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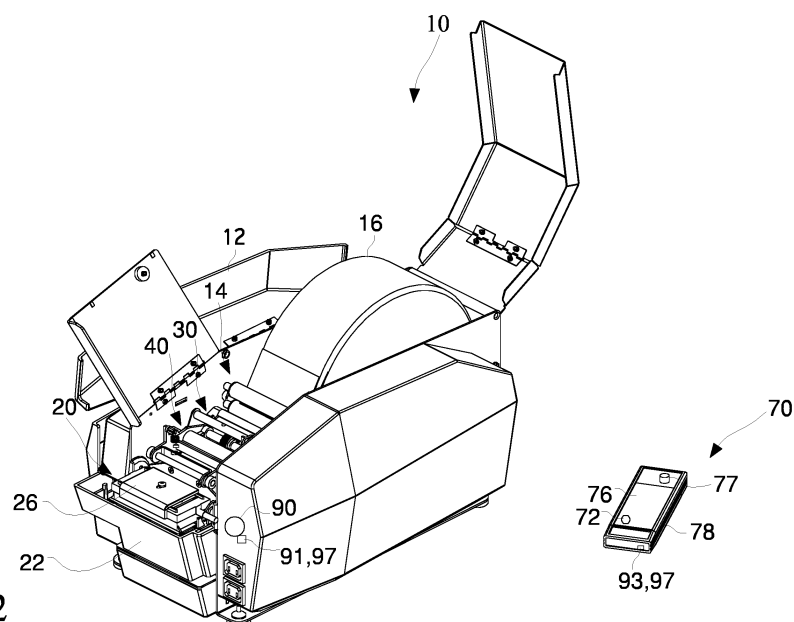
(54) **DISPENSER MACHINE FOR ADHESIVE TAPE**

(57) A liquid-activated adhesive tape dispensing machine is described comprising:

- a holder for a roll of tape;
- a wetting system to activate adhesive provided on the tape comprising:
  - a tank of liquid,
  - means for transferring an amount of liquid from the tank to the tape,
  - a feed mechanism to advance the tape through the wetting system,

- a tape cutting system to produce pieces of tape,
- a user interface to receive commands from a user,
- an electronic controller which is connected to the user interface and configured to interpret a command entered via the user interface and drive said systems to execute the command.

To ease the functioning of the machine, the user interface is a device detached from the rest of the dispensing machine so as - and configured - to be able to remain at a certain distance from the dispensing machine.



**Fig. 2**

## Description

**[0001]** The invention refers to an adhesive tape dispensing machine, more particularly a liquid-activated adhesive tape dispensing machine to activate an adhesive provided on the tape, and to a method for controlling the machine. This machine may be a wetting machine, a term which conventionally refers to manual or benchtop machines with the presence of an operator, or a gummed paper taping machine, a term which conventionally indicates in-line machines with or without the presence of an operator. As used herein, *liquid-activated or liquid-activatable tape* means any water-activated tape, or paper or gummed tape, or other tape having an adhesive on at least one main surface (the adhesive side) that is activated by the application of a liquid because the adhesive is of the type that becomes sticky when wetted. The liquid may be water, but not only. The tape may also be a reinforced tape.

**[0002]** Various machines are known for sealing the edges of boxes by pieces of gummed paper taken from a continuous roll and suitably wetted, see e.g. EP0558122 or WO2014/018823 A1, taken here as examples. These machines are designed to dispense predetermined lengths of adhesive tape e.g. to close boxes. The dispensing machine comprises a programmable controller that manages the tape feeding, cutting and humidification functions. A user interface allows an operator to send commands to the controller. The user interface is mounted on the external casing of the dispenser and may have function keys, potentiometers, a *touch display* or a PC keyboard.

**[0003]** These types of user interface have the disadvantage that the operator must work very close to the dispensing machine to reach the controls. Therefore the dispensing machine must necessarily be on the work table, where it hinders and limits not only the operator's freedom of maneuver but also (and consequently) the dimensions of the boxes that the operator can efficiently close with the tape.

