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(54) Information recording devices.

(57) The device 10 comprises a printer 12 having dual printing heads 13 and 14 mounted one above the other on a carrier 15 so as to be moveable simultaneously in parallel spaced relationship as drive shaft 16 rotates and progresses carrier peg 39 along spiral groove 40 in the shaft 16. As the printing heads 13, 14 move their print needles impinge through ink-ribbon 35 upon a document immovably held between a document platen 21 and a platen damp-plate 22. The opening and closing of the clamp-plate 22 with respect to the platen 21 is controlled by a substantially cylindrical cam 26 rotatable by a solenoid 25 through level 27 and linkage 28. The solenoid 25 is activated when the inserted document passes in front of a document sensor 32 facing the document platen 21 through a gap 34 in the platen clamp-plate 22.

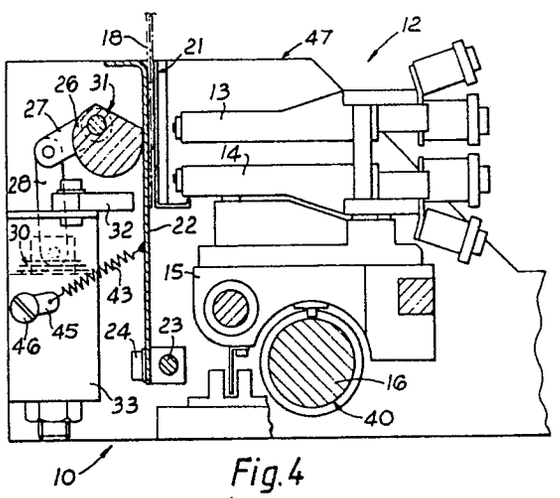


Fig.4

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INFORMATION RECORDING DEVICES

This invention concerns information recording devices, and more particularly but not exclusively such devices for use in betting shops, bookmakers, turf accountants and like premises, for permanently recording on betting tickets or slips introduced into the device any desired information relating to bets taken.

Conventional such recording devices comprise a housing containing a single head dot-matrix printer. Adjacent the printer, the housing has an external opening allowing for the insertion of a betting ticket or slip into the opening so that it comes into register with the printer. Such recording devices are intended to take betting tickets or slips usually having at least two sheets detachable from one another. Typically the sheets are secured to each other (e.g. by an adhesive) at or adjacent their respective top margins so that they lie one on top of the other and with the bottom margin portion of the bottom sheet extending below the bottom margin portion of the top sheet. The top sheet is blocked-off into printed sections and the bottom sheet is blank and self-carboning. The top sheet is for retention by the betting shop and the bottom sheet is the customers copy.

In premises such as betting shops, bookmakers and turf accountants, the betting slips are held in appropriate dispensers distributed throughout the premises. Persons coming into the premises to place a bet e.g. on a horse race, each take a betting slip or slips from one of the dispensors. In some of the printed sections on the top sheet of the betting slip they write details of their bet, these details being automatically copied on the bottom sheet due to the fact that it is self-carboning. The completed betting slip is then taken to a cashier who places the betting slip bottom margins end first into the appropriate opening of a conventional recording device located conveniently on or adjacent the till.

The betting slip is inserted into the opening of the recording device so that the bottom margin portion of the top sheet comes into line with the single head dot-raster matrix printer. The printer is connected to a micro-processor memory of the device, said memory containing any desired information such as the precise time of the bet, cashiers reference number etc. Automatically, the printer moves in a linear fashion to print information in the form of a row of characters across the bottom margin portion of the betting slip. These characters are carboned onto the bottom sheet at the same time. However, for security reasons (e.g. prevention of fraud) the identical row of characters must be printed directly on the bottom margin portion of the bottom sheet.

Consequently, after the row of characters is printed on the bottom margin portion of the top sheet, the betting slip is engaged by pinch-rollers of the device and is moved by the rollers until the bottom margin portion of the bottom sheet comes into line with the head of the printer. Once this occurs, the same row of characters is printed on the bottom margin of the bottom sheet. Thereafter the betting slip is released from the pinch-rollers and can be removed from the printer whereafter the cashier detaches the two sheets giving the bottom sheet to the customer on payment of the stake money and keeping the top sheet.

The known printing devices as aforesaid have several disadvantages.

Firstly, they are comparatively slow in processing the betting slip so that it has on it the desired printed information. The head of the printer takes about two seconds to print a single row of characters and to return to its tarting position in order to print the other row of characters. It also takes a small amount of time for the betting slip to be engaged and advanced by the pinch-rollers before the other row of characters can be printed.

