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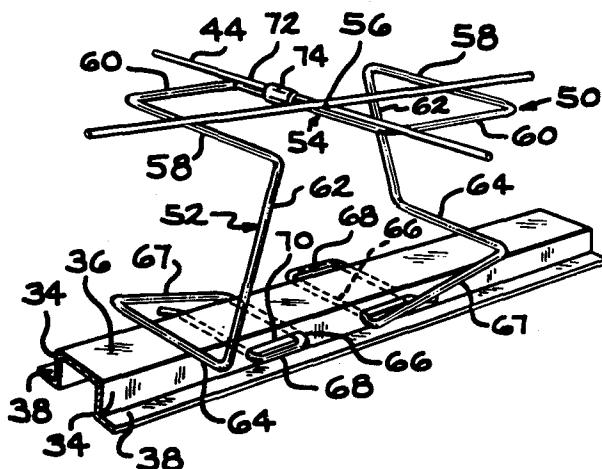
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㉓ Welded wire grid unit for box spring assemblies.

㉔ A welded wire grid unit for use in a box spring assembly, the grid unit comprising a rectangular border wire formed of spring steel and a criss-cross network of straight wires encircled by the border wire and arranged in a supporting relation with the border wire. The wire components in the grid are proportional to improve the edge support for the border wire.



WELDED WIRE GRID UNIT FOR BOX SPRING ASSEMBLIES

1 BACKGROUND OF THE INVENTION

This invention relates generally to mattress foundation structures and more particularly to a box spring assembly of a type which utilizes non-coil springs. More 5 particularly, the invention relates to a welded wire grid unit for box spring assemblies of the type in which wire springs are mounted on a supporting frame and the wire grid is supported on the upper ends of the springs. These box spring assemblies are advantageous, relative to coil-type 10 box spring assemblies from the standpoints of prolonged service life, ease of assembly and cost of manufacture. In addition, these box spring assemblies are capable of providing a desired stiffer foundation for the mattress and contain a reduced amount of wire.

15 The present invention provides an improved welded wire grid unit that utilizes a basic wire grid encircled by a spring wire border wire. The unit is readily manufactured with automated machinery, is readily clipped to supporting springs, and provides the desired edge 20 support in the box spring assembly for the mattress.

It is an object of the present invention, therefore, to provide an improved welded wire grid unit in which basic wire and spring wire members are combined to achieve a desired mattress support that can be manufactured in large 25 numbers.

SUMMARY OF THE INVENTION

The welded wire grid unit of this invention is used in a box spring assembly which includes a generally rectangular horizontal frame and a plurality of wire springs 30 mounted on the frame and extending upwardly therefrom. The welded wire grid unit is supported on the upper ends of the

1 wire springs and consists of a rectangular border wire having straight side and end sections and corresponding substantially in overall size and shape to the rectangular support frame. The welded wire grid unit 5 also includes a plurality of straight first wires that are formed of basic wire and are secured at their ends to the border wire end sections. A plurality of straight second wires, also formed of basic wire, are secured at their ends to the border wire side sections, the first and 10 second wires being arranged criss-cross fashion and welded together at their points of intersection to form a welded wire grid that is positioned within and substantially encircled by the rectangular border wire.

The second wires, which extend side-to-side relative 15 to the border wire, are positioned on the top sides of the first wires which extend end-to-end relative to the border wire and are of a larger diameter than the first wires. The second wires are positioned in a supporting relation with the border wire side sections and, by virtue of their 20 increased size, provide increased support for the border wire side sections which perform the important function of supporting the edges of the mattress. The edges of bed mattresses are commonly used for seating purposes and are thus subjected to increased loads during use that often 25 damage more fragile box spring assemblies. The construction of the welded wire grid unit of this invention effectively avoids such a possibility of damage.

The smaller first wires facilitate mounting of the welded wire grid unit on the upper ends of the supporting 30 springs. This is accomplished by the use of conventional clips which encircle side-by-side sections of the first wires and the supporting springs.