**[0004]** The main object of the invention is to improve this state of the art.

**[0005]** Another object is to propose an improved machine of the aforementioned type which facilitates the operator's work, in particular allowing him greater freedom of movement around the machine and/or with respect to an object on which the dispensed tape is to be applied.

**[0006]** Therefore a machine is proposed for dispensing adhesive tape activatable by a liquid, comprising:

- a holder for a roll of tape;
- a wetting system to activate adhesive provided on the tape comprising:
  - a tank of liquid (e.g. water),
  - means for transferring a quantity of liquid from the tank to the tape,

- a feeding mechanism to advance the tape through the wetting system,

- a tape cutting system for producing lengths of tape,
- a user interface for receiving commands from a user,
- an electronic controller that is connected to the user interface and configured to interpret a command entered via the user interface and drive said systems to execute the command,

wherein the user interface is a device detached and separate/separable from the rest of the dispensing machine so as - and configured - to be able to remain at a certain distance from the dispensing machine.

**[0007]** Thanks to this feature, it is possible to work further away from the dispensing machine, which for example can be placed above, below or next to the work table. In general, the maximum distance can then be reached between the dispensing machine and the operator, i.e. the distance of an arm, necessary for the operator to be able to take the piece of tape cut and dispensed by the dispensing machine.

**[0008]** It follows that the operator is able to seal even very bulky packages with the tape, because he has more space, and can, for example, work directly on the pallet used for the final shipment.

**[0009]** E.g. said certain distance may be greater than 50 cm or 1 m.

**[0010]** As preferred variants, the user interface is or comprises a keyboard and/or a *touch display*, a cell phone, or a *tablet*. More preferably the user interface comprises a display for displaying an operator selection or operating parameters of the dispensing machine. The user interface may also comprise potentiometers.

**[0011]** The data line through which the user interface and the electronic controller communicate may have various embodiments. In a preferred embodiment, of simple and economical construction, the user interface and the electronic controller are connected by a cable or an electrically conductive element for data transmission.

**[0012]** The cable has e.g. length of 1 m, or 2-3 m, and extends between the machine and the user interface.

**[0013]** In a preferred embodiment, which favors the absence of physical constraints with the dispensing machine, the user interface and the electronic controller are connected by a wireless channel for data transmission, e.g. an infrared channel, a wi-fi channel, a *bluetooth* channel, a radio frequency channel or a GSM channel.

**[0014]** Said data transmission may be bidirectional or unidirectional.

**[0015]** In particular, said controller is provided with a wireless signal receiver and the user interface is provided with a wireless signal transmitter. For bidirectional data communication between the controller and the interface, said controller and said interface are both provided with a wireless signal transceiver.

**[0016]** In a preferred embodiment, the user interface is a portable remote control, a solution that maximizes

the freedom of placement for the dispensing machine.

**[0017]** In a preferred embodiment, the user interface, or said remote control, is a module separate from the dispensing machine and configured to be mechanically connected to the dispensing machine. The advantage is to create a secure anchoring base for the user interface, avoiding losing it or simplifying the transport of the machine-user interface assembly. For this purpose, at least one of the machine and the user interface comprises means for stable mechanical coupling to the other. The advantage is being able to exploit the user interface also as a control interface on board the machine like the well-known user interfaces. In particular, to facilitate coupling with the user interface, the dispensing machine and the user interface comprise mutual mechanical connection means. In particular, the dispensing machine has an external casing provided with a seat to receive the user interface. The seat is e.g. a recess made in the casing. Or the dispensing machine and the user interface comprise mutual interlocking means of the male-female or bayonet or snap type.

**[0018]** In a preferred embodiment, the user interface, or said remote control, is configured for being electrically connectable to the dispensing machine, in particular simultaneously with the mechanical connection of the user interface to the dispensing machine.

