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(54) A combined energiser and reel for electric fences.

(57) An electric fence wire reel (1) having a hub (2) or support (3) which accommodates an electric fence energiser device (6) and which in use can be supported from a ground surface by an earth stake (8) in contact with the energiser device (6). Optionally the hub may accommodate a plurality of batteries (10).

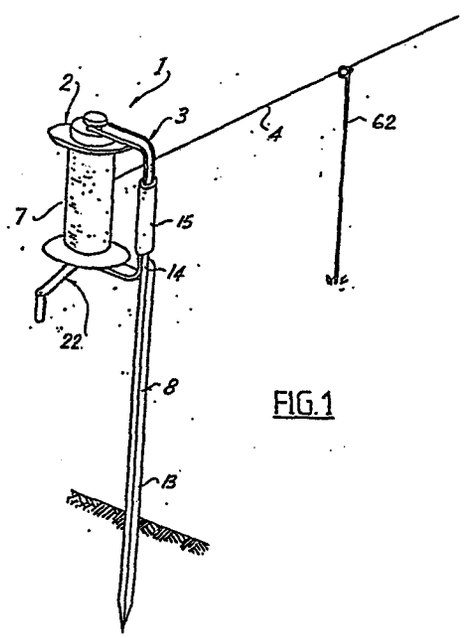

FIG.1

EP 0 127 422 A2

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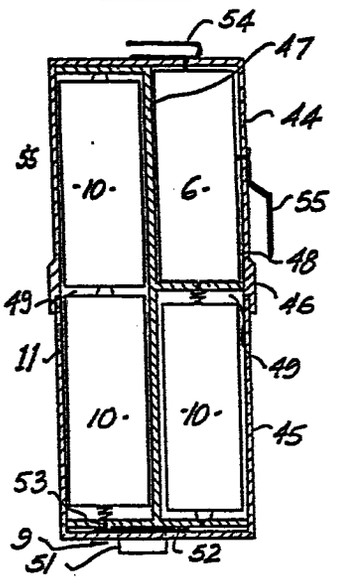
FIG 4



A COMBINED ENERGISER AND REEL FOR ELECTRIC FENCES

This invention relates to electric fences.

One of the advantages of electric fencing systems is their portability and because of this electric fences have found almost universal acceptance for grazing control. The typical electric fencing system will comprise an energiser, a power source for exciting the energiser, electric fence wire (usually on a reel) and fence standards for supporting the wire from the ground. The power source, energiser and reel are conventionally separate units, and relative connections between the units are made each time an electric fence is erected.

It is an object of the present invention to provide an electric fence wire reel embodying an energiser.

It is a further object of the present invention to provide an electric fence wire reel embodying an energiser and a battery unit for exciting the energiser.

Further objects and advantages of the present invention will become apparent from the ensuing description which is given by way of example.

According to the present invention therefore there is provided an electric fence wire reel comprising a hub having a wire storage portion, support means engagable with the reel and about which the reel may be rotated for the purpose of paying out or rewinding an electric fence wire from the reel, an energiser locating region within the hub

or associated with the support means of the reel, an electric fence energiser device located within the energiser locating region, said electric fence energiser device being adapted to supply an electric current to electric fence wires paid out from or stored from the wire storage portion, an earthing member adapted to connect the energiser device to eath, and connecting means for connecting the energiser to a power source.

Aspects of the present invention will now be described by way of example only with reference to the accompanying drawings in which:

Figure 1: is a perspective view of an electric fence system incorporating an electric fence wire reel in accordance with one possible embodiment of the present invention, and

Figure 2: is a partial sectional view of the electric fence wire reel and support means of Figure 1, and

Figure 3: is a side view of an energiser and battery housing for the electric fence wire reel of Figure 1, and

Figure 4: is a cross-section of the housing of Figure 3, and

Figure 5: is an end view of the housing of Figure 3.