1 The basic low carbon steel wire from which the
criss-crossed grid wires are formed has not been heat
treated and is lacking in "springiness" that characterizes
spring wire. The basic wire is thus less expensive and is
5 particularly adapted for advantageously performing the
grid function in the unit of this invention, namely, the
provision of a support deck on the upper ends of the springs
and providing a support for the border wire which is to
some extent cantilevered over the edge of the box spring
10 assembly. By virtue of the fact that the grid wires are
formed of basic wire, they are readily welded together at
their intersections so as to form a unit that can readily
be handled. At their ends, the grid wires are arranged
in a supporting relation with the undersides of the border
15 wire side and end sections and are bent back over the top
sides of the border wire sections so as to effectively
secure the border wire in position on the grid.

 In the drawing:

 Fig. 1 is a top plan view of a box spring assembly
20 which includes the welded wire grid unit of this invention;

 Fig. 2 is an enlarged sectional view of the box
spring assembly as seen from substantially the line 2-2 in
Fig. 1 and illustrating the grid unit supporting springs in
their normal unloaded condition;

25 Fig. 3 is a fragmentary sectional view of a portion
of the box spring assembly, like Fig. 2, showing the grid
supporting springs in a compressed or loaded condition;

 Fig. 4 is a fragmentary perspective detail view of
a portion of the box spring assembly;

30 Fig. 5 is an enlarged fragmentary sectional view
of a portion of the welded wire grid unit of this invention,
showing the grid unit clipped to a portion of a supporting
spring; and

 Fig. 6 is a diagrammatic view illustrating the
35 relationship between the intersecting grid wires in the
welded wire grid unit of this invention.

1 The box spring assembly 10 is illustrated in
Fig. 1 as consisting of a rectangular, horizontally
disposed frame 12, and a wire spring assemblage 14
mounted on the top side of the frame 12. The frame
5 12 has wooden side rails 16 and end rails 18 and metal
cross rails 20 which are secured to and extend between
the side rails 16.

Each of the side rails 16 (Figs. 2, 4) consists
of a lower member 22 and an upper member 24 which is
10 smaller than the lower member 22 and is supported on the
top surface 26 thereof. The top member 24, which has a
top surface 28, is spaced outwardly at its inner edge 30
from the inner edge 32 of the lower member 22, for a
purpose to appear presently. Each cross rail 20 is of
15 a spherical shape, and includes a pair of upright webs 34
which are spaced apart and connected at their upper edges
by a top plate 36. At their lower edges, the webs 34 are
provided with oppositely extending flat flanges 38.

Extensions 40 of the top plate 36 extend beyond the
20 ends 42 of the rail 20. As a result, when the rails 20 are
supported on the side rails 16, the flat flanges 38 rest
on the top surface 26 of the lower member 22 and the plate
extensions 40 rest on the top surface 28 of the upper member
24. This enables the cross rails 20 to be firmly secured
25 to the side rails 16 by extending staples, nails, or the
like (not shown) through either or both the flanges 38 and
the extensions 40 into the side rails 16.

The spring assemblage 14 also includes the horizontally disposed welded wire grid unit 42 of this invention.
30 The grid unit 42 consists of a plurality of straight wires
that are arranged in criss-cross fashion, some of the
wires extending lengthwise of the frame 12, referred to
hereinafter as "lengthwise wires" 44 and some of the wires
extending crosswise of the frame 12, hereinafter referred
35 to as "crosswise wires 46". The wire grid 42 also includes
a rectangular border wire 48 which is mounted on and

1 secured to the ends of the wires 44 and 46 which are in turn welded together at their junctures. The border wire 48 is a continuous and endless length of spring wire, formed by welding, bent to a rectangular shape of substantially the same size and shape as frame 12. The border wire 48 has side sections 47 and end sections 49.

The welded wire grid 42 forms a mattress support deck disposed in a horizontal plane at a predetermined distance above the frame 12. A plurality of limited deflection support springs 50, arranged in a predetermined pattern on frame 12 yieldably support the grid unit 42 in this position above the frame 12 for movement toward the frame to accommodate bedding loads.

Each of the springs 50, which is formed of spring wire, consists of an upright yieldable portion 52 formed integral at its upper end with an attaching portion 54 and secured at its lower end to one of the frame crossrails 20.

