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(12) # EUROPEAN PATENT APPLICATION

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(71) Applicant: **DOBSON PARK INDUSTRIES PLC**
Dobson Park House Colwick Industrial Estate
Nottingham NG1 2BX(GB)

(72) Inventor: **Collison, Alan**
36 Lodge Farm Lane
Redhill Nottingham(GB)

(72) Inventor: **Chambers, John Allan**
14 Sherwood Grove Greenwood
Bingham Nottinghamshire(GB)

(74) Representative: **Brown, David Alan et al,**
MATHYS & SQUIRE 10 Fleet Street
London EC4Y 1AY(GB)

(54) **Toy printing apparatus.**

(57) Toy printing apparatus comprises a frame 14 adapted to support embossed printing elements 30, a backing plate 16 which can be connected to the frame 14 with a sheet of paper 72 and a sheet of carbon paper 74 sandwiched between the frame and the backing sheet. The frame and backing plate are fed through a pair of rollers 18 and 20 rotated by a handle 64, so that the pressure applied by the rollers causes an impression of the embossed printing elements to be transferred to the paper. The frame 14 has a number of cross-bars 32 and the printing elements 30 slide between the cross-bars so that they can be selectively arranged at different positions in the frame. Larger size printing elements 42 can be mounted on blank elements 38 slidable between the cross-bars.

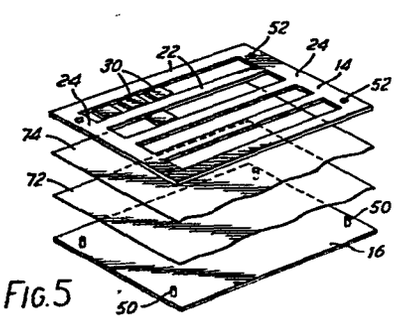

FIG.5

EP 0 085 502 A1

Toy printing apparatus

This invention relates to toy printing apparatus.

United States patent 4 253 394 describes a toy printing apparatus in which a printing frame carrying an embossed plate, a sheet of carbon paper and a sheet of paper is passed between two rollers so that, under pressure of the rollers, an impression of the pattern on the embossed plate is transferred to the paper. A disadvantage of such apparatus is that a separate embossed plate is needed for each pattern to be printed, so that the apparatus lacks flexbility in use.

This invention consists in toy printing apparatus comprising a frame adapted to support embossed printing elements, a backing plate arranged so that a sheet of paper and a sheet of carbon paper can be sandwiched between the frame and the backing plate, and means for effecting relative movement between the frame and a roller so that in use the roller applies pressure to the paper and carbon paper to cause an impression of the embossed printing elements to be transferred to the paper, in which the frame is adapted to support a plurality of discrete printing elements which can be selectively arranged at different positions in the frame.

Preferably, the frame has a number of parallel longitudinal mounting means each of which can receive a number of printing elements

arranged in a row. For example, the printing elements may include elements embossed with letters, so that the elements can be arranged in a row to form words to be printed.

In one form of the invention, the frame has a number of parallel cross-bars and the printing elements consist of blocks slidable in the gaps between adjacent cross-bars, each printing element having a pair of laterally extending lugs which project into and slide in longitudinal grooves formed in the cross-bars.

The printing elements may also include plates of width sufficient to span two or more of the cross-bars, the plates being mounted in the frame by means of pins on the plate engaging in holes in the frame or in support elements slidable between the cross-bars in the same manner as the smaller printing elements.

With the apparatus of the invention, selected printing elements can be mounted in a variety of arrangements in the frame, for example to print messages or to print various patterns.

The invention also includes a device for forming a decorative edging on a sheet of paper, comprising a housing containing two rotatable elements, drive means for rotating the elements, and guide means for feeding the peripheral portion of a sheet of paper between the rotatable elements, the surfaces of the elements which engage the paper being adapted

to act on the paper to give a decorative effect. In one form of the invention the elements have co-operating ridged surfaces adapted to produce an embossed strip along the edge of the paper. In another form of the invention, the elements have co-operating cutting edges adapted to cut the edge of the paper into a decorative shape, for example to give a zig-zag or scalloped edge to the paper.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of toy printing apparatus in accordance with the invention,

Figure 2 is a plan view of a printing frame forming part of the apparatus,

Figure 3 is a section on line III-III of Figure 2,

Figure 4 is a section on line IV-IV of Figure 2,

Figure 5 shows the arrangement of sheets of paper and carbon paper between the printing frame and a backing plate,

Figure 6 is a perspective view of a printing element of the apparatus,

Figure 7 is an exploded view of part of the apparatus, showing the drive to the printing rollers,

Figure 8 is an exploded view of a device in accordance with the invention for forming a decorative edge on a sheet of paper,

Figure 9 illustrates the decorative edge formed by the device of Figure 8,

Figure 10 illustrates another form of device for forming a decorative edge,

Figure 11 illustrates the decorative edge formed by the device of Figure 10, and

Figure 12 illustrates an embodiment of the invention in which the printing apparatus is contained in a carrying case.