With respect to the drawings an electric fence wire reel in accordance with the present invention is generally indicated by arrow 1 and comprises a hub generally indicated by arrow 2, support means generally indicated by arrow 3, engagable with the reel 1 about which the reel may be rotated for the purpose of paying out or rewinding an electric fence wire 4 from the reel. The hub 2 is provided with an energiser locating region generally indicated by arrow 5 and an electric fence energiser device 6 adapted to supply electric current to the fence wire 4 is located within the energiser locating region 5, of the hub 2, and an earthing member indicated by arrow 8 adapted to connect the energiser device 6 to earth and a switch generally indicated by arrow 9 for connecting the energiser to a power source such as batteries 10. In the example illustrated the energiser device 6 and the batteries 10 are housed within a housing 11 which is located in the energiser locating region 5 of the reel 1.

In the example illustrated, the support means 3 is a substantially U-shaped member having free ends 12 thereof adapted to support the fence wire reel 1 for rotation in a vertical plane, the support means 3 being fixed relative to earthing member 8 which is a steel ground stake. The support means 3 can be fabricated from a U-section member in steel or fashioned into that shape from light guage steel. The ground stake 8 can have a lower section 13 which is substantially L-shaped and one limb 14 thereof extends upwardly into a handle 15 which is preferably

moulded from an insulating material such as plastics or rubber where the limb 14 makes contact with the U-section member. For ease of manufacture common limb 16 may be split at 17 this split being accommodated within the handle 15.

The hub 2 which can be moulded or fabricated in plastics is formed as a circular cross-section cylinder 18 having closed ends 19,20 with the end 19 having a cap mounting a boss 21 which supports a winding handle generally indicated by arrow 22. The boss 21 extends through an aperture 23 in the adjacent free end 12 of the support means 3 and is provided with an external peripheral groove 24 to which is attached a complementary hub 25 of the handle 22. The groove 24 is not a deep groove and in the prefered form of the invention where both the closed end 19 and its boss 21 and the hub 25 of the handle are mounted in plastics, in the event that the handle was to be subjected to a sudden impact it would be likely that the hub 25 would break free from the boss 21 thus reducing the possibility of damage ocurring to either part. The end of the cap 19 is reinforced by reinforcing ribs 26.

The wire storage region 7 is defined by central outer portions 27 of the cylinder 18 and complementary peripheral rims 28. Both of the rims 28 which are inclined as illustrated with respect to the surface of the central outer portion 27.

At the closed end 20 of the hub 2 an end plate 29 mounts a boss 30 and the hub 2 is rotatable with respect to

adjacent free end 12 of the support means 3 on an adjustable pivot and contact member generally indicated by arrow 31. The pivot and contact member 31 comprises an adjustment knob 32 and a contact pin 34 is provided which extends through the lengthwise axis of the boss 30.

The contact pin 34 comprises a threaded part 35 which is engagable in a complementary thread 36 of the boss 33 and a plain end 37 which extends through an aperture 38 in the free end 12 of the support means 3 and an aperture 39 in the boss 30 of the end plate 29. The lower end 40 of the pin 34 is fashioned into a point and also mounts a fixed locking member 41. A friction washer 42 is positioned between the underside of the free ends 12 of the support means 3 and the top side of the boss 30 of the end plate 29. The end of the boss 30 of the pivot and contact member 31 is provided with a rim 43 so that the surface area of the boss 33 in contact with the free end 12 is minimal and the contact pin 34 is locked (not shown) in relation to the aperture 38 so that it does not rotate when the knob 32 is tightened. To lock the pin 34 in relation to aperture 38 the aperture and pin may be provided with matching flat surfaces where the pin co-operates with the aperture. The knob 32 can be tightened or loosened to adjust the pressure on the friction washer 42 and to control the freedom for rotation of the hub 2 with respect to the support means 3, this facility being used as required during paying out wire when total freedom of the hub is not desirable, and in winding, in when the knob 32 can be loosened.

With respect to Figures 3,4 and 5 of the drawings, in the embodiment illustrated the housing 11 is adapted to accommodate a series of batteries 10 as well as an electric fence energiser device 6.

