



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
20.06.2018 Bulletin 2018/25

(51) Int Cl.:
B41J 3/407 ^(2006.01) **B41J 11/06** ^(2006.01)
B41J 13/12 ^(2006.01) **B41J 13/30** ^(2006.01)

(21) Application number: **17020572.8**

(22) Date of filing: **13.12.2017**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD TN

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(30) Priority: **14.12.2016 IT 201600126141**

(54) **DRAGGING DEVICE FOR MARKING ELECTRICAL TAGS AND METHOD FOR THE REALIZATION OF AN AUTOMATIC LOADER**

(57) The present invention refers to a device for dragging labels made of plastic material for labeling cables and electrical components in order to position them under an inkjet head to obtain the printing.

The innovation consists in the possibility to use the electrical marking labels born specifically to be printed with the plotter by a printer that use inkjet printing technology. In this way, it is possible saving money because

it doesn't need to modify the injection molds of the labels.

A further advantage of the present invention is that an adapter plate is not used, the user works easily and saves time, because he doesn't need to fit the labels into the adapter plate before printing and removing them after.

Also a method of making an automatic loader, which uses this dragging system, forms object of the invention.

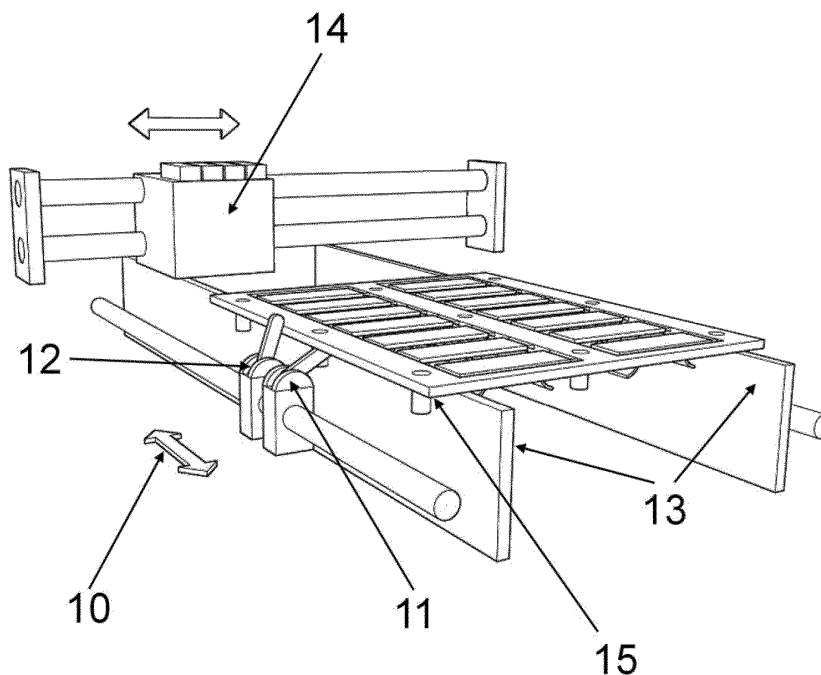


Fig. 4

Description

[0001] The present invention concern a device for dragging labels for marking electrical panels to obtain printing by means of an inkjet printer.

[0002] The innovation consists in being able to use the labels already present on the market, created to be printed by a plotter.

[0003] The object of the invention is also a method of making an automatic loader which uses this dragging system.

FIELD OF APPLICATION OF THE INVENTION

[0004] The present invention relates to a device for translating plastic labels and bringing them underneath an inkjet head so as to obtain the labels printed.

PRIOR ART

[0005] In the explanation of the description it will be made reference to the attached drawings, provided for indicative purposes only and therefore not for limiting purposes, in which:

- Figure 1 shows schematically a plotter with the adapter plate and some labels inserted in the adapter plate.
- Figure 2 shows a schematic view of a label module for terminal blocks seen from above and below to highlight that the upper part, where the printing takes place, is substantially flat, while the lower part presents the pins for attachment to the adapter plate and the hooking pins for the attachment to the terminal blocks.
- Figure 3 shows a schematic view of the drawings of two labels for terminal blocks which differ in the shape and thickness of the hooking pins to the terminals.
- Figure 4 shows a schematic view of the drag system, object of the invention.
- Figure 5 shows a schematic view of a possible automatic feeding method.

[0006] The printing of labels for the marking of the electrical panels has always presented difficulties because these labels are generally done of rigid plastic material and have a complex shape.