Referring to the drawings, a toy printing apparatus comprises a housing 10 having a horizontal flat surface 12 on which a frame 14 and backing plate 16 can be fed between two rollers 18 and 20.

The frame 14 consists of a number of equally spaced, parallel cross-bars 22 extending between two end members 24. Each cross-bar 22 is formed in its opposite sides with grooves 26 (except for the two outermost cross-bars, which each have only one groove, on the inwardly facing side). At one end of each cross-bar 22 portions of the upper part of the cross bar are cut away at 28 to allow access to the grooves 26.

The frame 14 receives printing elements 30, each of which consists of a rectangular block 31 having a thickness approximately equal to the thickness of the cross-bars 22 of the frame. Each block 31 has two lugs 32 extending from opposite sides 34 of the block. The width between the sides 34 is slightly less than the gap between adjacent cross-bars 22, and the lugs 32 are dimensioned so as to fit into the grooves 26 in the cross-bars, so that the block can move in the gap between the cross-bars with the lugs sliding in the grooves. Each block 30 can be inserted between any pair of adjacent cross-bars by positioning the lugs 32 in the open portions 28 of grooves 26 and sliding the block away from the adjacent end member 24. Each block 31 is formed on one face with an embossed character 36, which may for example be a letter or a numeral. The opposite face may be marked with a representation of the character, so that the indentities of the printing elements can be seen from above when the elements are fitted into the frame 14.

The printing elements also include spacer blocks 38 which are similar to the blocks 30 except that they are not formed with embossed characters. The spacer blocks 38 can be positioned between character blocks 31, for example to define spaces between words set up on the frame 14. In addition, the spacer blocks 38 can be used to mount larger printing elements, such as element 42 which consists of a plate of width sufficient to overlie two or more adjacent cross-bars 22. To this end each spacer block 38 has a bore 40 which can receive a peg 44 projecting from one face of the plate 42. The plate 42 has one or more pegs which can be push-fitted into the bores in one or more spacer blocks 38 positioned appropriately on the frame 14, to support the plate on the frame. The other face of the plate 42 is formed with an embossed pattern 46.

The backing plate 16 is a relatively rigid, flat plate having projecting pegs 50 which fit into co-operating holes 52 in the end members of frame 14, so that the frame 14 and backing plate 16 can be releasably joined together.

The rollers 18 and 20 are mounted one above the other in a head 56 of the housing 10, so that the frame 14 and backing plate 16 can be placed on the surface 12 and fed between the rollers. The upper roller 18 has a shaft 58 of hexagonal cross-section which projects from one end of the roller. A bevel gear 60 fixed to shaft 58 is in engagement with a gear 62 rotatable about a vertical axis by means of a handle 64.

The lower roller 20 is freely rotatable about its axis. The vertical spacing between the axis of the two rollers can be adjusted by means of adjusting screws 66 which act against the shaft 68 of the lower roller 20 to accommodate paper of different thicknesses.

In operation, printing elements 30 are loaded into the frame 14, a sheet of paper 72 is placed on the backing plate 16, a sheet of carbon paper 74 is laid over the paper 72, with the carbon side down, and the frame is placed on top of the carbon paper and pressed into position on the backing plate, the pegs 50 fitting into the holes 52 in the frame 14. The frame and backing plate are then placed on the surface 12 of the housing 10, with the backing plate lowermost, and moved into engagement with the rollers 18 and 20. The handle 64 is turned to rotate the upper roller 18, so that the frame and backing plate, with the enclosed paper and carbon paper, are drawn between the rollers, until they emerge from the other side of the head 56 and can be removed from the housing. During the passage between the rollers, the pressure exerted by the rollers causes impressions of the embossed faces of the printing elements 30 to be formed on the paper 72 by the carbon paper 74. The frame 14 and backing plate 16 are then separated and the paper removed.

