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(54) **Foundation case for automatic gate systems**

(57) A foundation and containing case for gate automatic systems is described, said case being designed to be buried underground and to house a gearmotor for displacing a leaf of the gate and being obtained by means

of a method involving drawing as one piece and comprising an opening having an edge which is flared outwards and defines internally a step for receiving and supporting a cover.

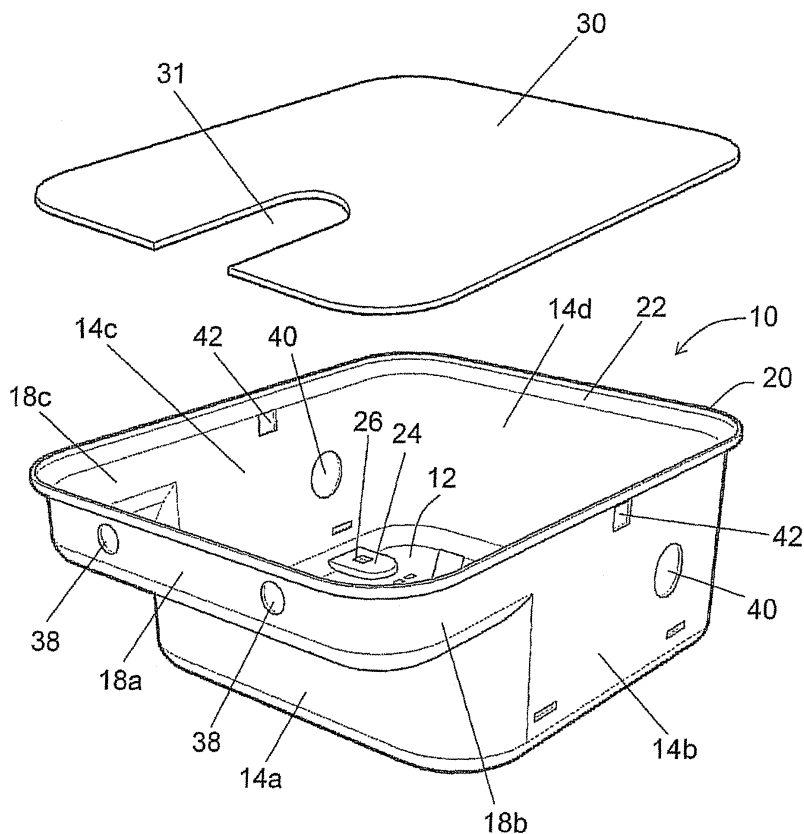


Fig. 1

Description

Technical field of the invention

[0001] The present invention relates to a foundation box or case for gate automatic systems. State of the art prior to the invention

[0002] In automatic systems for leaf gates generally two different types of electromechanical gearmotors are used. The first type comprises all those gearmotors which are mounted "visibly" between the gate and a support body such as a wall or a pillar, while the second type comprises gearmotors which are buried underground below the gate leaf which is operated.

[0003] Underground gearmotors, which are particularly advantageous from an aesthetic point of view since they remain completely concealed from view, are contained inside a metal case which is placed underground and then embedded in cast concrete.

[0004] The manufacture of this type of case, however, requires various machining operations, including cutting, bending and shaping of the sheet metal and welding of the various parts.

[0005] The welding operation is particularly delicate since heating of the sheet metal, and consequent deformation thereof, may result in a corresponding deformation of the interaxial distances between holes or openings which are normally formed in the walls of the case for fixing therein the internal components of the gearmotor.

[0006] EP 0,683,298 describes a hydraulic device which is contained inside a box-shaped case and is designed to move a gate leaf. A support block for a shaft acting as a hinge for the gate projects from a perimetral wall of the case, within said case. The block is formed as one piece with the case by means of casting and/or fusion.

[0007] The casting and/or fusion method is, however, extremely costly, in particular for mass production, for which reasons usually welding techniques are employed.

[0008] The main object of the present invention is to provide a foundation and containing case for gate automatic systems by means of a particularly low-cost and efficient method which is able to eliminate most of the machining operations described above.

[0009] This object, together with others, which will appear more clearly below, is achieved using a plastic deformation method, in particular drawing.

[0010] Owing to this drawing method it is possible to obtain, by means of a single machining operation, a metal case of suitable thickness designed to contain gate actuating means, without the need for further machining steps.

[0011] In particular, it is possible to avoid the welding step which, as described, gives rise to not insignificant drawbacks for the structure itself.

[0012] Finally the costs for mass production of a metal case manufactured as described are far less than those of conventional manufacturing methods.

[0013] Further advantageous features of the invention are described in the dependent claims.