**[0019]** In a more preferred embodiment, the user interface and the electronic controller are connected or connectable via an electrical connector whose electrical contact terminals are separable. The connector is configured so that, by applying the user interface on the dispensing machine, the connector creates a bridge between electrical terminals of the user interface and electrical terminals of the dispensing machine, thus completing an electrical signal line.

**[0020]** In an embodiment, the machine comprises an electrical connector for electrically connecting the user interface and the electronic controller, the connector comprising electrical contact terminals that are separable. The connector is configured so that, by applying the user interface on the dispensing machine, the connector creates a bridge between electrical terminals of the user interface and electrical terminals of the dispensing machine, thus completing an electrical signal line.

**[0021]** In an embodiment, the user interface and the dispensing machine comprise respective electrical terminals that are electrically connectable to each other, thus completing an electrical signal line between the user interface and the dispensing machine. In particular, the electrical terminals are configured for coming into contact with each other simultaneously with the mechanical anchoring of the user interface on the dispensing machine.

**[0022]** The user interface may have buttons with preset sizes for the cut piece of tape and/or sizes pre-programmed by the user.

**[0023]** Another dispensing machine that can benefit from the aforementioned user interface is for example an in-line machine, manual or automatic, for sealing card-

boards or boxes.

**[0024]** Another aspect of the invention concerns a method for controlling a liquid-activated adhesive tape dispensing machine, the machine comprising:

- a holder for a roll of tape;
- a wetting system for activating adhesive present on the tape comprising:
  - a tank of liquid (e.g. water),
  - means for transferring a quantity of liquid from the tank to the tape,
  - a feeding mechanism for advancing the tape through the wetting system,
- a tape cutting system for producing lengths of tape,
- an electronic controller configured to interpret a user command and drive said systems to execute the command,

with the step of sending commands to the electronic controller from a user interface or device which is separate - and preferably located at a certain distance - from the dispensing machine.

**[0025]** In a preferred step of the method, the user interface and the electronic controller communicate via cable or an electrically conductive element.

**[0026]** In a preferred step of the method, the user interface and the electronic controller communicate via a wireless channel, e.g. an infrared channel, a wi-fi channel, a *bluetooth* channel, a radio frequency channel or a GSM channel.

**[0027]** In a preferred step of the method, the user interface and the electronic controller communicate data bidirectionally or unidirectionally.

**[0028]** In a preferred step of the method, the user interface is installed on a handheld remote control.

**[0029]** In a preferred step of the method, the user interface, or said remote control, is mechanically connected to the dispensing machine, e.g. by placing the user interface, or remote control, in a seat obtained on the dispensing machine.

**[0030]** In a preferred step of the method, the user interface, or said remote control, is electrically connected to the dispensing machine to establish a mutual electrical connection. In particular, the user interface, or said remote control, is electrically connected to the dispensing machine to establish a mutual electrical connection simultaneously with the mechanical connection of the user interface to the dispensing machine.

**[0031]** Another aspect of the invention concerns a method for sending commands to a liquid-activated adhesive tape dispensing machine, the machine comprising:

- a holder for a roll of tape;
- a wetting system for activating adhesive present on the tape comprising:

- a tank of liquid (e.g. water),
  - means for transferring a quantity of liquid from the tank to the tape,
  - a feeding mechanism to advance the tape through the wetting system,
- a tape cutting system to produce lengths of tape,
  - an electronic controller configured to interpret a user command and drive said systems to execute the command,

with the step of sending commands to the electronic controller from a remote control that communicates with the electronic controller via cable or via a wireless, e.g. radio or infrared, channel.

**[0032]** Another dispensing machine that can benefit from the aforementioned user interface is for example an in-line machine, manual or automatic, for sealing cardboards or boxes.

