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(54) A Multi-colour pad printing machine for printing on objects

(57) A compact and light multi-colour pad printing machine (1) for printing objects comprises a plurality of plates (5, 6), respective inked cartridges (19, 20) and pads (14, 15) disposed in respective parallel alignments along one direction (Y-Y), the pads (14, 15) being movable stepwise along the said direction between the plates (5, 6) and an object-carrier table (16) for successively pad printing an object (17) positioned on the object carrier table (16).

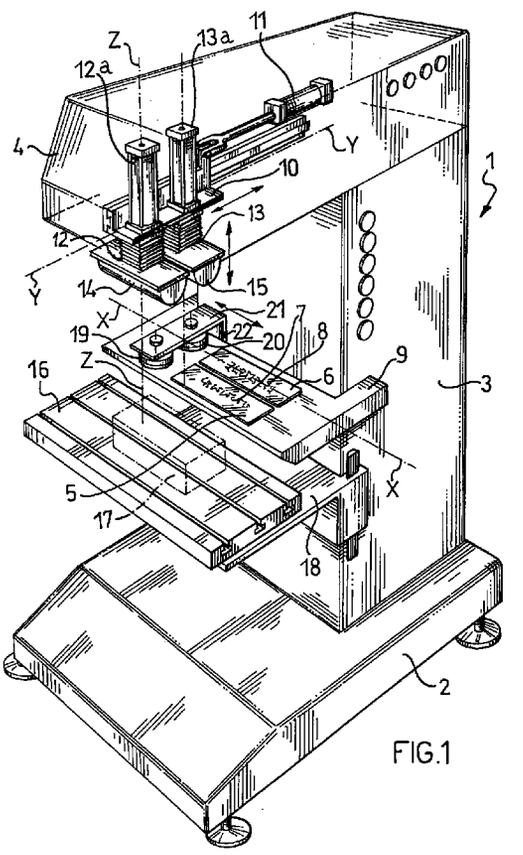


FIG.1

EP 0 718 098 A2

Description

The present invention relates to a multi-colour pad printing machine for printing on objects, of the type comprising a plurality of plates and respective inked cartridges, one for each colour, disposed in alignment parallel to one direction, and at least one pad.

As is known, such machines utilise pads to transfer ink from the plate to an object to be printed.

It is to be noted that multi-colour pad printing machines used to date effectively comprise one-colour machines placed side to side, in front of which the object to be pad printed stops to receive from each a printing of one colour.

Whilst generally satisfactory and substantially responding to the objects, such machines are heavy and bulky.

The problem on which the present invention is based is that of devising a machine of the specified type which will have structural and functional characteristics such as to overcome the disadvantages mentioned above with reference to the prior art.

This problem is resolved by a pad printing machine of the type specified, which is characterised in that the said at least one pad is movable along the said direction between the plates and an object-carrier table for pad printing an object positioned on the said table.

In order to understand the invention and its advantageous aspects a detailed description of a preferred embodiment will now follow, given by way of non-limitative example with reference to the attached drawings, in which;

Figure 1 is a partially sectioned perspective view of a pad printing machine according to the present invention; and

Figures 2 to 6 represent details of the machine of Figure 1 in successive phases during operation.

With reference to the attached drawings, the reference numeral 1 generally indicates a two-colour pad printing machine.

The machine 1 comprises a column 3 extending along a vertical direction Z-Z between a base 2 and a print head 4 projecting from the column 3 in a direction Y-Y perpendicular to Z-Z so as to form a substantially C-C shape frame.

A plurality of plates, in the example two indicated 5 and 6, are fixed to a bracket 9 which is carried so as to project from the vertical column 3. The plates 5 and 6 have respective incisions 7 and 8 and are disposed on the bracket 9 in alignment along the direction Y-Y.

The machine 1 further includes a slide 10 supported by the head 4 and movable in the direction Y-Y under the action of a pneumatic cylinder 11.

The slide 10 carries a plurality of moving elements, in the example two, indicated 12 and 13, which are movable in the vertical direction Z-Z under the action of respective pneumatic cylinders 12a and 13a. To the movable elements 12 and 13 are fixed respective pads 14 and 15.

An object-carrier table 16, on which is disposed an object 17 to be pad printed, is fixed to a bracket 18 which is supported so as to project from the vertical column 3 and is adjustable in height.