The attaching portion 54 consists of an intermediate straight wire section 56 and a pair of straight connecting wire sections 58 which are disposed on opposite sides of the section 56 in a spaced relation with the section 56 and in positions generally parallel to each other and to the straight section 56. The connecting sections 58 are joined to opposite ends of the intermediate section 56 by cross wire sections 60. The yieldable portion 52 consists of a pair of upright columns 62 formed integral at their upper ends with the connecting wire sections 58. At their lower ends, the columns 62 are formed integral with transversely extending torsion bars 64 that are substantially parallel to and are disposed directly below and outwardly of the connecting sections 58 so that the columns 62 diverge in a downward direction, as shown in Fig. 2.

1 Torsion bars 66 at the lower end of the yieldable portion 52 form part of foot sections 68 which extend through and are retained in horizontally aligned slots 70 formed in the webs 34 in the cross rail 20. Inclined 5 bars 67 connect the bars 64 and 66.

Each straight wire section 56 is arranged in a side-by-side relation with a section 72 of straight wire 44 in the grid 42. The side-by-side straight wire sections 56 and 72 are then secured together by wrap-around clips, 10 of conventional type, indicated at 74. It is to be noted that in the illustrated forms of the invention, the spring attaching portions 56 are all attached to lengthwise wires 44 in grid 42. In such an embodiment, at least the sections 72 of the wires 44 that are clipped to the springs 15 50 can be provided with a coating of a yieldable plastic material prior to application of the clips 74. The plastic coating can be a vinyl coating or it can be a polyurethane coating or can be some other soft plastic coating that will facilitate the application of the clips 74 to the springs 20 50 and the wire grid 42.

In the wire grid unit 42, the transversely spaced grid wires 44 and 46 are arranged in criss-cross fashion and welded together at their intersections. The wires 44 and 46 are formed of basic wire to facilitate welding and 25 to reduce cost. As shown in Figs. 5 and 6, the cross wires 46 are positioned on top of the lengthwise wires 42 and are of a larger diameter. This provides the cross wires 46 with an increased ability to support the side sections 47 of the border wire 48 which are supported on the top 30 sides of the cross wires 46. Each of the grid wires 44 and 46 is bent upwardly and then return bent upon itself at its ends to provide an attaching end portion 76 which encircles a portion of the border wire 48, as illustrated for one of the wires 46 in Fig. 5.

1 As shown in Figs. 2 and 3, the cross wires 46
in the grid 42 project transversely outwardly of the box
spring assembly 10 at the sides to provide for a relatively
short cantilevered support section. When a mattress is
5 supported on the grid 42, the edge of the mattress is often
used for seating purposes so that the side sections 47 of
the border wire are subjected to relatively heavy loading.
The increased diameter construction of the cross wires
46, illustrated in Figs. 5 and 6, provides the necessary
10 support for the side sections 47 of the border wire 48
to stand up under these loading conditions.

In a preferred embodiment of the invention, the grid
wires 44 are formed of twelve gauge wire (0.105 inch diameter)
and the cross wires 46 in the grid are formed of nine gauge
15 wire (0.148 inch diameter) which is nearly 1-1/2 times the
diameter of the wires 44. The support springs 50 are formed
of eight and one-half gauge spring wire (0.155 inches dia-
meter) and the border wire is also formed of eight and
one-half gauge spring wire. The smaller diameter of the
20 wires 44 facilitates the clipping of these wires to the
springs 50.

It is thus seen that this invention provides an
improved welded wire grid unit for box spring assemblies
in which the basic wire grid members 44 and 46 are welded
25 together so as to form a criss-cross network of wires that
provide a firm support for a border wire 48 formed of spring
wire.

