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(54) **ARRANGEMENT FOR AUTOMATIC SETTING OF PRINTERS AND MATERIALS THEREFOR**

ANORDNUNG ZUM AUTOMATISCHEN EINSTELLEN VON DRUCKEN UND MATERIALIEN DAFÜR

ENSEMBLE POUR LA CONFIGURATION AUTOMATIQUE D'UNE IMPRIMANTE ET SUPPORTS
CORRESPONDANTS

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WO-A-97/28001 **GB-A- 2 180 823**
US-A- 4 369 361 **US-A- 5 280 159**
US-A- 5 534 890

- **DERWENT INFO., RESEARCH DISCLOSURE,**
Vol. 340, No. 076, ANONYMOUS,
"Shrink-Wrapped Film Covered Textile Tube(s) -
Include Alphanumeric, Bar-Code, Electronic or
Coloured Identification Means in, on, or Under
Film".

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Description

[0001] This invention relates to a printer including an arrangement for the automatic setting of printers, and more particularly to the setting of printer parameters by means of code reading. The parameters concern the printer work parameters, data communication or printing layout. The code to be read may be affixed directly onto material to be used in the printer, or onto separate sheets or labels. This invention also relates to materials, i.e. printing materials and dyes, to be used together with a printer. With the aid of the present invention, an optimum setting of the printer is automatically obtained, entailing a high quality and making the printer easily usable also for unqualified staff members.

State of the art

[0002] In the prior art, the setting of the printer was performed by entering parameters using a keyboard in connection to the printer, or by data transfer. There are, however, many parameters to be entered, and the parameter theory is rather complicated, implying that frequently the user may not be able to perform a correct printer setting himself. Furthermore, some parameters are factory set and can only be changed by a qualified service technician. This of course means that the quality of the printed product will be less than optimal.

[0003] Within other technical areas, coding has been used for the setting of various devices. As an example, programming of video recorders with the aid of bar codes, setting of cameras by reading codes on film cartridges, setting of audio tape recorders by sensing cavities on the tapes, etc. It is not known, however, to control a printer by codes in the way that the present invention teaches. The document WO 97/28001 was published after the priority date of the present application. Thus, the document falls under Art. 54(3) (EPC). The document discloses a printer for use with at least one cartridge of consumable material. The printer includes communication means using an electromagnetic connection to an electric label on each cartridge. The communication is effected when a cartridge is inserted into the printer. Data is sent from the labels to the printer for optimizing the function of the printer. The preamble of claim 1 is based on this document.

[0004] The present invention resolves the problem of setting the printer by affixing a code onto, or in connection with, materials to be used together with the printer. The code may be read automatically or through a simple manipulation performed by the printer user.

[0005] Owing to the invention, an optimum setting of the printer is achieved fully automatically or semi-automatically. This means that a high print-out quality can be warranted. The invention allows for quick and easy exchange of dye and receiver material with an automatic or semi-automatic optimal setting of the printer work parameters with regard to the dye as well as to the receiver

material. Furthermore, other printer functions, such as data communication with peripheral equipment, and printing layout, can be controlled in a simple manner.

Summary of the invention

[0006] The present invention thus provides a printer including an arrangement for the automatic setting of printer parameters. The printer includes a printing mechanism and a control unit for providing a print-out on a printing material with the aid of a dye. In accordance with the invention, an external code reader is connected to the control unit for reading a code for controlling at least one parameter of the printer. Alternatively, the code may be associated with the printing material, the dye, a printer means peripheral device, or a printing layout.

[0007] The present invention also provides materials intended for use together with such an arrangement.

[0008] The invention is defined in claim 1.

[0009] Various detailed embodiments of the invention are described in the dependent claims.

Brief description of the drawings

[0010] The invention will be described in detail below, with reference to the drawings, in which:

- Fig. 1 is a block diagram showing the arrangement according to the invention;
- Fig. 2 shows an example of a code;
- Fig. 3 illustrates a material onto which a code has been applied in accordance with an embodiment of the invention;
- Fig. 4 illustrates a material onto which a code has been applied in accordance with another embodiment of the invention; and,
- Fig. 5 illustrates a core of a roll of material, onto which a code has been applied in accordance with a further embodiment of the invention;

Detailed description of preferred embodiments

[0011] The invention will initially be described in detail with reference to a preferred embodiment of the invention, as illustrated in the drawings. The principle may be applied in various ways, as stated below.