In all it may take from six to ten seconds for the betting slip to be processed by the device so that it has printed on it all the desired information. This may not seem long but it can be too long when the cashier is trying to serve a queue of people trying to place their bets before the start of a particular event. If the cashier is impatient, the betting slip can be torn in the device if it is pulled out before it is released by the pinch-rollers.

Secondly, if the betting slip is not properly engaged by the pinch-rollers it can slip therebetween so that it is not properly aligned with the head of the printer and thereby misprinted or otherwise spoilt. This would slo down the processing of betting tickets by the cashier. It can also lead to fraud on the part of the cashier.

It is an object of the present invention to provide an information recording device which does not have the disadvantages of the known devices.

With this object in view the present invention provides an information recording device, for recording information on documents, comprising an housing having an opening for the insertion of documents and containing printing means having a plurality of associated printing heads moveable in simultaneous parallel relationship, a document sensor within the opening, document retention means for the stationary retention of documents inserted within the opening so that the printing heads can impinge on the documents, and actuation means

for the document retention means operative on actuation of the document sensor, characterised in that the document retention means comprises a fixed platen for the documents and a platen clamp-plate which is moveable relative to the platen.

With the device of the present invention there is no need to employ pinch rollers to take up the inserted document so that it can be moved to ensure full use of the printing heads. Furthermore, the movement of the printing heads in simultaneous parallel relationship ensures fast and accurate printing of two or more lines of parallel print, of either identical or non-identical information, on the inserted document which considerably reduces document processing time as compared to known devices.

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

Fig. 1 is a schematic view of a typical form of document for use with the information recording device of the invention;

Fig. 2 is a simplified perspective view of part of a preferred embodiment of the information recording device of the invention showing how the document of Fig. 1 is inserted into its housing through an opening therein;

Fig. 3 is a detailed side elevation of the preferred embodiment of Fig. 1 with its housing removed;

Fig. 4 is an unobstructed enlarged view of part of the side elevation of Fig. 3;

Fig. 5 is an end elevation of the preferred embodiment of Figs. 2 to 4 with the housing shown in Fig. 2 removed; and

Fig. 6 is a plan view of that part of the preferred embodiment shown in Fig. 4.

The essential features of the preferred embodiment of the information recording device will now be described primarily with reference to Figs. 2 to 6.

The preferred information recording device 10 comprises a substantially box-like housing 11 of, for example, sheet metal or extruded plastics, which housing can be secured to a cash register or till (not shown).

Contained in the housing 11 is printing means in the form of a storage dot-raster matrix printer 12 having twin seven-pin print heads 13 and 14. The printer 12 is mounted on a carrier 15 which in turn is associated with a drive shaft 16 mounted on a spindle 41 the movement of which is controlled by a motor/tachometer generator 50.

The housing 11 has an opening 17 which extends parallel to the plane of movement of the print heads 13 and 14. The opening 17 allows the insertion of documents onto which information is desired to be recorded. Fig. 1 shows such a document which as evident is in the form of a betting ticket or slip 18 having two detachable portions 19, 20 which overlap one another in the region of their respective bottom margins while being attached in the region of their respective top margins e.g. by a strip of adhesive.

The housing 11 also contains document retention means for retaining inserted documents in a stationary fashion closely adjacent the printing heads 13, 14 so that the documents can be impinged upon by the latter. As will be appreciated, the document retention means is disposed within the opening 17 of the housing 11 and comprises a document platen 21 and a moveable platen clamp-plate 22.

The platen clamp-plate 22 is hinged on a spindle 23 at its end remote from the document platel 21 by means of, for example, screws 24.

hinged axis i.e. about spindle 23, from its open position as shown in Fig. 3 to its closed position as shown in Fig. 4, is effected by actuation means which consists of a solenoid 25 and a substantially cylindrical cam 26 which is mounted in an axially off-set manner on a cam operating lever 27 which in turn is hinged in a secure fashion to a cam operating linkage 28. The solenoid 25 has a moveable core 29 to the exposed end of which is pivotally mounted the cam operating linkage 28. The core 29 has a return spring 30.

The cylindrical cam 26 has a longitudinally-extending flat portion 31 against which the platen clamp-plate 22 rests when in its open position as shown in outline in Fig. 3.

A document sensor 32 is mounted on an L-shaped mounting plate 33 which is attached to the side of the solenoid 25. The document sensor 32 is a reflective infra-red sensor and it faces the document platen 21 through a gap 34 in the platen clamp-plate 22.

The preferred embodiment of the information recording device of the invention will be better understood from the following description of its operation.