Detailed description of the drawings

[0014] Characteristic features and advantages of the present invention will emerge more clearly from the following detailed description of a currently preferred example of embodiment thereof, provided solely by way of a non-limiting example, with reference to the accompanying drawings in which:

Figure 1 is an exploded perspective view of a foundation and containing case for gate automatic systems according to the present invention, and of the associated closing cover;

Figure 2 is a plan view of the case according to Figure 1;

Figure 3 is a right-hand side view of the case according to Figure 2;

Figure 4 is a cross-sectional view, along the line A-A, of the case according to Figure 2;

Figure 5 is a partially sectioned view, which shows the case according to the invention in the working position; and

Figure 6 is an exploded perspective view which shows the connection between a gearmotor housed inside the case and the movable leaf of a gate.

[0015] In the accompanying drawings, identical or similar parts are indicated by the same reference numbers.

Detailed description of the invention

[0016] With reference to the abovementioned figures, a foundation and containing case for gate actuating means, which is denoted generally by the reference number 10, is obtained by subjecting a metal sheet to plastic deformation, in particular drawing.

[0017] As is known, drawing is a technological process by means of which a metal sheet is deformed plastically and assumes a box-like, cylindrical or bowl-like form. Deformation is performed by means of a punch, which pushes the metal sheet, which may be fixed with a sheet clamp, inside a die.

[0018] The case 10 thus obtained has a bottom surface 12 from which side walls or flanks 14a-14d extend.

[0019] The case 10 is moreover open at the top and has a peripheral edge 20 which is flared outwards so as to define two consecutive curved sections with an S shape.

[0020] In other words, the peripheral edge 20 defines internally a step 22 which extends along the entire length of the peripheral edge 20 and is designed to receive a corresponding peripheral portion of a flat cover 30 which has an eyelet-shaped opening 31 formed therein in order to allow the projection, from the cover 30, of a transmission pin acting as an idle hinge for the gate leaf, as de-

scribed in detail below.

Along the side 14a the case 10 has an internally shaped zone which defines a flat base 16 situated at a midway height between the peripheral edge 20 and the bottom surface 12 (see Figures 2 and 4), parallel to the bottom surface 12, and from which respective side walls 18a-18c extend.

[0021] The following are formed in the bottom surface 12:

- at least one seat, the example showing four seats 24 which are provided with square holes 26 for mounting and fixing a gearmotor 44;
- at least one hole, the example showing four holes 28 for draining the water present inside the case 10; and
- at least one reinforcing rib 32 preferably with an X shape.

[0022] Advantageously, the reinforcing rib 32 and the seats for mounting and fixing the gearmotor are raised a few millimetres, preferably 1 mm, from the bottom surface 12 of the case 10, so as to create a cavity for accumulating the water which will then be drained through the holes 28.

[0023] The flat base 16 has, formed therein, an inset zone 34 with a hole 36 for supporting and fixing a pin 46 for the return of the movement transmitted by the gearmotor 44 to the movable leaf 45 of the gate, while openings 38 for fixing respective end-of-travel devices are present in the side wall 18a.

[0024] The side walls or flanks 14b and 14c have openings 40 for receiving suitable electric connection cables and seats 42 for fixing means able to lock the cover 30 onto the case 10.

[0025] Figures 5 and 6 show schematically the stages for installation of the case 10 and connection of the leaf 45 to the gearmotor 44 for actuating said leaf.

[0026] Firstly (Figure 5), the case 10, together with the gearmotor 44 suitably fixed inside it and connected to the electric mains, is placed inside a hole dug out at the base of a gate 41, making sure that the transmission pin 46 is aligned with the axis X of the hinge 48. Then the case 10 is embedded in concrete C, making sure that it is aligned and level.

[0027] At this point (Figure 6) an end 52 of an actuating bracket 50 is mounted on the pin 46, which acts as an idle hinge, the other end 54 thereof being coupled, via a ball bearing 60, with the leaf 45 of the gate. In turn, the actuating bracket 50 is connected to the gearmotor 44 by means of a lever 56 so as to transmit the movement from the gearmotor 44 to the bottom edge 47 of the gate leaf via the eyelet opening 31 in the cover 30.

[0028] To summarise, as mentioned above, owing to the drawing method, it is therefore possible to obtain, in a single machining operation, a metal case which has all the characteristics necessary for correct use thereof, in particular without the need for further operating steps, first and foremost welding, which, as previously men-

tioned, gives rise to not insignificant drawbacks.

[0029] The cost of the case is, moreover, limited precisely because of the reduction in the number of machining steps, and the associated equipment.