[0012] The printer 1 comprises a printing mechanism 2, performing the actual printing. In the embodiment example shown, the printing mechanism is of the thermo-transfer type, i.e. the printing mechanism includes a printing head having heated points or dots (not shown). The dots act on a heat-sensitive dye or transfer ribbon which transfers dye to a receiver material, normally paper, but synthetic materials are also commonly used. The paper may be a single layer or comprise of a carrier or back paper carrying labels or tickets to be printed. The receiver material may come in the form of a roll,

loose sheets, or a continuous web. The transfer ribbon is delivered as a roll which is fitted into the machine and wound past the printer head. Printing mechanisms of this type are well known in the trade and do not, as such, constitute any part of the invention.

[0013] In order to achieve an optimum print-out result, it is of utmost importance that the transfer ribbon dye, the receiver material, the temperature of the dots and the printing speed, are correctly adapted to each other. The wrong materials and erroneous printer settings are, regrettably, often one of the most common causes of a bad or unsuccessful printing result. A correct printer setting and a correctly chosen printing material will also prevent overheating, which might otherwise easily cause damage to the printer head, leading to a premature exchange thereof. A universal ribbon having an optimal print-out quality, and fitting all printers, is impossible to develop.

[0014] For the thermo-transfer technology it is especially important that the transfer ribbon and the receiver material are adapted to each other.

[0015] Thus, the various parameters of the printing mechanism must be correctly set. The printing mechanism is controlled by a control unit 3 (CPU), which may be microprocessor based. In order to feed the correct parameters to the control unit in accordance with the present invention, a code reader is used. The code reader may be external 4, and be complemented by an internal code reader 5, or vice versa, as will be explained below. The code reader reads a code, in the discussed example illustrated by a bar code 6 (Fig. 2), which is provided in connection with the transfer ribbon and the receiver material.

[0016] In the possibly most user-friendly version of the invention, the code is pre-printed or affixed directly onto the start end of the dye ribbon roll and the roll of receiver material. When such rolls, respectively, are fitted into the printer, the internal code reader is utilised, reading the code at the beginning of the roll, before any print-out has been performed. Thereby, the printer is immediately set for optimum printing quality.

[0017] An alternative to this, is the code being pre-printed or pre-manufactured on a label, which is glued onto the roll for reading. This may be useful when having dye ribbons or paper of a known quality, but without a pre-printed code. There might be a large stock of older paper that one might want to use, or it might for some reason become necessary to change dye ribbon or paper in the middle of a roll.

[0018] In the above case, only the internal code reader 5 was used. The printer according to the invention however includes also an external code reader 4, that may completely replace the internal code reader, e.g. if wanting to modernise an existing printer without a code reader. The external code reader 4 may be used for reading from e.g. separate sheets comprising codes for various possible paper and dye ribbon qualities. A printer manufacturer could for example enclose such a sep-

arate sheet with many different codes listing dye ribbon and printing material data from different manufacturers, in order to make his printer flexible and not to be confined to certain manufacturers. The materials manufacturer obtains the same advantage of increased flexibility, as his material will not be confined to a certain printer.

[0019] Another suitable location for affixing the code may be on a material packing. This is especially preferable when the printing material comes in sheets rather than on a roll, and when the dye consists of ink or dye powder that is not suitable in itself to carry the code. The code may in this case be read either internally, if the package or a part thereof is fed into the reader, or be read by the external code reader.

[0020] In Fig. 2, a bar code is shown. The advantage of the bar code is that a reliable reading is quickly and simply available. There are already a number of standards for the writing and reading of bar codes. Other optical codes are of course also possible, e.g. two-dimensional codes, colour codes, dot codes, matrix codes, etc.

[0021] Also magnetic codes and magnetic code readers are suitable for the present invention. The magnetic code may be applied directly onto the material in question, or onto a label in the same manner as the above described bar code. The magnetic code may also be provided on a plastic card and be read by an internal or external slot reader.

[0022] The code may also be provided in the form of a conductive metal layer for electronic reading. The metal layers might preferably be arranged on the packaging for internal reading; compare film cartridges in minicameras.

[0023] Codes may also be read electronically by means of RF tags or RF labels. These consist of metal layers constituting electronic components. When subjected to a radio frequency magnetic field, caused by the code reader, they answer with a frequency comprising the code.

[0024] Fig. 3 shows an embodiment of the arrangement according to the invention, where an RF tag 7 is positioned at the beginning of a roll of material 8, i.e. at the exterior end 9 of the roll. The RF tag is read automatically by an integrated RF code reader.