The housing is of a rectangular square configuration and can conveniently be moulded in plastics in two half sections 44,45 split about central flange 46. The interiors of the housing 11 can be compartmentalised by a frame 47, also moulded in plastics, and the arrangement may for example be such that there is one compartment 48 for the energiser device 6 and a number of compartments 49 for a series of primary or secondary batteries 10. The batteries can be orientated within the housing 11 so that a switching device generally indicated by arrow 9 and disposed at one end of the housing 11 can be used to complete a circuit to the energiser for the purpose of supplying power to it.

The switch 9 can comprise a knob 51 slidable in a slot 11A in the base of the housing 11 and a contact member 52 which is arranged to complete a connection between contacts 53 of the batteries 10 when the energiser is in use or to break the connection when the energiser is not being used.

The housing 11 is provided with an earthing contact 54 for the energiser and a power output contact 55.

When the housing 11 is assembled with its components and it is placed within the hub 2 of the wire reel (Figure 2)

it is located by locating ribs 60 extending from the inner walls of the cylinder 18 and on such assembly the earth contact 54 is in position to make contact with the lower end 40 of the pin 34 and the power contact 55 makes contact with a wire contact 61 which extends in a loop to the outside of a cylinder 18 within the wire storage region 7, where electric fence wire for the reel is connected thereto.

When the electric fence wire reel is to be used to erect an electric fence the earthing member 8 is inserted in a ground surface and fence standards 62 are set up as illustrated by Figure 1. Electric fence wire 4 from the reel 2 can then be paid out and engaged with the fence standards 62 and the switch 49 can be used to switch the power supply to the energiser. The energiser is earthed via the contact pin 40, the support means 3, and the earth stake 8.

Whereas in the prior art a typical electric fence comprises a separate energiser and reel the present invention combines these two elements and, optionally, as described a power source may also be combined within the reel. It is to be appreciated however that power to the energiser within the reel may be supplied from an external source such as a vehicle battery or mains power and if that were the case then connections between the power source and the energiser may be made through a contact device (not shown) associated with the support means and the reel, or through a detachable plug and socket (not shown).

The energiser 6 may be an electric fence energiser of the capacitor discharge type which is arranged to give high voltage impulses to an electric fence wire 4 separated by approximately one second. Typically such a device will comprise a dc to dc invertor, an energy storage device, a switching device, an impulse switching circuit and a step-up output transformer such components being mounted on a printed circuit board, which is readily replacable in the unit with appropriate connections being made to connectors 54,55. The energiser device is preferably self contained within compartment 48, and only releasable therefrom by the use of a special key or tool (not shown).

Although in the preferred embodiment illustrated the energiser device is contained within the hub 2 of the reel 1, it is envisaged that the energiser may be contained within a housing which is external to the interiors of the hub, or alternatively, in the handle 15.

Whilst a U-shaped support means 3 supports the reel 1 in the embodiment illustrated the reel may be pivotably mounted with respect to a single arm (not shown).

Aspects of the present invention have been described by way of example only and it will be appreciated that modifications and additions thereto may be made without departing from the scope of the invention as defined in the appended claims.

CLAIMS:

1. An electric fence wire reel (1) comprising a hub (2) having a wire storage portion (7), support means (3) engagable with the reel (1), about which the reel and (1) may be rotated for the purpose of paying out or rewinding an electric fence wire (4) from the reel (1), an energiser locating region (3) within the hub or associated with the support means (3) of the reel (1), an electric fence energiser device (6) located within the energiser locating region (5), said electric fence energiser being adapted to supply an electric current to electric fence wires (4) payed out from or stored by the wire storage portion (7), an earthing member (8) adapted to connect the energiser device (6) to earth, and connecting means (50) for connecting the energiser to a power source.

2. An electric fence reel (1) as claimed in claim 1 wherein the energiser locating region (5) includes at least one battery housing to accommodate a battery or batteries (10) for supplying electric power to the energiser device (6).

3. An electric fence reel as claimed in claim 1 or claim 2 wherein the earthing member (8) is a ground stake.

4. An electric fence reel as claimed in any one of claims 1 to 3 wherein the support means (3) comprises a substantially U-shaped support arm with free ends (12) adapted to support the reel (1) for rotation, said U-shaped support arm being fixed relative to the earthing member (8).