**[0033]** In general the method shares the variants for the machine and vice versa.

**[0034]** The advantages of the invention will be clearer from the following description of a preferred embodiment of wetting machine, referring to the attached drawing in which:

- Fig. 1 shows a three-dimensional view of a dispensing machine for wetted adhesive tape;
- Fig. 2 shows a three-dimensional view of the machine in fig. 1 with the lid raised;
- Fig. 3 shows a vertical cross-section of the machine of fig. 1;
- Fig. 4 shows a three-dimensional view of a variant of a dispensing machine for wetted adhesive tape.

**[0035]** A dispensing machine 10 is illustrated in fig. 1, and may be operated manually, in tabletop or semi-automatic manner. The machine 10 comprises an outer casing 12 which internally delimits a housing 14 for: a roll 16 of tape, a wetting system 20 for the tape, a tape feeding mechanism 30, and a tape cutting stage 40.

**[0036]** The wetting system 20 comprises - in a known way - a tank for liquid (e.g. water), a liquid dispenser 22, a liquid transfer system 24 (e.g. a roller or a brush) and a pressure plate 26. The system 20 is electrically operated and acts to wet the tape to activate its surface adhesive, and may comprise any known system suitable for the purpose.

**[0037]** The cutting stage 40 works electrically and acts to cut a piece of tape from the roll 16 with a desired length, and in particular has a drive generally equipped with a movable blade and an abutment for the blade. The cutting mechanism may, however, comprise any known mechanism suitable for the purpose.

**[0038]** The feeding mechanism 30 serves to advance the tape inside the machine 10, and e.g. generally comprises known means such as one or idle rollers 32, guide means 34 for the tape, a feed roller 36, and an electric

drive motor 38. The mechanism 30 may, however, comprise any known mechanism suitable for the purpose.

**[0039]** The machine 10 also comprises an electronic controller 90, which is connected to the aforementioned components to electrically drive their operation and is configured to receive and execute commands from a user interface 70. That is, the user interface 70 is configured to receive commands from a user allowing them to activate and/or program the functions of the machine 10 by sending appropriate commands and/or signals to the controller 90, which acts to consistently command the components connected to it to execute the user's command or program.

**[0040]** In the example illustrated, the user interface 70 is remote, in the form of a remote control or device separate from the machine 10 and external to the casing 12.

**[0041]** In particular, the interface 70 comprises its own casing 78 in which there are installed e.g. one or more keys 72 to send pre-programmed commands to the controller 90, such as for example the activation of a dispensing program for a piece of wetted tape of a preset length or a length pre-programmed by the user (e.g. always via the interface 70).

**[0042]** Preferably, the interface 70 on the casing 78 comprises a display 76 to display an operator selection, and/or data and/or operating parameters of the machine 10.

**[0043]** Preferably, the user interface 70 comprises a touch display, to integrate all the aforementioned functions and/or implement the keys 72.

**[0044]** Preferably, the user interface 70 comprises one or more potentiometers 77, for adjusting the machine parameters.

**[0045]** In an embodiment, in which the interface 70 can be mechanically unconstrained from the machine 10, the interface 70 communicates with the controller 90 via a wireless data line (radio, infrared, bluetooth, wi-fi or GSM, for example). For this purpose, the controller 90 is provided with a wireless signal receiver 91 and the interface 70 is provided with a wireless signal transmitter 93. The data communication between the controller 90 and the interface 70 is preferably bidirectional, whereby the controller 90 and the interface 70 are both provided with a wireless signal transceiver 97.

**[0046]** In another, simpler embodiment, for data transmission the interface 70 and the controller 90 are connected by a cable, or an electrically conductive element. The cable, which extends between the machine 10 and the interface 70, has e.g. length of 1 m, or 2-3 m, to reach the user's work station distant from the machine 10.

**[0047]** It is then understood that the interface 70 may be positioned at a certain distance from the machine 10 while still allowing it to be easily controlled. This results in improved freedom of movement for the operator and for the placement of the machine 10 in the space surrounding the operator.