CLAIMS

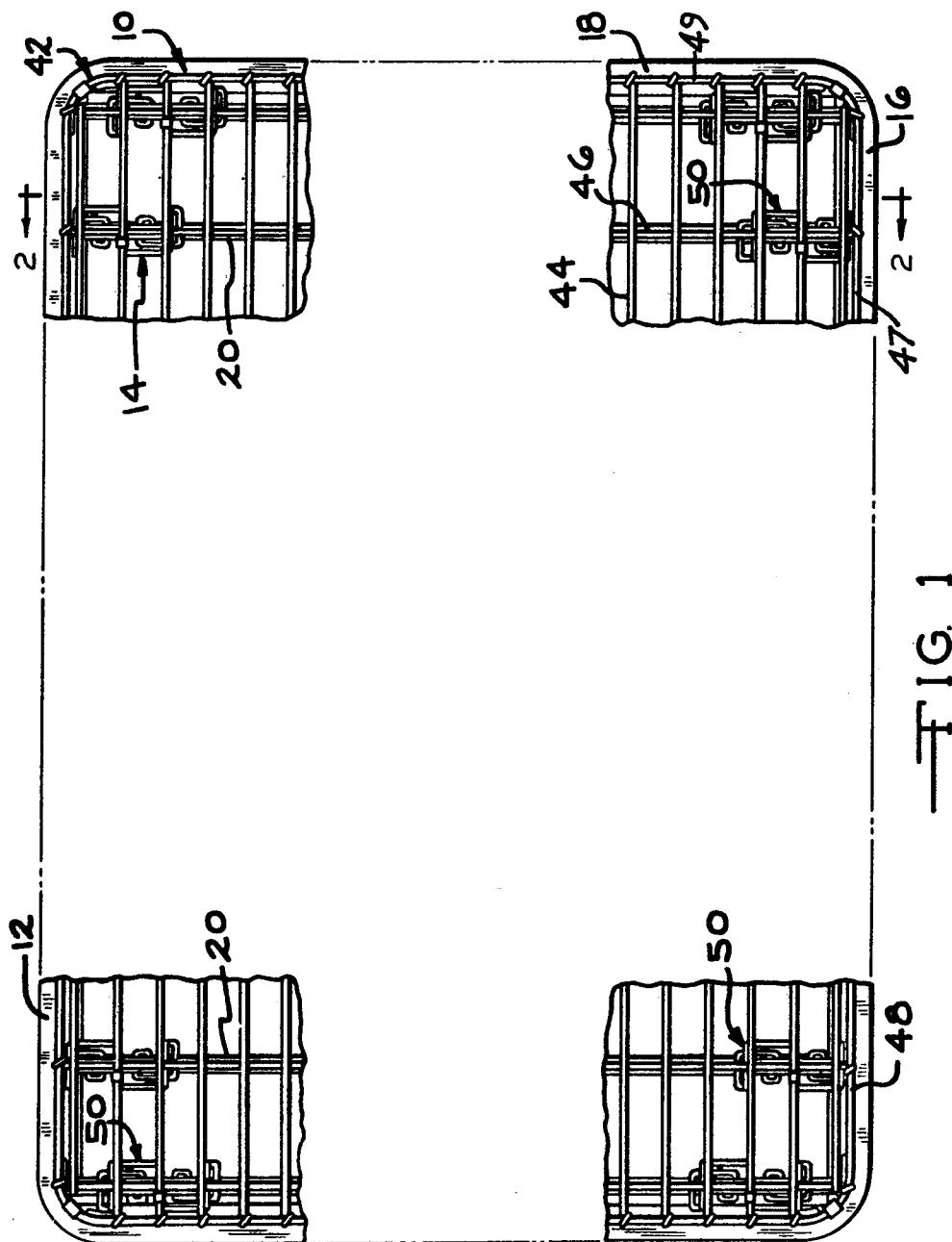
1. In a box spring assembly which includes a generally rectangular horizontal frame and a plurality of wire springs mounted on said frame and extending upwardly therefrom; a grid unit supported on said wire springs and comprising a rectangular border wire having side and end sections and corresponding substantially in overall size and shape to said rectangular frame, said border wire being substantially parallel to and spaced above said frame, a plurality of transversely spaced first wires substantially parallel to said border wire side sections, a plurality of transversely spaced second wires substantially parallel to said border wire end sections and supported on the top sides of and welded to said first wires, said first wires being secured at their ends to said border wire end sections, said second wires being arranged at their ends in a supporting relation with said border wire side sections, said first and second wires being formed of basic wire and being welded together at their points of intersection.

2. The structure according to claim 1 wherein said border wire is formed of spring steel.

3. The structure according to claim 2 wherein said second wires are of a larger diameter than said first wires to provide increased support for said border wire side sections.