A plurality of inked cartridges, two in the example shown and indicated 19 and 20, in the form of inverted cups containing ink of a given colour, are supported by a cross beam 21 fixed to a slide 22. The slide 22 is movable under the action of a pneumatic cylinder, not shown, along a direction X-X which is transverse and precisely perpendicular to the direction Y-Y. The cartridges are maintained in contact pressed on respective plates 5 and 6 in a manner known per se.

With reference to Figures 1 and 2, the operation of a two-colour pad printing machine is described hereinafter with reference to an initial condition illustrated in Figures 1 and 2 in which the pads 14 and 15 are located vertically above the plates 5 and 6 in spaced relation from them.

The two inked cartridges 19 and 20 drawn by the slide 22 effect inking of the plates 5 and 6 following a forward and reverse stroke over the incisions 7 and 8 (Figure 3).

In the following phase the movable elements 12 and 13 effect a movement, in the direction Z-Z, which comprises a descent to bring the pads 14 and 15 into contact with the respective plates 5 and 6 (Figure 4) and a subsequent rise. In this phase each pad withdraws the ink contained in the incision 7 and 8 from the corresponding inked plates.

Subsequently the slide 10 forms a stepwise movement in the direction Y-Y to position, in successive instants, first the movable element 12 and then the movable element 13 vertically over the object 17 to be pad printed. Each movable element, when positioned vertically over the object 17 to be pad printed and before the subsequent displacement of the slide 10, performs a movement in the direction Z-Z which comprises a descent to bring its pad into contact with the object to be pad printed (Figures 5 and 6) and a subsequent rise. Upon contact between the pad and the object pad printing takes place with the transfer of the ink from the surface of the pad to that of the object.

Once the printing phase is completed the pad printed object is replaced on the object-carrier table with another object to be pad printed, whilst the machine starts the cycle again as described.

The pad printing machine according to the present invention is of exceptionally low weight and small dimensions. In fact, the multi-colour pad printing machine according to the invention has weight and dimensions only slightly greater than the weight and dimensions of a single colour pad printing machine.

A further advantage lies in the fact that it lends itself to pad printing large objects. In fact, during the operating cycle the object to be pad printed remains stationary.

Obviously, the machine described above can have modifications, adaptations and substitution of elements with functionally equivalent elements by a man skilled in the art in order to satisfy specific and contingent requirements, without by this departing from the scope of protection of the invention as defined in the following claims.

Claims

1. A multi-colour pad printing machine (1) for printing objects, of the type comprising a plurality of plates (5,6) and respective inked cartridges (19,20), one for each colour, disposed in respective alignments parallel to one direction (Y-Y), and at least one pad (14,15), characterised by the fact that the said at least one pad (14,15) is movable along the said direction (Y-Y) between the plates (5,6) and an object-carrier table (16) for pad printing an object (17) printed on the said table (16).

2. A machine (1) according to claim 1, characterised in that there are a plurality of pads (14,15) disposed in alignment parallel to the said direction (Y-Y) and movable stepwise along said direction (Y-Y) between the plates (5,6) and the object-carrier table (16) for successively pad printing the said colours on to the object (17).

3. A machine (1) according to claim 2, characterised in that the inked cartridges (19,20) are movable towards and away from the plates (5,6) transversely of the said direction (Y-Y).