The apparatus also includes a device 80 by means of which embossed edges can be formed on the sheets of paper. The device comprises a housing 82 in which are mounted two intermeshing

rollers 84 and 86, each formed with fine teeth to give a corrugated curved surface 88. The rollers are mounted for rotation about vertically spaced parallel axes. The upper roller 84 has a hexagonal bore 90 which engages over a projecting part 92 of the shaft 58 of printing roller 18 when the device 80 is positioned in a recess 94 formed in the housing 10 adjacent the head 56, so that the rollers 84 and 86 can be rotated by turning handle 64. The housing 82 of device 80 has a slot 96 in its front wall 98 and slots 100 in its side walls, the slots 100 leading into guide passages 102 which act to guide a sheet of paper fed into one slot 100 to run between the embossing rollers 84 and 86.

In operation of the device 80, the peripheral portion of a sheet of paper is fed into one of the slots 100, and the handle is turned to rotate the embossing rollers 84 and 86 so that the paper is drawn between the rollers, the paper emerging from the other slot 100. The embossing rollers 84 and 86 act to emboss a decorative strip 104 (Figure 9) along the edge of the sheet of paper.

The apparatus may include other devices similar to device 80, but with the embossing rollers 84 and 86 replaced by other elements for producing a decorative edge on a sheet of paper. For example, Figure 10 illustrates a device in which the embossing rollers are replaced by two cutter wheels 106 and 108, each having teeth 110 formed on an axial face and providing a zig-zag

cutting edge 112 on the periphery of the wheel. The cutter wheels are arranged so that the teeth 110 on one wheel 106 mesh with the teeth on the other wheel 108, with the wheels overlapping one another by only a small distance so that the edge portion of a sheet of paper can be fed between the wheels. The wheels are biased towards one another by a spring 111. Rotation of the cutter wheels causes the edge of the paper to be cut-away in a zig-zag fashion, as shown in Figure 11.

The flat surface 12 on which the frame 14 moves is bounded by two raised guides 114 which guide the frame as it is moved to the rollers 18 and 20. The surface 12 may be formed on a rectangular plate 116 hinged to the housing 10 along one edge 118 so that it can be raised to allow access to a storage compartment (not shown) in the housing below the plate. The storage compartment may be used to hold a compartmented tray for storing the printing elements 30 and spacer blocks 38.

Figure 12 illustrates an embodiment of the invention in which printing apparatus as shown in Figures 1 to 7 is provided with a carrying case 120. The printing apparatus is removably housed in the lower part 121 of the case, so that it can be operated either in the case, as shown in Figure 7, or after it has been removed from the case. The apparatus may be supported in the lower part of the case in such a way as to leave a space between the bottom of the apparatus and the case, which can be used to store sheets of paper and carbon paper. The handle 64 is removable, to make the apparatus more compact when not in use, and a suitably

shaped recess 122 is provided in the housing 10 to receive the handle.

The upper part 124 of the case is hinged to the lower part 121 and co-operating catch members 125 on the upper and lower parts are provided to hold the case closed. On the inner face of the upper part 124 are provided a rigid pocket 126 to house two of the edging devices 80, and flexible pockets 127 which may be used for example to hold pencils or the like. Thus, the printing apparatus and all the accessories and materials required to use the apparatus, as well as useful ancillary articles such as pencils, can be neatly and conveniently stored in the carrying case.

It will be appreciated that modifications could be made in the described embodiment. For example, the large printing elements 42 could be mounted directly onto the frame 14, the pins 44 engaging in suitably positioned holes in the cross-bars 22. The means for releasably holding the frame and backing plate could take other forms.

CLAIMS:

1. Toy printing apparatus comprising a frame adapted to support embossed printing elements, a backing plate arranged so that a sheet of paper and a sheet of carbon paper can be sandwiched between the frame and the backing plate, and means for effecting relative movement between the frame and a roller so that in use the roller applies pressure to the paper and carbon paper to cause an impression of the embossed printing elements to be transferred to the paper, characterised in that the frame is adapted to support a plurality of discrete printing elements which can be selectively arranged at different positions in the frame.

2. Apparatus as claimed in claim 1, in which the frame has a number of parallel longitudinal mounting means each of which can receive a number of printing elements arranged in a row.

3. Apparatus as claimed in claim 2, in which the frame has a number of parallel cross-bars and the printing elements consist of blocks slidable in the gaps between adjacent cross-bars, each printing element having a pair of laterally extending lugs which project into and slide in longitudinal grooves formed in the cross-bars.

4. Apparatus as claimed in claim 3, in which the printing elements also include plates of width sufficient to span two or

more of the cross-bars, the plates being mounted in the frame by support means releasably securing the plate to the frame or to support elements slidable between the cross-bars.

5. Apparatus as claimed in claim 4, in which the support means comprises pins on the plate engaging in holes in the cross-bars or in the support elements.