4. The structure according to claim 3 further including spring clip means securing the upper ends of said springs to at least some of said first wires.

5. The structure according to claim 3 wherein said first and second wires are straight from end to end.



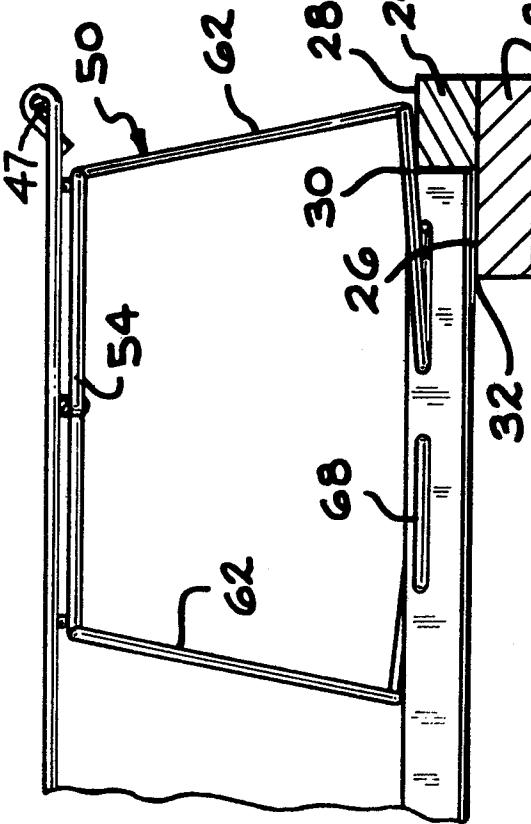
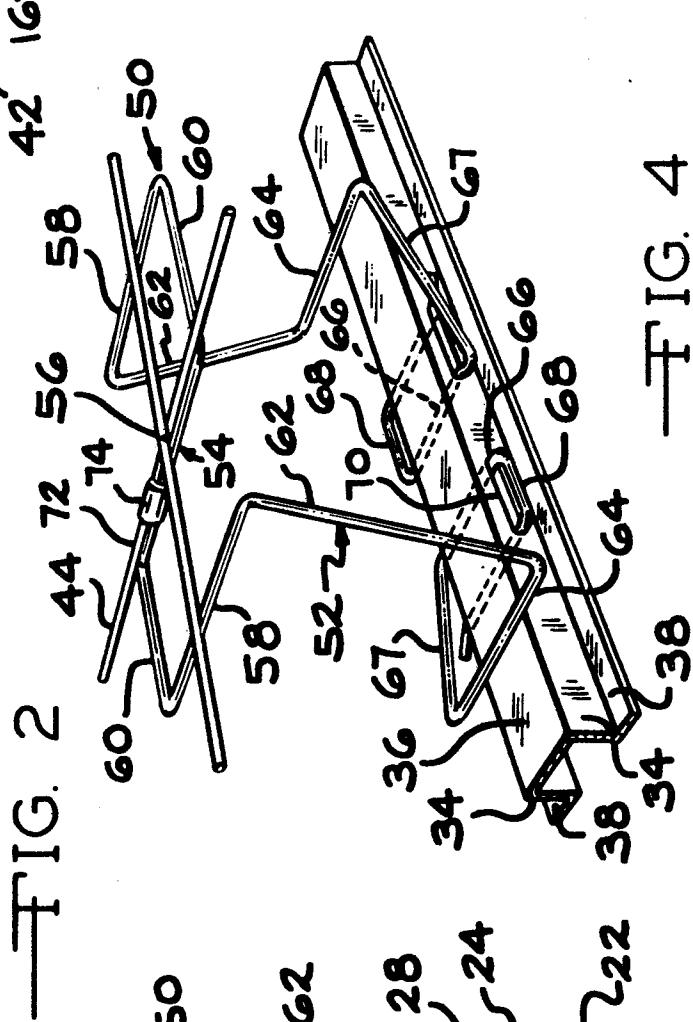
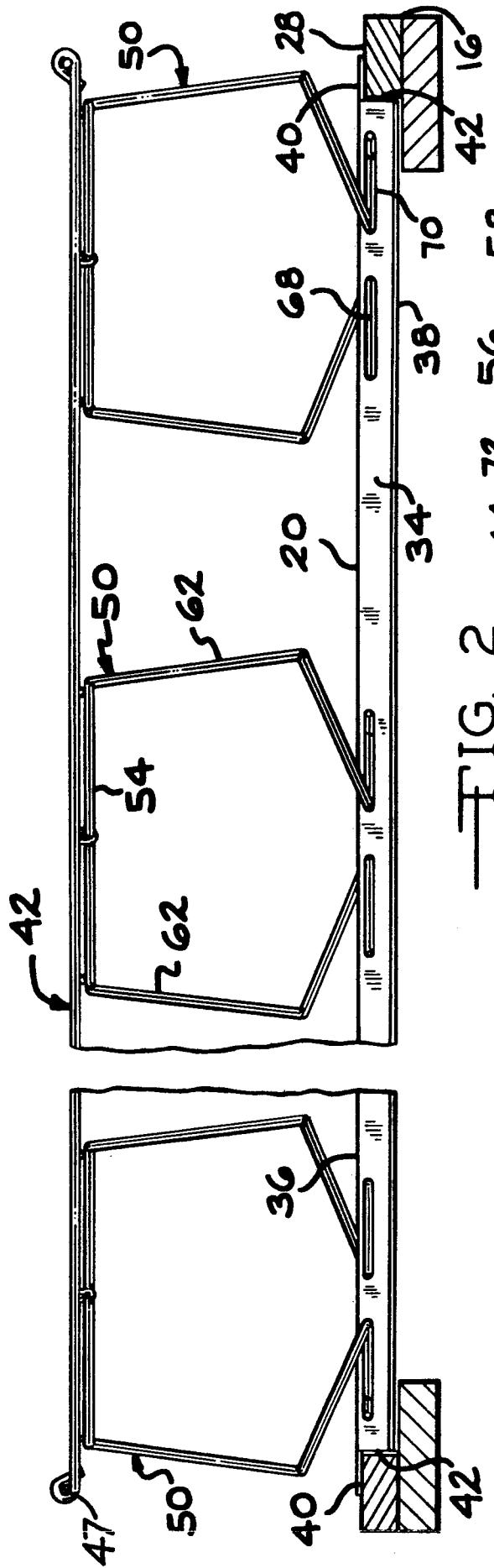