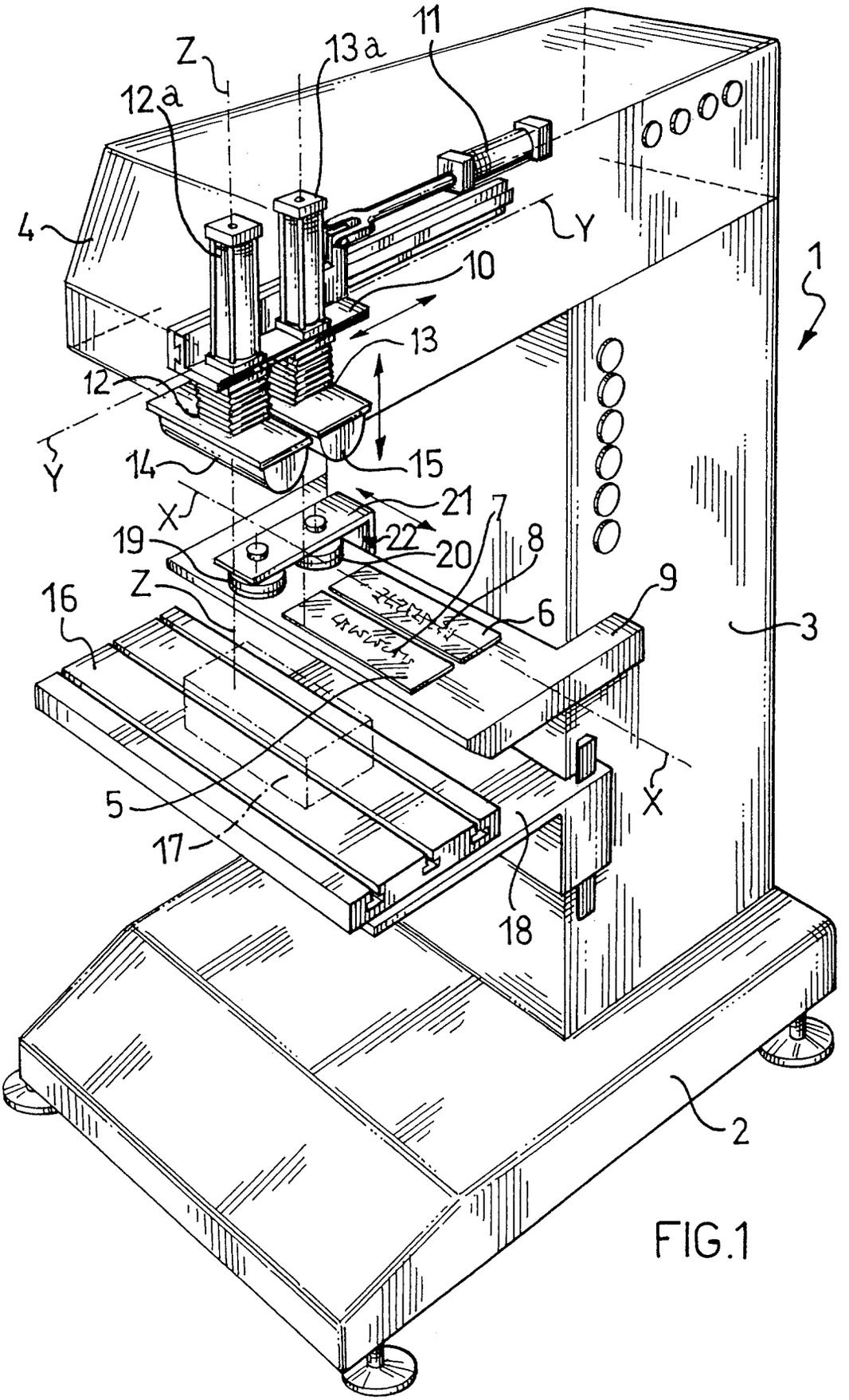