**[0048]** In another embodiment (fig. 4), the user interface 70, or said remote control, is mechanically connect-

able to the machine 10, so as to incorporate it into the machine 10 and be able to exploit the interface 70 as a stable on-board device of the machine 10. For this purpose e.g. the external casing 12 is superficially provided with a seat 50, e.g. a recess, to house and/or retain the casing 78. Alternatively or in combination, on the external casing 12 there may be mounted interlocking or hooking means for at least temporarily fixing the interface 70, in particular the casing 78, on the outer casing 12.

**[0049]** In an embodiment, the user interface 70 and the electronic controller 90 are connected or connectable via an electrical connector whose electrical contact terminals are separable. The connector is configured so that, by applying the user interface on the dispensing machine, the connector creates a bridge between electrical terminals of the user interface and electrical terminals of the dispensing machine, thus completing an electrical signal line.

**[0050]** Another advantage of the machine 10 is that the constraint which forced to keep a known tape dispensing machine on the working table, no longer exists. Instead, the machine 10 can be placed for example on a shelf, where it does not get in the way. Furthermore, the interface 70 can be positioned (and for example fixed) in a convenient point for the operator, so as not to force him to hold the interface 70 in his hand but still have it at hand.

## Claims

### 1. Liquid-activated adhesive tape dispensing machine comprising:

- a holder for a roll of tape;
- a wetting system to activate adhesive provided on the tape comprising:

- a tank of liquid,
- means for transferring an amount of liquid from the tank to the tape,
- a feed mechanism to advance the tape through the wetting system,

- a tape cutting system to produce pieces of tape,
- a user interface to receive commands from a user,
- an electronic controller which is connected to the user interface and configured to interpret a command entered via the user interface and drive said systems to execute the command,

wherein the user interface is a device detached from the rest of the dispensing machine so as - and configured - to be able to remain at a certain distance from the dispensing machine.

### 2. Machine according to claim 1, wherein the user in-

terface comprises a keyboard and/or a touch display.

### 3. Machine according to claim 1 or 2, wherein the user interface and the electronic controller are connected by a cable or an electrically conductive element for data transmission.

### 4. Machine according to any preceding claim, wherein the user interface and the electronic controller are connected by a wireless channel for data transmission.

### 5. Machine according to claim 3 or 4, wherein said data transmission is bidirectional or unidirectional.

### 6. Machine according to any preceding claim, wherein the user interface is a portable remote control.

### 7. Machine according to any preceding claim, wherein the user interface, or said remote control, is a separate module which can be mechanically connected to the dispensing machine.

### 8. Machine according to claim 7, wherein the user interface, or said remote control, is configured to be electrically connected to the dispensing machine simultaneously with the mechanical connection between the user interface, or said remote control, and the dispensing machine.

### 9. Machine according to any preceding claim, wherein the user interface and the electronic controller are connectable via an electric connector whose electric contact terminals are separable.

### 10. Method of controlling a liquid-activated adhesive tape dispensing machine, the machine comprising:

- a holder for a roll of tape;
- a wetting system to activate adhesive provided on the tape comprising:

- a tank for liquid,
- means for transferring an amount of liquid from the tank to the tape,
- a feed mechanism to advance the tape through the wetting system,

- a tape cutting system to produce pieces of tape,
- an electronic controller configured to interpret a command from a user and drive said systems to execute the command,

with the step of sending commands to the electronic controller from an interface or user device detached - and preferably placed at a certain distance - from

the dispensing machine.