A document, in this case the betting slip 18, is inserted into the opening 17 of the housing 11 generally in the direction indicated by the arrow shown in Fig. 2. It will be appreciated that the position of the platen clamp-plate 22 as the betting slip 18 is inserted is that shown in Fig. 3.

The betting slip 18 after its insertion into the opening 17 passes in front of the document sensor 32. Normally in the absence of any document such as the betting slip 18 infra-red light emitted from the sensor 32 falls on an ink ribbon 35 (which is shown in dot-dash outline in Figs. 3 and 6), arranged on a ribbon spool 36, which is guided in the region of the document platen 21 and the printing heads 13, 14 by means of respective guide posts

37. Little or none of the infra-red light emitted by the sensor 32 is reflected from the ribbon 35 back to a light receiving part of the sensor 32. However, when the slip 18 comes in front of the sensor 32 light is reflected back from the slip 18 to the light receiving part of the sensor 32. This results in a change the level of voltage in the sensor 32, which voltage change is used to energise the solenoid 25.

Upon energisation of the solenoid 25 its moveable core 29 is retracted under the action of its return spring 30 which in turn rotates the cam 26 through the cam operating lever 27 and the cam operating linkage 28. As the cam 26 rotates its curved surface runs up against the back of the platen clamp-plate 22 moving the latter towards the document platen 21 until it comes up against platen clamp-plate stop 38 (Fig. 6). At this point the betting slip 18 is held securely between the document platen 21 and the platen clamp-plate 22 as shown in Fig. 4.

The motor/tachometer generator 50 is now activated and this in turn activates the drive shaft 16 through drive gears 42 and spindle 41. In addition print timing signals for the printings heads 13, 14 are generated from the generator 50.

The printer carrier 15 is moved by the turning drive shaft 16 in that its carrier peg 39 is entrained to move along a spiral groove 40 in the drive shaft 16.

As the carrier 15 moves on the drive shaft 15 the printing heads 13, 14 of the printer 12 move with it in simultaneous parallel relationship. As this happens printing head pin solenoids are energised by the timing signals generated by the motor/tachometer generator 50. The pins of both printing heads 13, 14 are activated to strike the betting slip 18, held between the platen 21 and the clamp-plate 22, through the ink ribbon 35.

As the printing head pin solenoids are activated by the same timing signals they are able to generate rows 44 (Fig. 1) of identical print. As shown in Fig. 1 each row 44 of print can be on a separate portion 19, 20 of the betting slip 18. The printing of the rows 44 is accomplished in one right to left (as viewed in Fig. 5) traverse movement by the two printing heads 13, 14 giving a print speed for eighty characters (40 per row) of approximately 440 milliseconds.

After the parallel rows 44 of information have been printed, but before the carrier 15 of the printer 12 moves back to its starting position taking the printing heads 13, 14 with it, the solenoid 25 is de-energised. Thus the moveable core 29 of the solenoid 25 returns to its rest position under the action of its return spring 30 and this counter-rotates the cam 26 through level 27 and linkage 28. Once the flat portion 31 of the cam 26 is more or less facing towards the platen clamp-plate 22 the latter can move away from the platen 21 under the action of a return spring 43 connected to the platen clamp-plate 22 and the mounting plate 33, to the latter of which it is connected by an eyelet 45 and a screw 46, until the platen clamp-plate 22 abuts the flat portion 31 of the cam 26. The betting slip 18 can now be removed from between the platen 21 and the clamp-plate 22 and indeed from the opening 17 of the housing 11.

It is to be noted from the drawings that the preferred device has a pair of side plates 47. 48 for supporting various components of the device such as, for example, the spindle 41 of the drive shaft 16.

It will be appreciated that the information recording device of the invention can record information on documents other than betting slips such as for example cheques. Indeed it could be used in shops and department stores in conjunction with bank card or credit card readers for the speed translation of information on such cards onto the front and/or back of cheques or credit card vouchers.

The preferred device of the invention is ideally provided with a micro-processor which is programmable and serves for the control of the operation of the various component parts of the device.

Claims

1. An information recording device, for recording information on documents, comprising a housing having an opening for the insertion of documents and containing printing means having a plurality of associated printing heads moveable in simultaneous parallel relationship, a document sensor within the opening, document retention means for the stationary retention of documents inserted within the opening so that the printing heads can impinge on the documents, and actuation means for the document retention means operative on actuation of the document sensor, characterised in that the document retention means comprises a fixed platen for the documents and platen clamp-plate which is moveable relative to the platen.

2. A device as claimed in claim 1 wherein the platen clamp-plate is hinged on a spindle at its end remote from that end thereof adjacent the document platen.