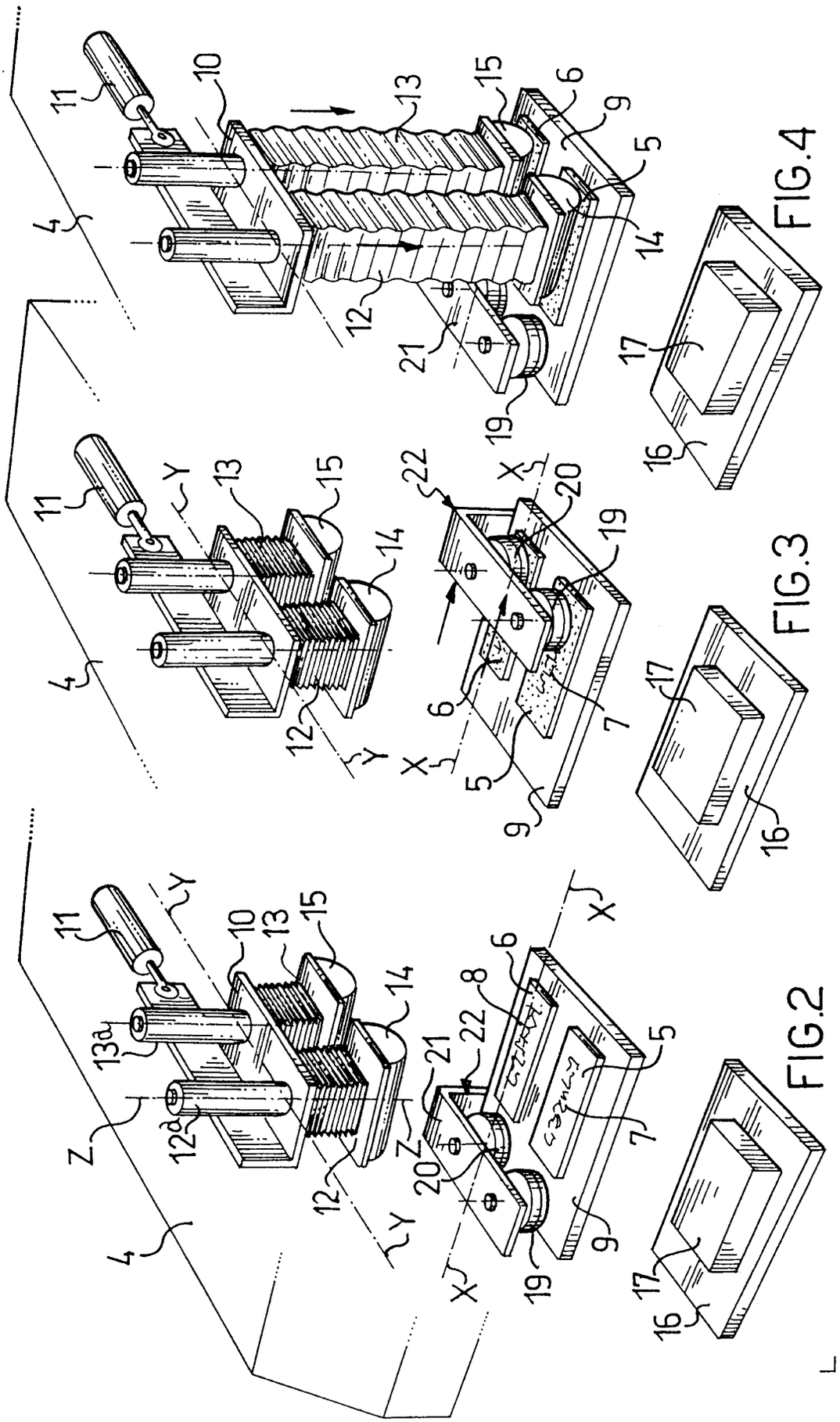