5. An electric fence reel as claimed in claim 4 wherein one of the free ends (12) of the arm mounts a contact member (31) for connecting the earth member (8) to the energiser device.

6. An electric fence reel as claimed in claim 5 wherein the reel (1) is provided with a winding handle (22).

7. An electric fence energiser as claimed in claim 5 or claim 6 wherein the reel (1) is a hollow tubular member, and is arranged to accommodate a separate energiser device housing (11) providing a contact from the energiser (6) to the contact member (31) and connections (55) for electric fence wires which can be accommodated with the wire storage portion (7).

8. An electric fence reel (1) as claimed in any one of claims 3 to 7 wherein the U-shaped support arm (3) is provided with a handle (15) in an insulating material.

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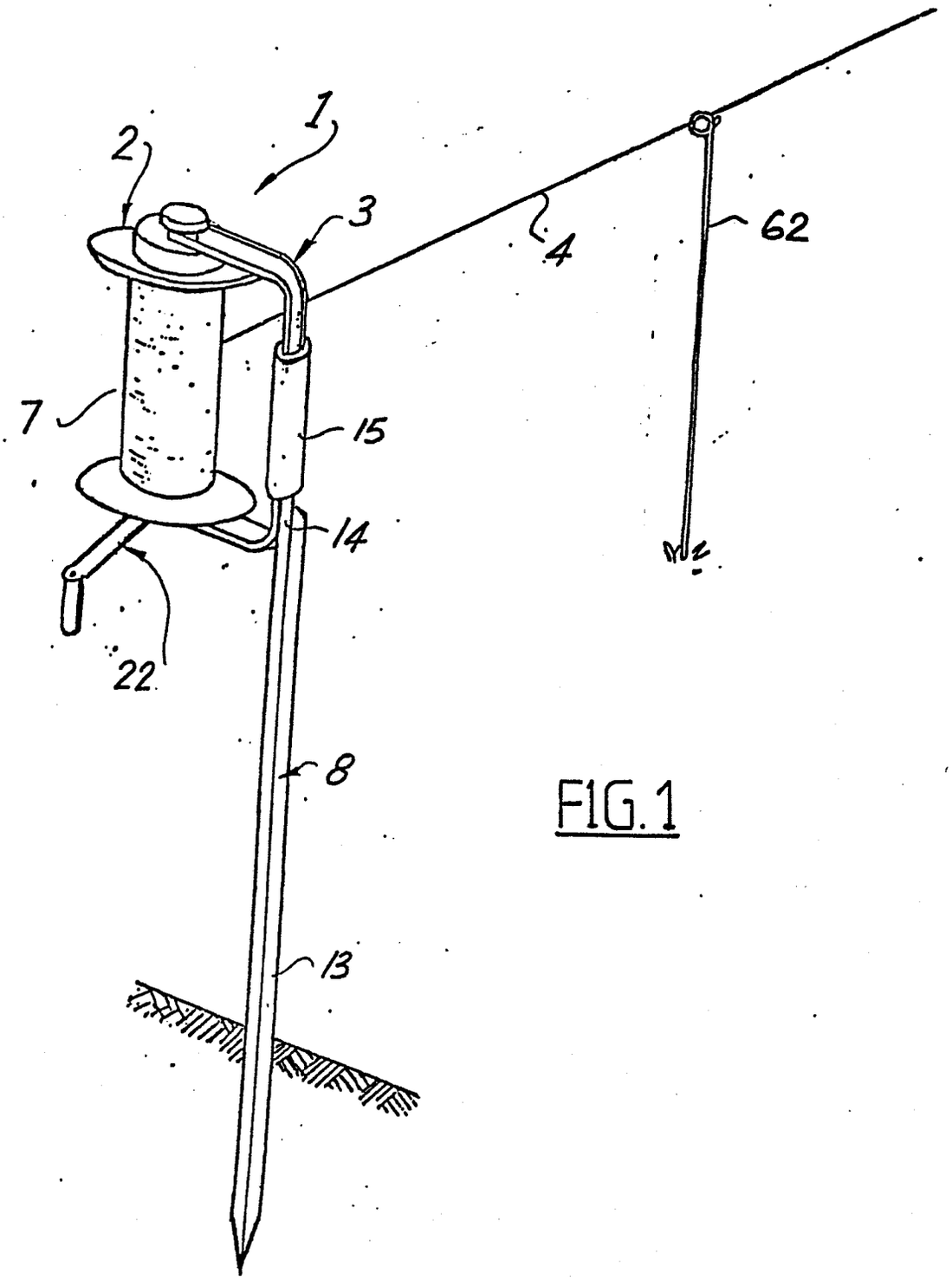