[0007] They are injection molded into frames that contain multiple labels. Each label is connected to the frame in one or more points and it is possible to detach it and use it leaving the others unaltered. The shape of the frame facilitates the insertion of the labels in transparent tubes for the marking of electric cables.

[0008] Other labels, used for the marking of the terminal blocks, present in the lower part the feet that allow their positioning in the special housings that are on the outer edge of the terminal blocks. These last labels are

more difficult to print because they are not flat and the thickness varies according to the type of terminal blocks to which they are applied.

[0009] In the first years of marketing of these labels, plotter (1) was used to print on them. The articles containing the labels to be printed (4) were placed on an adapter plate (2) positioned on the printing table (3) of the plotter. In this way labels of different thicknesses were all at the same height respect to the plotter pen (6) and they could be printed.

[0010] The adapter plate was itself hooked to the plotter plane and it was not possible to create automatic loaders for this reason. The user needed to hook the labels (4) on the adapter plate and launch the print; at the end of the print, he needed to extract the printed labels and to hook the new items for the next print.

[0011] Over time the technology has evolved and, to print on the labels, people has begun to use thermal transfer or inkjet printers modifying the format of the labels in order to be printed by these devices. They used adapter plates also in this case. The adapter plate, in which the article is housed, is made to pass along the printing path.

[0012] The use by the user is similar to that of the plotter, he fits the article into the adapter plate, launches the print and removes it. The substantial difference is the greater printing speed of these last devices compared to that of the plotter. The use of plotters as a printing system is still widespread today again.

SUMMARY OF THE INVENTION

[0013] A feature of the plotter label frames is to have small cylindrical pins (8) on the underside that allow the label frame to be fixed to the adapter plate and prevent it from moving during printing. These pins on the frame are positioned in as many holes (5) on the plotter adapter plate.

[0014] To minimize the number of adapter plates, the frames, even if they host labels of different sizes, have the pins for the fitting to the adapter plate in the same position.

[0015] In most cases the frame supporting the labels has a shape similar to Fig. 2 where the pins (8) are located on the two outer sides.

[0016] The invention consists in using the pins themselves as a constraint on the outer edges of a fixed rail which extends up to pass the system which moves the print head. The frame is free to slide along this rail and the pins prevent it from moving sideways.

[0017] A lever actuate by a solenoid, a motorized actuator or anything else, moved longitudinally by a motor, hooks the pin and drags the frame under the print head (14) so that all the labels can be printed.

[0018] Another lever pushes the pin, or directly the frame, on the corresponding rail and keeps it pressed in order to avoid backlash during the translation. This avoids transversal positioning errors and consequent

print centering problems on the individual labels.

[0019] With this system consisting of: rail, hooking and dragging it is possible to use articles specifically designed for the plotter on inkjet printer without the need to modify them, or by making minor modifications, with evident saving money given the cost of injection molds.

[0020] The essence of the invention is based on the fact that, with this system, it is possible to obtain printing without using an adapter plate, increasing the practicality of use by the user, which no needs anymore to place the labels on the adapter plate to print them and remove them after the print has been performed, with consequent time saving. Furthermore, this system open the way to the possible realization of automatic loaders.

[0021] Further characteristics and advantages will be highlighted in the detailed description of the realization, but not exclusive, of the label dragging system according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0022] The printing of labels through the use of a plotter (1) occurs by fitting the frames (9) containing the labels onto an adapter plate (2). The fixing is done by inserting the pins (8) on the frame into the appropriate holes on the plate (5). The plate has grooves (7) so as to accommodate the hooking pins of the labels to the terminal blocks. In this way the upper side of the labels is always at the same height even for labels with different thickness (Fig. 3). The plotter pen (6) finds the printable areas always at the same height and then printing is possible.

[0023] This is achieved thanks to the fact that the thickness of the frame (9) is always the same and the labels are positioned on it so as to offer the upper part printable at the same height.

[0024] Moreover, the hooking pins on the frame (8) are located in the same points also for different labels, this to allow the use of the same adapter plate (2) for the largest possible number of different labels.

[0025] From the two previous considerations it is clear that in the labels for plotters there is a sort of standardization that forces the position of the hooking pins and the thickness of the frame.

[0026] The thickness remains constant even in the immediate proximity of the hooking pin because there must be a mechanical consistency in the adapter plate between the hole receiving the pin (5) and the slots receiving the lower part of the tags (7).