6. Apparatus as claimed in any preceding claim, in which the roller is rotatable about a fixed axis and the frame and backing plate are movable between the roller and a second roller rotatable about an axis parallel to and spaced from the axis of rotation of the fixed roller, the means for effecting relative movement between the frame and the roller comprising drive means for rotating at least one of the rollers, and in which the drive means is arranged also to drive a device for forming a decorative edge on a sheet of paper.

7. Apparatus as claimed in claim 6, in which the device for forming a decorative edging comprises a housing containing two rotatable elements, means for coupling the elements to the drive means, and guide means for feeding the peripheral portion of a sheet of paper between the rotatable elements, the surfaces of the elements which engage the paper being adapted to act on the paper to give a decorative effect.

8. A device as claimed in claim 7, in which the elements have co-operating ridged surfaces adapted to produce an embossed strip along the edge of the paper.

9. A device as claimed in claim 7, in which the elements have co-operating cutting edges adapted to cut the edge of the paper into a decorative shape, for example to give a zig-zag or scalloped edge to the paper.

10. A device for forming a decorative edging on a sheet of paper, comprising a housing containing two rotatable elements, drive means for rotating the elements, and guide means for feeding the peripheral portion of a sheet of paper between the rotatable elements, the surfaces of the elements which engage the paper being adapted to act on the paper to give a decorative effect.

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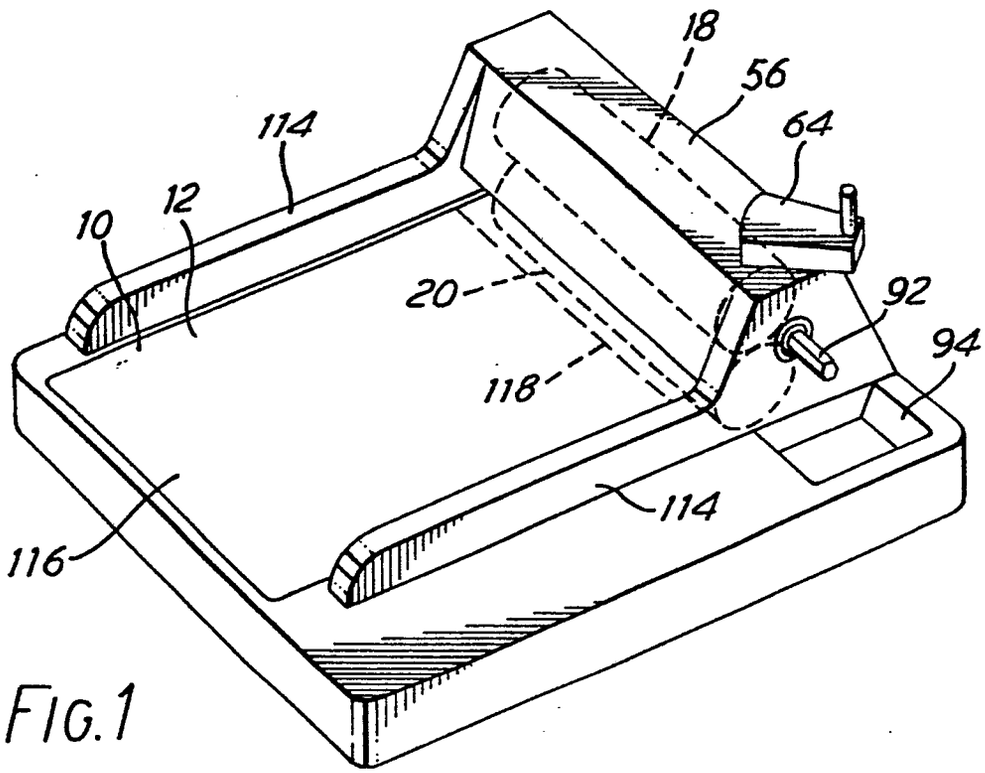