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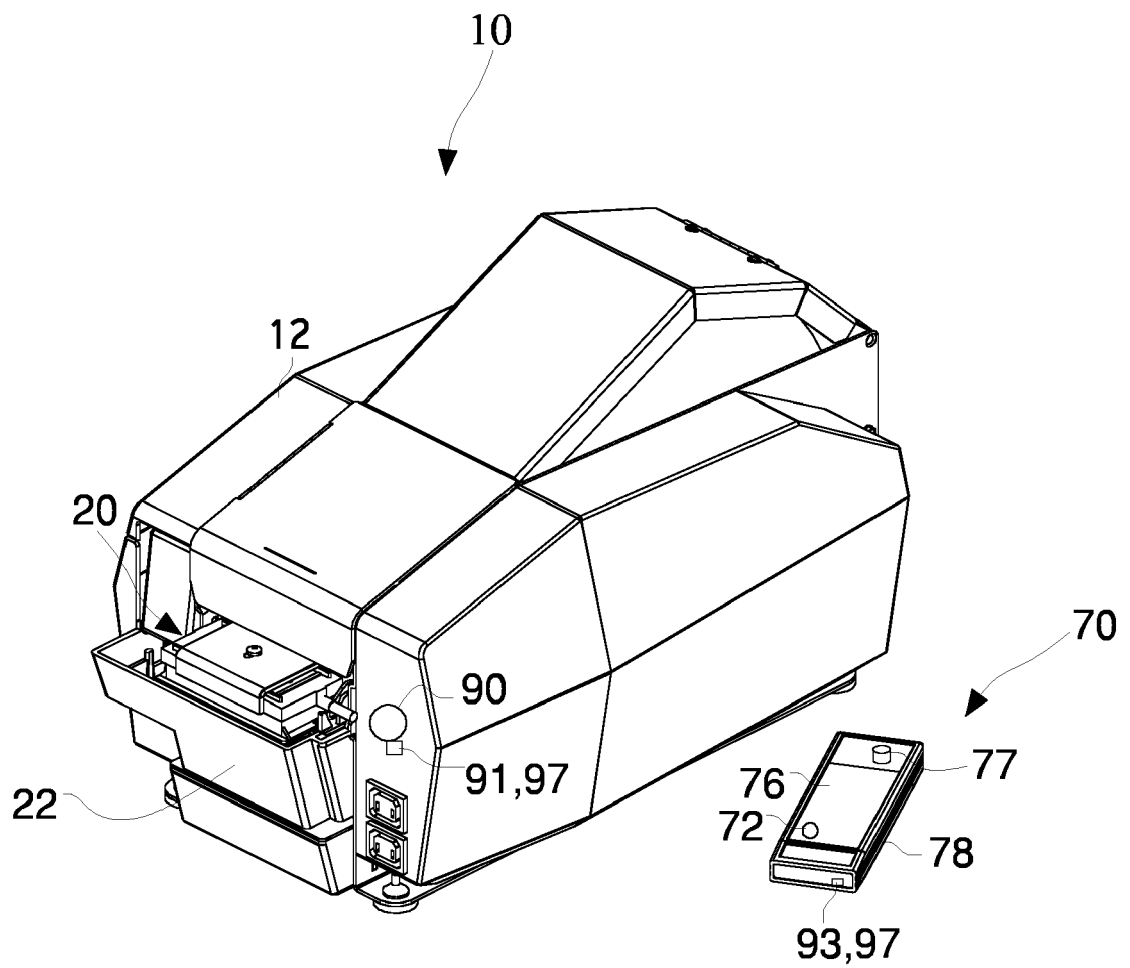