FIG.1


11
10
13
15
6
9
5
14
4
12
21
19
17
16
FIG.4
22
20
X
Y
FIG.3
13a
12a
Z
8
FIG.2

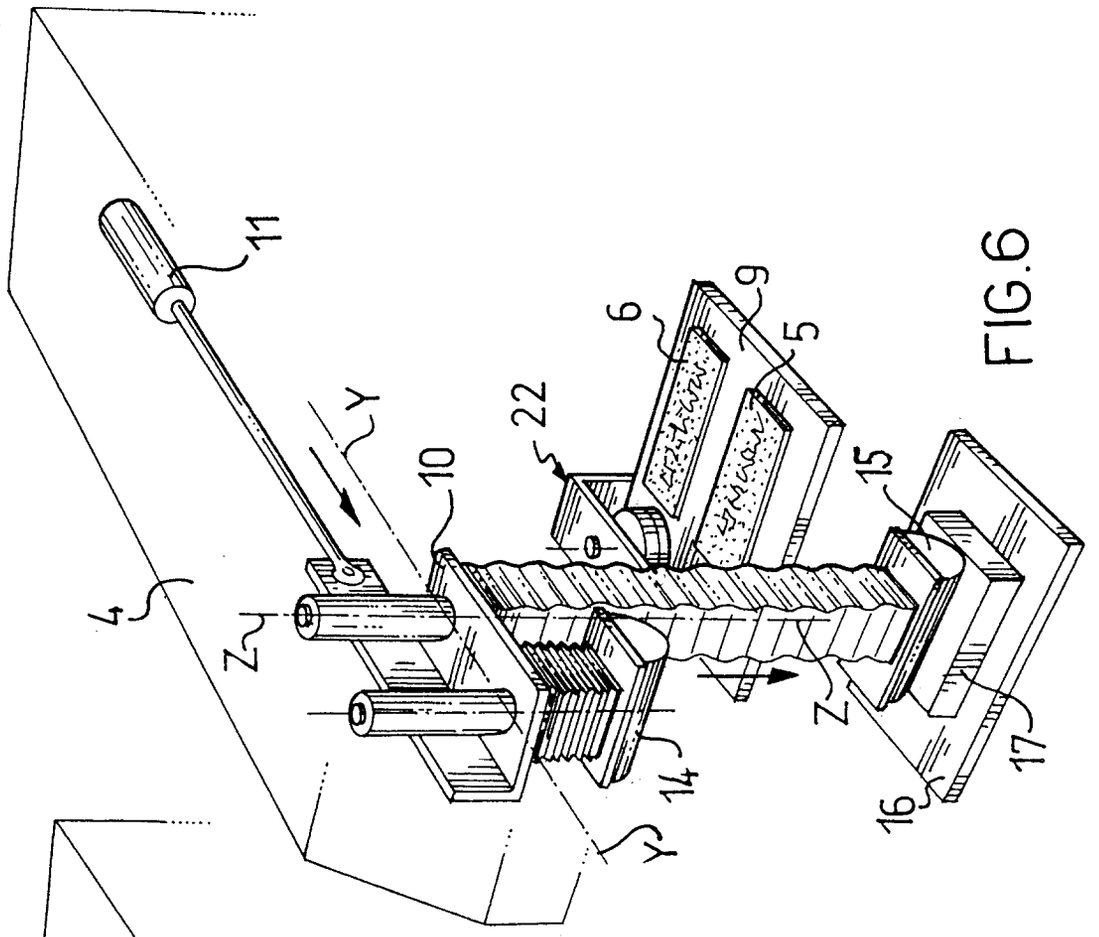

11
Y
10
22
6
9
5
15
4
Z
Z
14
Y
16
17

FIG.6

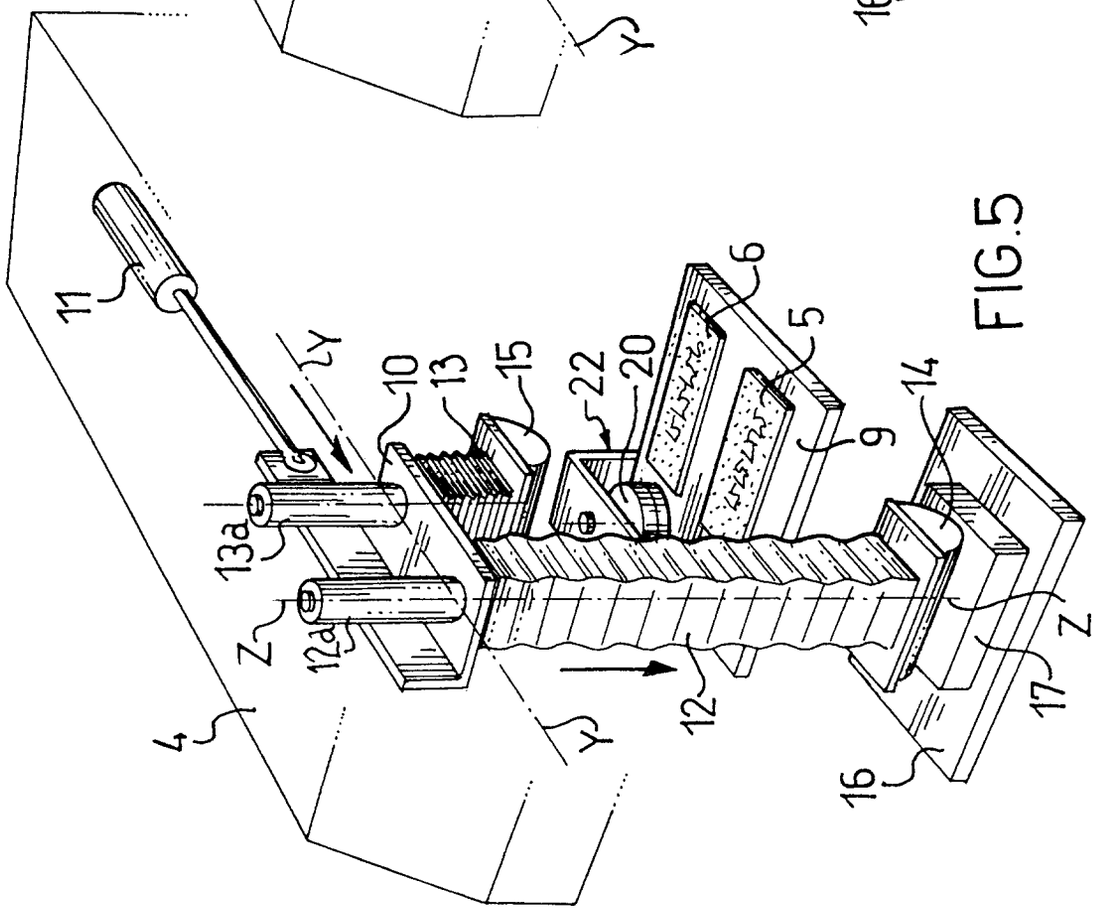

11
Y
10
13
15
22
20
6
5
14
9
13a
Z
12a
4
Y
12
16
17
Z

FIG.5