FIG. 1

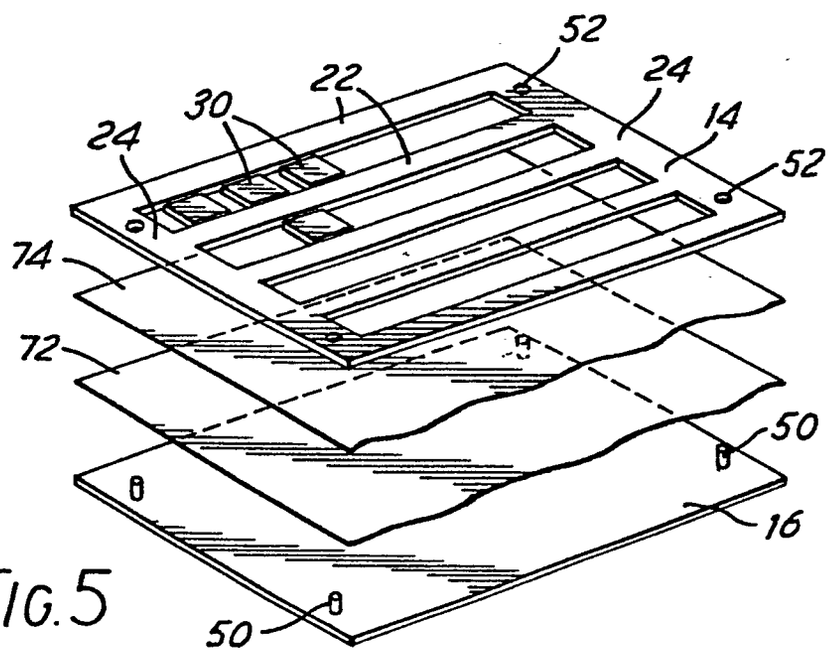

FIG. 5

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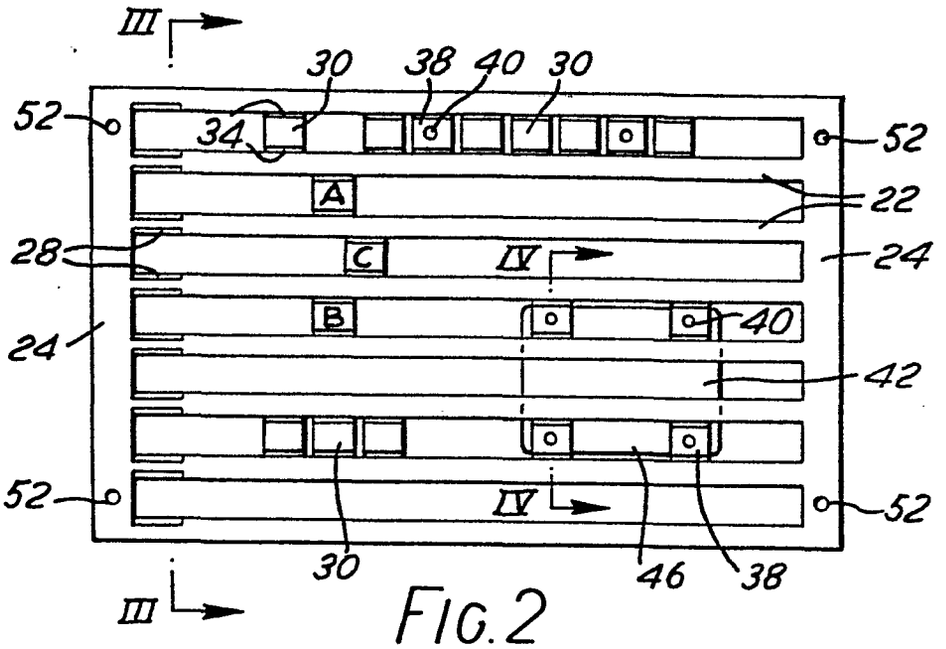