Fig. 1

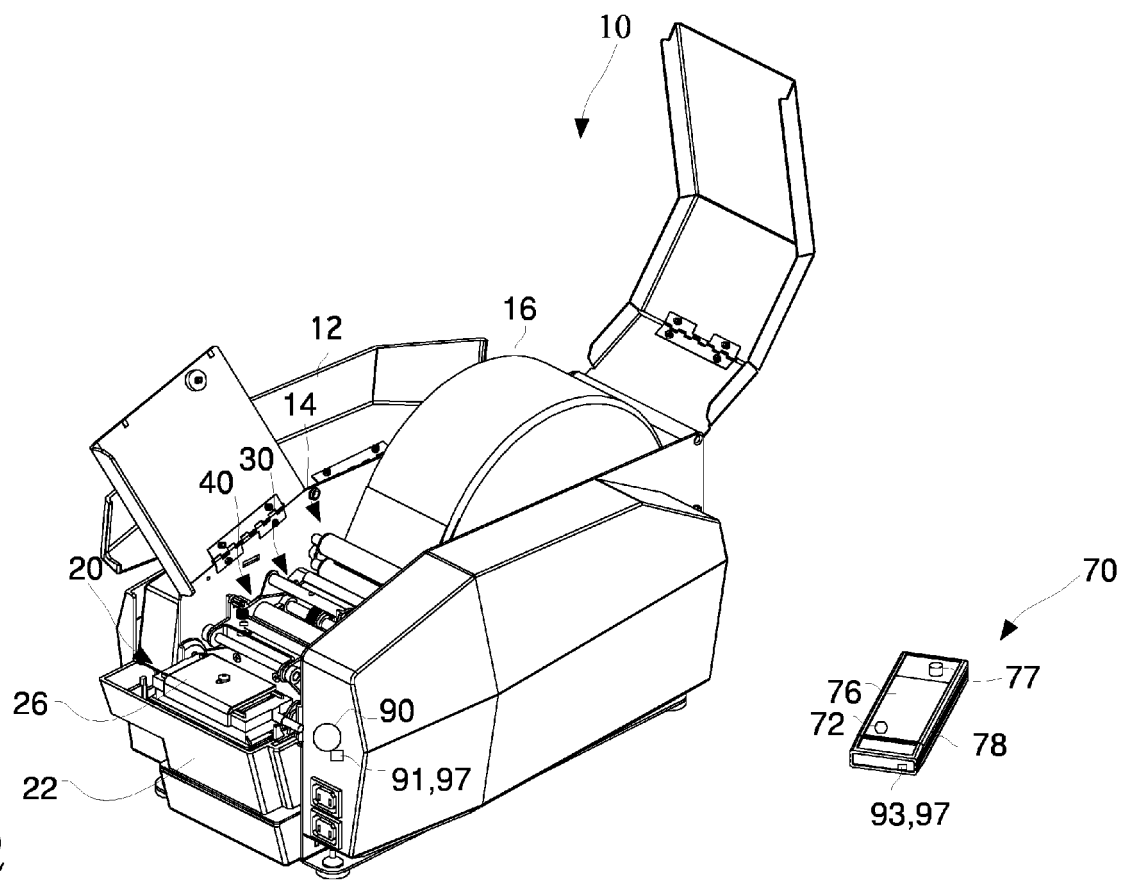


Fig. 2



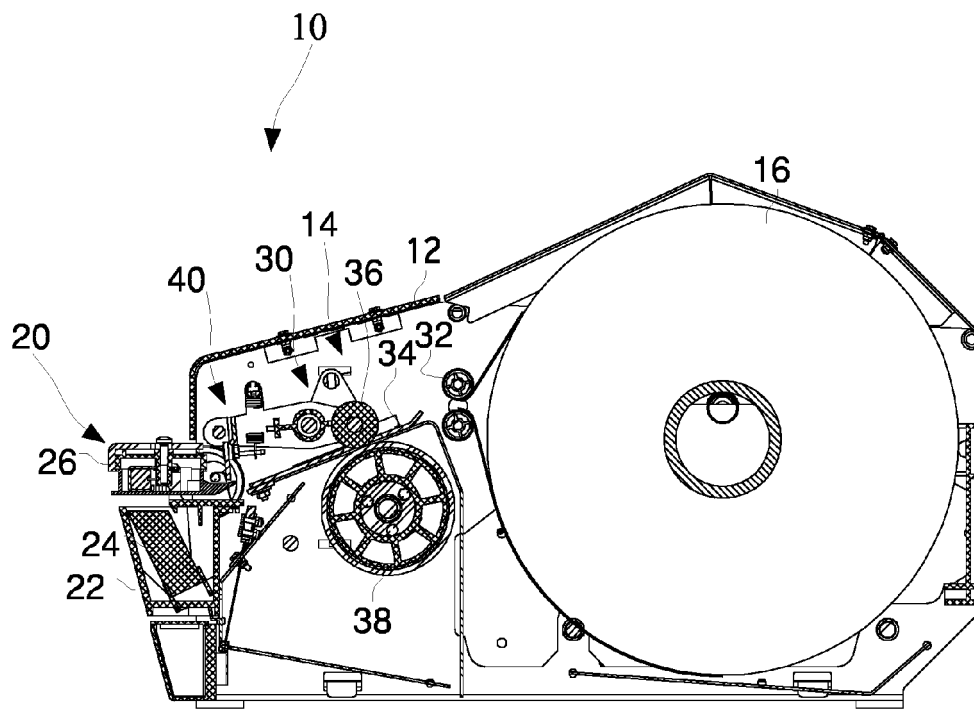


Fig. 3

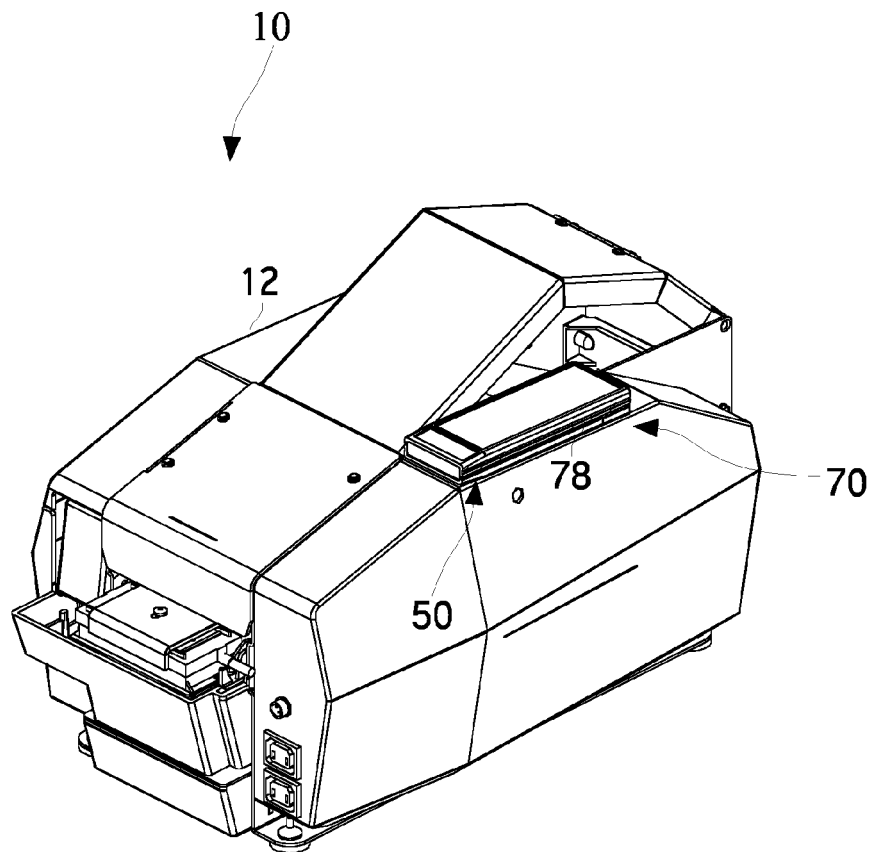


Fig. 4



## EUROPEAN SEARCH REPORT

Application Number

EP 24 17 3637

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EPO FORM 1503 03.82 (P04C01)

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| The present search report has been drawn up for all claims   |   |   |  |
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| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |   |   |  |

# **ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.**

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