[0025] As shown in Fig. 4, an RF tag 10 may alternatively be positioned at the inner end 14 of the roll, i.e. adjacent the core 11, or support, upon which the material has been wound. As the reading is electronic, reading through the material can be performed without problems. One advantage with this location is that the RF tag 10 is completely protected and there is no risk of it accidentally falling off or being torn off.

[0026] A further variant is to place an RF tag 12 directly on the outside of the core before winding the material on, or an RF tag 13 on the inside of the core 11. The RF tag can be placed on the inside also when the material has already been wound onto the core.

[0027] It is also possible to use a mechanical reading,

by arms being placed in different positions by means of protrusions and recesses provided on a dye powder cartridge or similar.

[0028] The invention may also be applied to other types of printers. Direct thermo-printers function in a similar manner to thermo-transfer printers but utilise no transfer ribbon. Instead, the printing head is allowed to apply heat directly onto a heat-sensitive paper.

[0029] Ink jet and laser printers use ink and carbon powder, respectively, as dye, which is supplied in cartridges. The printers may need adjustment for writing on special materials, e.g. metal and plastic resins. Codes may be easily applied e.g. on the ink or carbon powder package, as mentioned above.

[0030] There are commercially available readers of different types that can be used with the present invention. The most common types are contact readers, e.g. bar code pens, or distance readers, e.g. CCD readers and laser scanners, which may be fixed or hand held, and slot readers, being common with plastic cards but also usable for bar codes. The external reader may be mounted on a stand, or be fixed in the form of an eye on the side of the printer, for reading by sliding the code past the eye at a suitable distance. The readers as such do not constitute any part of the present invention.

[0031] In the embodiment described above, the printer has been set mainly with regard to the print-out quality. However, the invention is not intended to be limited to this only, but the reading may also be used for controlling the data communication between the printer and its peripheral equipment, such as baud rate and number of bits, and printing layouts. For a printer which is to print labels in various standard formats and with varying texts, the printing can thus be controlled by a simple reading of a code from a "ready-reckoner", best done using the external reader 4. The code constitutes a command to the control unit or to an external computer, controlling the printing layout.

[0032] The person skilled in the art will realise that the invention may be embodied with many different types of printing mechanisms, codes, code readers and control units. The invention will only be limited by the following patent claims.

Claims

1. A printer (1) including an arrangement for the automatic setting of printer parameters, comprising a printing mechanism (2) and a control unit (3) for providing a print-out on a printing material by means of a dye, and at least one code reader (4, 5) connected to the control unit (3) for reading a code for controlling at least one parameter of the printer (1), **characterised in that** the printer comprises an external code reader (4), being connected to the control unit (3) for reading a code from an object for controlling at least one parameter of the printer (1).

2. A printer according to claim 1, **characterised in that** one code reader (4, 5) is arranged to sense RF tags or RF labels.

3. A printer according to claim 1 or 2, **characterised in that** the code is associated with the printing material, the dye, or a peripheral device of the printer (1), or with a printing layout.

4. A printer according to any one of claims 1, 2 or 3, **characterised in that** the code reader (4, 5) is an optical reader.

5. A printer according to claim 4, **characterised in that** the code is a bar code, dot code, matrix code or a colour code.

6. A printer according to any one of claims 1, 2 or 3, **characterised in that** the code reader (4, 5) is a magnetic reader and that the code is a magnetic code.

7. A printer according to any one of claims 1, 2 or 3, **characterised in that** the code reader (4, 5) is an electronic unit and that the code is electronically readable.

8. A printer according to any one of the previous claims, **characterised in that** a further code reader (5) is integrated into the printer means.

9. A printer according to any one of the previous claims, **characterised in that** the code is provided on a printing material or dye packing.

10. A printer according to any one of the previous claims, **characterised in that** the code is provided on a dye roll.

11. A printer according to any one of the previous claims, **characterised in that** the code is provided on the printing material.

12. A printer according to any one of the previous claims, **characterised in that** the printing material is a roll or a continuous web.

13. A printer according to any one of the previous claims, **characterised in that** the code is provided on a separate sheet.

14. A printer according to any one of the previous claims, **characterised in that** the code is applied to a label.

15. A printer according to any one of the previous claims **characterised in that** the code is provided on a plastic card.