FIG. 2

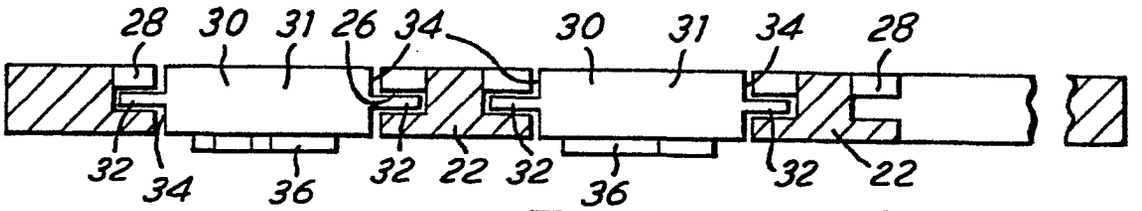

FIG. 3

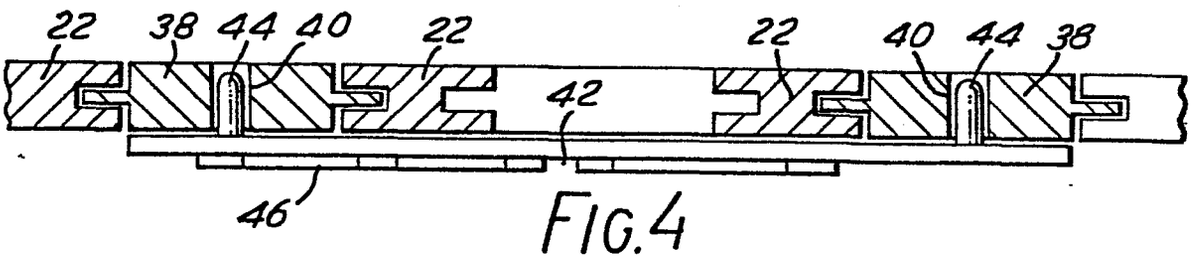

FIG. 4

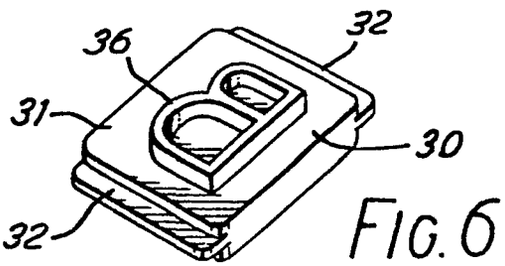

FIG. 6

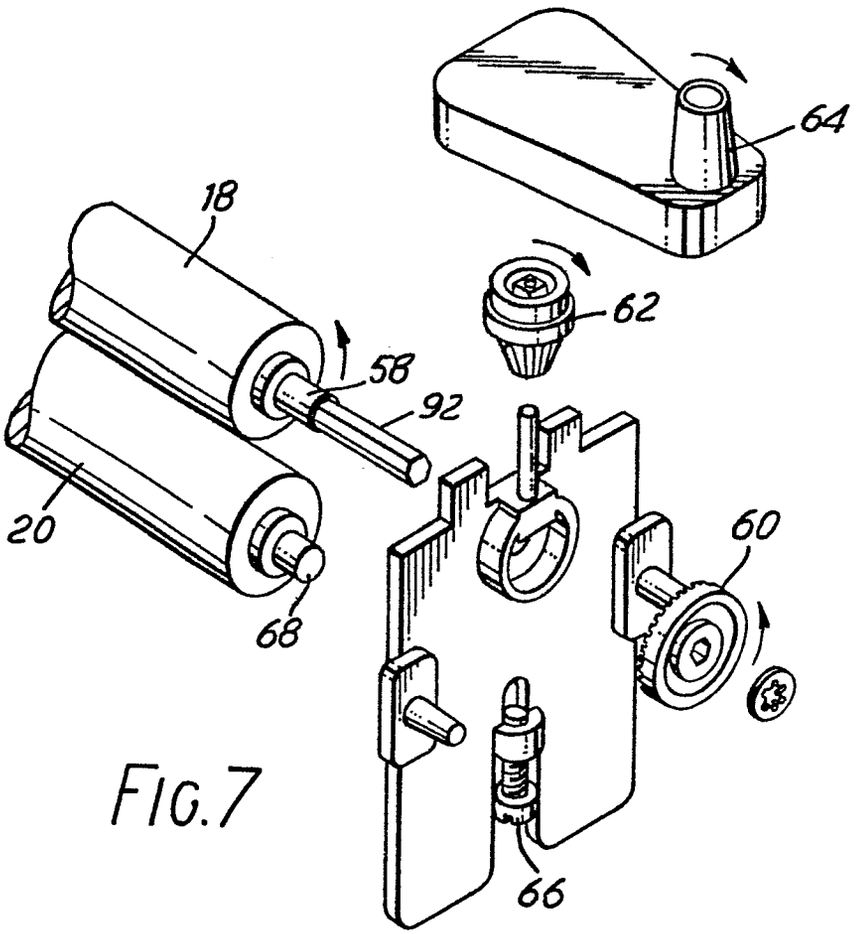

FIG.7

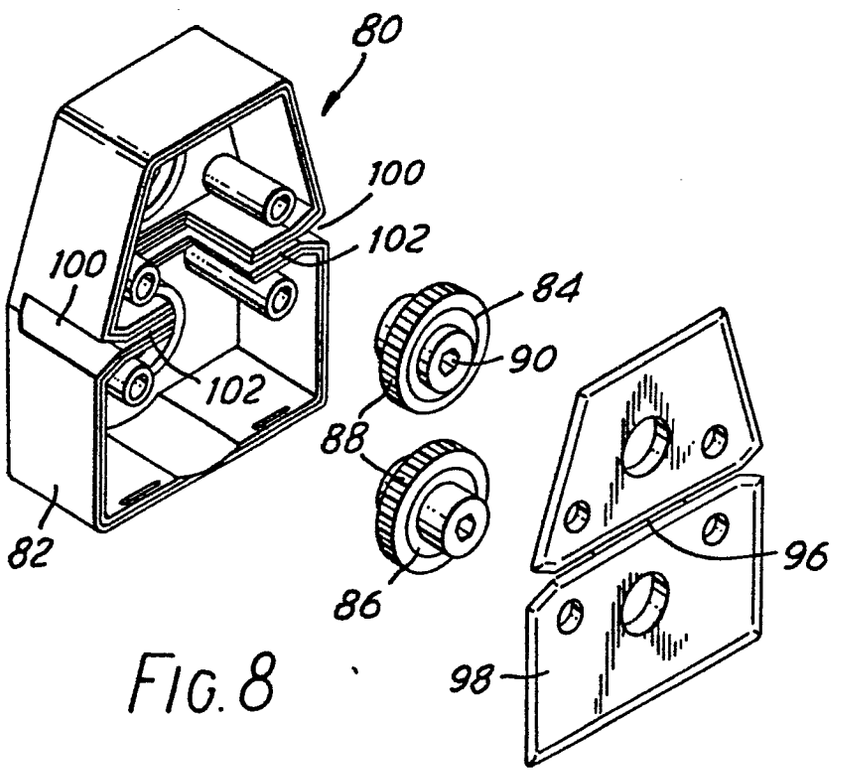

FIG.8

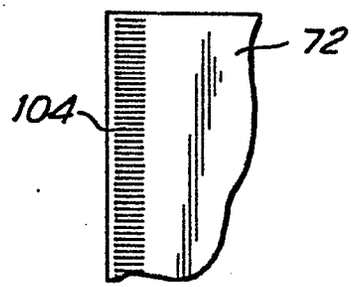

FIG. 9

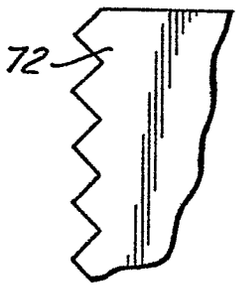

FIG. 11