[0027] It is therefore possible to make a guide composed of two parallel walls (rail) able to house the frame so that the most external hooking pins touch the external side of the rail (15). In this way the frame is in a forced position and is free to slide longitudinally in the direction of the rail while it is transversely locked. The pins are located outside the rail.

[0028] Two mechanisms are positioned on the sides of the rail, they hook two pins, one for side, and drag the frame with the labels along the printing path. The two

mechanisms are moved each one by a corresponding motor in the longitudinal direction of the rail (10) and they are composed of a lever actuates by a solenoid, a motorized actuator or whatever (11). In this way, the printing takes place without the mediation of an adapter plate.

[0029] Since the pins placed on the sides of the frame can be arranged in a non-symmetrical manner, the fact of having two separate dragging mechanisms, one on each side, allows to hook the two pins which are in the most suitable position to obtain a force of homogeneous translation.

[0030] If, to facilitate the insertion of the frame on the rail, the distance between the walls of the rail is smaller than that between two pins, there may be a backlash that affects the quality of printing. In this case, another mechanism (12), for example, but not limited to, a lever, a spring, a clutch or whatever, is used to push the pins of one side of the frame towards the corresponding site of the rail. In this way the backlash and any lateral movements, due to the vibrations that are produced when the frame advances in the printing path, are eliminated.

[0031] An automatic loader system for the printer can be easily implemented by stacking the items at the end of the rail and using the hooking mechanism to extract the items one by one from the stack (Fig. 5).

[0032] In the drawing (Fig. 5) illustrating a possible, but not exclusive, method of making an automatic loader, the container that holds the stack of articles in position has not been shown. This one container is structured in such a way as to allow the system to pick up the article and take it to a print position. The hooking and dragging system, consisting of movable levers, is able to disengage the newly printed article by withdrawing the levers, going back and hooking the next article of the stack. In this way all the items in the loader can be printed in succession.

Claims

1. A device able to transporting the frame with the labels (9) along the print path, without the use of an adapter plate, comprising:

- A rail (13) consisted of two vertical walls on top of which are placed the frames. The distance between the rails is calculated in such a way that the more external pins on the perimeter of the labels frame are on the outside of the rails and in contact with them.

- Two hooking devices of the pins of the frames (8), consisting by a lever (11) actuated by a solenoid, a motorized mechanical actuator or whatever, moved by a motor in the longitudinal direction of the print (10). These hooking devices are placed on both the sides of the rails and they are able to move the frames containing the labels, that are placed on the rail, until reach the

printer head (14), so the labels can be printed.

- A lever device (12), actuated by a solenoid, a motorized mechanical actuator, a friction device or anything else, is positioned on only one side of the rail. This lever device is jointed with the movement of the previous hooking device. It pushes one side of the labels frame to the corresponding rail to remove any backlash.

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2. An automatic feeding method for a printer, consisting of a container, not shown in the fig. 5, that held in position one stack of articles (16) and structured so that the hooking device according to claim 1 can hook the first article placed on the rails, drag it along the print path leaving all the remaining items in the stack. Thanks to the fact that the hooking devices are constituted by movable levers, the system is able to disengage the just printed article retracting the levers. Then it goes back to hook the next article of the stack and so on, in order to be able to print in succession all available items.