5 **[0030]** Although the invention has been described with reference to a preferred example thereof, experts skilled in the art will understand that numerous modifications and variations may be made thereto, all of which fall within the scope of protection defined by the accompanying claims.

Claims

- 10 1. Foundation and containing case for gate automatic systems, designed to be buried underground and house a gearmotor for displacing a gate leaf, **characterized in that** it is obtained by means of a method involving drawing as one piece and comprises an opening having an edge (20) which is flared outwards and defines internally a step (22) for receiving and supporting a cover (30).
2. Case according to Claim 1, wherein said step (22) extends along the entire flared edge (20).
3. Case according to Claim 1 or 2, wherein the flared zone comprises two consecutive curved sections with an S shape.
- 30 4. Case according to any one of the preceding claims, wherein the case has a bottom surface (12) in which at least one seat (24) with openings (26) for mounting and fixing the gearmotor is formed.
- 35 5. Case according to Claim 4, wherein said bottom surface (12) has reinforcing ribs (32).
- 40 6. Case according to Claim 4 or 5, wherein said seats (24) and said ribs (32) project from the bottom surface (12) of the case by at least 1 mm.
- 45 7. Case according to any one of the preceding claims, comprising openings (28) for draining the water at least on said bottom surface (12).
- 50 8. Case according to any one of the preceding claims, comprising an internally shaped zone which defines a flat mounting base (16) for a support pin (46), the base (16) being arranged at a height midway between said edge (20) and said bottom surface (12).
- 55 9. Case according to Claim 8, comprising an inset zone (34) for fixing said pin (46), formed in said flat base (16).
10. Case according to any one of the preceding claims, having openings (38) for fixing respective end-of-

travel devices, formed in a side wall (18a).

11. Case according to any one of the preceding claims, having openings (40) positioned on the flanks (14b, 14c) for receiving suitable electrical connection cables. 5
12. Case according to any one of the preceding claims, having seats (42) for fixing respective means/devices for closing/fixing said cover. 10

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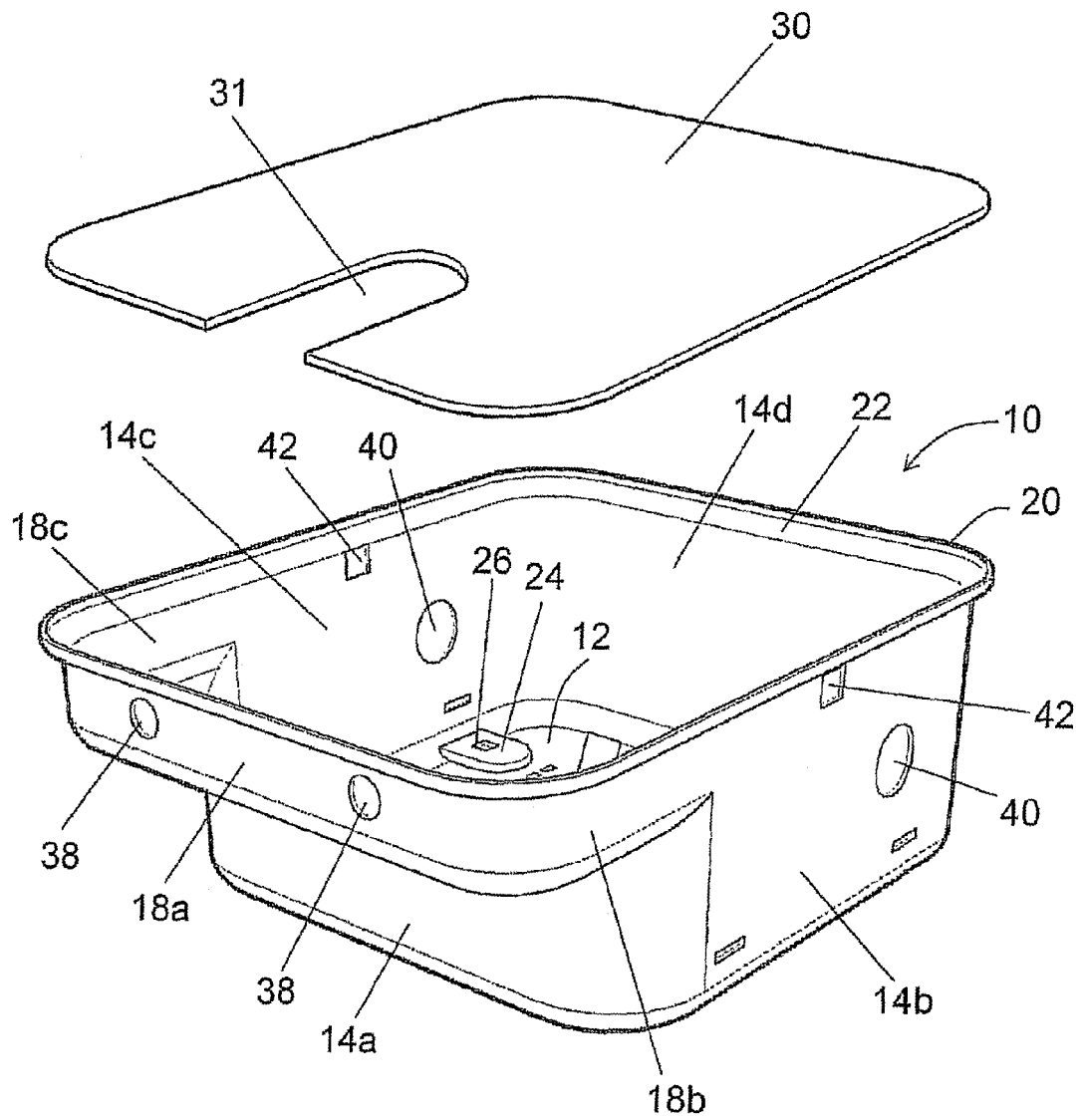