FIG. 4

FIG. 3

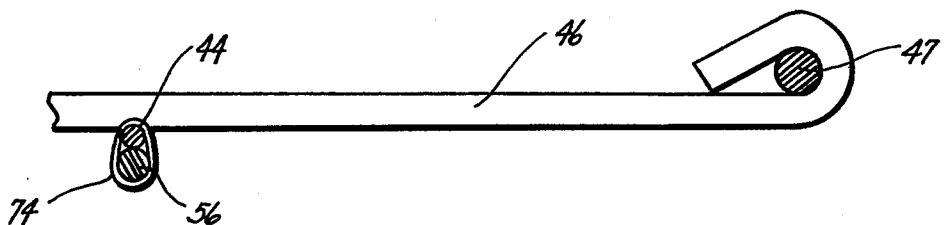


Fig. 5

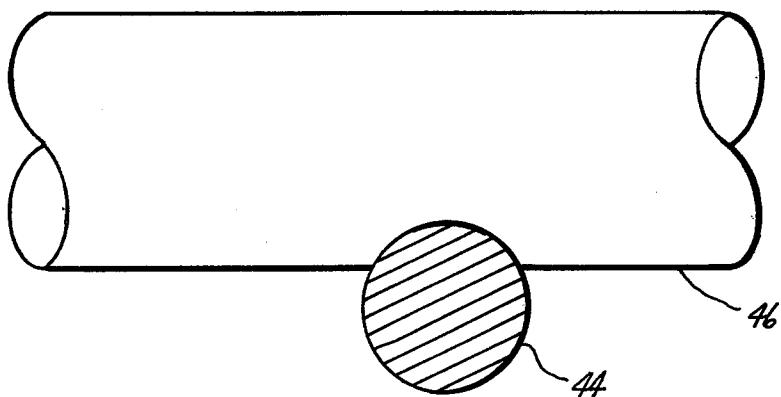


Fig. 6