3. A device as claimed in claims 1 or 2 wherein the actuation means comprises a solenoid and a substantially cylindrical cam mounted in an axially off-set manner on a cam operating lever mounted in a hinge-like manner on cam operating linkage which in turn is pivotally mounted on the solenoid's moveable core.

4. A device as claimed in claim 3 wherein the cylindrical cam has a longitudinally-extending flat portion against which the platen clamp-plate rests when in its open position.

5. A device as claimed in any preceding claim wherein the document sensor is a reflective infra-red sensor.

6. A device as claimed in claim 5 wherein the infra-red sensor is mounted on an L-shaped mounting plate, which is attached to the side of the solenoid, and faces the document platen through a gap in the platen clamp-plate.

7. A device as claimed in any preceding claim wherein the printing means is a storage dot-raster matrix printer.

8. A device as claimed in claim 7 wherein the printer has twin seven-pin print heads arranged one above the other.

9. A device as claimed in claim 7 or 8 wherein the printer is mounted on a carrier which in turn is associated with a drive shaft mounted on a spindle the movement of which is controlled by a motor/tachometer generator.

10. A device as claimed in claim 9 wherein the carrier has a carrier peg and the drive shaft has a spiral groove in which the carrier peg moves upon rotation of the drive shaft.

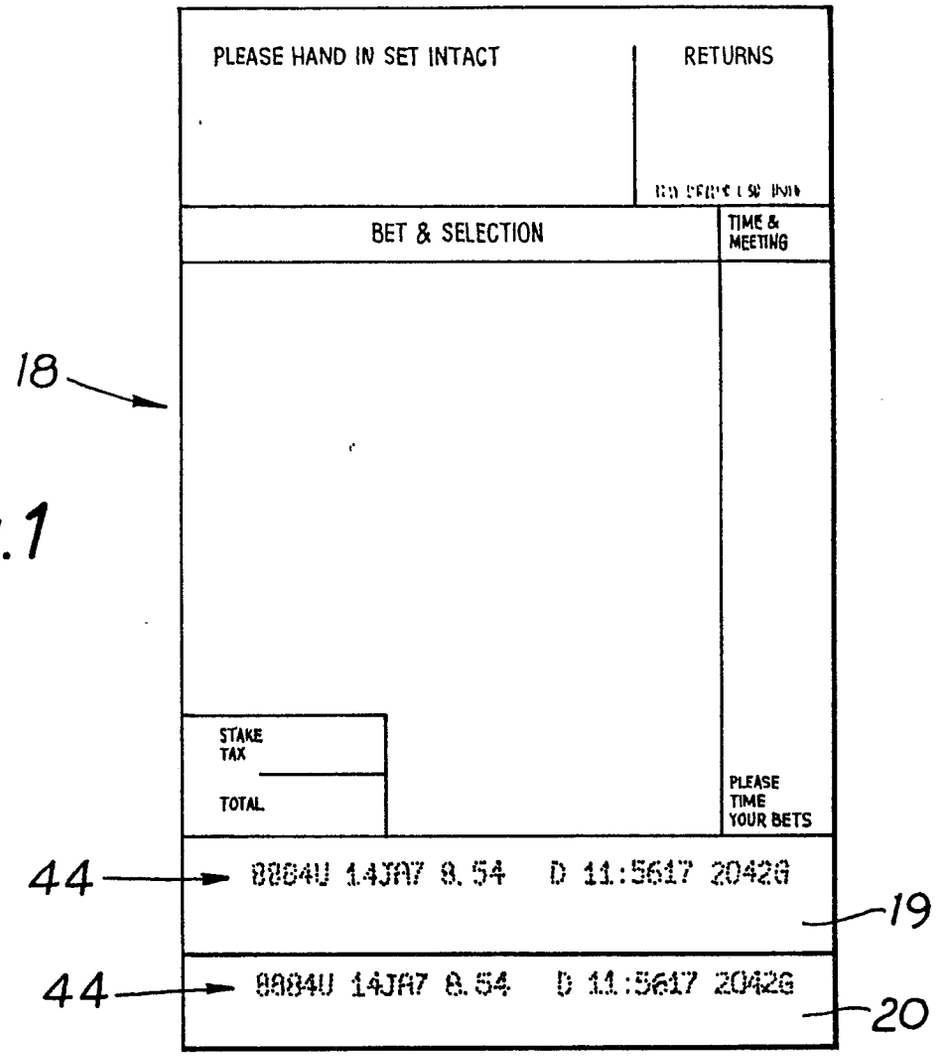

PLEASE HAND IN SET INTACT
RETURNS
BET & SELECTION
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Fig.1