Fig. 1

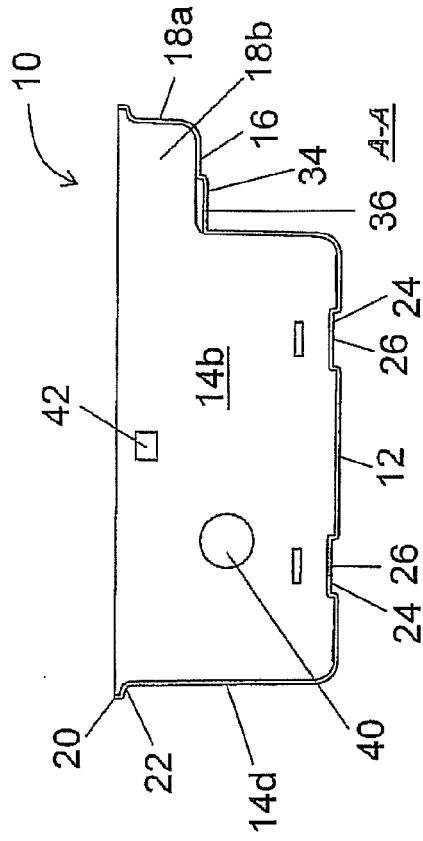


Fig. 4

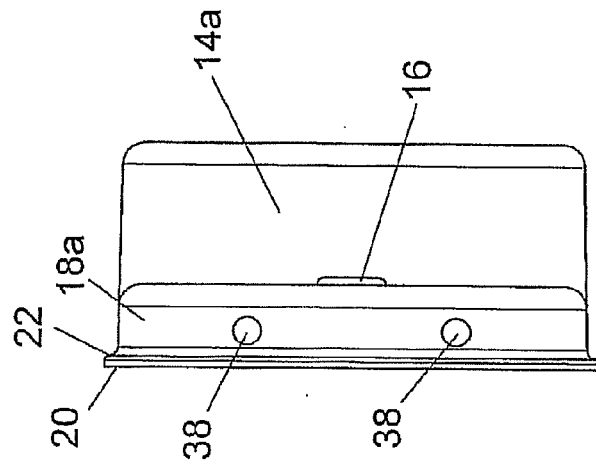


Fig. 3

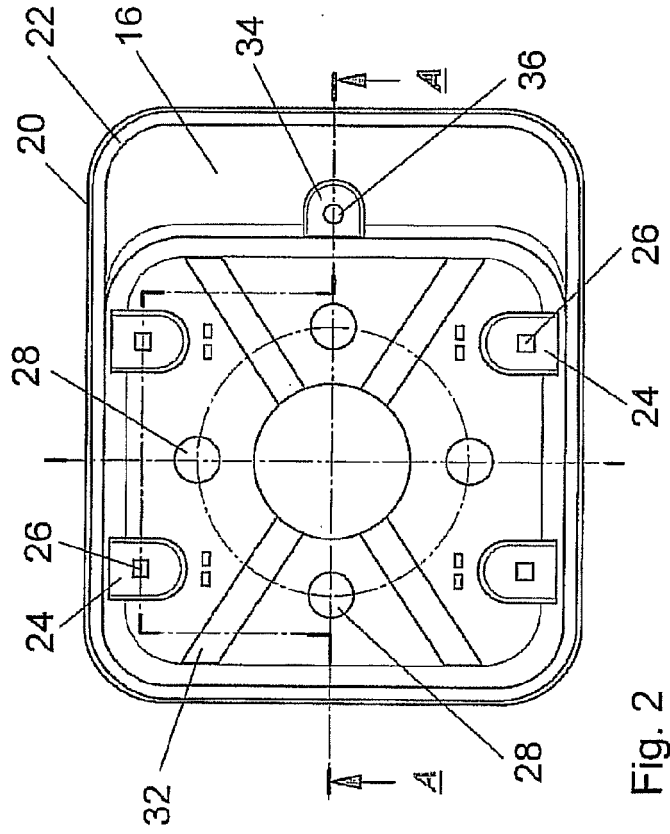