FIG.1

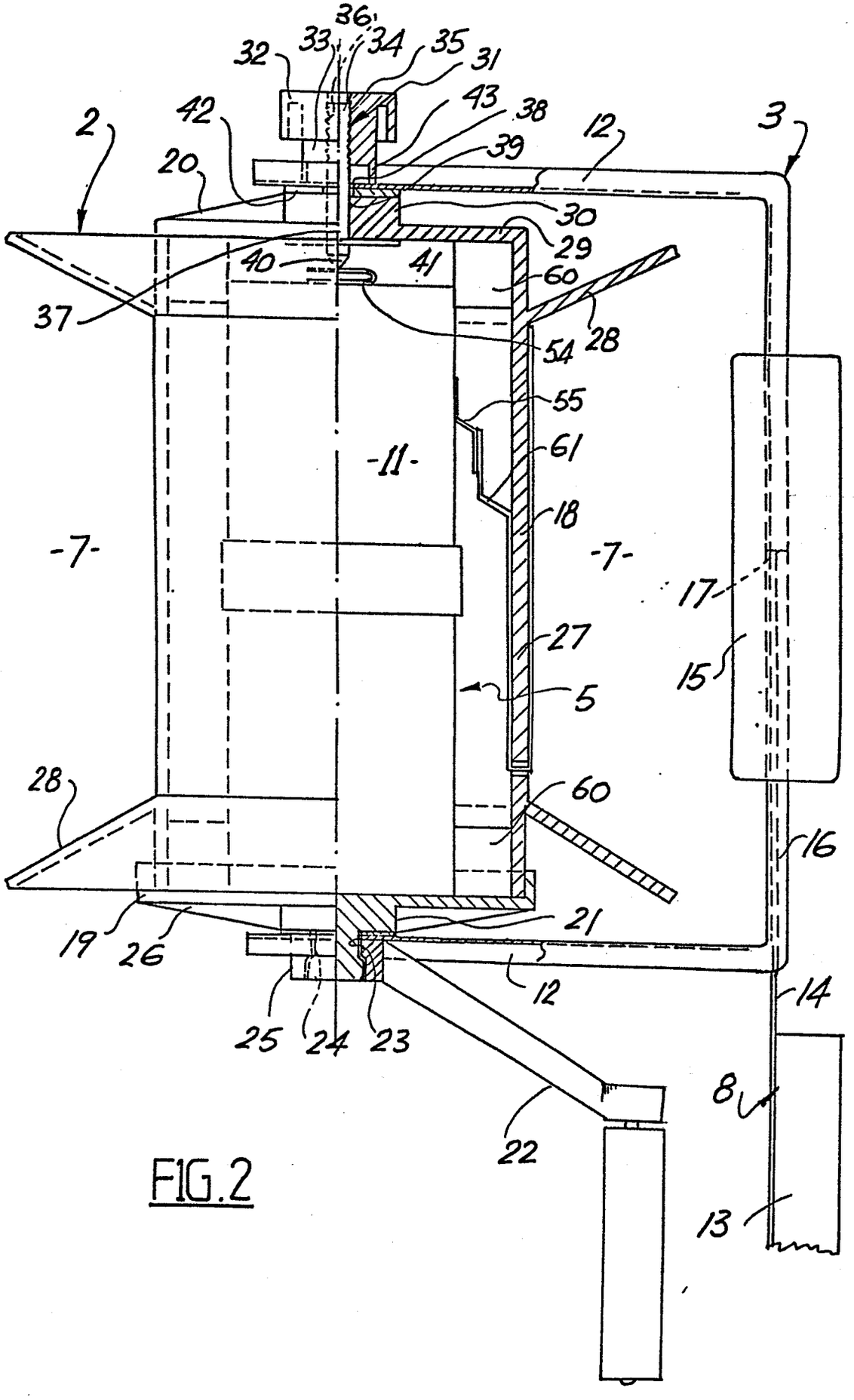
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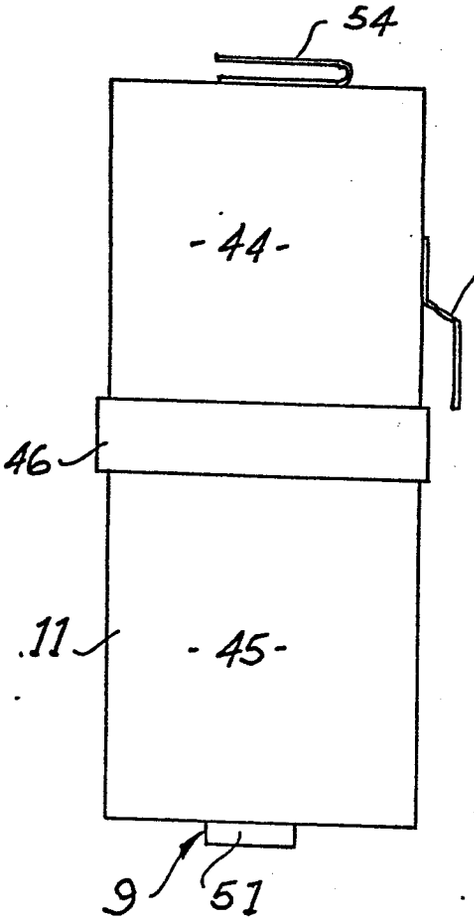
FIG.2