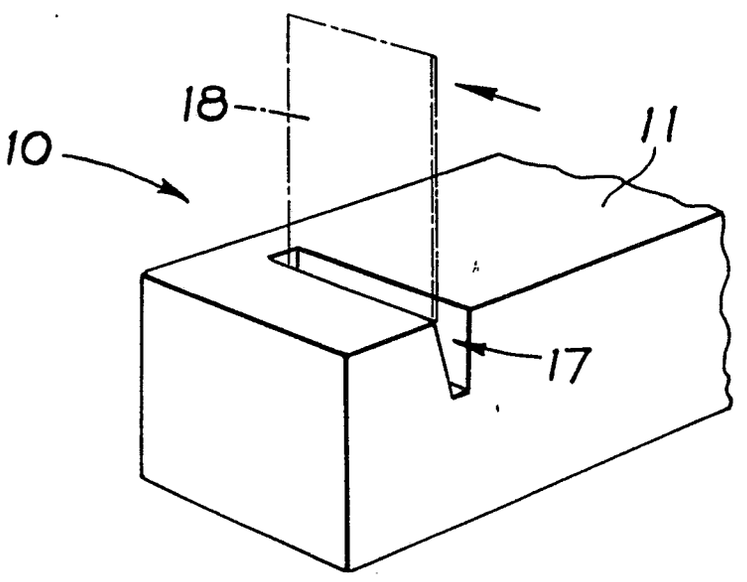

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Fig. 2

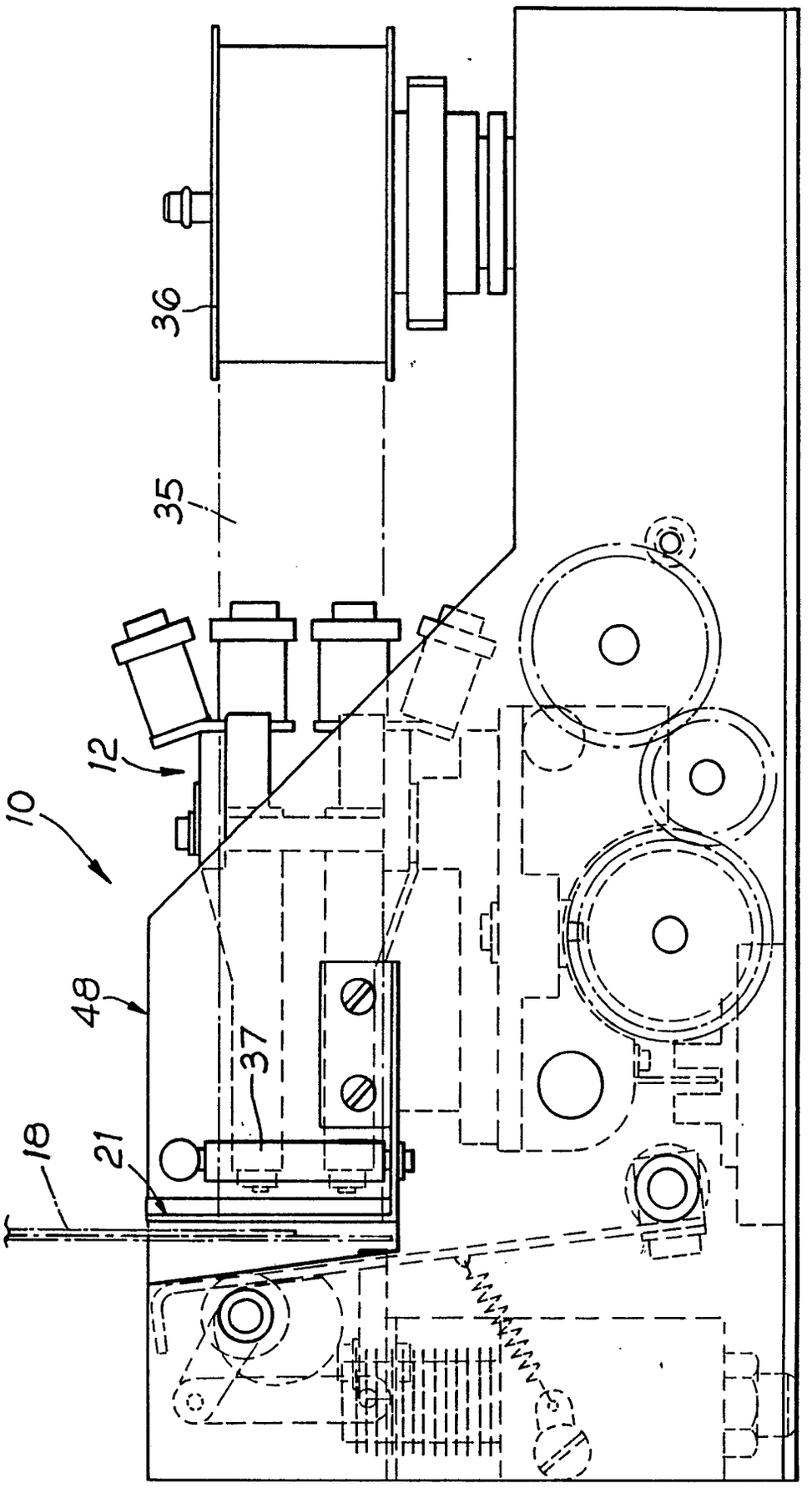


Fig. 3

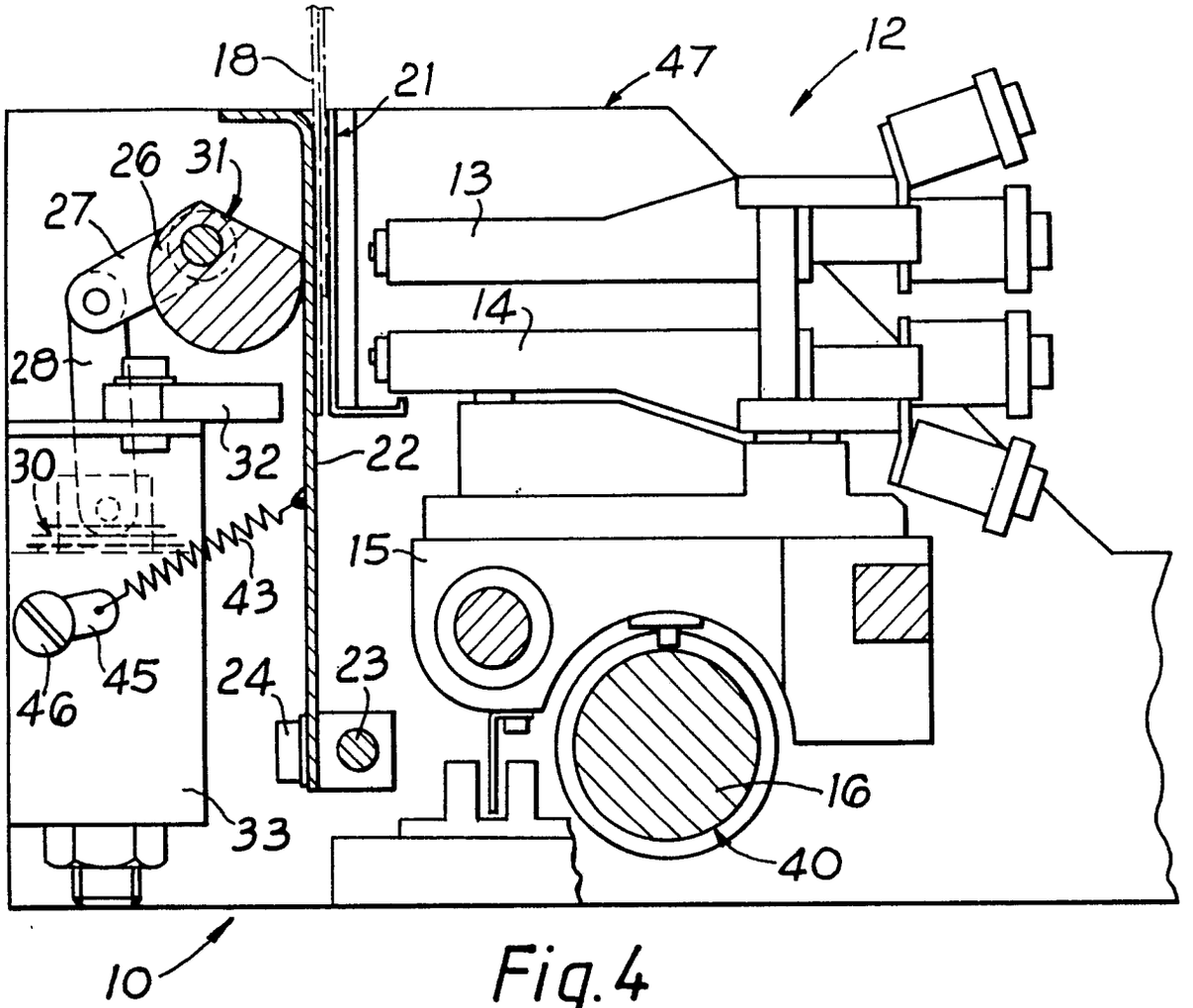

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Fig.4

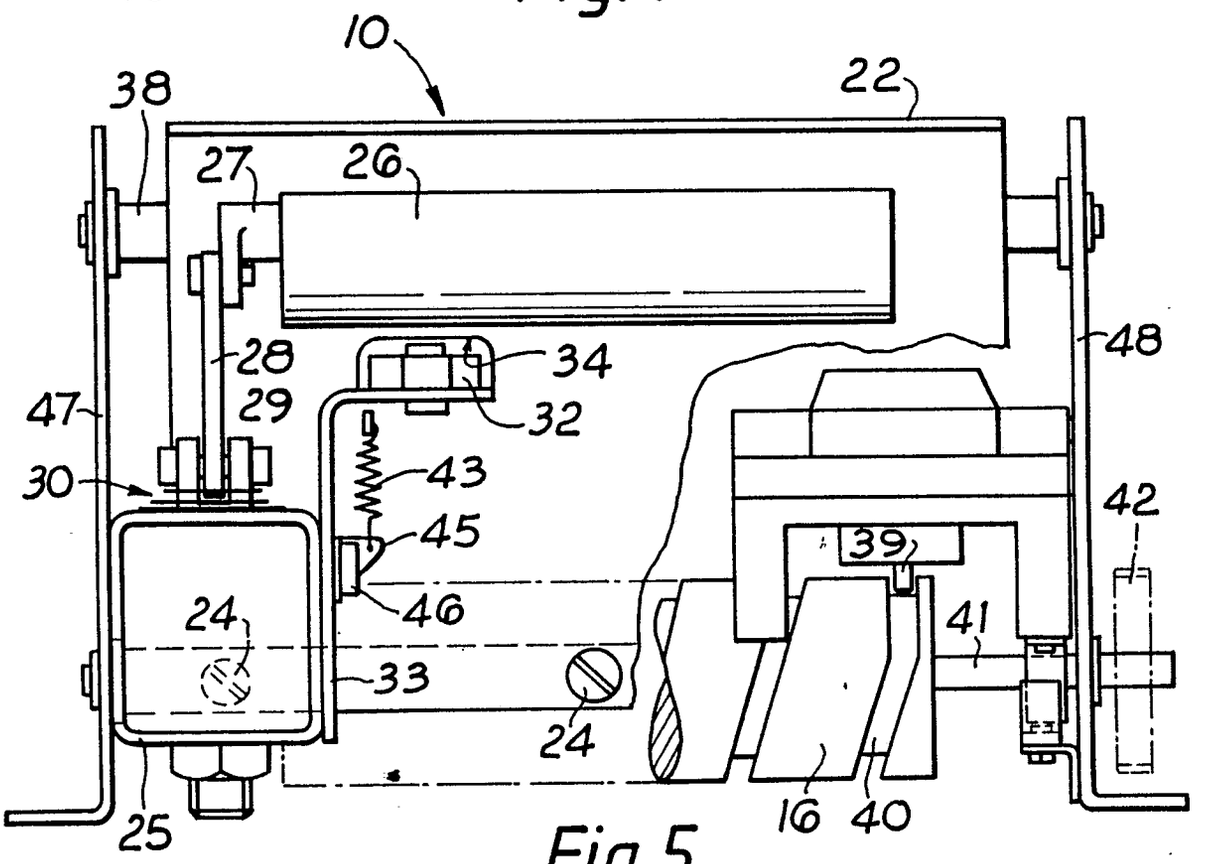

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Fig.5

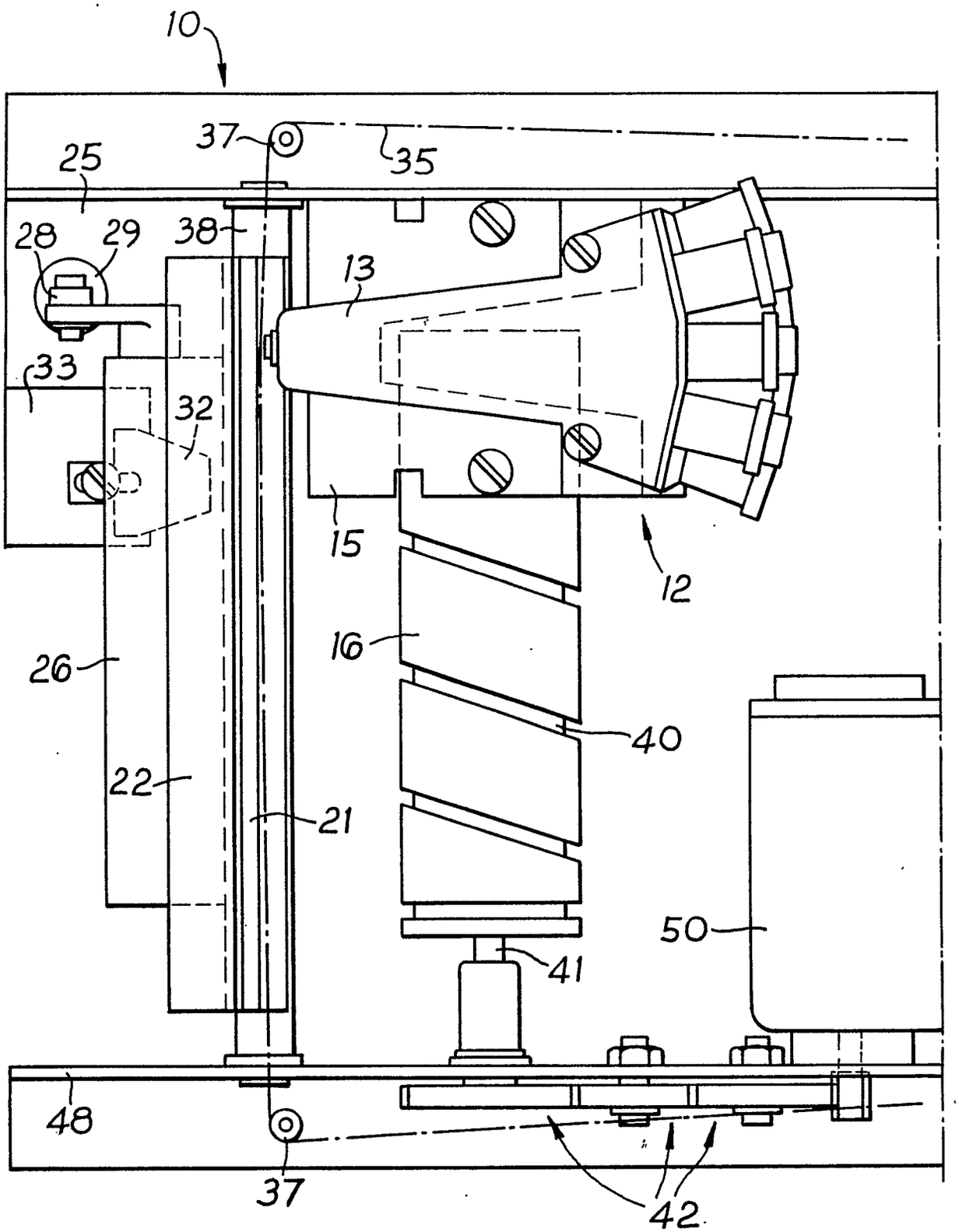


Fig. 6

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EUROPEAN SEARCH REPORT

Application Number

EP 87 30 7542