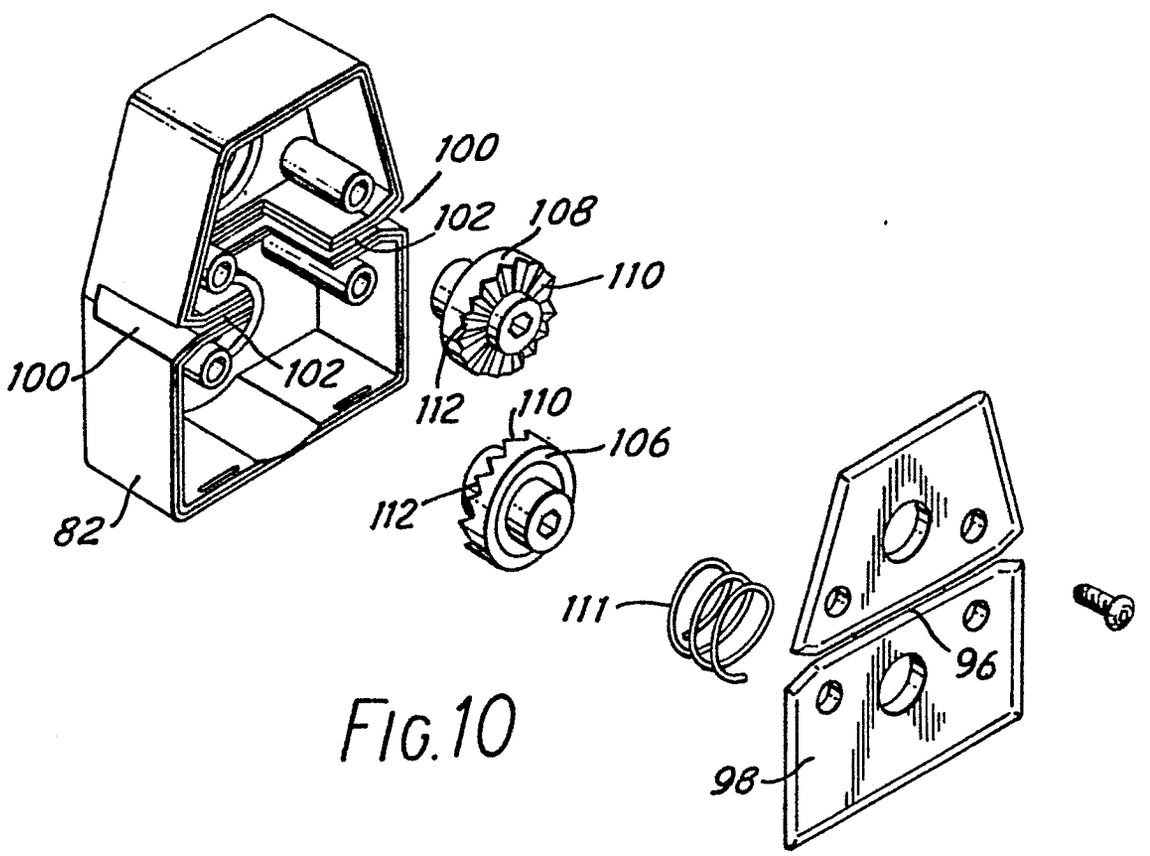

FIG. 10

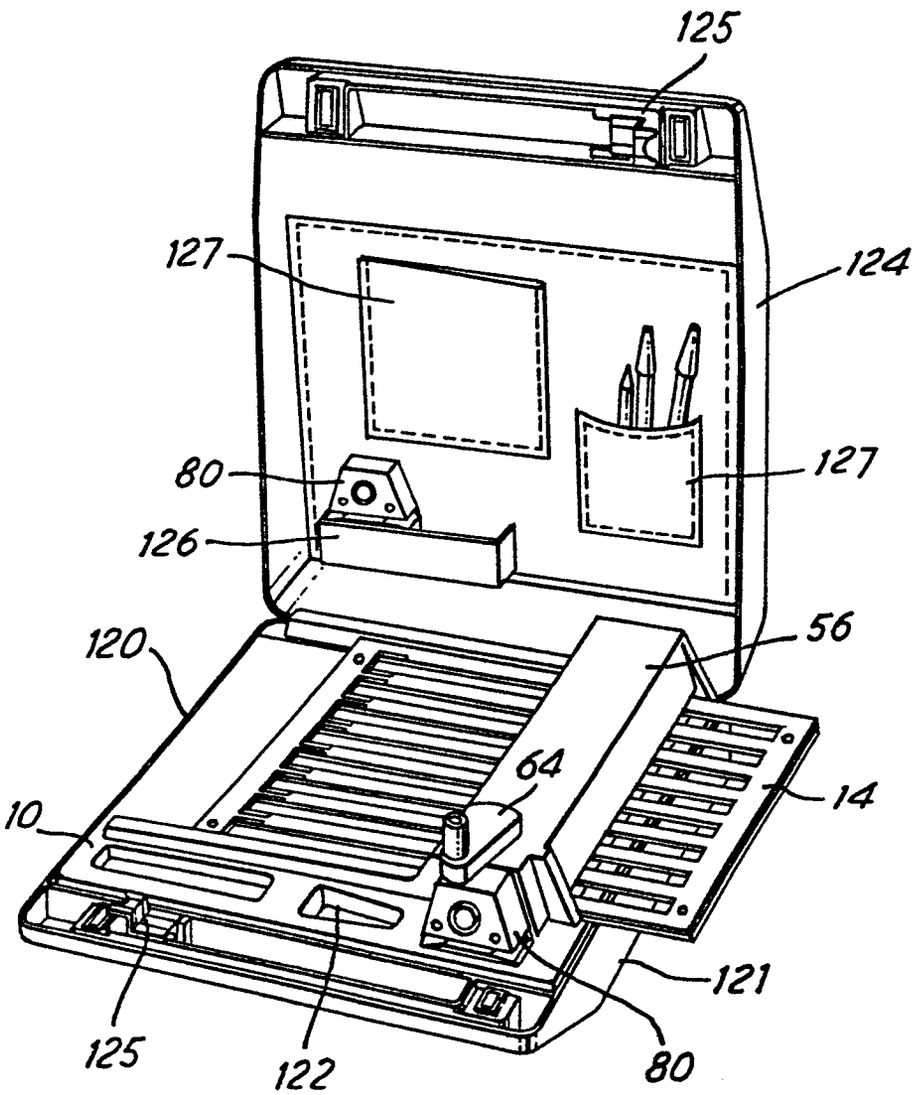

FIG. 12

European Patent Office

EUROPEAN SEARCH REPORT

0085502
Application number

EP 83 30 0243

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
D,Y	US-A-4 253 394 (TADA) *Claim 1; figures*	1	A 63 H 33/30
A		6	

Y	US-A-1 411 381 (RUFFALO) *Page 1, lines 40-97; figures*	1	
A		2,3	

Y	FR-A-1 165 485 (CUBIZOLLES) *Abstract; figures*	1	
A		2,3	
	---		TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
A	US-A-2 842 202 (BOYD) *Claim 1; figures*	6,10	A 63 H B 41 F B 41 L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	03-05-1983	VANRUNXT J.M.A.

CATEGORY OF CITED DOCUMENTS

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