16. A printer according to any one of the previous claims, **characterised in that** the code controls the data communication of the printer means, e.g. the baud rate, or the number of bits, or the work settings of the printer means, e.g. print head temperature setting. 5
17. A printer according to any one of the previous claims, **characterised in that** the code constitutes a command for influencing the printing layout of the printer means. 10
18. A printer according to any one of the previous claims, **characterised in that** the code constitutes a command to an external computer. 15

Patentansprüche

1. Drucker (1), enthaltend eine Anordnung zum automatischen Einstellen der Druckerparameter, wobei der Drucker (1) aufweist:
- einen Druckmechanismus (2) und eine Steuereinheit (3) zum Erzeugen eines Ausdruckes auf einem Druckmaterial mittels eines Farbstoffes und weiterhin enthaltend zumindest eine Codeleseeinrichtung (4, 5), welche mit der Steuereinheit (3) zum Lesen eines Codes verbunden ist, um zumindest einen Parameter des Druckers (1) zu steuern, 25
- dadurch gekennzeichnet, dass** der Drucker eine externe Codeleseeinheit (4) enthält, die mit der Steuereinheit (3) zum Lesen eines Codes von einem Gegenstand verbunden ist, um zumindest einen Parameter des Druckers (1) zu steuern. 30
2. Drucker nach Anspruch 1, **dadurch gekennzeichnet, dass** eine Codeleseeinheit (4, 5) angeordnet ist, um Hochfrequenzetiketten oder Hochfrequenzlabels zu erfassen. 35
3. Drucker nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der Code mit dem Druckmaterial, dem Farbstoff oder einem Peripheriegerät des Druckers (1) oder mit einem Drucklayout verknüpft ist. 40
4. Drucker nach einem der Ansprüche 1, 2 oder 3, **dadurch gekennzeichnet, dass** die Codeleseeinheit (4, 5) eine optische Leseeinheit ist. 45
5. Drucker nach Anspruch 4, **dadurch gekennzeichnet, dass** der Code ein Barcode, ein Punktcod, ein Matrixcode oder ein Farbcode ist. 50
6. Drucker nach einem der Ansprüche 1, 2 oder 3, **dadurch gekennzeichnet, dass** die Codeleseeinheit (4, 5) eine magnetische Leseeinheit ist und dass der Code ein magnetischer Code ist. 55
7. Drucker nach einem der Ansprüche 1, 2 oder 3, **dadurch gekennzeichnet, dass** die Codeleseeinheit (4, 5) eine elektronische Einheit ist und dass der Code elektronisch lesbar ist.
8. Drucker nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** eine weitere Codeleseeinheit (5) in das Druckmittel integriert ist.
9. Drucker nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Code auf einem Druckmaterial oder einer Farbstoffpackung angeordnet ist.
10. Drucker nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Code auf einer Farbstoffwalze angeordnet ist.
11. Drucker nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Code auf einem Druckmaterial angeordnet ist.
12. Drucker nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** das Druckmaterial eine Rolle oder eine kontinuierliche Bahn ist.
13. Drucker nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Code auf einem separaten Blatt angeordnet ist.
14. Drucker nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Code auf einem Etikett angeordnet ist.
15. Drucker nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Code auf einer Plastikkarte angeordnet ist.
16. Drucker nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Code die Datenkommunikation des Druckmittels, beispielsweise die Baud-Rate oder die Zahl an Bits oder die Arbeitseinstellungen des Druckmittels, beispielsweise eine Temperatureinstellung für den Druckkopf steuert.
17. Drucker nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Code einen Befehl zum Beeinflussen des Drucklayouts des Druckmittels enthält.
18. Drucker nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Code einen

Arbeitsbefehl für einen externen Computer bildet.