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.4)
Y	DE-A-2 644 049 (NCR) * Page 3, line 8 - page 4, line 19; page 7, lines 10-32; figures *	1,2	B 41 J 11/20 B 41 J 3/58 G 07 B 11/03
A	---	7,8	
Y	US-A-4 029 193 (KWAN) * Abstract; column 3, line 27 - column 4, line 56; figures *	1	
A	---	3-5,7,9	
Y	US-A-3 954 054 (BUSCH) * Abstract; column 3, line 14 - column 4, line 15; figures *	2	
A	---	1,3	
A	GB-A-2 175 854 (ELLIS) * Abstract; page 1, line 101 - page 2, line 51; page 3, line 106 - page 4, line 49; figures *	1,3,5	

A	US-A-3 912 068 (KWAN) * Abstract; column 1, line 63 - column 2, line 38; column 2, line 63 - column 4, line 26; figures *	1,3-5,7,9	TECHNICAL FIELDS SEARCHED (Int. Cl.4) G 07 B B 41 J G 06 K

A	US-A-2 035 310 (FLORANCE) * Page 2, column 2, lines 17-51; figures *	1,2	

A	US-A-4 098 389 (KWAN) * Abstract; figures *	1,3	

A	US-A-3 995 730 (KWAN) * Abstract; claims; figures *	1,3,5,7,9	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	03-05-1988	MEYL D.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EUROPEAN SEARCH REPORT

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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.4)
A	GB-A-2 131 353 (BYTEISSUE) * Abstract; figures * ---	1	
E	GB-A-2 186 844 (HALO RETAIL SYSTEMS) * Whole document * -----	1-10	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)

The present search report has been drawn up for all claims

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THE HAGUE	03-05-1988	MEYL D.

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