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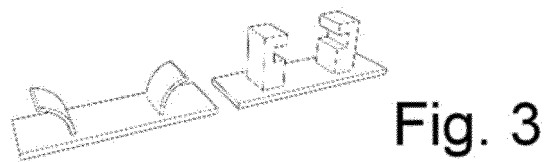
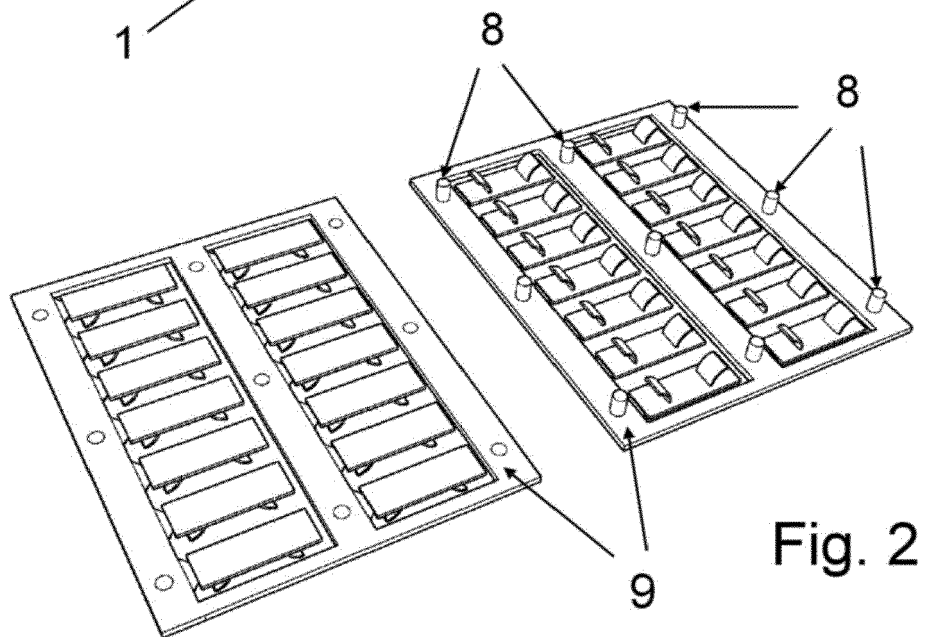
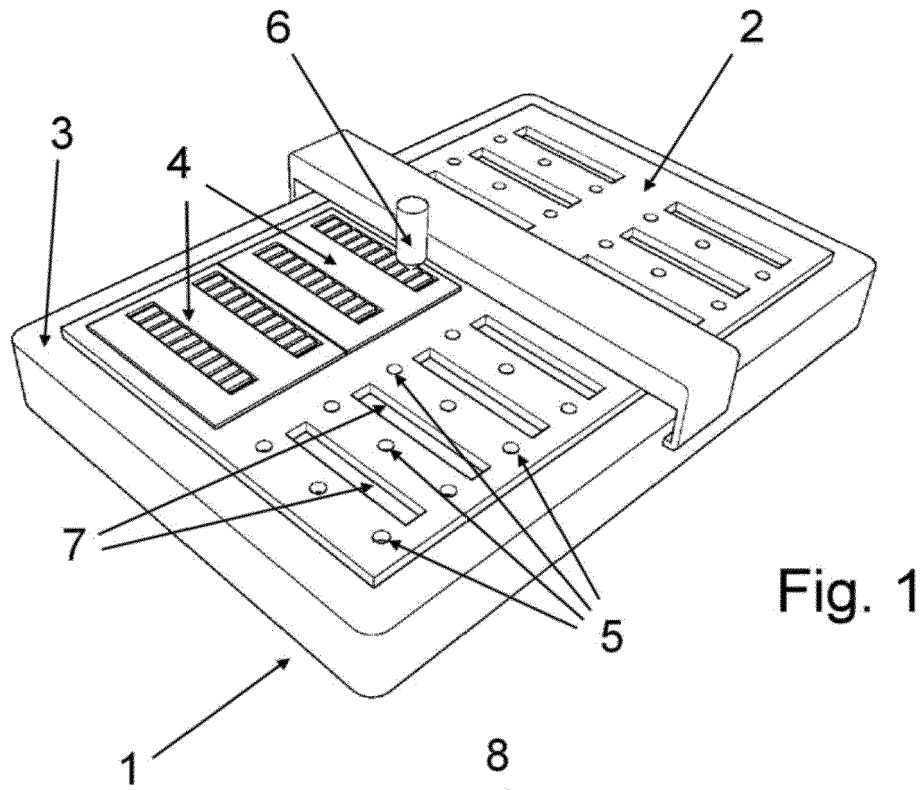
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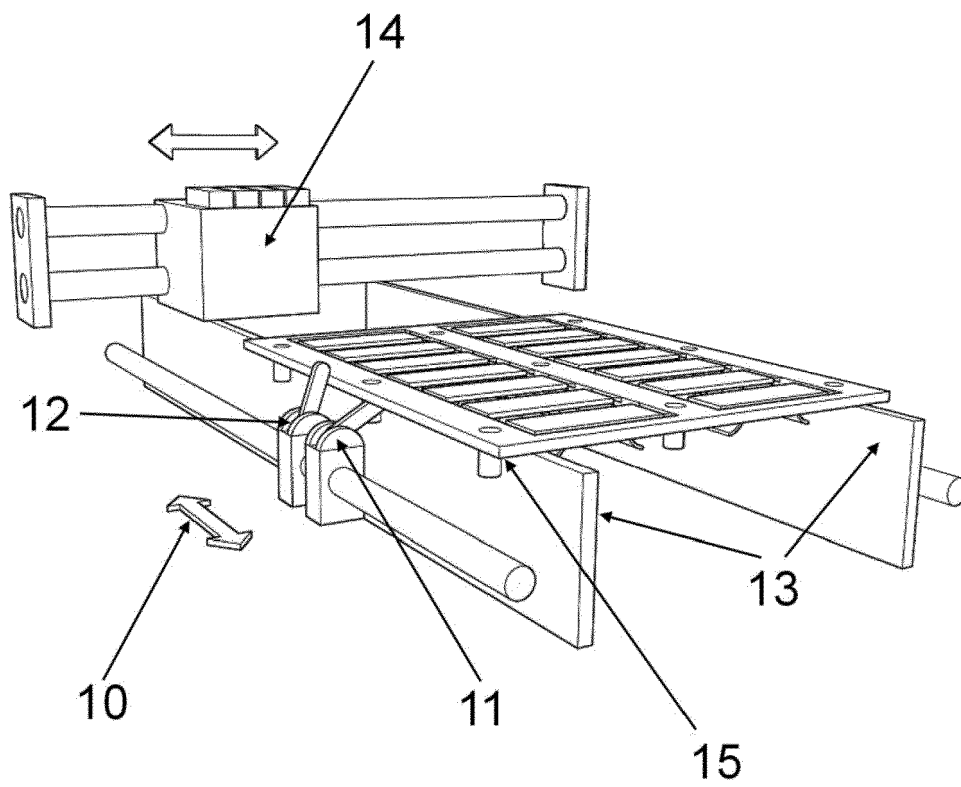