Revendications

1. Imprimante (1) comprenant un arrangement de réglage automatique de paramètres de l'imprimante, comprenant un mécanisme d'impression (2) et une unité de commande (3) destinée à donner une épreuve sur un matériau d'impression à l'aide d'un colorant, et au moins un lecteur de code (4, 5) connecté à l'unité de commande (3) et destiné à lire un code de réglage d'au moins un paramètre de l'imprimante (1), **caractérisée en ce que** l'imprimante comporte un lecteur de code externe (4) connecté à l'unité de commande (3) pour la lecture d'un code placé sur un objet et pour le réglage d'au moins un paramètre de l'imprimante (1). 5
2. Imprimante selon la revendication 1, **caractérisée en ce qu'un** lecteur de code (4, 5) est disposé afin qu'il détecte des supports ou étiquettes actifs en hyperfréquences. 10
3. Imprimante selon la revendication 1 ou 2, **caractérisée en ce que** le code est associé au matériau d'impression, au colorant ou à un dispositif périphérique de l'imprimante (1), ou à une disposition d'impression. 15
4. Imprimante selon l'une quelconque des revendications 1, 2 et 3, **caractérisée en ce que** le lecteur de code (4, 5) est un lecteur optique. 20
5. Imprimante selon la revendication 4, **caractérisée en ce que** le code est un code à barres, un code à points, un code matriciel ou un code de couleur. 25
6. Imprimante selon l'une quelconque des revendications 1, 2 et 3, **caractérisée en ce que** le lecteur de code (4, 5) est un lecteur magnétique et le code est un code magnétique. 30
7. Imprimante selon l'une quelconque des revendications 1, 2 et 3, **caractérisée en ce que** le lecteur de code (4, 5) est une unité électronique, et le code est lisible électroniquement. 35
8. Imprimante selon l'une quelconque des revendications précédentes, **caractérisée en ce qu'un** autre lecteur de code (5) est intégré au dispositif d'imprimante. 40
9. Imprimante selon l'une quelconque des revendications précédentes, caractérisée en ce le code est disposé sur un matériau d'impression ou un conditionnement de colorant. 45
10. Imprimante selon l'une quelconque des revendications précédentes, caractérisée en ce le code est disposé sur un rouleau de colorant. 50
11. Imprimante selon l'une quelconque des revendications précédentes, caractérisée en ce le code est disposé sur le matériau d'impression. 55
12. Imprimante selon l'une quelconque des revendications précédentes, caractérisée en ce le matériau d'impression est un rouleau ou une feuille continue.
13. Imprimante selon l'une quelconque des revendications précédentes, caractérisée en ce le code est disposé sur une feuille séparée.
14. Imprimante selon l'une quelconque des revendications précédentes, caractérisée en ce le code est appliqué à une étiquette.
15. Imprimante selon l'une quelconque des revendications précédentes, caractérisée en ce le code est disposé sur une carte de matière plastique.
16. Imprimante selon l'une quelconque des revendications précédentes, caractérisée en ce le code règle les communications de données du dispositif d'imprimante, par exemple la fréquence en bauds ou le nombre de bits ou les réglages de travail du dispositif d'imprimante, par exemple un réglage de température de la tête d'imprimante.
17. Imprimante selon l'une quelconque des revendications précédentes, caractérisée en ce le code constitue une commande destinée à influencer la disposition de l'impression du dispositif d'imprimante.
18. Imprimante selon l'une quelconque des revendications précédentes, caractérisée en ce le code constitue une commande d'un ordinateur extérieur.