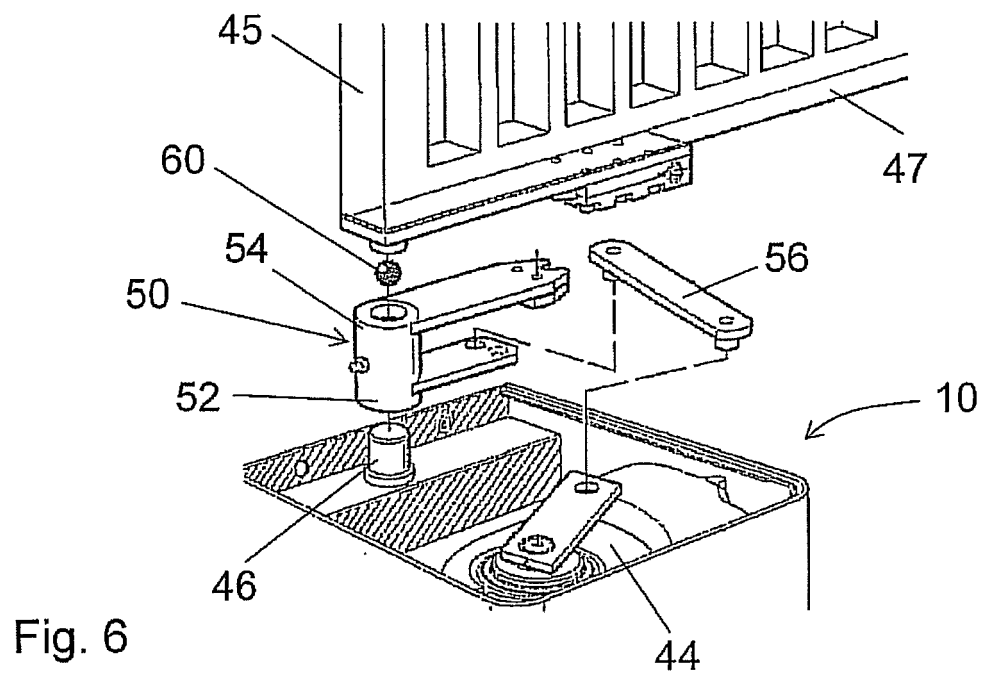
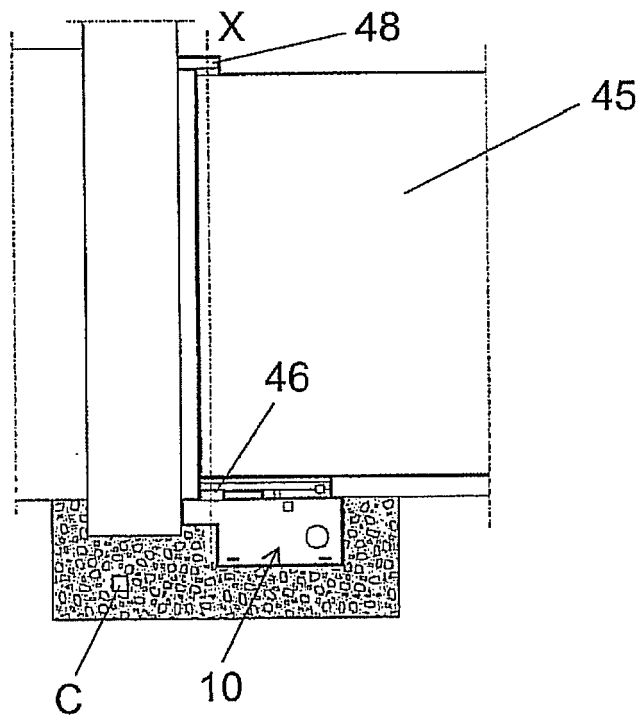


Fig. 2



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0683298 A [0006]