Fig. 4

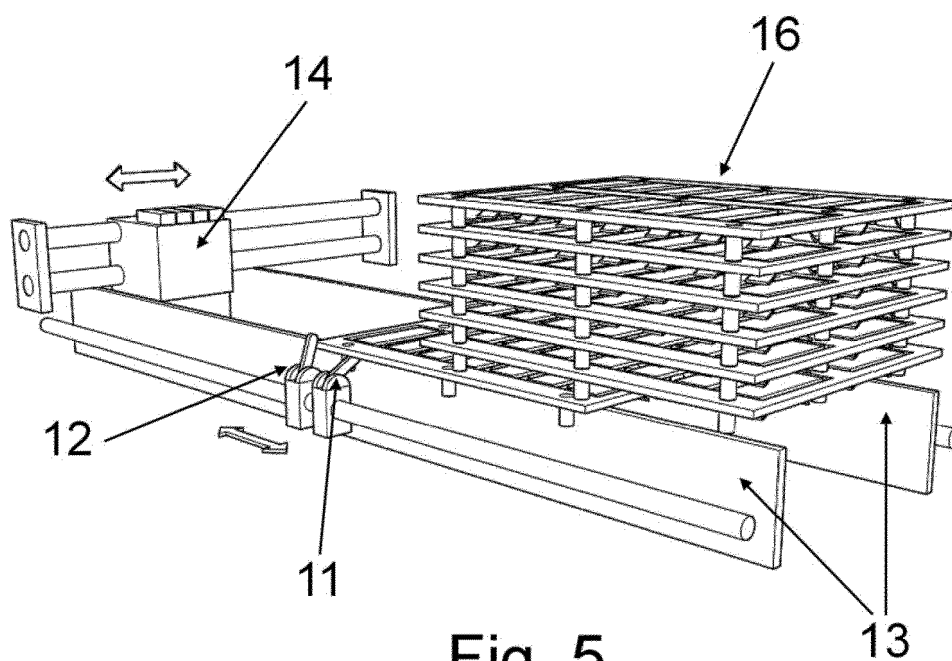


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 17 02 0572

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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 (IPC)
A	WO 2015/151042 A2 (HOMEWARE INNOVATION DI SALA MARCO & C S A S [IT]) 8 October 2015 (2015-10-08) * claim 1; figures 1-3, 5a, 5b * * page 5, line 3 - page 6, line 14 * * page 6, line 23 - page 7, line 13 * * page 7, lines 26-28 * -----	1,2	INV. B41J3/407 B41J11/06 B41J13/12 B41J13/30
			TECHNICAL FIELDS SEARCHED (IPC)
			B41J
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 15 May 2018	Examiner Gaubinger, Bernhard
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.02 (P04C01)

15-05-2018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2015151042	A2	08-10-2015	NONE

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82