FIG.3



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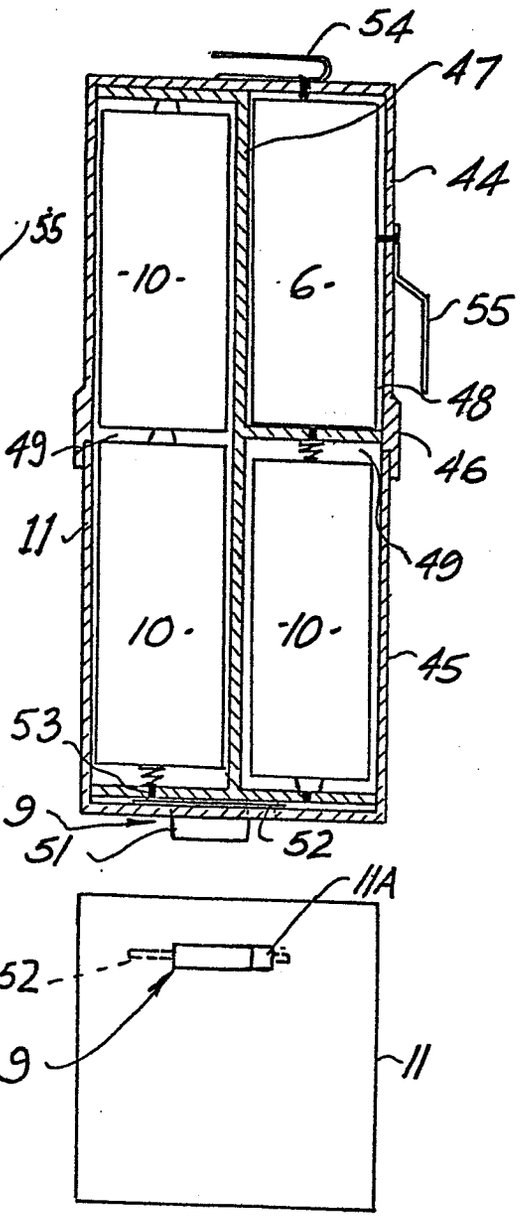

FIG.5