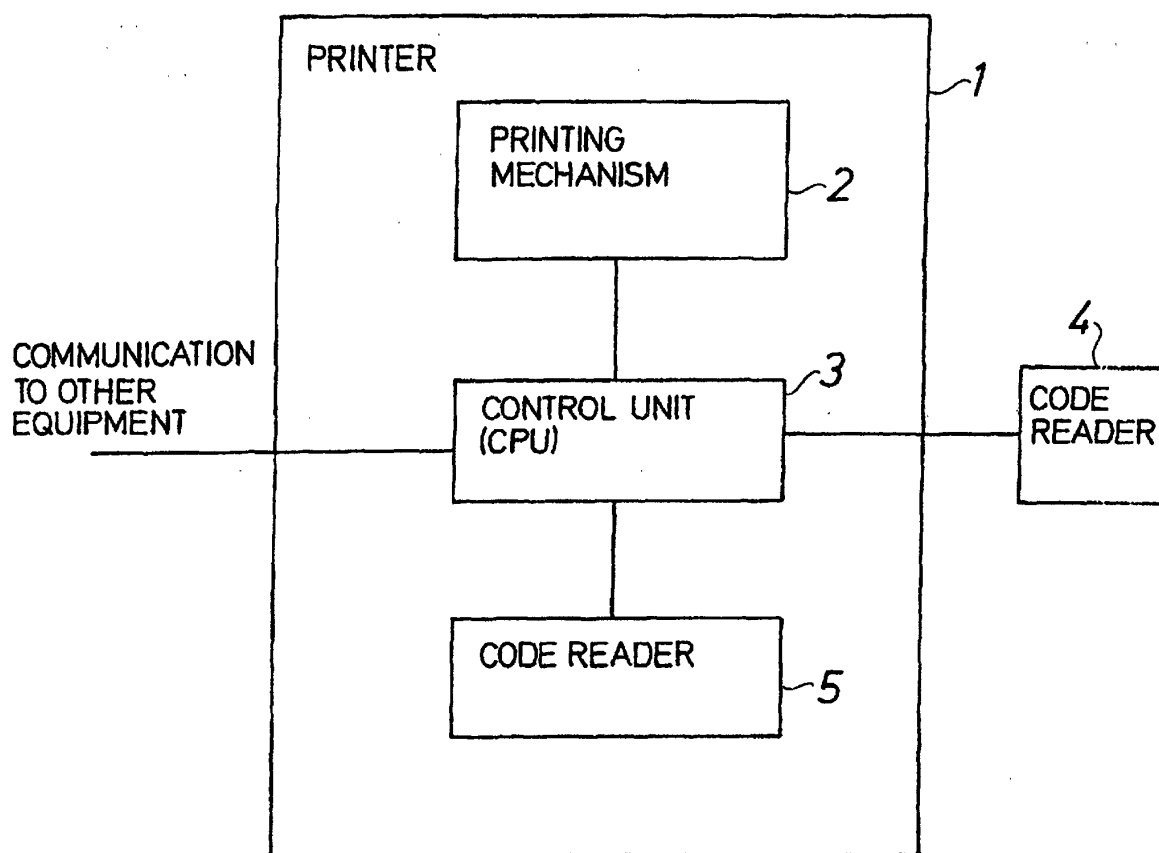


FIG. 1



FIG. 2

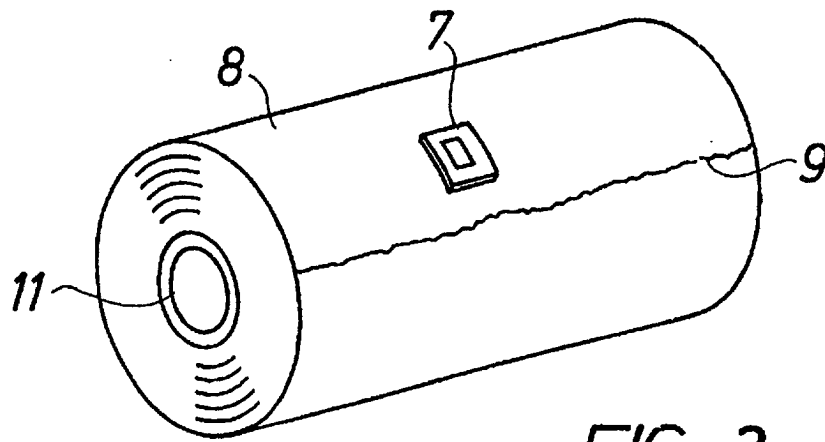


FIG. 3

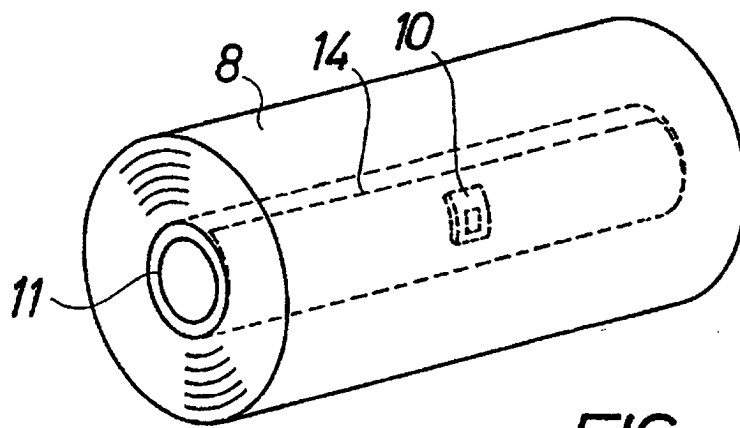


FIG. 4

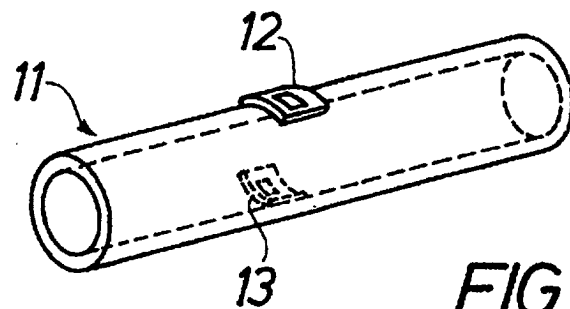


FIG. 5