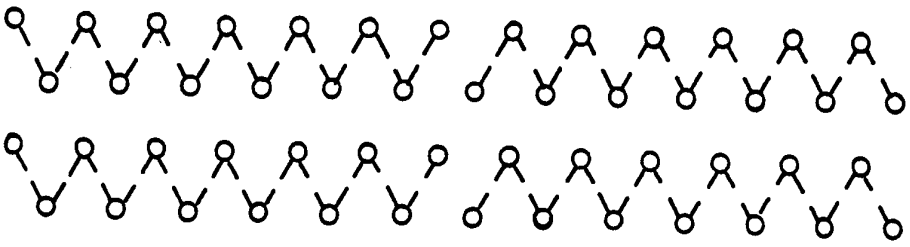
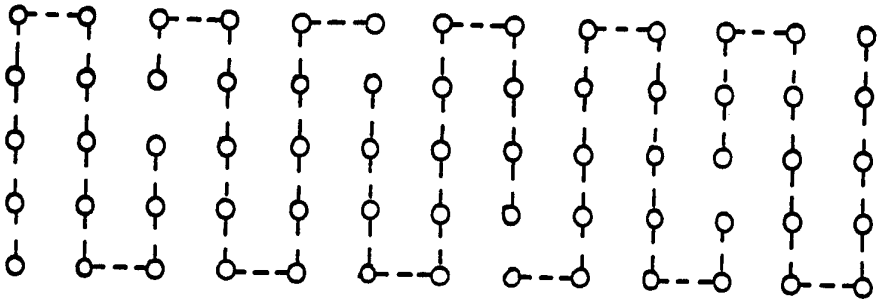


FIG.4E



INTERNATIONAL SEARCH REPORT

Internal Application No
PCT/GB 95/01079

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A01M29/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A01M E04D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR-A-2 641 304 (ASSOULINE) 6 July 1990 see claims; figures	1,6
A	FR-A-2 556 932 (L'HERMITE) 28 June 1985 see claims; figures & GB-A-2 153 644 cited in the application	1,6
A	WO-A-93 07744 (SPIT SARL) 29 April 1993 cited in the application see claims; figures	1,6
A	DE-U-92 16 299 (AHRENS BAUTECHNOLOGIE HANDELSGESELLSCHAFT) 17 June 1993 see claims; figures	1,6

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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18 August 1995	25.09.95

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DE-U-9216299	17-06-93	NONE		